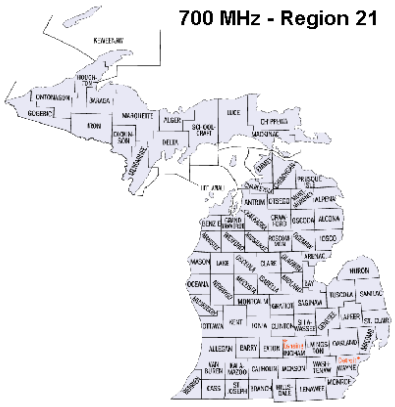


REGION 21 700 MHz PLANNING COMMITTEE

Joseph M. Turner, Chairman
2719 State Street
Saginaw, MI 48602
Tel 989 793-7373
e-mail: jturner@michiganpropertytax.com

January 23, 2008

Office of the Secretary
Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, SW,
Washington, DC 20554

Attention: Public Safety and Homeland Security Bureau

Re: Region 21 700 MHz Plan: WTB Docket 02-378 and PS Docket 06-229

Dear Ms. Dortch:

On behalf of all the members of Michigan's 700 MHz Regional Planning Committee (Region 21 RPC), I am pleased to submit the attached plan for coordination of 700 MHz frequencies.

We look forward to the FCC's review of the plan and would be pleased to respond to any questions you or the FCC staff may have. Feel free to contact me via any of the means listed in this letter of transmittal.

Yours truly,

Joseph M. Turner

Joseph M. Turner, Chairman
Region 21 700 MHz Planning Committee

cc: FCC Jeannie Benfaida,K. Bradshaw, P. Coates, members 700 MHz RPC and adjacent region RPCs

REGION 21

700 MHz PUBLIC SAFETY BAND

REGIONAL PLAN

REGION 21 PLANNING COMMITTEE

Chairman:	**Joseph M. Turner**
Vice Chairman:	**Dale Berry**
Secretary:	**Keith M. Bradshaw**
Treasurer:	**Patricia Coates**
Convener:	**Richard DeMello**

Submitted for FCC Review - January 2008

DEDICATION

The Region 21 700 MHz Plan is hereby dedicated to Richard S. DeMello, our original Convener and William Folske, the Plan's Vice-Chairman. Both were exceptional contributors who unfortunately, died prior to its formal approval.

SPECIAL THANKS

This is a Plan that provides for a strong and more reliable telecommunication network to assist units of government and public safety professionals. It is they who provide first responses to the approximately ten million people living in the state of Michigan and protect more than thirty-five trillion dollars of property value. The safety of first responders and those they've been sent to help, in a great part, depends upon a reliable and modern communication system. The creation of a workable telecommunication plan utilizing contemporary technology, and providing wisely for future change, is no small under taking. This Plan developed over eight years.

Over the course of those years, there were those whose dedication and effort to bring this Plan to fruition were exceptional. Fairness dictates that Patricia Coates (RPC Treasurer) and Keith Bradshaw (RPC Secretary) be recognized for their contributions as leaders. They held their offices during the entire eight years, kept this document on track and helped the committee persevere during changes in regulations that had to be navigated. Their record keeping and mailings provided essential records. The Committee's efforts were supported by Ms. Joy Alford and Jeannie Benfaida of the FCC who were most gracious in their advice and guidance. Mr. Dave Held brought the Committee insights from more than 50 years of telecommunication experience. Finally, Mr. Karl Beckman should receive special recognition for the time and effort he put into assembling individual documents and transferring them into a portable format for easy exchange.

Special note should also be made of the Chairpersons of the Regions lying adjacent to Region 21. They, and in some cases their predecessors, came to our meetings or conferenced with us via telephone or shared concerns and offered assistance during the development of this plan. You will find the signatures of the Chairpersons of Regions 14, 33, 45 and 54 affixed in Appendix X.

Documentation illustrates that almost 300 persons were contacted or somehow participated in discussion or e-mails or some other form of interaction during the eight years this plan was developed. Outstanding among them were the few scores of individuals who formed the membership of the 700 MHz Regional Planning Committee. With the limited space of one page, it would be imprudent to attempt to name all of them now. Nevertheless, they played important roles in the development of the Region 21 700 MHz Plan and it breaks my heart not to be able to set each contributor before you for recognition.

The reader is asked to review the list of Committee members in Appendix A. Each and every one of the persons listed contributed in an important way or ways to this Plan's development. Some engaged in knowledgeable and civil debates, formulating written concepts codified within the Plan. Others distributed important documentation which may have been included within the Plan. All played important rolls and we thank them.

On behalf of the Region 21 700 MHz Planning Committee:

Joseph M. Turner

Note: As indicated herein, This submission contains elements unchanged from the original 2006 submission

The Region Twenty-One 700 MHz Plan

APPENDICES

A - Regional Plan Officers and membership lists
B - Membership application and list of documented participant/contacts
C - Region map and listing of Michigan cities
D - Region Bylaws
E - Notification Information: General meeting notices, agendas and special notices
F - Minutes of the meetings and sign-in sheets
G - Plan submittal requirements, co-channel assignments and return to pool
H - Regional Plan appeal process
I - Field strength measurements
J - Pre-assignment rules - Interoperability channels/requirements
K - Funding request document
L - Population and value of protected property documentation
M - Application and competing application matrix
N - Spectrum Allocations and map with protection zones
O - NPSTC spectrum management reference
P - MOU template and sharing agreement template
Q - NCC Planning Documents and SIEC reference
R - Regional survey document and membership application
S - Interference Information
T - DTV transitions
U - MPSFAC Committee Structure
V - Existing interoperability agreements and rules
W - Certification of open meetings
X - Signed concurrence documents and signed Dispute Resolution Agreements
Y - Acronyms Used in this Document

The Region 21 700 MHz Plan

SCOPE

Introduction

This is the second major planning thrust for Region 21. The first was to meet the Federal Communications Commission (FCC) requirements for the NPSPAC spectrum. This planning thrust was precipitated by the establishment of the 700 MHz public safety band.

The FCC announced the allocation of 24 MHz in the 700 MHz radio spectrum subsequent to the Public Safety Wireless Advisory Committee (PSWAC) report that established need requirements throughout the country. Interoperability within and among public safety and public service providers was identified in the PSWAC report as a basic minimum essential requirement.

Subsequent to the PSWAC the FCC established a Federal Advisory Committee called the National Coordination Committee (NCC). The NCC was created to address interoperability, technology, and implementation issues to be considered for the 700 MHz spectrum. The FCC required that a Regional Plan outlining the use of public safety radio frequencies be complete and approved of by the FCC before any agency within a region would receive channels from this new allocation. The Regional 21 Plan conforms to the NCC planning guidelines. The Region 21 committee's membership represents a cross-section of public safety and public service users. A Region Planning Committee membership list is contained in Appendix A.

Purpose

The purpose of the Regional Plan is to insure that maximum public benefit is derived from use of the 700 MHz spectrum by eligible agencies. Further, the plan was developed to guide eligibles through the application process and provide an equitable means of settling disputes concerning frequency allocations should they arise.

Plan Summary

First, Region 21 is defined as the entire State of Michigan. The broad classifications of entities eligible to apply for spectrum are defined in accord with NCC definitions. Next, to garner their participation in and support of the planning process, an attempt was made to contact all eligible agencies. These attempts are documented. The authority by which the Regional Planning Committee undertook these planning efforts is reviewed. A discussion follows of the process by which the initial spectrum allocation was made. Finally, a detailed discussion of the application process is given. This includes guidelines for spectrum use, application requirements, the application review process and dispute resolution. Also included is a discussion of the future planning process.

The Region 21 Committee accepts the Computer Assisted Pre-Coordination Resource and Database (CAPRAD) database initial allocation based on population density and call volume by county. It has been noted by the committee that this allocation closely matches the description of Designated Statistical Areas by the US Department of Management and Budget Bulletin 03-04 of June 6, 2003. See Appendix L. The Committee will use the CAPRAD database when allocating frequency resources in Region 21. Use of allocated frequencies in counties “north of Line A” are subject to international treaty obligations. Please see Title 47 Code of Federal Regulations Part 90.7 for the definition of Line A.

Interoperability guidelines and usage must be in accordance with the requirements of the State Interoperability Executive Committee (SIEC). Any conflict between the I/O rules for National Calling and Tactical channels in this plan and SIEC guidelines, the SIEC guidelines will prevail.

Television broadcasting activity is currently limited to approximately the southern half of the Region. Therefore, until February 18, 2009, assignments in certain aras of the state on channels where interference issues are anticipated will be made on the basis of the guidelines laid out in National Coordinating Committee (NCC) planning documents (see Appendix T). Frequency assignments which are secondary to Public Safety operations, such as television translator, Low Power TV stations, or other secondary assignments will not be granted interference protection. Licensees of transmitters located within the state of Michigan were notified of the last Public Hearing prior to finalization of the Plan. They will be notified again when the FCC has approved the Region 21 Plan, and a final time when applications for frequency assignment within the station's coverage area are received by the Region.

Region 21 Defined

Region 21 consists of the entire state of Michigan[1]. The total area is 56,809 square miles. The value of all taxable property in Region 21 in the year 2003 was estimated as Seven Hundred Thirty Nine Billion, Fifty Million, Ninety Four Thousand, Six Hundred Fifty Four dollars ($739,050,594,654). The population of this region is 9,938,444 based upon the 2000 US Census (Appendix L), a 6.9% increase since 1990. This Regional plan will consider the communication needs of all agencies currently eligible in the FCC Public Safety pool (PW). No other agencies within Region 21 that we are aware of have developed 700 MHz band plans.

[1] At the April 15,2001 planning committee meeting pursuant to FCC notice DA 01-58 of January 10,2001, the committee discussed modification of the region 21 boundaries. After consultation with region 54, the planning committee informed the FCC of its desire to modify region 21 boundaries to include the entire state of Michigan.

Definition of Eligible Entities

Eligible agency users are defined by the Public Safety Wireless Advisory Committee (PSWAC) and NCC as follows: Public safety – the public's right, exercised through Federal, State or Local government as prescribed by law, to protect and preserve life, property, and natural resources and to serve the public welfare. Public safety services – those services rendered by or through Federal, State or Local government entities in support of Public Safety duties. Public safety services provider – governmental and public entities or those non-government, private organizations, which are properly authorized by the appropriate governmental authority whose primary mission is providing Public Safety duties. Public services – those services provided by non-Public Safety entities that furnish, maintain, and protect the nation's basic infrastructures which are required to promote the public's safety and welfare.

Meetings, Public Notices and Meeting Attendance

A diverse group of individuals and agencies were invited to participate in the development of the Regional Plan. Notification was accomplished by LEIN, US mail, web page postings and e-mail sent to public safety and public service organizations and to organizations representing eligible agencies. In addition, Federal, State, Local, and Tribal government agencies concerned with National Security and Emergency Preparedness were contacted. Appendix B contains the notification list, Appendix E contains the initial convening information and Appendix F contains the minutes of the meetings. All Region 21 RPC meetings are open to the general public, as certified in Appendix W.

AUTHORITY

Regional Planning Committee Authority

Authority for the Regional Planning Committee to carry out its assigned tasks is derived from the Federal Communications Commission (FCC) Report and Order, Docket 96-86. The by-laws for Region 21 are contained in Appendix D of this plan.

National Interrelationships

The Region 21 700 MHz Plan conforms to the NCC planning documents. If there is a conflict between this plan, the NCC documents, or the FCC rules, the FCC rules will prevail. It is expected that Regional Plans for other areas in the country may differ from this plan due to their local needs. By officially sanctioning this Plan, the FCC agrees that it conforms to the NCC and FCC planning requirements. This Plan is not intended to conflict with the proper functions and duties of the frequency coordination entities in the Private Land Mobile Service. The Region 21 Plan provides procedures that are the consensus of the group of individuals involved in its development over several years. If there is a perceived conflict, the judgment of the FCC will prevail.

SPECTRUM ALLOCATION

Usage Guidelines

Systems operating in the Region must comply with all applicable FCC rules and regulations and the requirements of this Plan. Applications for the purpose of expanding exisiting systems will NOT be given consideration unless the applicant can demonstrate that the existing system is loaded to the criteria contained in this Plan.

Adjacent Region Coordination

Any applicant requesting frequency allocation(s) within 113 km (70 miles) of the border between Region 21 and the adjoining regions (including Region 54) must be coordinated with the effected adjoining Region. Applicants will be required to file identical applications with the Region 21 committee and the committee of the region or regions adjoining the proposed stations.

Application Requirements

This portion of the plan provides a basis for proper spectrum utilization. Its purpose is to evaluate the implementation of 700 MHz radio communication systems within the Region. Any applications for spectrum must be submitted after the date this plan is approved by the FCC and will be processed in the order they are received.

Agencies that desire spectrum must submit a complete application containing various documents as listed in Appendix G. The applicant may need to include a system design that incorporates base stations for use on the interoperability channels. This will be dependent upon the hierarchy of levels of government as listed on page 11, the geographic coverage of the proposed system, or the pre-existence of any other 700 MHz applications or systems in the same geographic area. Evaluation of applications for available spectrum is accomplished during the regularly scheduled MPSFAC meetings.

Applicants are encouraged to join larger existing systems whenever possible, or to form consortiums with neighboring agencies to create spectrum efficient new systems. As the 700 MHz spectrum is allocated, applicants for new systems surrounded by or adjacent to existing systems may be required to document as part of the application process the technical, functional, financial, or political reasons joining the existing system does not meet their requirements.

Interoperability

Interoperability between Federal, State and Local Governments during both daily and emergency and disaster operations will primarily take place on the interoperability channels. These channels are identified in this and the National Plan. Additionally, through the use of an S-160 or the MOU (see Appendix P) or equivalent agreements, a licensee may permit Federal use of non-Federal communications system spectrum.

Interoperability Requirements

All applicants shall submit an Interoperability Plan with their application. In this plan, the applicant shall:

A) identify the organizations with whom interoperable communications are to be achieved, and

B) stipulate how they will accomplish interoperable communications in their proposed system (for example, via gateway, switch, cross-band repeater, console cross patch, software defined radio, or other means) with the agencies listed in A as well as for each of the following priorities:

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 and including task force operations.)

Through proper consideration, design, and implementation, the best possible interoperability will be achieved.

Interoperability Responsibilities

Responsibility for the implementation of operation on the interoperability frequencies rests with:

1 The highest level of government submitting an application within or encompassing a given geographical area, or
2 The applicant whose proposed system coverage encompasses the largest geographical area, or
3 The first or “lead” agency in a multi-agency environment using 700 MHz frequencies in a given geographic area.

The hierarchy of levels of government shall be as follows:

1. The State of Michigan
2. Regional Consortiums or Multi-county systems
3. County systems
4. Multiple city, village or township Consortium systems
5. Single city, village, township or other eligible system

For Region 21, the largest geographic area and the highest level of government is the State of Michigan. Should the State of Michigan apply for a statewide 700 MHz system on channels outside the state channel block, their application must show the inclusion of interoperability frequencies according to state and regional area requirements. Otherwise, the next largest jurisdiction to apply must include provisions for wide area operation on the interoperability frequencies throughout their coverage area and so forth. System implementations must provide interoperability between area wide agencies as mandated by this plan. Such implementation must be reviewed and approved by the State Interoperability Executive Committee (SIEC) and Region 21.

Incident Command System Standard

Region 21 supports NCC recommendations regarding the National Incident Management System (NIMS) and ICS.

Coverage and Interference

Systems are to be designed and protected in accordance with the methods given in TIA/EIA Telecommunications Systems Bulletin TSB-88A and its addendums. Required engineering submittals are listed in Appendix G. Applicants which demonstrate compliance with 40 dB curve standards shall be deemed to have complied with the coverage requirements of this plan. Where a question of compliance arises, applicants shall demonstrate to the committee that they are in compliance with the applicable portions of TSB-88A and its addendums.

Those systems that are designed to provide "wide area" coverage must demonstrate their need to require such coverage. Communication coverage beyond the bounds of a jurisdictional area cannot be tolerated unless it is critical to the protection of life and property. Otherwise, strict criteria for limiting area of coverage to the boundaries of the applicant's jurisdiction must be observed. Overlapping or extended coverage must be minimized, even where "intermixed" systems are proposed 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 placed on the "high ground," reduced transmitter output ERP limits and special antenna patterns must be employed to produce the necessary coverage within and confined to the protected service area.

Interference complaints will be addressed in cooperation with the appropriate FCC certified frequency coordinators. In the event that the Committee determines adjacent channel interference is likely, the applicant will be required to provide the appropriate technical data in accord with the NCC Implementation Sub-Committee Simplified 700 MHz Pre-Assignment Rules Recommendation pp 132 - 134 (see Appendix Q). The Committee may require additional technical exhibits and documentation in order to conduct a full and proper evaluation of the complaints.

TV/DTV Protection

Analog television operations exist on some of the NTSC channels 60 through 69 in Region 21. Two areas of the region, Detroit (WWJ-TV 62) and Kalamazoo (WLLA -TV 64) are currently entitled to protection as primary TV operations until February 18, 2009. All other stations within the Region are televison translators or Low Power (LP) stations and are secondary to Public Safety operations. Some primary television assignments in IL, IN, OH, and WI may also be entitled to receive protection until February 18, 2009.

Applicants desiring to utilize channels prior to February 18, 2009 which are presently affected by incumbent Primary TV stations are required to protect these incumbents by:

a) utilizing geographic separation specified in the 40 dB Tables of 90.309, or

b) submitting an engineering study justifying other distance separations which the FCC approves, or

c) obtaining concurrence from the applicable TV station (see Appendix T).

Loading

Per-channel block loading requirements are given in Appendix G.

Channel Reuse

All necessary precautions will be taken to gain maximum reuse of the limited 700 MHz spectrum. The distance between transmitters for co-channel reuse will be determined through the use of TR 8.8 standards. Consideration will be given to the coverage needs of the applicant, natural barriers for separation, antenna patterning, and limiting ERP where possible. System tests and/or propagation studies should be provided to establish minimum distances for separation.

The Regional Committee shall be responsible for reviewing the engineering submittals on an application. Applicants will submit additional relevant documents to the FCC certified coordinators as the MPSFAC deems necessary.

Reassignment of Existing Frequencies

Applicants shall furnish the committee with a list of agencies transitioning to the 700 MHz system. At the time of application, the applicant must provide a Letter of Intent listing all frequencies per agency to be relinquished if 700 MHz allocations are granted and an anticipated date the frequencies will be relinquished. This document will be submitted as a condition of license grant by the FCC. At the time the applicant files a Construction Completion Notification and /or final Slow Growth Imp[lementation Report with the FCC, a copy of these documents shall immediately be provided to the Michigan Public Safety Frequency Advisory Committee. When the transition to the 700 MHz band has been completed, the VHF and UHF frequencies presently licensed to an applicant and listed for relinquishment shall be returned to the frequency pool for reassignment.

However, the Committee recognizes that it may be necessary for an applicant to maintain certain operations on legacy systems. Therefore, applicants desiring to maintain such legacy operations must submit a request to retain each existing frequency in writing. This request must specify the current as well as the future use of the requested legacy frequency.

Frequencies not approved for retention will be returned to the pool by cancellation of those frequencies from the appropriate FCC license(s). It shall be the responsibility of the licensee to cancel all frequencies not approved for retention from their FCC Licenses. Normal application and coordination procedures will be followed with returned channels.

It is not consistent with the goals and objectives of this Region to permit the direct reassignment of radio frequencies between agencies. Similarly, agencies shall not "farm down" or otherwise make frequencies available to other radio services within their political structure.

Channel Assignment

The applicant evaluation criteria established in the NCC process and further defined in this Regional plan are to be complied with. In cases where more than one applicant requires a specific allotment, the Competing Application Evaluation Matrix will be utilized to determine the successful applicant. In all cases, area of coverage criteria, technical requirements, and channel loading criteria will be applied, except upon unique circumstances after review and approval from the MPSFAC. No deviation from FCC rules is to be approved unless a fully justifiable waiver has been presented to the MPSFAC.

Expansion of Existing NPSPAC Systems

Existing NPSPAC systems that are to be expanded to include the frequency bands of 700 MHz will have to separately meet the requirements of the Region 21 plans on each band. They must maintain compliance with the NPSPAC plan and the 700 MHz plan also.

FREQUENCY ALLOTMENT METHODOLOGY

Allotment Process

The Region 21 700 MHZ Planning Committee accepts the NLECTC database as the official allotment for Region 21. See Appendix O for explanation. The sorted channel assignments by county are given in Appendix N.

Application Review

The flow chart entitled "Application Review Matrix" presents the sequence of events that will be followed in the allocation of the 700 MHz spectrum. The flow chart may be found in Appendix M.

Applications are received and reviewed by the MPSFAC (Block #I & II). If the application is not in compliance with SIEC requirements (Block #III) and Regional Plan requirements, the application will be rejected at this point and returned to the applicant with an explanation of the reason(s) for rejection. If there are no competing applications to be considered, the application will be populated with channels and be forwarded to the frequency coordinating body of choice (Block #V and beyond). The Competing Application Evaluation Matrix will be used when competition for spectrum arises.

Competing Application Dispute Resolution

The implementation of the Competing Application Evaluation Matrix (see Appendix M) will result in the award of a score for each application. The application score is the total number of the points awarded in eight categories. The applicant with the highest total score will have their application processed and supported for frequency coordination. Others will be returned to the applicant if no spectrum is available. The eight categories are as follows:

1. Service and Use (Block #1) – maximum score 360 points. Each of the eligible services, and each use, has a predetermined point value. Total points for this block will be the sum of the point assignments for each service and use the system is to support.

SERVICE	Points
Federal	24
Tribal Nation	24
State	24
Local Gov	24
Police	24
Special Emerg./EMS	24
Emergency Management	24
Fire	24
Forestry Consv.	24
Highway Maint.	24
USE	
Rescue	40
Safety of Life and Property	40
Environmental Protection	40
Maximum Total	360

Environmental protection shall be considered tasks that directly reduce any contamination to the air, water or ground by chemicals or waste materials.

2. Interoperability Diversity (Block #2) – maximum score 100 points.

The application is scored on the degree of interoperability that is demonstrated, with range of points from 0 to 100. This category does not rate the application on the inclusion of the mandated interoperability channels. This category does rate the application on its proposed ability to communicate with different levels of government and services during times of emergency.

Each applicant is encouraged to have direct mobile-to-mobile communications among the Federal, State, and Local Government, Tribal Nations, police, special emergency-EMS, fire, forestry conservation and highway maintenance radio services. All applications start with 100 points and points are deducted based upon their lack of intersystem communications.

Deducts

Deduct 10 points for each radio service type function in which the applicant lacks communication at the operator position via console patch or other means, when direct mobile-to-mobile communication does not exist. Radio services type functions are stated above.

Deduct five points for each radio service that the applicant lacks direct mobile-to-mobile communications with. Radio services type functions are stated above.

3. Cooperative Use (Block #3) – maximum score 150 points. Those applications that have demonstrated that they are part of cooperative, multi-organization systems will be scored depending upon the extent of the cooperative system.

System Points

Multi agency trunked system fully loaded	150
Trunked system fully loaded/channel	100
Conventional system fully loaded/channel	75

Expansion of Existing Systems

As it is the intent of this plan to promote cooperative use of the spectrum, expansion of an existing system will be given greater competitive weight than a competing new system. Therefore, the point award from the aforementioned category will be doubled as,

System Points (from previous category) X 2 = Score.

4. Spectrum Efficient Technology (Block #4) maximum score 125 points.

This category scores the applicant on the degree of spectrum efficient technology that the system demonstrates. A point value range of 0 to 100 points can be awarded for this category. Technologies that are designed to provide for more efficient spectrum use shall be awarded twenty-five (25) additional points.

Spectrum Efficiency Points.

Description	Points
Trunked System, voice only on narrow channels	50
Trunked System, voice and data or equally efficient Technology	100
Conventional System using MDT on wide channels	50
Technologies that result in increased system throughput	add 25

5. This section (Block #5) gives municipalities consideration for the impact of urban sprawl. If they have recently established or plan to establish a public safety agency with approved funding and they do not yet have any radio frequencies allocated, they will receive 150 points.

Applicants requesting initial radio frequency(ies) for the purpose of communicating vital voice messages.	150

6. Systems Implementation Factors (Block #6) – maximum score 100 points.

This category scores the applicant on two factors, budgetary commitment and planning completeness. The degree of budgetary commitment is scored on a range of 0 to 50 points. An applicant who demonstrates a high degree of commitment in funding the proposed system will receive the higher score. Each applicant will be scored on the degree of planning completeness with a range of scoring from 0 to 50 points. Applicants will be required to submit a timetable for the implementation of the communications system or systems.

Description	Points
Multi Phase Project with the applicant committing funds to all phases.	50
Multi phase project plan completed for all phases	50

Applicants with less than a complete funding commitment and/or incomplete plan will have their point score reduced accordingly. Resolutions shall be included in each plan stating the applicants governing boards (or equal) financial commitment.

7. System Density (Block #7)

Each applicant will be scored on the ratio of subscriber units to the area covered.

System Density Points

(Total number of subscriber units) / (Area in square miles) x 100 = score.

8. Givebacks or relinquished Frequency(ies) (Block #8) – maximum score 200 points. The applicant is scored on the number of channels given back. The greater the number of channels given back, the higher the score.

Scoring: Number frequencies to be Relinquished x 10 = Score

Points are totaled for each competing application (Block #SUM).

The competing applications are prioritized based on the total number of points each has received in the evaluation process. The application with the higher score will then proceed with the approval process. The application with the lower score will be returned to the applicant. The applications (Block #VI) are sent to the PW coordinated requested by the applicant. Subsequent to coordination approval (Block #VII) the FCC would grant the license(s) to the applicant (Block #VIII).

This plan has been prepared to enable consistent evaluation of competing applications. Variation within the parameters of this plan and submitted application and/or plans may require extensive evaluation. Therefore the MPSFAC shall evaluate each plan or situation on its own merit, as well as on a relative basis to other competing applications.

REGIONAL COMMITTEE

The Michigan Public Safety Frequency Advisory Committee shall be responsible for the frequency coordination of the application. This shall include making a determination about the engineering of the system, ERP, coverage, and compliance with FCC requirements.

System Implementation

Should system implementation not begin (award of contract) within a two-year period or if projected channel loading is not attained within four years after the granting of license(s), the channel(s) will be returned for reassignment to others. A one-year extension may be supported by the MPSFAC depending upon circumstances that are beyond the control of the applicant. The applicant will be responsible to contact the FCC to request an extension from the Commission. Any applicant must be doing all in their power to implement the project within their authority.

The MPSFAC will determine if progress is being made on the implementation of the system (Block #IX & X). Monitoring of systems implementation by the MPSFAC will take place at intervals not longer than one-year. If progress is made, the system is implemented (Block #XI). If progress is not made, the licensee is advised of the consequences and the MPSFAC informs the PW frequency coordinator of the situation (Block #XII). The MPSFAC continues to monitor progress on the implementation of the system (Block #IX). If progress is still not being made in the next evaluation period, the licensee is notified of the pending action of the MPSFAC to advise FCC of lack of progress (Block #XIII).

The notified licensee can appeal this action (Block #XIV) or can allow the license to be cancelled or withdrawn. If the authorized frequencies are withdrawn they are added back to the frequency allotment pool (Block #XVI).

Appeal Process

Throughout the application review and frequency allotment process, applicants are given opportunities to appeal decisions that have caused the rejection of their application. The appeal process has two levels: the MPSFAC and the FCC. An applicant who decides to appeal a rejection should initiate that appeal within ten (10) business days after receiving the decision. In the event that an appeal reaches the second level, the FCC, the FCC decision will be final and binding upon all parties. The Region 21 appeal process is contained in Appendix H.

Future Planning Process

The Michigan Public Safety Frequency Advisory Committee (MPSFAC) shall serve as the Plan Update Committee. This committee's responsibility is to recommend changes in the Plan and resolve interregional problems that may arise. The MPSFAC shall also be responsible for receiving, reviewing, considering, and acting on applications as well as updating the database for spectrum in the 700 MHz band. The CAPRAD Administrator and Alternate Administrator will each be members of the MPSFAC committee with voting privileges. MPSFAC committee structure and routine duties are contained in Appendix U.

APPENDIX A - REGION 21 700 MHz PLAN

This Appendix Contains

1. A listing of the current officers of the Region 21 RPC

2. Documentation of the identity of Committee Members

Historical Accounting of 700 MHz RPC Officers

October 12, 2000	Organization formalized and following officers are installed
	Andre T. Brooks, Chairman Stephen Todd, Vice Chairman Patricia Coates, Treasurer Keith Bradshaw, Secretary
January 31, 2001	Stephen Todd assumes duties as “Acting Chairman”
April 25, 2001	Stephen Todd elected as Chairman Joseph M. Turner, elected as Vice Chairman
July 1, 2001	Joseph M. Turner, assumes duties of “Acting Chairman”
August 1, 2001	Joseph M. Turner, elected as Chairman William Folske, elected as Vice Chairman
September 14, 2004	Dale Berry, elected as Vice Chairman to replaced deceased Vice Chairman

700 MHz RPC Officers as of January 7, 2008

Joseph M. Turner,	Chairman
Dale Berry,	Vice Chairman
Patricia Coates,	Treasurer
Keith Bradshaw,	Secretary

Initial

700 MHz Membership List

Name	Agency	Address	Phone	Fax	E-mail	
Alger, Dean A.	Alger Communications, Inc	4290 Cascade Road SE Grand Rapids, MI 49546	(616) 954-9000 pager (616) 564-3322	Office fax (616) 954-9001 Home fax (616) 897-3179	algercomm@aol.com	Gov agency
Altland, Thomas	Mason Oceana-911	PO Box 27 Hart, MI 49420	(231) 873-8868	(231) 873-0095	mo911@voyager.net	Gov agency
Andrus, Robert	City of Dearborn	16087 Michigan Ave Dearborn, MI 48126	(313) 943-2082	(313) 943-3055	bandrus@ci.dearborn.mi.us	Gov agency
Betz, Dennis	Washtenaw Central Dispatch	2201 Hogback Rd Ann Arbor, MI 48105	(734) 971-8400 ext. 1298	(734) 971-7296	betzd@co.washtenaw.mi.us	Gov agency
Bradshaw, Keith	Macomb County	21930 Dunham Mount Clemens, MI 48048	(810) 469-6433	(810) 783-0957	macrad@libcoop.net	Gov agency
Coates, Patricia	Oakland County	1200 N Telegraph, 49W Pontiac, MI 48341-0421	(248) 452-9947	(248) 452-9128	coatesp@co.oakland.mi.us	Gov agency
DeMello, Richard	Retired DNR	536 Lyons Rd Portland, MI 48875	(517) 647-4630	(517) 373-8048	demellor@power-net.net	Gov agency
Folske, William	APCO Frequecy Adv	1235 S Maple #102 Ann Arbor, MI 48103	(734) 741-1346	(734) 741-1846	wfolske@worldnet.att.net	Co. that provides public safety
Grant, John H.	Lansing School District	Dept. of Public Safety 519 W Kalamazoo St Lansing, MI 48933	(517) 325-6125	(517) 325-6129	jgrant@lsd.k12.mi.us	Gov agency
Ogden, Bob	DNR	7th Floor Mason Bldg PO Box 30711 Lansing, MI 48909	(517) 373-2172	(517) 373-8048	ogdenr@state.mi.us	Gov agency
Rutare, Louis	DNR	7th Floor Mason Bldg PO Box 30711 Lansing, MI 48909	(517) 335-4597	(517) 373-8048	rutarel@state.mi.us	Gov agency
Swenson, Craig	Washtenaw Central Dispatch	2201 Hogback Rd Ann Arbor, MI 48105	(734) 971-8400 ext. 1297	(734) 971-7296	swensonc@co.washtenaw.mi.us	Gov agency

APPENDIX A

Initial Membership List

Thomas, Erica	DNR	7th Floor Mason Bldg PO Box 30711 Lansing, MI 48909	(517) 373-8048	(517) 373-8048	thomasem@state.mi.us	Gov agency
Turner, Joe	Retired	520 Jameson St Saginaw, MI	(517) 797-3816		turnerj@juno.com	Non-public safety
Uslan, Rick	Motorola	925 Alexandria Dr Lansing, MI 48917	(517) 323-9770	(517) 321-2382	R.Uslan@motorola.com	Co. that provides public safety
Warner, Harry	MSP	Communications Division 4000 Collins RD PO Box 30631 Lansing, MI 48909-8131	(517) 336-6623		warnerh@state.mi.us	Gov agency

Region 21 700 RPC Membership List 2006						
Name	**Agency**	**Address**	**Phone**	**Fax**	**E-mail**	**Agency Type**
Adamczyk, Gene	State of Michigan	4000 Collins Road Lansing, MI 48933				State Police
Alger, Dean A.	Alger Communications, Inc	4290 Cascade Road SE Grand Rapids, MI 49546	(616) 954-9000 pager (616) 564-3322	W (616) 954-9001 H (616) 897-3179	algercomm@aol.com	Vendor
Aprill, Brian	State of Michigan		(517) 336-6212			State Gov
Altland, Thomas	Mason Oceana-911	PO Box 27 Hart, MI 49420	(231) 873-8868	(231) 873-0095	mo911@voyager.net	911 Center
Andrus, Robert	City of Dearborn	16087 Michigan Ave Dearborn, MI 48126	(313) 943-2082	(313) 943-3055	bandrus@ci.dearborn.mi.us	Radio Maint.
Beckman, Carl	Motorola	12955 Snow Rd Parma, Ohio 44130	(216) 265-2092			Vendor
Beltinch, Richard	GTE				ricbelt@gte.net	Vendor
Bengry, Mark	Veterans Affairs	2215 Fuller Road Ann Arbor, MI 48105	(734) 761-7772			Veterans
Berry, Dale	Huron Valley Ambulance	2215 Hog Back Ann Arbor, MI 48105	(734) 776-6262	(734) 971-4385	dberry@hva.org	non-profit agency
Betz, Dennis	Washtenaw Central Dispatch	2201 Hogback Rd Ann Arbor, MI 48105	(734) 971-8400 ext. 1298	(734) 971-7296	betzd@co.washtenaw.mi.us	911 Center
Bevns, Ron	Monroe Co. Central Dispatch	100 E Second Monroe, MI 48184	(734) 243-7052	(734) 241-5820		911 Center
Bouma, Larry					boumal@iserv.net	
Bradshaw, Keith	Macomb County	21930 Dunham Mount Clemens, MI 48048	(810) 469-6433	(810) 783-0957	Keith.Bradshaw@macombcountymi.gov	Radio Maint.
Brooks, Andre T.	Detroit Police Department	Belle Isle Radio Detroit, MI 48207	(313) 596-5775	(313) 596-5793	atbrooks@flash.net	Radio Maint.
Brozewski, Gary					bro911bro@hotmail.com	
Chadwick, Karen	Ingham County 911					911 Center
Charon, William	Ionia County 911				bcharon@ioniacounty.org	911 Center
Coates, Patricia	Oakland County	1200 N Telegraph, 49W Pontiac, MI 48341-0421	(248) 452-9947	(248) 452-9128	coatesp@co.oakland.mi.us	IT
Collins, Lloyd	South Lyon PD	219 Whipple South Lyon, MI 48175	(248) 437-1773	(248) 437-0459		Police
Corbett, William J.	Port Huron PD	180 W. Mcmorran Port Huron, MI	(810) 984-7108	(810) 987-9860		Police
Crichton, Jim	Lapeer County				jcrichton@mail.lapeer.lib.mi.us	911 Center
Dashney, Mack	Lansing School District	Dept. of Public Safety 519 W Kalamazoo St Lansing, MI 48933	(517) 325-6105		mdashney@lsd.k12.mi.us	Education
DeMello, Richard (D)	Retired DNR	536 Lyons Rd Portland, MI 48875	(517) 647-4630	(517) 373-8048	demellor@power-net.net	Convener
DeMeester, Joe	St. Clair Shores PD	27665 Jefferson St. Clair Shores, MI 48081	(586) 445-5320			Police
Dundas, Dan	M/A-COM					Vendor
Eader, Douglas	Oakland County Sheriff				eaderd@co.oakland.mi.us	Police
Eichenberg, Al	State of Michigan DIT	4000 Collins Road Lansing, MI 48909	(517) 333-5020			MPSCS
Enderle, Craig	Huron County Central Dispatch					911 Center
Enright, John	Buford Goff & Associates	1331 Elmwood Ave. Columbia, SC 29201	(803) 254-6302	(803) 771-6142	johne@bgainc.com	Consultant
Fayling, Lloyd	Genesee Co. 911	4481 Corunna Flint, MI 48532	(810) 732-4720	(810) 732-7986	lrf911@voyager.net	911 Center
Folske, Doris	Ass. APCO Freq. Advisor	1235 S Maple #102 Ann Arbor, MI 48103	(734) 741-1346	(734) 741-1846	wfolske@worldnet.att.net	
Folske, William (D)	APCO Frequency Adv	1235 S Maple #102 Ann Arbor, MI 48103	(734) 741-1346	(734) 741-1846	wfolske@worldnet.att.net	Police
Fyvie, Jim	Clinton County 911					911 Center
Geml, Ron	Macomb Co. Sheriff Dept.	43565 Elizabeth Mount Clemens, MI 48043	(586) 469-5502	(586) 469-6389		Police
Goldberger, Andy	Saint Joseph County 911				stjoe911@voyager.net	911 Center
Grant, John H.	Lansing School District	Dept. of Public Safety 519 W Kalamazoo St Lansing, MI 48933	(517) 325-6125	(517) 325-6129	jgrant@lsd.k12.mi.us	Education
Held, Dave	APCO Frequency Adv	3833 New Salem Ave. Okemos, MI 48864	(517) 349-0269	(517) 853-8397		
Hemple, Philip	CSI, Inc.	PO Box 74 Berrien Center, MI	(616) 461-3253	(616) 461-3219	phemple@csi-inc.ws	Consultant
Herkimer, Harry	Herkimer Radio		(313) 242-0806	(313) 242 3572	herkimer@tdi.net	Vendor
Hetzler, Tim	Ohio State Patrol	1670 W. Broad Columbus, Ohio	(614) 466-8243	(614) 995-0067	thetzler@DPS.State.Oh.us	State Gov

Irlbeck, Steve	Dataradio				sirlbeck@dataradio.com	Vendor
Johnson, David V.	Macomb County	21930 Dunham Mount Clemens, MI 48043	(586) 469-5888	(586) 783-0957		Radio Maint.
Jongekrijg, Mark	Ottawa County Central Dispatch	15 N. Sixth St. Grand haven, MI 49417	(616) 842-2299 x209	(616) 842-2319	mjongekrijg@occda.org	911 Center
Kazmirzack, David	Lansing Police Department	817 W. Holmes Road Lansing, MI	(517) 483-4840	(517) 882-7334	Dkaz@voyager.net	Police
Lasher, Steve	Motorola					Vendor
Lee, Jim	MI Health & Hospital Assoc.					non-profit
LeFavour, Peter C.	Newaygo County 911				petel@co.newaygo.mi.us	911 Center
Matelski, Pam	Mackinac County 911					911 Center
Mayer, Paul	Ohio Dept. Admin. Srvcs	1820 Arthur E. Adams Dr. Columbus, Ohio	(614) 995-0063	(614) 995-0067		State Gov
McDowell, Dennis	M/A-COM					Vendor
McCuean, Theresa	City of Detroit				mccuean@dwsd.org	Radio Maint.
Mlujeak, Kasey	DOC	4901 Hawkins Jackson, MI 49201	(517) 780-6370	(517) 780-6049	Mlujeakl@state.mi.us	Radio Maint.
Nowakowski, Al	State of Michigan Radio	4000 Collins Road Lansing, MI	(517) 333-5010		nowakowskia@michigan.gov	MPSCS
Nelson, Bill	City of Troy FD	500 W. Big Beaver Troy, MI	(248) 524-3419	(248) 689-7520	nelsows@ci.troy.mi.us	Fire
Ogden, Bob	DNR	7th Floor Mason Bldg PO Box 30711 Lansing, MI 48909	(517) 373-2172	(517) 373-8048	ogdenr@state.mi.us	DNR
Palazzi, Ken	M/A-COM					Vendor
Palazzola, Joe	City of Fraser DPS	33000 Garfield Fraser, MI 48026	(586) 294-8900			Public Safety
Rinehart, Bette	NCC	1270 Fairfield PA, 17345	(717) 334-0694	(717) 334-9584	C18923@email.mot.com	Vendor
Russell, Christina	Oakland Co. Sheriff					911 Center
Rutare, Louis	DNR	7th Floor Mason Bldg PO Box 30711 Lansing, MI 48909	(517) 335-4597	(517) 373-8048	rutarel@state.mi.us	DNR
Rybicki, Rich	State of Michigan Comm	4000 Collins Road Lansing, MI				Police Radio
Sandor, Mike	Buford Goff & Associates	1331 Elmwood Ave. Columbia, SC 89201	(803) 254-6302	(813) 771-6142	mies@bgainc.com	Consultant
Shinew, Theron	MPSCS	4000 Collins Road Lansing, MI			shinewt@michigan.gov	MPSCS
Smith, Dennis	Oakland County Radio	1201 N. Telegraph Pontiac, MI				
Smith, Ray	Region 33 Chairperson	State of Ohio	(614) 863-2808		rsmith4@insight.rr.com	State Gov
Stirrett, Chris	Huron Co. Central Dispatch					
Strauss, David	Ann Arbor PD	100 N. St. Ann Arbor, MI 48104	(734) 994-4182	(734) 994-4635	dstrauss@ci.ann-arbor.mi.us	Police
Swenson, Craig	Washtenaw Central Dispatch	2201 Hogback Rd Ann Arbor, MI 48105	(734) 971-8400 ext. 1297	(734) 971-7296	swensonc@co.washtenaw.mi.us	911 Center
Thomas, Erica	DNR	7th Floor Mason Bldg PO Box 30711 Lansing, MI 48909	(517) 373-8048	(517) 373-8048	thomasem@state.mi.us	DNR
Todd, Stephen	Ottawa County 911	15 N. Sixth St. Grand Haven, MI 49417	(616) 842-2299 *6		director@novagate.com	911 Center
Turner, Joe	Retired MML	520 Jameson St Saginaw, MI	(517) 797-3816		turnerj@juno.com	Public Services
Uslan, Rick	Motorola	925 Alexandria Dr Lansing, MI 48917	(517) 323-9770	(517) 321-2382	R.Uslan@motorola.com	Vendor
Wamendi, John	Veterans Affairs	2215 Fuller Road Ann Arbor, MI 48105		(734) 761-9913		
Warner, Harry	MSP	Communications Division 4000 Collins RD PO Box 30631 Lansing, MI 48909-8131	(517) 336-6623		warnerh@state.mi.us	State Gov
Whately, Mike	CSI	1709 W. Lyons Mount Pleasant, MI	(517) 773-0368	(517) 773-6340	mewhat@attglobal.net	Consultant
Williams, Brent	MI Dept. of Community Health	12390 15 1/2 Mile Road Marshall, MI 49068	(517) 285-6678		emsradio@core.com	Health
Zabkowski, Larry	City of Southfield Radio		(248) 354-4202		l.zabkowski@cityofsouthfield.com	Radio Maint.

(D) member deceased

APPENDIX B - REGION 21 700 MHz PLAN

This Appendix Contains

1. Membership Application

2. List of individuals contacted to participate and participating in the planning process

Region 21
700 MHz Membership Application

Name _____

Agency _____

Address _____

_____

_____

Phone _____ Fax _____

E-mail _____

Your primary responsibilities are _____

_____

_____

_____

Your agency is (please check one): _____Governmental agency/authority.

_____ Company that provides public safety or public service to a governmental agency.

_____ Non-public safety or public service agency or organization.

Public safety and public service definitions follow.

Public safety – the public's right, exercised through Federal, State or Local government as prescribed by law, to protect and preserve life, property, and natural resources and to serve the public welfare.

Public safety services – those services rendered by or through Federal, Sate or Local government entities in support of Public Safety duties.

Public safety services provider – governmental and public entities or those non-government, private organizations, which are properly authorized by the appropriate governmental authority whose primary mission is providing Public Safety services.

Public services – those services provided by non-Public Safety entities that furnish, maintain, and protect the nation's basic infrastructures which are required to promote the public's safety and welfare.

List of persons participating in planning process which can be documented in writing or from sign-in sheets

Note: Partial List - Showing only one contact per representative... some representatives were at other meetings or communicated in multiple ways
IDENTITY OF REPRESENTATIVES APPEARING AT MEETINGS OR SENDING OR RECEIVING WRITTEN COMMUNICATIONS RELATED TO 700 MHZ PLAN

Surname	Given Name	Year	Source	On Committee	Entity
Ackley	Dave	01/31/05	e-mail		Genesee County, MI
Adamczyk	Gene	01/31/05	e-mail	2006 List	State of Michigan
Adams	Dawn	01/31/05	e-mail		Muskegon County, MI
Agens	David	01/31/05	e-mail		Berrien County, MI
Albrecht	Gary	01/31/05	e-mail		St. Clair County, MI
Alford	Joy	06/03/05	e-mail		Federal Communications Commission
Alger	Dean		Membership List	2004 List	Alger Communications
Altland	Thomas	01/31/05	Membership List	2004 List	Mason/Oceana Counties
Anderson	Jamel	01/31/05	e-mail		Grand Traverse County, MI
Anderson	Patricia	01/31/05	e-mail		Ameritech
Andrus	Robert	11/20/03	Minutes	2004 List	City of Dearborn
Aprill	Brian		Membership List	2006 List	State of Michigan
Ash	Michael	01/31/05	e-mail		Shiawassee County, MI
Assaf	Karen	01/31/05	e-mail		City of Novi, Michigan
Ballentine	Greg	06/20/05	e-mail		Mid-America Regional Council (K.C., MO)
Barnwell	William	06/05/07	e-mail		Montcalm County
Bawol	John	01/31/05	e-mail		Roscommon County, MI
Bawol	John	06/12/07	e-mail		Roscommon County 911
Bay Mills Community	Brimley, Mi	06/05/07	e-mail		Native American Entity
Beals	Angie	01/31/05	e-mail		Clinton County, MI
Becker	Harvey	01/31/05	e-mail		Montcalm County, MI
Beckman	Karl	09/22/04	e-mail	2006 List	Motorola
Beemer	Sandi	01/31/05	e-mail		Saginaw Chipewa Indian Tribe
Behrens	Cathrene	01/31/05	e-mail		Walled Lake, MI
Beltinch	Richard		Membership List	2006 List	GTE
Benfaida	Jeannie	06/12/07	e-mail		Federal Communications Commission
Bengry	Mark		Membership List	2006 List	Veteran Affairs, Ann Arbor, MI
Berns	Ron	01/31/05	e-mail		Monroe County, MI
Berry	Dale	06/05/07	e-mail	2006 List	Huron Valley Ambulance
Beyers	Richard	05/17/00	e-mail		Volunteer Citizen - Computer Web Design Instructor
Betz	Dennis		Membership List	2004 List	Washtenaw Central Dispatch
Bevns	Ron	01/31/05	Membership List	2006 List	Monroe County Central Dispatch, Monroe, MI
Bianconi	Marcia	01/31/05	e-mail		Conference of Western Wayne County, MI
Bradley	Robert	01/31/05	e-mail		Charlevoix and Cheboygan Counties, MI
Bradshaw	Keith		Membership List	2004 List	Macomb County
Brooks	Andre'		Membership List	2006 List	
Brown	Elizabetgh	01/31/05	e-mail		State of Michigan
Brozewski	Gary	01/31/05	e-mail	2006 List	Bay County, MI
Buck	J.	01/31/05	e-mail		LEO Law Enforcement Online (US Government)
Bunker	Brandy	01/31/05	e-mail		Montcalm County, MI
Bureau of Indian Affairs	Saulte Se. Marie, MI	06/05/07	e-mail		U.S. Government
Cardenas	Zenon	01/31/05	e-mail		Ionia County, MI
Carlson	Karen A.	01/28/05	e-mail		Brown County, WI (Region 45 contact)
Carnago	John	01/31/05	e-mail		Roe-Comm Inc.
Carter	Robert	03/30/06	e-mail		Region 54 SLM
Carter	William	03/22/05	e-mail		Region 54, 700 MHz RPC, Chairman
Ceo	Jack	01/31/05	e-mail		City of Saline, MI
Chadwick	Karen	06/05/07	e-mail	2006 List	Ingham County, MI
Charchan-Moore	Wendy	01/31/05	e-mail		
Charon	William	01/31/05	e-mail	2006 List	Ionia County, MI
Coates	Patricia	11/20/03	Minutes	2004 List	Oakland County
Collins	Lloyd	06/05/07	e-mail	2006 List	Michigan Police Chiefs/South Lyon Police
Cool	George	01/31/05	e-mail		Wayne State University
Corbett	William		Membership List	2006 List	City of Port Huron, MI
Cousineau	Joseph	01/31/05	e-mail		Ameritech
Crichton	Jim		Membership List	2006 List	Lapeer County, MI
Cromell	David	01/31/05	e-mail		Alger County, MI
Croy	DC	01/31/05	e-mail		City of Novi, Michigan
Cubitt	Dawn	01/31/05	e-mail		Sanilac County, MI
Dashney	Mac		Membership List	2006 List	Lansing School District
Davies	G	01/31/05	e-mail		Oakland County, MI
De Young	Keith	01/31/05	e-mail		Grand Traverse County, MI
DeGrande	Brian	01/31/05	e-mail		City of Farmington Hills, MI
Deluge	Chris	01/31/05	e-mail		CDM
DeMello	Richard	05/03/00	Membership List	2004 List	MDNR Forestry - Original Convener - Now Deceased
DeMeester	Richard		Membership List	2006 List	MDNR - Retired
Denny	V.	01/31/05	e-mail		Ionia County, MI
Deview	Ellen	01/31/05	e-mail		City of Birmingham, MI
Devine	Stephen	05/17/04	e-mail		Missouri State Highway Patrol, Freq. Coordinator
Dicicco	S.	01/31/05	e-mail		City of Novi, Michigan
Donahue	Jim	01/31/05	e-mail		Sterling Solutions of America
Dorsey	J.	01/31/05	e-mail		Dorsey-Pages L.L.C.
Dundas	Dan	01/31/05	e-mail		Tyco Electronics
Duvall	Michael	01/31/05	e-mail		Shelby Township, MI
Eader	Douglas		Membership List	2006 List	Oakland County, MI
Eichenberg	Al	11/20/03	Membership List	2006 List	State of Michigan I.T.
Enderle	Crain		Membership List	2006 List	Huron County Central Dispatch
English	Rich	03/22/05	e-mail		Comcast Corp
Enright	John		Membership List	2006 List	Buford, Goff and Assoc., Inc.
Espvik	James	01/31/05	e-mail		Manistee County, MI
Farquhar	Ann	01/31/05	e-mail		City of Southfield, MI
Fayling	Lloyd	01/31/05	e-mail	2006 List	Genesee County, MI
Felde	Andrew	01/31/05	e-mail		Drew Wireless L.L.C.
Fish	Jill	01/31/05	e-mail		Calhoun County, MI
Folske	Doris		Membership List	2006 List	APCO Freq. Coord. (Asst)
Folske	William	11/20/03	Minutes	2004 List	APCO Freq. Coord. - Deceased
French	Larry	01/31/05	e-mail		Kent County, MI
Fritz	Barbara	01/31/05	e-mail		City of Novi, Michigan
Fyvie	James	06/05/07	e-mail	2006 List	Clinton County
Gabbard	Jack	01/31/05	e-mail		State of Michigan
Garner	Roger	01/31/05	e-mail		Midland County, MI
Gaukel	Bruce	01/31/05	e-mail		Newago County, MI
Geml	Ron		Membership List	2006 List	Macomb County, MI
Gerencer	Bernie	01/31/05	e-mail		Newago County, MI
Gignac	David	01/31/05	e-mail		Ottoway County, MI

List of persons participating in planning process which can be documented in writing or from sign-in sheets

Goeschel	Chris	09/19/03	e-mail		MHA Keystone Center for Patient Safety and Quality
Goldberger	Andy	01/31/05	e-mail	2006 List	St. Joseph County, MI
Goodman	George	12/30/99	Letter		Michigan Municipal League, Exec. Dir.
Gracia-Lindstrom	Catherine	01/31/05	e-mail		City of Walker, MI
Grand Traverse Bay Band	Suttons Bay, MI	06/05/07	e-mail		Native American Entity
Grant	John H.	05/26/04	e-mail	2004 List	Lansing School District
Green	Phyllis	09/19/03	e-mail		U.S.D.A Forest Service (US Gov't)
gress@pplant.msu.edu		03/22/05	e-mail		Michigan State University
Griffin	Mary	01/31/05	e-mail		City of Auburn Hills, MI
Guinn	Ellen	01/31/05	e-mail		Clinton County, MI
Halterman	David	01/31/05	e-mail		Washtenaw County, MI
Hannahville Indian Community	Wilson, MI	06/05/07	e-mail		Native American Entity
Harris	Fred	01/31/05	e-mail		Wexford County, MI
Hach	Larry	05/26/04	e-mail		National Park Service (Fed. Gov't)
Hayes	S.	01/31/05	e-mail		City of Southgate, MI
Hazlett	David	01/31/05	e-mail		
Heersche	Joseph	01/31/05	e-mail		E.F. Johnson Company
Heinz	April	01/31/05	e-mail		Eaton County, MI
Held	David	09/22/04	e-mail	2006 List	APCO Freq. Coord.
Hemple	Phillip	10/18/01	Minutes	2006 List	CSI, Inc.
Hensel	Suzan	01/31/05	e-mail		Midland County, MI
Herkimer	Harry	09/19/03	e-mail	2006 List	Herkimer Radio and Wireless
Hetzler	Timothy		Membership List	2006 List	Ohio State Patrol
Hine	Andrea	01/31/05	e-mail		Ionia County, MI
Hoff	Gary	11/02/04	Letter		Pyramid Communications
Hogston	Darrell	01/31/05	e-mail		City of Muskegon, MI
Hude	Edward	01/31/05	e-mail		Ingham County, MI
Huron Potawatomi Inc	Fulton, WI	06/05/07	e-mail		Native American Entity
Irlbeck	Steve	01/31/05	e-mail	2006 List	Dataradio, Inc.
Jackson	Karen	01/31/05	e-mail		City of Novi, Michigan
Jerman	Rob	01/31/05	e-mail		Isabella County, MI
Johgekrijg	Mark	06/05/07	e-mail	2006 List	Deputy Dir. Ottowa County Central Dispatch
Johnson	David		Membership List	2006 List	Macomb County, MI
Kalm	Rick	01/31/05	e-mail		Macomb County, MI
Kaplan	Janet	01/31/05	e-mail		City of Novi, Michigan
Kazmirzack	David		Membership List	2006 List	City of Lansing, MI
Keeweenaw Bay Indian Community	Baraga, MI	06/05/07	e-mail		Native American Entity
Kenealy	Patrick	03/22/04	e-mail		State of Michigan
Kirk	David	06/30/06	Letter		Reion 45, 700 MHz RPC, Chairman
kleinlein	Steven	01/31/05	e-mail		Botsford Healthcare Continuum
Klenk	Robert	01/31/05	e-mail		Tuscola County, MI
Klink	Paul	01/31/05	e-mail		City of Dearborn, MI
Knezek	David	03/22/05	e-mail		City of Dearborn Heights, MI
Koepplinger	Suzy	08/01/00	e-mail		City of Saginaw - City Mngr's Office
Kooyers	M.	01/31/05	e-mail		Tele-Radio Inc.
Kottlowski	Don	05/25/07	e-mail		State of Indiana
Kudla	Patricia	01/31/05	e-mail		Oakland County, MI
Kunath	R.	01/31/05	e-mail		Oakland County, MI
Lac Vieux Desert Band of Ottowa	Manistee, MI	06/05/07	e-mail		Native American Entity
LaFavour	Pete	01/31/05	e-mail	2006 List	Newago County, MI
Larabel	Marc Sr.	01/31/05	e-mail		City of Grandville, MI
Larson	Tracy	01/31/05	e-mail		Montcalm County, MI
Lasher	Steve		Membership List	2006 List	Motorola Corporation
Lee	Jim	03/22/05	e-mail	2006 List	Michigan Health and Hospital Assoc.
Leonard	Roland	01/31/05	e-mail		BIS Digital, Inc
Levequews	Sherry	01/31/05	e-mail		City of Troy, MI
Little River Band of Ottowa	Manistee, MI	06/05/07	e-mail		Native American Entity
Little Traverse Band	Harbor Springs, MI	06/05/07	e-mail		Native American Entity
Long	M.	01/31/05	e-mail		Huron Valley Ambulance
Machuta	Brianna	01/31/05	e-mail		Interact Public Safety Systems
Maier	Mel	01/31/05	e-mail		Garden City, MI
Marsh	Dale	01/31/05	e-mail		Ameritech
Martin	Vic	01/31/05	e-mail		Lapeer County, MI
Match-E-Loe-Nash-She-Wish Pokagon Band	Dorr, MI	06/05/07	e-mail		Native American Entity
Mateiski	Pam	01/31/05	e-mail	2006 List	Makinaw County, MI
Mayer	Paul	12/27/06	Letter	2006 List	Region 33 700 MHz RPC - Chairman
McCarthy	Sean	11/20/03	Minutes		
McCastle	David	01/31/05	e-mail		Muskegon County, MI
McClure	Nathan	01/31/05	e-mail		CTA Communications Inc.
McCord	Ron	01/31/05	e-mail		CoreComm Internet Services, Inc
McCuean	Therese		Membership List	2006 List	City of Detroit
McDowell	Dennis	03/22/05	e-mail	2006 List	Tyco Electronics
McGahey	Gene	07/17/01	e-mail		Nation Law Enforcement Corrections Tech. Center
McGuire	Timothy	08/01/04	Letter		Michigan Association of Counties, Exec. Dir.
McIntyre	Thomas	01/31/05	e-mail		Saginaw County Michigan Central Dispatch
McLain	Rod	05/18/04	e-mail		Buford, Goff and Assoc., Inc.
McPherson	Wm.	01/31/05	e-mail		Shiawassee County, MI
mdc911@tucker-usa.com		01/31/05	e-mail		Tucker Communications
Melnyk	Borys	01/31/05	e-mail		Visteon Corporation
Merrill	Lynn R.	03/05/03	Letter		Monte R. Lee and Company, Oklahoma Cty, Ok
Michigan Association of Counties		06/01/07	e-mail		MAC
Michigan Municipal League		06/01/07	e-mail		MML
Michigan Townships Association		06/01/07	e-mail		MTA
Miller	Daniel	01/31/05	e-mail		City of Wayland, MI
Miller-Brown	Harriet	01/31/05	e-mail		State of Michigan
Mitchell	R.	01/31/05	e-mail		M33 Access.Com Div. of Custom Software, Inc.
Moore	David	01/31/05	e-mail		New World Systems Corp.
Mora	Karen	01/31/05	e-mail		Motorola Corporation
Morehouse	George	01/31/05	e-mail		Shelby Township, MI
Morton	Bonnie	01/31/05	e-mail		Isabella County, MI
Nelson	Barry	01/31/05	e-mail		Saginaw County, Michigan
Nelson	William	11/20/03	Minutes	2006 List	Mich. Fire Chiefs/City of Troy
Nelson	David	01/31/05	e-mail		Ameritech
Newell	Tom	01/31/05	e-mail		State of Michigan
Newton	Jeff	01/31/05	e-mail		City of Fraser, MI
Nowakowski	Richard	01/31/05	e-mail		Montcalm County, MI
Nowakowski	Al	11/20/03	Minutes	2006 List	State of Michigan I.T.
Nystrom	Charlie	01/31/05	e-mail		Barry County, MI

List of persons participating in planning process which can be documented in writing or from sign-in sheets

Oberle	R.	01/31/05	e-mail		La Port, Indiana
Ogden	Bob		Membership List	2004 List	MDNR
Olko	Doreen	01/31/05	e-mail		City of Auburn Hills, MI
Osborn	James	01/31/05	e-mail		Wayne County A/P Authority
Ostin	Kim	01/31/05	e-mail		Sterling Heights, MI
Palazzi	Ken	03/22/05	e-mail	2006 List	Tyco Electronics
Palazzola	Joe	01/04/02	Sign-in Sheet	2006 List	City of Fraser, MI
Perialas	Carrie	01/31/05	e-mail		Roscommon County, MI
Perria	Steven	01/31/05	e-mail		Fluor Corporation
Rasmussen	Kelly	01/31/05	e-mail		Eaton County, Mi
Reynolds	Richard	06/20/05	e-mail		National Public Safety Telecommunications Council
Rice	Dave	01/31/05	e-mail		Midland County, MI
Rinehart	Bette		Membership List	2006 List	NCC
Rybicki	Richard	01/31/05	e-mail	2006 List	State of Michigan
Rockwell	Herbert	01/31/05	e-mail		Plymouth Township, MI
Rogers	Paul	01/31/05	e-mail		National Emergency Number Association
Russell	Christina	01/31/05	e-mail	2006 List	Oakland County, MI
Rutare	Louis		Membership List	2004 List	MDNR
Ruth	Marybeth	01/31/05	e-mail		City of Detroit Water and Sewer Department
Saginaw Chippewa	Mt. Pleasant, MI	06/05/07	e-mail		Native American Entity
Sandor	Mike		Membership List	2006 List	Buford, Goff and Assoc., Inc.
Sault Ste. Marie Tribe of Chippewa	Saulte Se. Marie, MI	06/05/07	e-mail		Native American Entity
Schooley	Bridget	01/31/05	e-mail		Washtenaw County, MI
Schreiner	Russ	03/30/06	e-mail		Region 45 700 MHz RPC
Schroeder	Dave	01/31/05	e-mail		Verizon
Schuler	Jim	09/19/03	e-mail		U.S.D.A Forest Service (US Gov't)
Schultz	Chris	01/31/05	e-mail		Isabella County, MI
Scott	Anna	01/31/05	e-mail		
Selesky	J.	01/31/05	e-mail		State of Michigan
Sellinger	Joseph	01/31/05	e-mail		City of Livonia, MI
Sheaffer	Neil	01/04/06	e-mail		Advanced Wireless Telecom
Shatney	Becky	01/31/05	e-mail		Ottoway County, MI
Shinew	Theron		Membership List	2006 List	State of Michigan - MPSCS
Short	J.	01/31/05	e-mail		City of Novi, Michigan
slwright@umich.edu		01/31/05	e-mail		University of Michigan
Smalla	Laurie	01/31/05	e-mail		Osceola County, MI
Smith	Dennis		Membership List	2006 List	Oakland County, MI
Smith	Ray		Membership List	2006 List	Region 33 Chairperson
Smith	T.	01/31/05	e-mail		Berrien County, MI
Soldan	Clint	01/31/05	e-mail		Onstar
Spalding	Kurt	01/31/05	e-mail		Branch County, MI
Speidel	Bob	05/26/04	e-mail		Evans, Bankert, Cohen, Lutz & Panzone, Esqs.
Stadt	Lou	01/31/05	e-mail		City of East Lansing, MI
Stantz	H. Anthony	05/18/07	Letter		Region 14, 700 MHz RPC, Chairman
Stevens	Suzanne	01/31/05	e-mail		Ottowa County, MI
Stirrett	Chris		Membership List	2006 List	Huron County Central Dispatch
Stites	B.	01/31/05	e-mail		City of Allen Park, MI
Strainovici	Pete	01/31/05	e-mail		City of Southfield, MI
Strang	Melinda	01/31/05	e-mail		City of Port Huron, MI
Strauss	David		Membership List	2006 List	City of Ann Arbor, Mi - Police Dept.
Summers	Leanne	01/31/05	e-mail		City of Novi, Michigan
Summersett	Dee Ann	01/31/05	e-mail		Tuscola County, MI
Sutherland	Kelly	01/31/05	e-mail		Northville Township, MI
Swainston	C	01/31/05	e-mail		Montcalm County, MI
Swenson	Craig	01/31/05	Membership List	2004 List	Washtenaw Central Dispatch
Tapper	J.	01/31/05	e-mail		Van Buren County, MI
Temple	Scott	01/31/05	e-mail		Cingular Corp.
Thomas	Erica	05/03/00	Minutes	2004 List	Mich. DNR Forestry
Thompson	Clyd	12/30/99	e-mail		U.S.D.A Forest Service (US Gov't)
Todd	Steven	01/31/05	e-mail	2006 List	Ottowa County C.D./City of Flint, MI
Torrence	Donna	01/31/05	e-mail		New World Systems Corp.
Troshak	Richard	01/31/05	e-mail		Ottowa County, MI
Turner	Joseph	11/20/03	Minutes	2004 List	City of Saginaw/Mich. Municipal League
Twarog	Jim	01/31/05	e-mail		Iosco County, MI
Uetrecht	Jonathon	01/31/05	e-mail		Coldwater Board of Public Utilities
Usian	Richard	11/20/03	Minutes		Motorola
Usian	Rick	01/31/05	e-mail	2004 List	Motorola Corporation
Van Horn	R.	01/31/05	e-mail		Ameritech
VanDenberg	Sandra	01/31/05	e-mail		CoreComm Internet Services, Inc
Vezina	Jeff	01/31/05	e-mail		DSS Corporation
Vosburg	Duane	01/31/05	e-mail		
Wamendi	John		Membership List	2006 List	Veteran Affairs, Ann Arbor, MI
Warner	Harry	11/20/03	Minutes	2004 List	Mich. State Police/private consultant
Whately	Michael	11/20/03	Minutes	2006 List	Communications Systems and Implementation, Inc
Whitaker	Alex	05/25/07	e-mail		Indiana State Police
Wittkamp	Paul	04/04/05	e-mail		Region 45 Secretary
Williams	Brent	03/22/05	e-mail	2006 List	Mich.Dept.Comm. Health/Communications Consulting Serv.
Wolfe	Barbara	01/31/05	e-mail		City of Royal Oak, MI
Wormwood	Debra	01/31/05	e-mail		Menominee County, MI
Yekulis	Joseph Jr.	01/31/05	e-mail		Washtenaw County, MI
Zabkowski	Larry	01/31/05	e-mail	2006 List	City of Southfield, MI
Zapolnik	J.	01/31/05	e-mail		Huron Valley Ambulance
Zeeman	Berry	01/31/05	e-mail		Oakland County, MI

APPENDIX C - REGION 21 700 MHz PLAN

This Appendix Contains

1. A listing of cities in the state of Michigan

2. A map identifying the FCC designated 700 MHz Region 21

Michigan Cities, Villages and Townships

Acme, Ada, Addison, Adrian, Afton, Ahmeek, Akron, Alanson, Alba, Albion, Alden, Alger, Algoma, Allegan, Allen, Allen Park, Allendale, Allenton, Allouez, Alma, Almont, Alpena, Alpha, Alpine Twp, Alto, Amasa, Anchorville, Ann Arbor, Applegate, Arcadia, Argyle, Armada, Arnold, Ashley, Athens, Atlanta, Atlantic Mine, Atlas, Attica, Au Gres, Au Train, Auburn, Auburn Hills, Augusta, Avoca, Azalia

Bad Axe, Bailey, Baldwin, Bancroft, Bangor, Bannister, Baraga, Barbeau, Bark River, Baroda, Barryton, Barton City, Bath, Battle Creek, Bay City, Bay Port, Bay Shore, Bay View, Bear Lake, Beaver Island, Beaverton, Bedford, Belding, Bellaire, Belleville, Bellevue, Belmont, Benton Harbor, Benzonia, Bergland, Berkley, Berrien Center, Berrien Springs, Bessemer, Beulah, Beverly Hills, Big Bay, Big Rapids, Bingham Farms, Birch Run, Birmingham, Bitely, Black River, Blanchard, Blissfield, Bloomfield Hills, Bloomfield Township, Bloomingdale, Boon, Boyne City, Boyne Falls, Bradley, Branch, Brant, Breckenridge, Breedsville, Brethren, Bridgeport, Bridgewater, Bridgman, Brighton, Brimley, Britton, Brohman, Bronson, Brooklyn, Brown City, Brownstown Township Bruce Crossing, Brutus, Buchanan, Buckley, Burlington, Burnips, Burr Oak, Burt, Burt Lake, Burton, Byron, Byron Center

Cadilac, Caledonia, Calumet, Camden, Cannonsburg, Canton, Capac, Carleton, Carney, Caro, Carp Lake, Carrollton, Carson City, Carsonville, Casco, Caseville, Casnovia, Caspian, Cass City, Cassopolis, Cedar, Cedar Lake, Cedar River, Cedar Springs, Cedarville, Cement City, Center Line, Central Lake, Centreville, Ceresco, Champion, Channing, Charlevoix, Charlotte, Chase, Chassell, Chatham, Cheboygan, Chelsea, Chesaning, Chesterfield, Chippewa Lake, Chocolay, Christmas, Clare, Clark Twp, Clarklake, Clarkston, Clarksville, Clawson, Clayton, Clifford, Climax, Clinton, Clinton Twp, Clio, Cloverdale, Cohoctah, Coldwater, Coleman, Coloma, Colon, Columbiaville, Columbus, Comins, Commerce, Comstock, Comstock Park, Concord, Conklin, Constantine, Conway, Cooks, Coopersville, Copemish, Copper City, Copper Harbor, Coral, Cornell,,Corunna, Covert, Covington, Cross Village, Croswell, Crystal, Crystal Falls, Curran, Curtis, Custer, Cutlerville

Dafter, Daggett, Dansville, Davisburg, Davison, De Tour Village, Dearborn, Dearborn Heights, Decatur, Decker, Deckerville, Deerfield, Deerton, Deford, Delhi, Delta Township, Delton, Detroit, DeWitt, Dexter, Dimondale, Dollar Bay, Dorr, Douglas, Dowagiac, Dowling, Drayton Plains, Drummond Island, Dryden, Dundee, Durand

Eagle, Eagle River, East China, East Grand Rapids, East Jordan, East Lansing, East Leroy, East Tawas, Eastlake, Eastpointe, Eastport, Eaton Rapids, Eau Claire, Eben Junction, Eckerman, Ecorse, Edenville, Edmore, Edwardsburg, Elberta, Elk Rapids, Elkton, Ellsworth, Elm Hall ,Elmira, Elsie, Elwell,,Emmett, Empire, Engadine, Erie, Escanaba, Essexville, Eureka, Evart, Ewen

Fair Haven, Fairgrove, Fairview, Falmouth, Farmington, Farmington Hills, Farwell, Felch, Fennville, Fenton, Fenwick, Ferndale, Ferrysburg, Fife Lake, Filer City, Filion, Flat Rock, Flint, Flushing, Forestville, Fort Gratiot, Foster City, Fostoria, Fountain, Fowler, Fowlerville, Frankenmuth, Frankfort, Franklin, Fraser, Frederic, Free Soil, Freeland, Freeport, Fremont, Frontier, Fruitport, Fulton

Gaastra, Gagetown, Gaines, Galesburg, Galien, Garden, Garden City, Gaylord, Genesee, Genoa, Georgetown, Germfask, Gibraltar, Gilford, Gladstone, Gladwin, Glen Arbor, Glenn, Glennie, Gobles, Goetzville, Good Harbor, Good Hart, Goodells, Goodland, Goodrich, Gould City, Gowen, Grand Beach, Grand Blanc, Grand Haven, Grand Junction, Grand Ledge, Grand Marais, Grand Rapids, Grandville, Grant, Grass Lake, Grawn, Grayling, Greenbush, Greenland, Greenville, Gregory, Grosse Ile, Grosse Pointe, Grosse Pointe Farms, Grosse Pointe Shores, Grosse Pointe Woods, Gulliver, Gun Lake, Gwinn

Hadley, Hagar Shores, Hale, Hamburg, Hamilton, Hamlin, Hampton, Hamtramck, Hancock, Hanover, Harbert, Harbor Beach, Harbor Point, Harbor Springs, Harper Woods, Harrietta, Harris, Harrison, Harrisville, Harsens Island, Hart, Hartford, Hartland, Harvey, Haslett, Hastings, Hawks, Hazel Park, Hell, Hemlock, Henderson, Hermansville, Herron, Hersey, Hesperia, Hessel, Hickory Corners, Higgins Lake, Highland, Highland Park, Hillman, Hillsdale, Holland, Holly, Holt, Holton, Homer, Honor, Hope, Hopkins, Horton, Houghton, Houghton Lake, Houghton Lake Heights, Howard City, Howell, Hubbard Lake, Hubbardston, Hubbell, Hudson, Hudsonville, Hulbert, Huntington Woods

Swartz Creek, Sylvan Lake

Tawas City, Tallmadge, Taylor, Tecumseh, Tekonsha, Temperance, Texas Twp, Thomas, Thompsonville, Three Oaks, Three Rivers, Tipton, Toivola, Topinabee, Tower, Traverse City, Trenary, Trenton, Trout Creek, Trout Lake, Troy, Trufant, Turner, Tuscola, Tustin, Twin Lake, Twining

Ubly, Union, Union City, Union Lake, Union Pier, Unionville, University Center, Utica

Vandalia, Vanderbilt, Vasser, Vermontville, Vernon, Vestaburg, Vicksburg, Vulcan

Wabaningo, Wakefield, Waldron, Walhalla, Walker, Wallace, Walled Lake, Walloon Lake, Warren, Washington, Waterford, Waters, Watersmeet, Watervliet, Watton, Wayland, Wayne, Webberville, Weidman, Wells, Wellston, Wequetonsing, West Bloomfield, West Branch, West Olive, Westland, Weston, Westphalia, Westwood, Wetmore, Wheeler, White Cloud, White Lake, White Pigeon, White Pine, Whitehall, Whitmore Lake, Whittaker, Whittemore, Williamsburg, Williamston, Willis, Wilson, Winn, Wixom, Wolverine, Wolverine Lake, Woodhaven, Woodland, Wyandotte, Wyoming

Yale, Ypsilanti

Zeeland

FEDERALLY RECOGNIZED (BIA) MICHIGAN NATIVE AMERICAN TRIBES

Jeffrey D. Parker, President
Bay Mills Indian Community of Michigan
Route 1, Box 313
Brimley, MI 49715
P: 906/248-3241
F: 906/248-3283
(Michigan)

Joseph C. Raphael, Tribal Chairman
Grand Traverse Band of Ottawa & Chippewa Indians of Michigan
Peshawbestown Community Center
2605 N.W. Bayshore Drive
Suttons Bay, MI 49682
P: 616/271-3538
F: 616/271-4861

Kenneth Meshigaud, Chairman
Hannahville Indian Community of Michigan
N14911 Hannahville B1 Road
Wilson, MI 49896
P: 906/466-2342
F: 906/466-2933

Shirley English, Chairperson
Huron Potawatomi Nation
2221 1´ Mile Road
Fulton, MI 49052
P: 616/729-5151
F: 616/729-5920

Frederick Dakota, President
Keweenaw Bay Indian Community
795 Michigan Avenue
Baraga, MI 49908
P: 906/353-6623
F: 906/353-7540

John C. McGeshick, Chairperson
Lac Vieux Desert Band of Lake Superior Chippewa Indians of Michigan
P.O. Box 249 - Choate Road
Watersmeet, MI 49969
P: 906/358-4577
F: 906/358-4785

Bob Guenthardt, Chairman
Little River Band of Ottawa Indians
409 Water Street
Manistee, MI 49660
P: 616/723-8288
F: 616/723-8761

Frank Ettawageshik, President
Little Traverse Bay Bands of Odawa Indians
P.O. Box 246-1345, U.S. 31 North
Petoskey, MI 49770
P: 616/348-3410
F: 616/348-2589

Matthew Wesaw, Acting Chairman
Pokagon Band of Potawatomi Indians
714 N. Front Street
Dowagiac, MI 49047
P: 616/782-8998
F: 616/782-6882

Phillip G.Peters, Sr., Chief
Saginaw Chippewa Indian Tribe of Michigan
7070 East Broadway
Mt. Pleasant, MI 48858
P: 517/772-5700
F: 517/772-3508

Bernard Bouschor, Chairperson
Sault Ste. Marie Tribe of Chippewa
523 Ashmun St.
Sault Ste. Marie, MI 49783
P: 906/635-6050
F: 906/632-4959

Ida, Idlewild, Imlay City, Indian River, Ingalls, Inkster, Interlochen, Ionia, Irish Hills, Iron Mountain, Iron River, Irons, Ironwood, Ishpeming, Ithaca

Jackson, Jamestown, Jasper, Jeddo, Jenison, Jerome, Johannesburg, Jones, Jonesville

Kalamazoo, Kaleva, Kalkaska, Kawkawlin, Kearsarge, Keego Harbor, Kendall, Kent City, Kenton, Kentwood, Kewadin, Keweenaw, Kimball, Kincheloe, Kinde, Kingsford, Kingsley, Kingston, Kinross

L'Anse, La Salle, Lachine, Lacota, Laingsburg, Lake, Lake Ann, Lake City, Lake George, Lake Gogebic, Lake Leelanau, Lake Linden, Lake Odessa, Lake Orion, Lakeland, Lakeside, Lakeview, Lakeville, Lambertville, Lamont, Lansing, Lansing Township, Lapeer, Lathrup Village, Laurium, Lawrence, Lawton, Leelanau, Leland, Lennon, Leonard, Leonidas, LeRoy, Leslie, Levering, Lewiston, Lexington, Lincoln, Lincoln Park, Linden, Linwood, Litchfield, Little Lake, Livonia, Long Lake, Loretto, Lowell, Ludington, Luna Pier, Lupton, Luther, Luzerne, Lyons

Macatawa, Mackinac Island, Mackinaw City, Macomb Twp, Madison Heights, Mancelona, Manchester, Manistee, Manistique, Manitou Beach, Manton, Maple City, Maple Rapids, Marcellus, Marenisco, Marine City, Marion, Marlette, Marne, Marquette, Marshall, Martin, Marysville, Mason, Mass City, Mattawan, Maybee, Mayfield, Mayville, Mc Bain, McBrides, McMillan, Mears, Mecosta, Melvin, Melvindale, Memphis, Mendon, Menominee, Meridian, Merrill, Merritt, Mesick, Metamora, Michigamme, Michigan Center, Middleton, Middleville, Midland, Mikado, Milan, Milford, Millersburg, Millington, Milton Twp, Minden City, Mio, Mohawk, Moline, Monroe, Montague, Montgomery, Montrose, Moorestown, Moran, Morenci, Morley, Morrice, Moscow, Mosherville, Mount Clemens, Mount Morris, Mount Pleasant, Muir, Mullett Lake, Mulliken, Munger, Munising, Munith, Muskegon, Muskegon Heights

Nadeau, Nahma, Napoleon, Nashville, National City, National Mine, Naubinway, Nazareth, Negaunee, New Baltimore, New Boston, New Buffalo, New Era, New Haven, New Hudson, New Lothrop, New Troy, Newaygo, Newberry, Newport, Niles, Nisula, North Adams, North Branch, North Lake, North Muskegon, North Star, North Street, Northeast, Northland, Northport, Northville, Northwest, Norton Shores, Norvell, Norway, Nottawa, Novi, Nunica

Oak Grove. Oak Park. Oakland. Oakley. Oden. Okemos. Old Mission. Olivet. Omena. Omer. Onaway. Onekama. Onondaga. Onsted. Ontonagon. Orchard Lake. Orion. Orleans. Ortonville. Oscoda. Oshtemo. Osseo. Ossineke. Otisville. Otsego. Ottawa Lake. Otter Lake. Ovid. Owendale. Owosso. Oxford

Painesdale, Palmer, Palmyra, Palo, Paradise, Parchment, Paris, Parma, Paw Paw, Pearl Beach, Peck, Pelkie, Pellston, Peninsula, Pentwater, Perkins, Perrinton, Perronville, Perry, Petersburg, Petoskey, Pewamo, Pickford, Pierson, Pigeon, Pinckney, Pinconning, Pittsfield, Plainfield, Plainwell, Pleasant Lake, Pleasant Ridge, Plymouth, Pointe Aux Pins, Pompeii, Pontiac, Port Austin, Port Hope, Port Huron, Port Sanilac, Portage, Posen, Potterville, Powers, Prescott, Presque Isle, Prudenville, Pullman

Quincy, Quinnesec, Quinicassee,

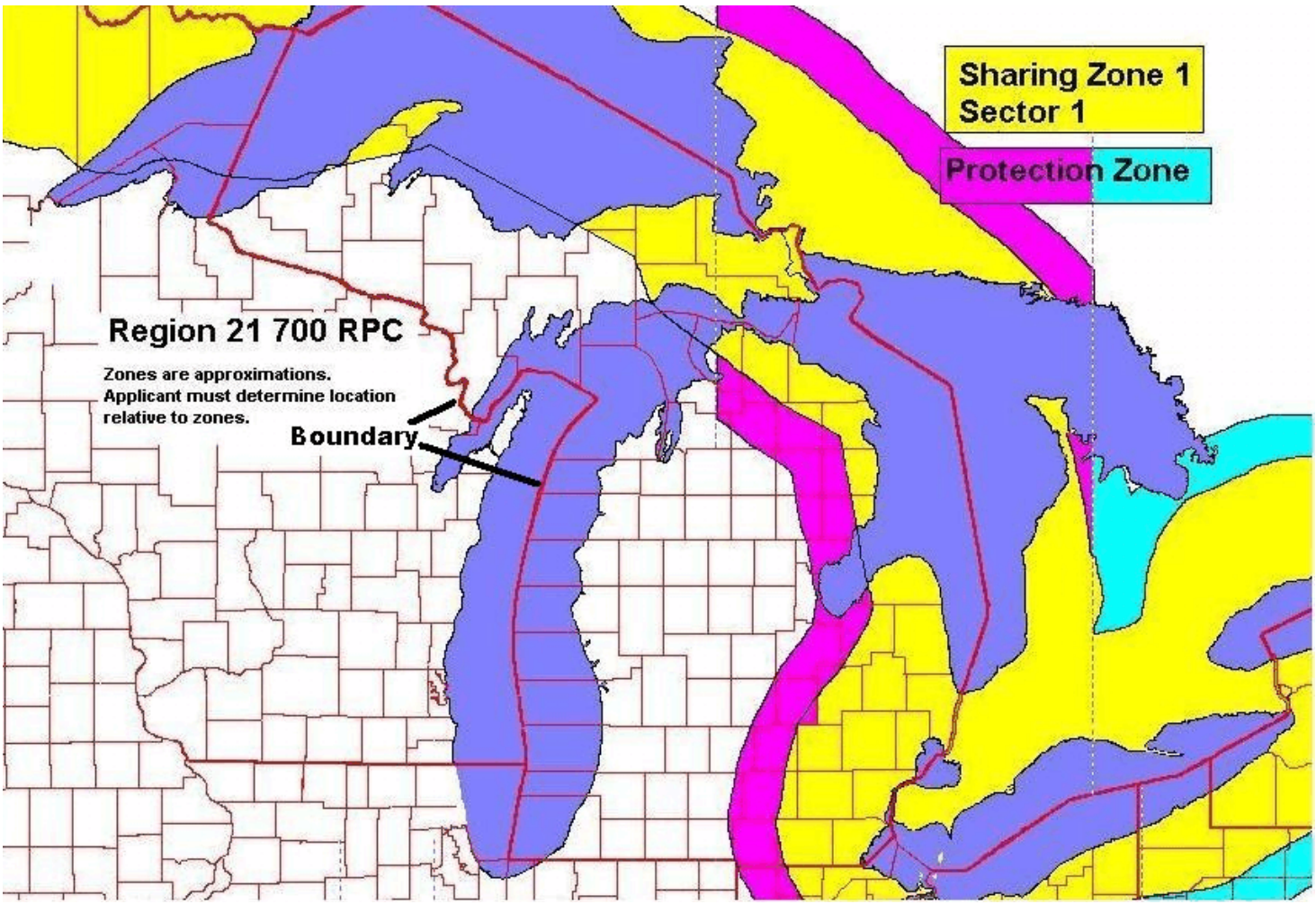
Ralph, Ramsay, Rapid City, Rapid River, Ravenna, Ray, Reading, Redford, Reed City, Reese, Remus, Republic, Rhodes, Richland, Richmond, Richville, Ridgeway, Riga, River Rouge, Riverdale, Riverside, Riverview, Rives Junction, Rochester, Rochester Hills, Rock, Rockford, Rockland, Rockwood, Rodney, Rogers City, Rollin, Romeo, Romulus, Roosevelt Park, Roscommon, Rose City, Rosebush, Roseville, Ross, Rothbury, Royal Oak, Ruby, Rudyard, Rumely, Ruth

Saginaw, Saginaw Township, Sagola, Saint Charles, Saint Clair, Saint Clair Shores, Saint Helen, Saint Ignace, Saint Johns, Saint Joseph, Saint Louis, Salem, Saline, Samaria, Sand Creek, Sand Lake, Sandusky, Sanford, Saranac, Saugatuck, Sault Sainte Marie, Sawyer, Schoolcraft, Scotts, Scottville, Sears, Sebewaing, Seneca, Seney, Shaftsburg, Shelby, Shelby Township, Shelbyville, Shepherd, Sheridan, Sherwood, Shingleton, Sidnaw, Sidney, Silverwood, Six Lakes, Skandia, Skanee, Skidway Lake, Smiths Creek, Smyrna, Snover, Sodus, Somerset, Somerset Center, South Boardman, South Branch, South Haven, South Lyon, South Range, South Rockwood, Southeast, Southfield, Southgate, Spalding, Sparta, Spring Arbor, Spring Lake, Springfield, Springport, Spruce, Stambaugh, Standish, Stanton, Stanwood, Stephenson, Sterling, Sterling Heights, Stevensville, Stockbridge, Strongs, Sturgis, Summit Twp, Sumner, Sunfield, Suttons Bay,

APPENDIX C

MAP OF REGION 21

(WITH PROTECTION ZONES)



APPENDIX D - REGION 21 700 MHz PLAN

This Appendix Contains

1. By-Laws for the Region 21 700 MHz RPC

BY LAWS OF THE REGION 21 700 MHZ PLANNING COMMITTEE

ARTICLE 1

NAME AND PURPOSE

1.1 The name of this Regional Planning Committee shall be Region 21 700 MHZ Planning Committee. Its primary purpose is to foster cooperation, planning, and development of regional plans and to expedite the implementation in the 700 MHz Public Safety Band.

ARTICLE II

MEMBERSHIP AND OPERATING RULES

2.1 Region 21 shall have two classes of members, 'voting members' and 'non-voting members'. New members may be added as needed. Voting members shall consist of one representative or designate from any agency engaged in public safety eligible to hold a license under 47 CFR 90.20, 47 CFR 90.523 or 47 CFR 2.103. An agency shall be allowed no more than one vote for each distinct eligibility category within the agency's organization or political jurisdiction. Non-voting members are all others interested in furthering the goals of public safety communications.

2.2 Membership shall be from the date of acceptance until resignation or removal.

2.3 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 A member may be suspended or removed by a majority vote of members after reasonable notice and opportunity to be heard. Failure to attend *50%* of meetings held in a calendar year shall be cause for removal.

2.5 A member may resign by written notice to the chairperson.

2.6 The annual meeting of Region 21 shall be held in conjunction with the annual meeting of the Michigan Chapter of the Association of Public Safety Communications Officials.

2.7 Special meetings of Region 21 may be called by the chairperson or by the vice-chairperson, or upon written application of two or more members. If an annual meeting is not held as herein provided, a special meeting of the members may be held.

2.8 Reasonable notice of the time and place of Region 21 meetings shall be given to each member. Such notice need not specify the purposes of a meeting unless there is to be considered at the meeting (i) amendments to these bylaws, or (ii) removal or suspension of an officer. It shall be reasonable and sufficient to notify the members at least seven days before the meeting.

2.9 At any meeting of Region 21 twenty (20) per cent of the voting members shall constitute a quorum. At no time shall a quorum be fewer than ten (10) voting members.

2.10 Each voting member shall have one vote. A majority of the votes cast shall decide any question, unless otherwise specified in these bylaws.

ARTICLE III

OFFICERS AND AGENTS

3.1 Officers of Region 21 shall be a chairperson, vice-chairperson, treasurer, secretary and other officers as deemed necessary.

3.2 Officers shall be elected by the voting members at the first meeting and thereafter at the annual meeting.

3.3 An officer may be removed by a majority vote.

3.4 An officer may resign by written notice to the chairperson.

ARTICLE IV

AMENDMENTS

These bylaws may be altered, amended or repealed in whole or in part at a meeting by two-thirds vote.

ARTICLE V

DISSOLUTION

Region 21 may be dissolved upon completion of its stated purpose and a two-thirds plus one majority vote of the members. The FCC shall be notified.

ARTICLE VI

RULES OF ORDER

The Conduct of Region 21 Meetings 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.

ARTICLE VII

DEFINITIONS

Region 21 has adopted the following definitions of *Public Safety* and *Public Services.*

Public Safety: The public's right, exercised through Federal, State or Local government as prescribed by law, to protect and preserve life, property, and natural resources and to serve the public welfare.

Public Services: Those services provided by non-Public Safety entities that furnish, maintain, and protect the nation's basic infrastructures which are required to promote the public's safety and welfare.

APPENDIX E - REGION 21 700 MHz PLAN

This Appendix Contains

1. A summary of Meeting Dates
2. Copies of Meeting Announcements and Agendas
3. Summary of methods used for notification
4. Summary of adjacent Region notifications

APPENDIX E

LISTING OF MEETING DATES AND LOCATIONS

Date	**Location**
May 3, 2000	2875 W..Liberty Rd., Ann Arbor, MI (Masonic Temple)
October 12, 2000	2875 W..Liberty Rd., Ann Arbor, MI (Masonic Temple)
January 31, 2001	5815 Wise Rd., Lansing School District Hill Ctr., Lansing, MI
April 25, 2001	111 S. MichiganAve., Saginaw, MI (Saginaw County Court House)
September 19, 2001	1200 N. Telegraph Rd., Pontiac, MI (Oakland County IT Bldg)
October 18, 2001	City Hall, Frankenmuth, MI
January 4, 2002	43565 Elizabeth, Mt. Clemens, MI (Macomb County Jail)
July 1, 2002	State wide telephone conference call
August 1,2002	2215 Hogback Rd., Ann Arbor, MI (Huron Valley Ambulance)
September 26, 2002	14901 4H Drive, Tustin, MI (Kettunen Center) APCO Conference
June 23, 2003	2215 Hogback Rd., Ann Arbor, MI (Huron Valley Ambulance)
September 26, 2003	14901 4H Drive, Tustin, MI (Kettunen Center) APCO Conference
October 23, 2003	240 W. Genesee Ave., Frankenmuth, Mi (City Hall)
November 20, 2003	2875 W. Liberty Rd., Ann Arbor, MI (Masonic Temple)
December 4, 2003	2201 Hogback Rd.,, Ann Arbor MI (Sheriff's Dept.)
January 15, 2004	2201 Hogback Rd., Ann Arbor, MI (Sheriff's Dept.)
March 25, 2004	205 Church St., Williamston, MI (Brookshire Inn and Golf Club)
May 27, 2004	6296 Saginaw Rd. (M-84), Bay City, MI (Howard Johnson's)
July 29, 2004	1200 N. Telegraph, Pontiac, MI (Oakland County IT Building)
September 14, 2004	2201 Hogback Rd., Ann Arbor, MI (Sheriff's Dept.)
October 1, 2004	14901 4H Drive, Tustin, MI (Kettunen Center) APCO Conference
November 16, 2004	2201 Hogback Rd., Ann Arbor, MI (Sheriff's Dept.)
January 18, 2005	2201 Hogback Rd., Ann Arbor, MI (Sheriff's Dept.)
April 14, 2005	2201 Hogback Rd., Ann Arbor, MI (Sheriff's Dept.)

May 6, 2005	Wisconsin - Michigan Conference Call
June 16, 2005	4000 Collins Rd., Lansing, MI (Mich. State Police Facility)
August 11, 2005	4000 Collins Rd., Lansing, MI (Mich. State Police Facility)
September 30, 2005	14901 4H Drive, Tustin, MI (Kettunen Center) APCO Conference
November 9, 2005	4000 Collins Rd., Lansing, MI (Mich. State Police Facility)
January 10, 2006	4000 Collins Rd., Lansing, MI (Mich. State Police Facility)
March 7, 2006	4000 Collins Rd., Lansing, MI (Mich. State Police Facility)
May 11, 2006	Clinton County Court House, St. John's, MI (cancelled)
June 13, 2006	4000 Collins Rd., Lansing, MI (Mich. State Police Facility)
September 29, 2006	14901 4H Drive, Tustin, MI (Kettunen Center) APCO Conference
April 6, 2007	Inter-state Conference Call (Region 13,15, 16, 21, 22, 24, 26, 33 & 54)
April 24, 2007	4000 Collins Rd., Lansing, MI (Mich. State Police Facility)
June 12, 2007	4000 Collins Rd., Lansing, MI (Mich. State Police Facility)
October 25, 2007	730 Main St., Frankenmuth, MI (Zehnder's Restaurant)
December 20, 2007	4000 Collins Rd., Lansing, MI (Mich. State Police Facility)
January 10, 2008	Interstate Conference Call with FCC
Total of 40	13 individual agencies or government units hosted public meetings plus wide area conference calls

APPENDIX E

METHODS OF NOTIFYING INTERESTED PARTIES

USED BY

REGION 21 700 MHZ RPC

1. DIRECT MAIL VIA U.S. POSTAL MAIL

2. DIRECT MAIL VIA E-MAIL

3. PAPER POSTING ON BUILDING - WHERE MEETING HELD

4. ELECTRONIC POSTING ON WEB SITES:
   a. FCC website
   b. MiAPCO website
   c. MPSFAC website

5. USE OF LIST SERVERS

6. DISTRIBUTION BY LEIN SYSTEM (Law Enforcement Information Network)

7. VERBAL ANNOUNCENTS TO PUBLIC OF NEXT MEETING DATE AND LOCATION MADE AT END OF CURRENT PUBLIC MEETING

8. SPECIAL MAILINGS TO GROUPS SUCH AS INDIGENOUS PEOPLES, MICHIGAN MUNICIPAL LEAGUE, MICHIGAN ASSOCIATION OF COUNTIES ET CETERA

9. PARTICIPATION IN INTRA-STATE AND INTER-STATE TELEPHONE CONFERENCE CALLS WITH INTERESTED PARTIES

Note: Documentation of each of these techniques follows in this Appendix

APPENDIX "E "

Meeting Notification and Solicitation of Comments

A major obligation and challenge for any rule making process is proper notification of the appropriate constituency. Reasonable notification has at least two critical components: (1) an adequate time period for information to be disseminated and responded to; (2) execution of reasonable efforts to contact appropriate parties.

With regard to time, this Plan's public comment period encompassed almost eight years. The first announcement to solicit committee members and inform interested parties of the planning process was made in March 2000. Since then forty formal public meetings and other conferences were held to solicit input. Two surveys were distributed (one via mail the other via the internet). Telephone conference calls were made with FCC officials, members of other Regional Planning Commissions and other interested parties. Besides public meetings, the eight years also included comments via the exchange of hundreds of e-mail and postal communications.

Notification of meetings and solicitations for comment were made to both general public and "specific" constituencies via several methods over the eight years.

First, internet posting requirements were complied with by using several internet sites including the FCC's, the NIJ's, the Michigan Chapter of APCO's and the Region 21 web sites. Second, information was physically posted on buildings at which meetings were held. Third, television broadcasters, who provide news to directly to the public, were contacted. Fourth, there were direct mailings to umbrella organizations.

Region 21 RPC members also worked diligently to identify and specifically notify parties who may have had a direct, or indirect, interest in the outcome of the planning process. In many cases, contact was made with groups that might be directly affected as potential users of new spectrum and the rules that would eventually be promulgated. In other cases, entities might have educational, technical or financial interests in the outcome of the planning process.

Examples of those parties who received meeting notices and planning information in addition to general "public" announcements include, but are not limited to: all public safety, first responder or other agencies and units of government within the state equipped to receive LEIN (Law enforcement Information Network)

broadcasts; public media outlets such as low power television stations; organizations representing public bodies such as the Michigan Association of Counties, the Michigan Township Association and the Michigan Municipal League; and individuals on the RPC's contact list. Three separate communications were sent to each of Michigan's Native American tribal organizations.

Region 21 RPC members also worked diligently to identify and specifically notify parties who may have had a direct, or indirect, interest in the outcome of the planning process. In many cases, contact was made to a group that might be directly affected as users of new spectrum and rules that would eventually be promulgated. In other cases, entities might have educational, technical or financial interests in the outcome of the planning process.

Entities with special concerns or interests communicated with the committee. They included commercial firms and manufacturers and distributors of technology.

There were academic researchers and others who had an interest in the project or process, who received information from a committee representative. Copies of the Region 21 Plan were sent to all adjacent regions along with solicitations for comment.

So that individuals residing in various geographic areas would have an easier opportunity to offer comment, the Region 21 RPC also conducted its formal meetings in about a dozen communities located around the state. RPC Committee members are all volunteers and the committee has no funding source. In some cases these volunteers are retired or otherwise received no compensation for gasoline or other expenses. The geographic area in which meetings where held is approximately 200 miles from the most northerly to the most southerly point and 100 miles wide. Reasonable opportunity for public comment over a broad geographic area was provided by RPC members who traversed those 20,000 square miles many times over the eight years. This meant long drives, substantial effort and considerable expense.

RPC members believe Region 21's efforts for notification and to solicit public comment substantially exceed any existing minimum standards. The Committee worked hard to meet or exceed efforts that any other RPC in the U.S. made to provide open access to the planning process. This appendix documents numerous communications notifying both the general public and entities with direct and indirect interests in the 700 MHz Plan of opportunities for public comment.

APPENDIX E

Notifications

This Section Of Appendix E Contains Distributed Agendas

and Meeting Notices

Note 1: The first announcement of the 700 MHz Planning Committee was a voice announcement on February 22, 2008 at the public meeting of the Michigan Public Safety Frequency Advisory Committee(MPSFAC)

Note 2: Adjacent Regions have on several occasions either received paper copies of the Region 21 700 MHz Plan or been notified electronically of the availability of the Plan on the internet.

Dates of notification	Method of Distribution
August 1 - 8, 2002	Hand delivered and mailed
June 11, 2004	Posting on internet
January 28 - 31, 2005	E-mail 235 recipients & Web Posting
May 4 - June 12, 2006	E-mails and Web Posting
January 21, 2008	E-mails and Web Posting

Notes from February 22, 2000 public meeting of Michigan Public Safety Frequency Advisory Committee
Documenting announcement of a new 700 MHZ RPC for Region 21. Source of note: Joseph M. Turner

MPSFAC MTG NOTES

2/22/00 CONTINUED . . .

700 MHZ IS EXTREMELY VALUABLE

BROADBAND VIDEO — FIRE

BROAD BAND —

WIDEBAND CHANNELS —

384 KB VIDEO — 2005 +/-

800 2 IMPROVEMENT IN CODECS COMPRESSED ANALOG

CERTAIN FEDERAL REQUIREMENTS

REGISTER

ANDRE' T BROOKS CHAIRMAN OF IMPLEMENTATION COMMITTEE

WEEK OF APRIL 17, 2000 1ST MTG.

JOE MILL —

REGION 21

4 COORDINATORS

CONTACTS USA LEIN

POSTAL MAILING

FIRE MARSHALLS — FIRE CHIEF'S

E-MAIL

MEETING

1ST MEETING IS TUTORIAL,

FREQUENCY — ~~746~~ — 806

PLAN — 2002

TIME FREQ AVAIL ASC 2004

APCO FCC IA

USES DIGITAL COMM., SPLIT CHANNEL FOR VOICE, DATA, AND VIDEO

ASSIGNMENT DEVELOP BAND PLAN

T-A MCINTYRE ALG ARMSTRONG

CANADIAN TV STATIONS WANT TO LEAVE 700 MHZ AND MOVE TO LOWER FREQ.

NEW REGIONAL PLANNING THRUST

March 1, 2000

TO: Public Safety/Service Agencies

FROM: Richard S. DeMello, Convener for 746-806 MHz Region 21 Plan

SUBJECT: First Planning Meeting

Where: Masonic Temple
2875 W. Liberty Road
Ann Arbor, MI

When: Wednesday, May 3, 2000

Time: 10:00 a.m. - 3:00 p.m.

Why: Discuss:

1. History, how we got to where we are.
2. Interoperability.
3. National planning requirements.
4. New planning thrust and discussion of needs and or uses of the spectrum.

Bill Folske is planning to have an inexpensive lunch available.

Please RSVP via the internet to thomasem@state.mi.us.

If you have any questions, you can contact Bill Folske at (734) 741-1346, Erica Thomas at (517) 373-8048 or Richard DeMello at (517) 335-3266.

March 1, 2000

p:\admin\telecom\700MHz\1stplanmeeting

APPENDIX E

NOTIFICATIONS

LEIN

A LEIN 58194 03/28/00 1049 GBDC1.
A ELOP GBDC.

ADMINISTRATIVE MESSAGE FROM MSP SPEC OPERATIONS DIV

GBDC #43

ATTN: ALL PUBLIC SAFETY AGENCIES

NEW REGIONAL PLANNING THRUST
FIRST PLANNING MEETING
RICHARD S. DEMELLO, CONVENER FOR 746-806 MHZ REGION 21 PLAN

MASONIC TEMPLE 2875 W. LIBERTY ROAD, ANN ARBOR, MI
WEDNESDAY, MAY 3, 2000 10:00 A.M. - 3:00 P.M.

MEETING IS FOR SPECTRUM ALLOCATION OF THE 700 MHZ FREQUENCIES.

THE FCC HAS ESTABLISHED THE PUBLIC SAFETY NATIONAL COORDINATION COMMITTEE (NCC), PURSUANT TO THE PROVISION OF THE FEDERAL ADVISORY COMMITTEE ACT, TO ADVISE THE COMMISSION ON A VARIETY OF ISSUES RELATING TO THE USE OF THE 24 MHZ OF SPECTRUM IN THE 764-776/794-806 MHZ FREQUENCY BANDS.

IT IS VERY IMPORTANT THAT THE PUBLIC, PARTICULARLY THE PUBLIC SAFETY COMMUNITY, PARTICIPATE IN THE NCC. THE 24 MHZ OF SPECTRUM IN THE 700 MHZ BAND REPRESENTS THE LARGEST ALLOCATION OF SPECTRUM FOR PUBLIC SAFETY USE THE FCC HAS EVER MADE. IT PRESENTS A ONCE-IN-A-LIFETIME OPPORTUNITY FOR BIG PICTURE THINKING ABOUT HOW THIS SPECTRUM RESOURCE CAN BEST SERVE THE NATION'S PUBLIC SAFETY AND EMERGENCY RESPONSE NEEDS.

DISCUSS:

1. HISTORY, HOW WE GOT TO WHERE WE ARE.
2. INTEROPERABILITY.
3. NATIONAL PLANNING REQUIREMENTS.
4. NEW PLANNING THRUST AND DISCUSSION OF NEEDS AND OR USES OF THE SPECTRUM.

QUESTIONS, CONTACT BILL FOLSKE (734)741-1346, ERICA THOMAS (517)373-8048 OR RICHARD DEMELLO (517)335-3266.

PLEASE RSVP VIA THE INTERNET TO THOMASEM@STATE.MI.US.

AUTH: HARRY WARNER,MICHIGAN STATE POLICE., COMMUNICATIONS DIVISION

MSP OPERATIONS
LT ALLAIRE
OPR OLGER

NEW REGIONAL PLANNING THRUST

April 10, 2000

TO: Public Safety/Service Agencies

FROM: Richard S. DeMello, Convener for 746-806 MHz Region 21 Plan

SUBJECT: First Planning Meeting

Where: Masonic Temple
2875 W. Liberty Road
Ann Arbor, MI

When: Wednesday, May 3, 2000

Time: 10:00 a.m. - 3:00 p.m.

Why: Discuss:
1. History, how we got to where we are.
2. Interoperability.
3. National planning requirements.
4. New planning thrust and discussion of needs and or uses of the spectrum.

Bill Folske is planning to have an inexpensive lunch available.

Please RSVP via the internet to thomasem@state.mi.us.

If you have any questions, you can contact Bill Folske at (734) 741-1346, Erica Thomas at (517) 373-8048 or Richard DeMello at (517) 335-3266.

March 1, 2000

p:\admin\telecom\700MHz\1stplanmeeting

700MHz Planning Meeting
May 3,2000
Wednesday
Agenda

Richard DeMello, Convener for the Plan
Welcomes attendees
Interoperability and Public Safety Communications
Planning for the future use of 700MHz spectrum.
Thomas Sugrue, Chief of the Public Safety Wireless Telecommunications Bureau
remarks delivered at the NCC January 14, 2000 meeting in Washington D.C.

Bill Folske, APCO frequency advisor
Michigan History regarding the Spectrum-Use and availability of spectrum in Michigan.
Michigan Public Safety Frequency Advisory Committee: membership and operation
MPSFAC member introduction.
APCO Chapter involvement and introduces Chapter dignitaries

Richard DeMello
Reports on the: Public Safety Wireless Advisory Committee process and report.
National Public Safety Telecommunications Council
National Coordination Committee
Steering Committee
Sub-Committees: Interoperability, Technology, Implementation
Web Page information

NCC February Report to the FCC
Interoperability Sub-Committee Products
Technology Sub-Committee Products
Interoperability Sub-Committee Products.

Bette Rinehart, Chairperson Writing Working Group: Progress report

David Eierman,Chairperson DTV Transition Working Group
Report regarding DTV stations and US Canadian activities.

Michigan Planning Committee and consideration of Survey and Implementation
Committee Draft report.

Select ~~Plan Chairperson~~, Co-Chairperson, Vice Chairperson
Select Plan working groups, charges, future meeting(s) and milestones

Adjourn

Survey Fax #
1-517-759-1444 - SECOND FAX
TURNER J@ JUNO.COM
EMAIL SURVEY

700 MHz PLANNING MEETING

August 10, 2000

TO: Public Safety/Service Agencies

FROM: Richard S. DeMello, Convener for 746-806 MHz Region 21 Plan

SUBJECT: The group will be responsible for the development of a plan for the use of 700 MHz spectrum for public safety and public service providers.

Where: Masonic Temple
2875 W. Liberty Road
Ann Arbor, MI

When: Thursday, October 12, 2000

Time: 10:00 a.m. - 2:00 p.m.

Why: Discuss:

1. By laws
2. Co-chair person
3. Status of National Coordinating Committee
4. Plan guidelines
5. 700 MHz data base

The meeting is being called by Richard S. DeMello, the Convener for 746-806 MHz Region 21 Plan.

Lunch will not be provided therefore, there will be a lunch break.

If you have any questions, you can contact Bill Folske at (734) 741-1346, Erica Thomas at (517) 373-8048 or Richard DeMello at (517) 335-3266.

August 10, 2000

p:\admin\telecom\700MHz planning meeting

700 MHz PLANNING MEETING

January 25, 2001

TO: Public Safety/Service Agencies

FROM: Richard S. DeMello, Convener for 746-806 MHz Region 21 Plan

SUBJECT: Region 21 Planning Committee Meeting

Where: Lansing School District Hill Center
5815 Wise Road
Lansing, MI 48911

When: Wednesday, January 31, 2001

Time: 9:45 a.m. – 11:45 a.m. Subcommittee Meeting
11:45 a.m. – 3:00 p.m. Region 21 Committee Meeting

Why: Subcommittee meeting: work on draft documents for review and action by the Regional Committee and incorporation into the regional plan.

The meeting is being called by Richard S. DeMello, the Convener for 746-806 MHz Region 21 Plan.

Lunch will not be provided therefore, there will be a lunch break.

If you have any questions, you can contact Bill Folske at (734) 741-1346, Erica Thomas at (517) 373-8048 or Richard DeMello at (517) 335-3266.

On the following two pages are maps to the meeting location. You can get further directions by clicking on or going to the following URL http://maps.yahoo.com/.

January 9, 2001

p:\admin\telecom\700MHz planning meeting 1-31-01

700 MHz PLANNING MEETING

April 11, 2001

TO: Public Safety/Service Agencies

FROM: Richard S. DeMello, Convener for 746-806 MHz Region 21 Plan

SUBJECT: Region 21 Planning Committee Meeting

Where: Saginaw County Court House (see attached for directions)
Saginaw, MI

When: Wednesday, April 25, 2001

Time: 9:45 a.m. – 11:45 a.m. Subcommittee Meeting
11:45 a.m. – 3:00 p.m. Region 21 Committee Meeting

Why: Subcommittee meeting: work on draft documents for review and action by the Regional Committee and incorporation into the regional plan.

The meeting is being called by Richard S. DeMello, the Convener for 746-806 MHz Region 21 Plan.

Suggest we have lunch brought in so we can continue the process.

If you have any questions, you can contact Bill Folske at (734) 741-1346, Erica Thomas at (517) 373-8048 or Richard DeMello at (517) 335-3266.

April 11, 2001

p:\admin\telecom\700MHz planning meeting 4-25-01

700 MHz PLANNING MEETING

April 11, 2001

Directions to the 700 MHz planning meeting for Wednesday, April 25, 2001 in Saginaw, Michigan.

The 911 center is in a new County Court House annex located at 618 Cass Street. The adjacent County Court house is located at the intersection of Court Street and Michigan Avenue (111 S. Michigan Avenue).

The 911 entry on Cass Street is about one block west of the Michigan Avenue/Cass Street intersection. Michigan Avenue is a principle north/south roadway within the city. It may be reached via intersections with, M-13, M-58, M-46 and I-675. Once a vehicle enters Michigan Avenue, they just motor on to the center of the city and the County Court House. Folks coming in on M-13 should follow M-13 to the central parks system (the Children's Zoo is a prominent feature) and turn west onto Ezra Rust Drive right in front of the Zoo. They'll follow Ezra Rust across the Saginaw River and directly to the County Court House or Saginaw Governmental Center.

Metered Parking is located adjacent to the 911 annex on Cass Street. Vehicles may be parked for free on some nearby streets. We'll be investigating some sort of arrangement which will permit committee members to park in the lot at no cost to them. No promises, but we'll see what we can do.

April 11, 2001


MAPQUEST
0 1 mi
0 1 km
Carrollton
675
Saginaw Township North
N Center Rd
Weiss St
84
N Mason St
N Michigan Ave
Carlisle St
Fitzhugh St
58
Mackinaw St
Brockway Rd
Houghton Ave
Van Ave
N Niagara St
Hoyt Ave
Saginaw
Saginaw Township South
46
Webber St
Superior St
Florence St
Hess Ave
Williamson St
Farmer St
S Center Rd
Bullhead Creek
Williamson Rd
S Washington Rd
Cass River
13
©2000 MapQuest.com, Inc.; ©2000 GDT, Inc.


MAPQUEST
0 300m
900ft
Mount St
S Carolina St
S Charles St
S Andre St
S Bates St
S Woodbridge St
N Mason St
N Oakley St
N Porter St
Troop St
Miller St
Hayes St
Monroe St
Mackinaw St
S Mason St
S Oakley St
N Bond St
N Webster St
N Harrison St
N Michigan Ave
S Bond St
S Porter St
S Granger St
N Granger St
N Hamilton St
N Niagara St
Jackson St
Lyon St
N Fayette St
Ames St
Williams St
S Webster St
S Harrison St
S Michigan Ave
Stephens St
Van Buren St
Adams St
Cass St
Ezra Rust Access
Ezra Rust Dr
Gratiot Ave
Hamilton St
S Niagara St
Bullock St
Braley St
Sweet St
46
Walter St
Saginaw St
Lee St
Perry St
Wayne St
Dearborn St
NYC Railroad
Fordney St
Newton St
Birch St
©2000 MapQuest.com, Inc.; ©2000 GDT, Inc.

700 MHz PLANNING MEETING AGENDA

April 25, 2001
Saginaw, MI

Report regarding national matters:

NPSTC – pre-coordination database

LMCC – 50-10 for interference

Subcommittee:

1. Interoperability
2. RPC matrix
   a. Application window(s)
   b. Open submission
3. Technical standard for systems
4. MOU consideration
5. Region definition and write ups
   a. County boundaries
6. Dispute resolution within the region
7. Regional committee review and adoption

700 MHz PLANNING MEETING

July 9, 2001

TO: Public Safety/Service Agencies

FROM: Stephen Todd, Chairman of 746-806 MHz Region 21 Plan

SUBJECT: The group will be responsible for the development of a plan for the use of 700 MHz spectrum for public safety and public service providers.

Where: Oakland County Department of Information Technology
Building 49W, Room 272
1200 N. Telegraph Rd
Pontiac, MI

A map to the above location can be viewed from the following web site:
www.clemis.org

When: Wednesday, September 19, 2001

Time: 9:45 a.m. - 3:00 p.m.

Why: Discuss:

1. Review recent National Coordinating Committee activity.
2. Review the plan in draft plan.
3. Create subcommittees to address areas that need to be considered.

The meeting is being called by Stephen Todd, Chairman of 746-806 MHz Region 21 Plan.

Lunch will be provided.

If you would like to join the 700MHz Region 21 list server, visit:
http://www.RPC21.listbot.com/

If you have any questions, you can contact Bill Folske at (734) 741-1346 or Erica Thomas at (517) 373-8048.

June 29, 2001

p:\admin\telecom\700MHz planning meeting 9-19-01

700 MHz PLANNING MEETING

October 11, 2001

TO: Public Safety/Service Agencies

FROM: Richard S. DeMello, Convener for 746-806 MHz Region 21 Plan

SUBJECT: Region 21 Planning Committee Meeting

Where: Frankenmuth, MI (at the annual APCO meeting site)

When: Thursday, October 18, 2001

Time: 1:00 p.m.

Why: Finalize 700 MHz Plan

FOLSKE W @ APCO 911. ORG

If you have any questions, you can contact Bill Folske at (734) 741-1346, Erica Thomas at (517) 373-8048 or Richard DeMello at (517) 335-3266.

October 11, 2001

700 MHz PLANNING MEETING

January 4, 2002

TO: Public Safety/Service Agencies

FROM: Richard S. DeMello, Convener for 746-806 MHz Region 21 Plan

SUBJECT: Region 21 Planning Committee Meeting

Where: Macomb County Sheriff's Department Training Room
Macomb County Jail
43565 Elizabeth
Mount Clemens, MI 48043

When: Friday, January 4, 2002

Time: 10:00 a.m.

Why: Review recent changes to the plan for approval by the regional committee. A sub committee will be determining the use of the interoperability frequencies by county on a statewide basis.

The Sheriff's department is co-located with the Macomb County Jail. The training Room is located off the WEST entrance. Parking is catch as catch can.

If you have any questions, you can contact Bill Folske at (734) 741-1346, Erica Thomas at (517) 373-8048 or Richard DeMello at (517) 335-3266.

December 13, 2001

p:\admin\telecom\700MHz planning meeting 1-4-02

REGION 21 700 MHz Planning Committee Meeting
AGENDA
10:00 a.m. July 1, 2002
Conference Call

I. Call to order
II. Approve agenda
III. Approve minutes of January 4, 2002 meeting
IV. New Business
  A. Appointment of vice-chair to chair
  B. Election on vice-chair
  C. Other
V. Old Business
  A. Review of draft plan
  B. Next Steps for submission of plan
  C. Other
VI. Next meeting date
VII. Adjournment

CONFERENCE CALL JULY 1, 2002

Announcement via Listgroup

From: "Erica Thomas" <thomasem@michigan.gov>
To: <RPC21@yahoogroups.com>
Date: Mon, 17 Jun 2002 12:40:37 -0400
Subject: [RPC21] 700 MHz Meeting Monday, July 1, 2002
Message-ID: <sd0dd8c9.067@gwia02.state.mi.us>
Reply-To: RPC21@yahoogroups.com
Received: from mx10.nyc.untd.com (mx10.nyc.untd.com [10.140.24.70])
by m6.boston.juno.com with SMTP id AAA8S6EJQAE8ZW4S
for <turnerj@juno.com> (sender <sentto-3643878-21-1024332043-turnerj=juno.com@returns.groups.yahoo.com>);
Mon, 17 Jun 2002 12:40:46 -0400 (EST)
Received: from n8.grp.scd.yahoo.com (n8.grp.scd.yahoo.com [66.218.66.92])
by mx10.nyc.untd.com with SMTP id AAA8S6EJPAWCTWXA
for <turnerj@juno.com> (sender <sentto-3643878-21-1024332043-turnerj=juno.com@returns.groups.yahoo.com>);
Mon, 17 Jun 2002 12:40:45 -0400 (EST)
Received: from [66.218.67.201] by n8.grp.scd.yahoo.com with NNFMP; 17 Jun 2002 16:40:44 -0000
Received: (EGP: mail-8_0_3_2); 17 Jun 2002 16:40:42 -0000
Received: (qmail 6840 invoked from network); 17 Jun 2002 16:40:42 -0000
Received: from unknown (66.218.66.216)
by m9.grp.scd.yahoo.com with QMQP; 17 Jun 2002 16:40:42 -0000
Received: from unknown (HELO gwia02.state.mi.us) (167.240.253.11)
by mta1.grp.scd.yahoo.com with SMTP; 17 Jun 2002 16:40:42 -0000
Received: from SOM-GWIA02-MTA by gwia02.state.mi.us
with Novell_GroupWise; Mon, 17 Jun 2002 12:40:41 -0400
X-Mailer: Novell GroupWise Internet Agent 6.0.1
MIME-Version: 1.0
Content-Type: multipart/mixed; boundary="=_530F6D19.FC9D79F2"
Precedence: bulk
Return-Path: <sentto-3643878-21-1024332043-turnerj=juno.com@returns.groups.yahoo.com>
X-eGroups-Return: sentto-3643878-21-1024332043-turnerj=juno.com@returns.groups.yahoo.com
X-Sender: thomasem@michigan.gov
Mailing-List: list RPC21@yahoogroups.com; contact
RPC21-owner@yahoogroups.com
Delivered-To: mailing list RPC21@yahoogroups.com
X-Apparently-To: RPC21@yahoogroups.com
List-Unsubscribe: <mailto:RPC21-unsubscribe@yahoogroups.com>

The 700 MHZ meeting will be via conference call on Monday, July 1, 2002, at 10:00 a.m. The meeting is being called by Joe Turner, Vice Chairperson and acting Chairperson for Region 21.

Those wishing to participate are asked to RSVP to Pat Coates at coatesp@co.oakland.mi.us by the end of business day on Monday, June 24, 2002.

Those wishing to participate with receive the conference call telephone number by June 27, 2002.

Attached is the meeting agenda.

Thank you,
Erica Thomas
MDNR
(517) 373-8048

REGION 21 700 MHz Planning Committee Meeting
AGENDA
10 AM AUGUST 1, 2002 ANN ARBOR, MICHIGAN MEETING

1. Call to Order

2. Approve Agenda
3. Review minutes of July 1, 2002 Conference call and any prior Minutes

4. New Business
   a. Confirm Chairman's vacancy
   b. Elect new Chairman
   c. Elect new Vice-Chairman

5. Old Business
   a. Review final hearings and notification process
   b. Agree upon dates for submission

6. Next Meeting date

7. Miscellaneous (FCC Migration Path Implementation)

8. Adjournment

Documentation of use of list server
This is a notice of change in list servers
per G. McGahey, NPSTC Support Office

From: <turnerj@juno.com>
To: <mpc@michiganpropertytax.com>
Sent: Friday, August 23, 2002 1:41 PM
Subject: Fw: [RPC21] RPC21 List Serve Info

--------- Forwarded message ----------
From: "McGahey, Gene" <gmcgahey@du.edu>
To: "'RPC21@yahoogroups.com'" <RPC21@yahoogroups.com>
Date: Wed, 18 Jul 2001 10:28:55 -0600
Subject: [RPC21] RPC21 List Serve Info
Message-ID:
<107B4AC1744BD411869C00508B9B2C11064824@exchange.nlectc.du.edu
Reply-To: RPC21@yahoogroups.com
Received: from mx7.boston.juno.com (mx7.boston.juno.com [64.136.24.129])
by m6.boston.juno.com with SMTP id AAA7XMQ5TA4ABSVJ
for <turnerj@juno.com> (sender
<sentto-3643878-2-995473975-turnerj=juno.com@returns.onelist.com>);
Wed, 18 Jul 2001 12:38:09 -0400 (EST)
Received: from ho.egroups.com (ho.egroups.com [64.211.240.236])
by mx7.boston.juno.com with SMTP id AAA7XMQ5QAVKFQPS
for <turnerj@juno.com> (sender
<sentto-3643878-2-995473975-turnerj=juno.com@returns.onelist.com>);
Wed, 18 Jul 2001 12:38:06 -0400 (EST)
Received: from [10.1.4.53] by ho.egroups.com with NNFMP; 18 Jul 2001
16:32:59 -0000
Received: (EGP: mail-7_2_0); 18 Jul 2001 16:32:54 -0000
Received: (qmail 37785 invoked from network); 18 Jul 2001 16:30:42 -0000
Received: from unknown (10.1.10.142) by l7.egroups.com with QMQP; 18
Jul
2001 16:30:42 -0000
Received: from unknown (HELO odin.cair.du.edu) (130.253.1.2) by mta3
with
SMTP; 18 Jul 2001 16:30:42 -0000
Received: from CONVERSION-DAEMON.du.edu by du.edu (PMDF V6.0-
025 #37556)
id <0GGO01Y01GJ68Q@du.edu> for RPC21@yahoogroups.com; Wed, 18

Jul 2001
10:30:42 -0600 (MDT)
Received: from nlectc-server.nlectc.du.edu ([130.253.96.2]) by du.edu
(PMDF V6.0-025 #37556) with ESMTP id <0GGO01Y2WGJ62H@du.edu>
for
RPC21@yahoogroups.com; Wed, 18 Jul 2001 10:30:42 -0600 (MDT)
Received: by exchange.nlectc.du.edu with Internet Mail Service
(5.5.2653.19) id <P1PGKTST>; Wed, 18 Jul 2001 10:28:56 -0600
X-Mailer: Internet Mail Service (5.5.2653.19)
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Precedence: bulk
Content-return: allowed
Return-Path:
<sentto-3643878-2-995473975-turnerj=juno.com@returns.onelist.com>
X-eGroups-Return:
sentto-3643878-2-995473975-turnerj=juno.com@returns.onelist.com
X-Sender: gmcgahey@du.edu
Mailing-List: list RPC21@yahoogroups.com; contact
RPC21-owner@yahoogroups.com
Delivered-To: mailing list RPC21@yahoogroups.com
X-Apparently-To: RPC21@yahoogroups.com
List-Unsubscribe: <mailto:RPC21-unsubscribe@yahoogroups.com>

NOTICE!!!!!!

The Region 21 RPC list serve is now at: RPC21@yahoogroups.com

To unsubscribe from this group, send an email to:
RPC21-unsubscribe@yahoogroups.com

Your use of Yahoo! Groups is subject to http://docs.yahoo.com/info/terms/

700 MHz PLANNING MEETING

October 11, 2001

TO: Public Safety/Service Agencies

FROM: Richard S. DeMello, Convener for 746-806 MHz Region 21 Plan

SUBJECT: Region 21 Planning Committee Meeting

Where: Frankenmuth, MI (at the annual APCO meeting site)

When: Thursday, October 18, 2001

Time: 1:00 p.m.

Why: Finalize 700 MHz Plan

FOLSKE W @ APCO 911. ORG

If you have any questions, you can contact Bill Folske at (734) 741-1346, Erica Thomas at (517) 373-8048 or Richard DeMello at (517) 335-3266.

October 11, 2001

700 MHz PLANNING MEETING

January 4, 2002

TO: Public Safety/Service Agencies

FROM: Richard S. DeMello, Convener for 746-806 MHz Region 21 Plan

SUBJECT: Region 21 Planning Committee Meeting

Where: Macomb County Sheriff's Department Training Room
Macomb County Jail
43565 Elizabeth
Mount Clemens, MI 48043

When: Friday, January 4, 2002

Time: 10:00 a.m.

Why: Review recent changes to the plan for approval by the regional committee. A sub committee will be determining the use of the interoperability frequencies by county on a statewide basis.

The Sheriff's department is co-located with the Macomb County Jail. The training Room is located off the WEST entrance. Parking is catch as catch can.

If you have any questions, you can contact Bill Folske at (734) 741-1346, Erica Thomas at (517) 373-8048 or Richard DeMello at (517) 335-3266.

December 13, 2001

p:\admin\telecom\700MHz planning meeting 1-4-02

REGION 21 700 MHz Planning Committee Meeting
AGENDA
10:00 a.m. July 1, 2002
Conference Call

I. Call to order
II. Approve agenda
III. Approve minutes of January 4, 2002 meeting
IV. New Business
  A. Appointment of vice-chair to chair
  B. Election on vice-chair
  C. Other
V. Old Business
  A. Review of draft plan
  B. Next Steps for submission of plan
  C. Other
VI. Next meeting date
VII. Adjournment

CONFERENCE CALL JULY 1, 2002

Announcement via Listgroup

From: "Erica Thomas" <thomasem@michigan.gov>
To: <RPC21@yahoogroups.com>
Date: Mon, 17 Jun 2002 12:40:37 -0400
Subject: [RPC21] 700 MHz Meeting Monday, July 1, 2002
Message-ID: <sd0dd8c9.067@gwia02.state.mi.us>
Reply-To: RPC21@yahoogroups.com
Received: from mx10.nyc.untd.com (mx10.nyc.untd.com [10.140.24.70])
by m6.boston.juno.com with SMTP id AAA8S6EJQAE8ZW4S
for <turnerj@juno.com> (sender <sentto-3643878-21-1024332043-turnerj=juno.com@returns.groups.yahoo.com>);
Mon, 17 Jun 2002 12:40:46 -0400 (EST)
Received: from n8.grp.scd.yahoo.com (n8.grp.scd.yahoo.com [66.218.66.92])
by mx10.nyc.untd.com with SMTP id AAA8S6EJPAWCTWXA
for <turnerj@juno.com> (sender <sentto-3643878-21-1024332043-turnerj=juno.com@returns.groups.yahoo.com>);
Mon, 17 Jun 2002 12:40:45 -0400 (EST)
Received: from [66.218.67.201] by n8.grp.scd.yahoo.com with NNFMP; 17 Jun 2002 16:40:44 -0000
Received: (EGP: mail-8_0_3_2); 17 Jun 2002 16:40:42 -0000
Received: (qmail 6840 invoked from network); 17 Jun 2002 16:40:42 -0000
Received: from unknown (66.218.66.216)
by m9.grp.scd.yahoo.com with QMQP; 17 Jun 2002 16:40:42 -0000
Received: from unknown (HELO gwia02.state.mi.us) (167.240.253.11)
by mta1.grp.scd.yahoo.com with SMTP; 17 Jun 2002 16:40:42 -0000
Received: from SOM-GWIA02-MTA by gwia02.state.mi.us
with Novell_GroupWise; Mon, 17 Jun 2002 12:40:41 -0400
X-Mailer: Novell GroupWise Internet Agent 6.0.1
MIME-Version: 1.0
Content-Type: multipart/mixed; boundary="=_530F6D19.FC9D79F2"
Precedence: bulk
Return-Path: <sentto-3643878-21-1024332043-turnerj=juno.com@returns.groups.yahoo.com>
X-eGroups-Return: sentto-3643878-21-1024332043-turnerj=juno.com@returns.groups.yahoo.com
X-Sender: thomasem@michigan.gov
Mailing-List: list RPC21@yahoogroups.com; contact
RPC21-owner@yahoogroups.com
Delivered-To: mailing list RPC21@yahoogroups.com
X-Apparently-To: RPC21@yahoogroups.com
List-Unsubscribe: <mailto:RPC21-unsubscribe@yahoogroups.com>

The 700 MHZ meeting will be via conference call on Monday, July 1, 2002, at 10:00 a.m. The meeting is being called by Joe Turner, Vice Chairperson and acting Chairperson for Region 21.

Those wishing to participate are asked to RSVP to Pat Coates at coatesp@co.oakland.mi.us by the end of business day on Monday, June 24, 2002.

Those wishing to participate with receive the conference call telephone number by June 27, 2002.

Attached is the meeting agenda.

Thank you,
Erica Thomas
MDNR
(517) 373-8048

REGION 21 700 MHz Planning Committee Meeting
AGENDA
10 AM AUGUST 1, 2002 ANN ARBOR, MICHIGAN MEETING

1. Call to Order

2. Approve Agenda
3. Review minutes of July 1, 2002 Conference call and any prior Minutes

4. New Business
   a. Confirm Chairman's vacancy
   b. Elect new Chairman
   c. Elect new Vice-Chairman

5. Old Business
   a. Review final hearings and notification process
   b. Agree upon dates for submission

6. Next Meeting date

7. Miscellaneous (FCC Migration Path Implementation)

8. Adjournment

Michigan Property Consultants

From: "Erica Thomas"
To: <mpc@michiganpropertytax.com>
Sent: Tuesday, September 24, 2002 4:52 PM
Subject: Re: Fw: Proposed Agenda

The meeting is Thursday, September 26th, at 1:00 p.m. at the Kettunen Center, 14901 4H Drive off 145th Avenue, Tustin, MI. Maps and directions are available at the Kettunen Center web site: www.kettunencenter.org

Erica Thomas
DNR Fisheries
Safety and Training Coordinator
8th Floor Mason Bldg
PO Box 30446
Lansing, MI 48909

(517) 373-8048
(517) 373-0381 Fax
thomasem@michigan.gov

>>> "Michigan Property Consultants" <mpc@michiganpropertytax.com> 09/24/02 04:52PM >>>
Erica:

Would you happen to have the name, address and perhaps directions to the
place in Tustin, Michigan the 700 MHz Plan Committee will be holding its
public hearing at on Thursday?

Thank you.

Joe Turner

Coordination of Posting with FCC

Mr. Turner,
Thank you for the updated info. We will post this information to our Public Safety web site shortly.
Joy Alford/FCC

>>> turnerj@juno.com 01/28/03 05:30PM >>>
Hello Ms. Alford:

Thank you for the e-mail. Here is an update for contact information. I am sending a copy to Keith, so he'll be aware of this communication.

Region 21 (Michigan)
Joseph M. Turner, Chairman
2719 State St.
Saginaw, Michigan 48602
PH: 989-793-7373
FX: 989-792-4199
Email: jturner@michiganpropertytax.com
Region 21 web site: www.miapco.org

The contact information as shown in your original communication will certainly work. However, this information has my office address, the day time telephone and fax numbers to my office and has my business e-mail address. These may be quicker ways of contacting me.

Thank you for the welcome message.

Best regards,

Joe

From: "Patricia Coates" <coatesp@co.oakland.mi.us>
To: "William S Nelson" <nelsonws@ci.troy.mi.us>; "Michael Whately" <mewhat@csi-inc.ws>; "Lloyd Collins" <slpd@voyager.net>; "Larry Zabkowski" <L_Zabkowski@cityofsouthfield.com>; "Ronald Berns" <ron.berns@monroemi.org>; "Rick Uslan" <R.Uslan@motorola.com>; "Dennis Betz" <betzd@ewashtenaw.org>; "Keith Bradshaw" <Keith.Bradshaw@co.macomb.mi.us>; "David H. Held" <daveheld@compuserve.com>; "Lloyd R. Fayling" <LRF@geneseecounty911.org>; "William Folske" <wfolske@sbcglobal.net>; "Al Eichenberg" <eichenba@michigan.gov>; "Al Nowakowski" <nowakowskia@michigan.gov>; "Joe Turner" <jturner@michiganpropertytax.com>; "Dean Alger" <algercomm@aol.com>; "Thomas Atland" <mo911@voyager.net>; "Robert Andrus" <bandrus@ci.dearborn.mi.us>; "John Grant" <jgrant@lsd.k12.mi.us>; "Bob Ogden" <ogdenr@michigan.gov>; "Louis Rutare" <rutarel@michigan.gov>; "Craig Swenson" <swensonc@co.washtenaw.mi.us>; "Bette Rhinehart" <c18923@lmpsil02.comm.mot.com>; "Chris Goeschel" <Cgoeschel@lans.mha.org>; "Lt David Knezek" <dhpsa@dhol.org>; "Harry Herkimer" <herkimerr@TDI.NET>; "Jim Schuler" <jschuler@fs.fed.us>; "Clyd Thompson" <cnthompson@fs.fed.us>; "Phyllis Green" <pagreen@fs.fed.us>; "Larry Hach" <larry_hach@nps.gov>
Sent: Friday, September 19, 2003 4:19 PM
Attach: KettMap.pdf; 700 MHz Meeting Notice 092603.doc; 700 MHz Agende 092603.doc
Subject: 700 MHz Meeting Notice

There will be a meeting of the Region 21 700 MHz Planning Committee in conjunction with the Michigan APCO Conference on Friday, September 26th, at 11:30 a.m. in the Ford Room of the Kettenun Center in Tustin, MI. A map, meeting notice and draft agenda are attached.
The meeting notice is also posted on the Michigan APCO web site.

Region 21 700 MHz Planning Committee
Meeting Notice

The Region 21 700 MHz Regional Planning Committee meeting will be held on
Friday, September 26, 2003
At 11:30 a.m.

At the Kettunen Center - Ford Room
14901 4H Drive, Tustin, MI

Draft Agenda:

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Approval of Minutes of June 23, 2003 meeting

V. Old Business
- A. Frequency sort and electronic plan update
- B. CAPRAD management and access
- C. Interoperability and Coordination with Adjacent Regions
- D. Frequency Channelization
- E. Other

VI. New Business
- A. Border Sharing Agreement by NYS-TEC
- B. 4.9 GHz
- C. Other

VII. Next meeting date

VIII. Adjournment

REGION 21 700 MHz Planning Committee
MEETING NOTICE

Thursday, October 23, 2003
11:00 a.m.

Frankenmuth City Hall
240 W. Genesee Street
Frankenmuth, MI

The Frankenmuth City Hall is two blocks west of Main Street (Highway M-83) on the north side of Genesee Street

The meeting will be held in the City Council Chambers on the second floor of City Hall. Attendees should turn right at the top of the stairs, or walk straight ahead from the elevator.

Region 21 700 MHz Planning Committee Meeting
Thursday, October 23, 2003
11:00 a.m.
Frankenmuth, MI

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Approval of Minutes of September 26, 2003 meeting

V. Old Business
   A. Frequency sort and electronic plan update
   B. CAPRAD management and access
   C. Interoperability and Coordination with Adjacent Regions
   D. Frequency Channelization
   E. Other

VI. New Business
   A. Border Sharing Agreement by NYS-TEC
   B. 4.9 GHz
   C. Other

VII. Next meeting date

VIII. Adjournment

Region 21 700 MHz Planning Committee
Meeting Notice

The Region 21 700 MHz Regional Planning Committee meeting will be held on
Thursday, November 20, 2003
At 10:00 a.m.

At the Ann Arbor Masonic Temple
2875 W. Liberty, Ann Arbor, MI
(cross-street is W. Stadium Drive)

Draft Agenda:

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Approval of Minutes of September 23, 2003 meeting

V. Old Business
   A. Plan Revisions
      1. Frequency sort and electronic plan update
      2. Electronic Format
      3. Coordination with Adjacent Regions/Border Sharing Agreement
      4. Channelization
      5. Other
   B. 4.9 GHz
   C. Other

VI. New Business
   A. Other

VII. Next meeting date

VIII. Adjournment

Region 21 700 MHz Planning Committee
Meeting Notice

The Region 21 700 MHz Regional Planning Committee meeting will be held on
Thursday, December 4, 2003
At 11:00 a.m.

At the Washtenaw County Sheriff Department EOC
2201 Hogback Road, Ann Arbor, MI
(Cross Street is Washtenaw Ave, east of US23)

Agenda to follow

Region 21 700 MHz Planning Committee
Meeting Notice

The Region 21 700 MHz Regional Planning Committee meeting will be held on
Thursday, December 4, 2003
At 11:00 a.m.

At the Washtenaw County Sheriff Department EOC
2201 Hogback Road, Ann Arbor, MI
(Cross Street is Washtenaw Ave, east of US23)

Draft Agenda:

I. Call to Order

II Introductions

III. Approval of Agenda

IV. Approval of Minutes of November 20, 2003 meeting

V Old Business
- A. Plan Revisions
  1. Frequency sort and electronic plan update
  2. Electronic Format
  3. Coordination with Adjacent Regions/Border Sharing Agreement
  4. Loading Criteria
  5. Other
- B. 4.9 GHz
- C. Other

VI New Business
- A. Other

VII. Next meeting date Jan 15th

VIII Adjournment

Michigan Public Safety Frequency Advisory Committee Meeting

Meeting Notice

The Region 21 MPSFAC meeting will be held on
Thursday, January 15, 2004
At 10:00 a.m.

At the Washtenaw County Sheriff Department EOC
2201 Hogback Road, Ann Arbor, MI
Ann Arbor, MI
(Cross Street is Washtenaw Ave, east of US23)

Agenda to follow

Region 21 700 MHz Planning Committee Meeting Agenda

The Region 21 700 MHz Regional Planning Committee meeting will be held on Thursday, January 15, 2004 At 11:00 a.m.

At the Washtenaw County Sheriff Department EOC 2201 Hogback Road, Ann Arbor, MI (Cross Street is Washtenaw Ave, east of US23)

Draft Agenda:

I. Call to Order

II Introductions

III. Approval of Agenda

IV. Approval of Minutes of December 4, 2003, 2003 meeting

V Old Business
- A. Plan Revisions
  1. Frequency sort and electronic plan update
  2. Electronic Format
  3. Coordination with Adjacent Regions/Border Sharing Agreement
  4. Loading Criteria — NO PRIMARY ZONE REQUIRED
  5. Other LOADING REQUIREMENTS PROGRESSIVE + GRANDFATHERED ADOPTED
- B. 4.9 GHz
- C. Other

VI New Business
- A. Other

VII Next meeting date @ MPCO MEETING IN LANSING OF MARCH 25

VIII. Adjournment @ MPCC MEETING IN BAY CITY OF MAY 27

Region 21 700 MHz Planning Committee
Meeting Notice

The Region 21 700 MHz Regional Planning Committee meeting will be held on Thursday, March 25, 2004 Approximately 1:00 p.m. (Immediately following the Michigan APCO Chapter meeting)

The meeting will be held at the Brookshire Inn and Golf Club, 205 W. Church Street in Williamston, MI.

From I-96, take exit 117, the "Dansville/Williamston" exit, and go north on Williamston Road. In the town of Williamston, Williamston Road becomes Putnam Street. Continue north on Putnam to left on W Church.

Draft Agenda:

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Approval of Minutes of the January 15, 2004 meeting

V. Old Business
- A. Plan Revisions
  1. Frequency sort and electronic plan update
  2. Electronic Format
  3. Coordination with Adjacent Regions/Border Sharing Agreement
  4. Loading Criteria
  5. Other
- B. 4.9 GHz PLAN 12 MONTHS FROM JULY 2003
- C. Other

VI. New Business
- A. Other
  a. DEFINITION OF CURVES — ~~KEEP~~ DANG TO FACILITIT

VII. Next meeting date MAY 27, 2004 BAY CITY

VIII. Adjournment 3:47 PM

Contact Information: Chairman Joseph M. Turner
Tel. 989 793-737 e-mail jturner@michiganpropertytax.com

Region 21 700 MHz Planning Committee
Meeting Notice

The Region 21 700 MHz Regional Planning Committee meeting will be held on
Thursday, May 27, 2004
Approximately 1:00 p.m.
(Immediately following the Michigan APCO Chapter meeting)

The meeting will be held at the Howard Johnson restaurant
6296 Saginaw Road (M-84)
Bay City, MI
(At Exit 160 on I-75, restaurant is on the west side of the expressway)

Draft Agenda:

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Approval of Minutes of the March 25, 2004 meeting

V. Old Business
   A. Plan Revisions
      1. Frequency sort and electronic plan update
      2. Electronic Format
      3. Coordination with Adjacent Regions/Border Sharing Agreement
      4. Loading Criteria
      5. Other
   B. 4.9 GHz
   C. Other

VI. New Business
   A. Other

VII. Next meeting date

VIII. Adjournment

Contact Information: Chairman Joseph M. Turner
Telephone: 989 793-737 e-mail: jturner@michiganpropertytax.com

Joe Turner

From: "Patricia Coates" <coatesp@co.oakland.mi.us>
To: "William S Nelson" <nelsonws@ci.troy.mi.us>; "Jim Fyvie" <fyviej@clinton-county.org>; "Michael Whately" <mewhat@csi-inc.ws>; "Lloyd Collins" <slpd@cablespeed.com>; "Dundas, Dan" <dundasda@tycoelectronics.com>; "Larry Zabkowski" <L_Zabkowski@cityofsouthfield.com>; "Ken Palazzi" <palazzike@tycoelectronics.com>; "Ronald Berns" <ron.berns@monroemi.org>; "Rick Uslan" <R.Uslan@motorola.com>; "Beckman Karl" <Karl.Beckman@motorola.com>; "Dennis Betz" <betzd@ewashtenaw.org>; "Mcdowell, Dennis" <mcdoweld@tycoelectronics.com>; "Richard Hoose" <richardh_atc@chartermi.net>; "William Folske" <wfolske@comcast.net>; "Lloyd R. Fayling" <LRF@geneseecounty911.org>; "William Folske" <wfolske@sbcglobal.net>; "Al Eichenberg" <eichenba@michigan.gov>; "Al Nowakowski" <nowakowskia@michigan.gov>; "Joe Turner" <jturner@michiganpropertytax.com>; "Dean Alger" <algercomm@aol.com>; "Tom Altland" <mo911@voyager.net>; "Robert Andrus" <bandrus@ci.dearborn.mi.us>; "John Grant" <jgrant@lsd.k12.mi.us>; "Bob Ogden" <ogdenr@michigan.gov>; "Louis Rutare" <rutarel@michigan.gov>; "Bette Rhinehart" <c18923@lmpsil02.comm.mot.com>; "Lt David Knezek" <dhpsa@dhol.org>; "Jim Schuler" <jschuler@fs.fed.us>; "Clyd Thompson" <cnthompson@fs.fed.us>; "Phyllis Green" <pagreen@fs.fed.us>; "Larry Hach" <larry_hach@nps.gov>; "William Carter (Region 54)" <bcarter@cityofchicago.org>; "Jim Lee" <jlee@mha.org>; "gress" <gress@pplant.msu.edu>; "Keith Bradshaw" <Keith.Bradshaw@macombcountymi.gov>; "Harry Warner" <gwingharry@cs.com>; "Joy Alford" <joy.alford@fcc.gov>; "Rich English" <rfenglish@comcast.net>
Sent: Tuesday, May 25, 2004 4:52 PM
Attach: 700 MHz Meeting Notice 052704.doc; 700 mhz 03252004 minutes.doc
Subject: 700 MHZ Meeting reminder and draft minutes

Attached are a reminder meeting notice and draft minutes for the Region 21 700 MHz meeting on Thursday, May 27, in Bay City.

APCO Notice of Plan Posting

From: "Keith Bradshaw" <Keith.Bradshaw@macombcountymi.gov>
To: <roscommon911@voyager.net>
Cc: <bandrus@ci.dearborn.mi.us>; <nelsonws@ci.troy.mi.us>; <coatesp@co.oakland.mi.us>; <mew@csi-inc.ws>; <lrf@geneseecounty911.org>; <dberry@hva.org>; <Mlujeakl@Mi.gov>; <EichenbA@michigan.gov>; <rutarel@michigan.gov>; <jturner@michiganpropertytax.com>; <Karl.Beckman@motorola.com>; <heldd@sbcglobal.net>; <slpd@voyager.net>
Sent: Friday, June 11, 2004 10:14 AM
Attach: 700 MHz Region 21 Plan Redo 4-04 no Cover.doc
Subject: current 700 Regional Plan

Hello John,

I have been asked to forward this to you for posting on the APCO website. Would you please post this for our committee?

Thanks

Keith Bradshaw

Keith M. Bradshaw
Service Manager
Technical Services
469-6433
keith.bradshaw@macombcountymi.us

Region 21 700 MHz Planning Committee
Meeting Notice

The Region 21 700 MHz Regional Planning Committee meeting will be held on
Thursday, July 29, 2004
10:00 a.m.

Oakland County Department of Information Technology
1200 N. Telegraph, Building 49W, Room 272
Pontiac, MI

Draft Agenda:

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Approval of Minutes of the May 27, 2004 meeting

V. Old Business
   A. Plan Revisions
      1. Frequency sort and electronic plan update
      2. Electronic Format
      3. Coordination with Adjacent Regions/Border Sharing Agreement
      4. Loading Criteria
      5. Other
   B. 4.9 GHz
   C. Other

VI. New Business
   A. Public Hearing Dates
   B. Other

VII. Next meeting date

VIII. Adjournment

Contact Information: Chairman Joseph M. Turner
Telephone: 989 793-737 e-mail: jturner@michiganpropertytax.com

Region 21 700 MHz Planning Committee
Meeting Notice

The Region 21 700 MHz Regional Planning Committee meeting will be held on
Tuesday, September 14, 2004
Approximately 11:00 A.M.
(The meeting will follow immediately after the Region 21 MPSFAC meeting)

At the Washtenaw County Sheriff Department EOC
2201 Hogback Road, Ann Arbor, MI
(Cross Street is Washtenaw Ave, east of US23)

Draft Agenda:

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Approval of Minutes of the July 29, 2004 meeting

V. Old Business
   A. Plan Revisions
      1. Frequency sort and electronic plan update
      2. Electronic Format
      3. Coordination with Adjacent Regions/Border Sharing Agreement
      4. Loading Criteria
      5. Other
   B. 4.9 GHz
   C. Other

VI. New Business
   A. Public Hearing Dates
   B. Other

VII. Next meeting date

VIII. Adjournment

Contact Information: Chairman Joseph M. Turner
Telephone: 989 793-737 e-mail: jturner@michiganpropertytax.com

Michigan Public Safety Frequency Advisory Committee Meeting

Meeting Agenda

The Region 21 MPSFAC meeting will be held on
Tuesday, September 14, 2004
At 10:00 a.m.
Washtenaw County EOC
Ann Arbor, MI

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Approval of Minutes of June 9, 2004 meeting

V. Old Business
- A. Applications
  1. Monroe County modification
  2. Other
- B. System Implementation Committee
- C. 821 Regional Plan Revision
- D. Consensus Plan
- E. South-East Michigan Frequency Subcommittee
  1. Letter from State regarding frequency swap
- F. Meeting attendance rules
- G. Other

VI. New Business
- A. Applications
  1. Other
- B. New APCO Appointee
- C. Other

VII. Next meeting date

VIII. Adjournment

Region 21 700 MHz Planning Committee
Public Meeting Notice

The Region 21 700 MHz Regional Planning Committee
Will hold a public meeting on Friday, October 1, 2004
at 10:30 a.m.

At the Kettunen Center - Ford Room
14901 4H Drive, Tustin, MI

The Region 21 700 MHz Regional Planning Committee invites all interested parties to provide input into the Region 21 plan prior to finalization.

Draft Agenda:

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Approval of Minutes of September 14, 2004 meeting

V. Review of Plan

VI. Public Comment

VII. Next meeting date

VIII. Adjournment

Contact Information: Chairman Joseph M. Turner
Telephone: 989 793-737 e-mail: jturner@michiganpropertytax.com

Region 21 700 MHz Planning Committee
Meeting Notice

The Region 21 700 MHz Regional Planning Committee meeting will be held on
Tuesday, November 16, 2004
At 10:00 A.M.

At the Washtenaw County Sheriff Department EOC
2201 Hogback Road, Ann Arbor, MI
(Cross Street is Washtenaw Ave, east of US23)

Draft Agenda:

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Approval of Minutes of the October 1, 2004 meeting

V. Old Business
   A. Plan Revisions
      1. Frequency sort and electronic plan update
      2. Electronic Format
      3. Coordination with Adjacent Regions/Border Sharing Agreement
      4. Loading Criteria
      5. CAPRAD access
   B. 4.9 GHz
   C. Other

VI. New Business
   A. Other

VII. Next meeting date

VIII. Adjournment

Contact Information: Chairman Joseph M. Turner
Telephone: 989 793-7373 e-mail: jturner@michiganpropertytax.com

---

From: "Patricia Coates" <coatesp@co.oakland.mi.us>
To: "Joe Turner" <jturner@michiganpropertytax.com>
Sent: Monday, December 27, 2004 9:54 AM
Subject: Re: Region 21 700 MHz RPC]

MPSFAC and 700 MHz are both scheduled for January 18 in Ann Arbor. I sent the
meeting notices to the FCC and the APCO web site on December 8. I should have
the minutes of the last MPSFAC meeting out today.

Joe Turner wrote:

> Pat:
>
> Merry Christmas to you.
>
> When you get a chance, will you verify upcoming meeting dates for me. I'm a
> little gun-shy having missed the one meeting. I understand we have the
> Broadband Over Power Line meeting on the 10th of January. What other
> meetings do you show scheduled in January? My understanding is the proposed
> meeting for the Midland area on the 27th is not viable.
>
> Best regards,
>
> Joe

Region 21 700 MHz Planning Committee
Meeting Notice

The Region 21 700 MHz Regional Planning Committee meeting will be held on
Tuesday, January 18, 2005
At 12:30 P.M
(Following the Michigan Public Safety Frequency Advisory Committee meeting)

At the Washtenaw County Sheriff Department EOC
2201 Hogback Road, Ann Arbor, MI
(Cross Street is Washtenaw Ave, east of US23)

Draft Agenda:

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Approval of Minutes of the October 1, 2004 meeting

V. Old Business
   A. Plan Revisions
      1. Frequency sort and electronic plan update
      2. Electronic Format
      3. Coordination with Adjacent Regions/Border Sharing Agreement
      4. Loading Criteria
      5. CAPRAD access
   B. 4.9 GHz
   C. Other

VI. New Business
   A. Other

VII. Next meeting date

VIII. Adjournment

Contact Information: Chairman Joseph M. Turner
Telephone: 989 793-7373 e-mail: jturner@michiganpropertytax.com

January 31, 2005

Notice to all Michigan counties and major population centers

700 MHz Plan is available on Internet

From: "John Bawol" <roscommon911@voyager.net>

To: "Zenon Cardenas Jr" <zcardenas@ioniacounty.org>; "Tom McIntyre" <911@saginawcounty.com>; "Ann Farquhar" <a_farquhar@cityofsouthfield.com>; <aa3725@wayne.edu>; "Gene Adamczyk" <adamczye@michigan.gov>; <adamsdist@provide.net>; "April Heinze" <aheinze@co.eaton.mi.us>; "Andrea Hine" <ahine@ioniacounty.org>; "Dean Alger" <algercomm@aol.com>; "David Cromell" <algershf@jamadots.com>; "Andrew Felde" <andrew@drewwireless.com>; "Anna Scott" <myns6@webtv.net>; "Barbara Fritz" <bfritz@ci.novi.mi.us>; "Barbara Wolfe" <barbaraw@ci.royal-oak.mi.us>; "Bill Charon" <bcharon@ioniacounty.org>; "Brian DeGrande" <bdegrande@ci.farmington-hills.mi.us>; "Angie Beals" <bealsa@clinton-county.org>; "Becky Shatney" <rshatney@occda.org>; "Bernie Gerencer" <bernie@co.newaygo.mi.us>; <beroff@livoniapd.com>; "Bruce Gaukel" <bgaukel@ci.lansing.mi.us>; <billa@voyager.net>; "Brianna Machuta" <bmachuta@interactsys.com>; "Bonnie Morton" <bmorton@isabellacounty.org>; "Bridget Schooley" <bmschooley@aol.com>; "Barry Nelson" <bnelson@saginawcounty.com>; "Bob Currier" <bobcurrier@comcast.net>; "Bonnie Bowman" <bonniebowman@hotmail.com>; "Borys Melnyk" <bmelnyk@visteon.com>; "Brandy Bunker" <bbunker@co.montcalm.mi.us>; "Gary Brozewski" <bro911bro@hotmail.com>; "Elizabeth Brown" <brownlr@michigan.gov>; <bs2@usol.com>; "Barbara Scott" <bs271@aol.com>; <bstites@allenparkpolice.org>; <carls@co.oakland.mi.us>; "'Carrie Perialas'" <cperialas@voyager.net>; "Cathrene Behrens" <cbehrens@walledlake.com>; "Bob Bradley" <cce100@yahoo.com>; "Chad Cole" <ccole026@msn.com>; "Charles Marsh" <cdm911@hotmail.com>; "Charlie Nystrom" <chasnice@voyager.net>; "Chris Deluge" <cdeluge@aol.com>; "Catherine Gracia-Lindstrom" <clindstr@ci.walker.mi.us>; "Clint Soldan" <clint.soldan@onstar.com>; "Duane Vosburg" <comoshop551@hotmail.com>; "Cornelia Shepperd" <conshep@juno.com>; "George Cool" <cool@wayne.edu>; "Craig Swenson" <CDSwenson@aol.com>; <CSWAINSTON@co.montcalm.mi.us>; "David Agens" <dagens@berriencounty.org>; "Dale Marsh" <dmarsh1@ameritech.net>; "Dana LaForest" <kingfluff2@aol.com>; "Daniel Miller" <millerd@ci.wayland.mi.us>; "Darrell Hogston" <darrell.hogston@postman.org>; "Dave Rice" <drice@midland911.org>; "Dave Schroeder" <dave.schroeder@verizon.com>; "David Held" <daveheld@compuserve.com>; "David Marshall" <davesway@wowway.com>; "David Rapalz" <dafchf1@aol.com>; "Dawn Cubitt" <dcubitt@sanilaccounty.net>; "Dale Berry" <dberry@hva.org>; "DC Croy" <dcroy@ci.novi.mi.us>; "Dave Ackley" <dca@geneseecounty911.org>; "Debra Wormwood" <dwormwood@new.rr.com>; "Dee Ann Summersett" <summersett911@tuscolacounty.org>; "Donald Hammond" <dhammond13@aol.com>; "Dawn Adams" <dmadams@dispatch.co.muskegon.mi.us>; "David Moore" <dmoore@newworldsys.com>; "David Nelson" <dn5683@ameritech.com>; "Doreen Olko" <dolko@auburnhills.org>; "Don Glasgow" <dtglasgow@core.com>; "Donna Torrance" <dtorrance@newworldsys.com>; "Dan Dundas" <dundasda@tycoelectronics.com>; "Ellen Deview" <edeview@ci.birmingham.mi.us>; "Allen Eichenburg" <Eichenba@michigan.gov>; "Ellen Guinn" <guinne@clinton-county.org>; <enigma0402@yahoo.com>; <fenwayprd@aol.com>; <foisyv@rochesterhills.org>; "Bill Folske" <wfolske@comcast.net>; "Fred Harris" <fharris@wexfordcounty.org>; <fyviej@clinton-county.org>; "Gary Albrecht" <galbrecht@stclaircounty.org>; <gdavies@rcoc.org>; "David Gignac" <giggys@chartermi.net>; "George Morehouse" <gmorehou@shelbytwpfd.com>; "Andy Goldberger" <goldbergera@stjosephcountymi.org>; <goralczym@ci.troy.mi.us>; <gould@wmis.net>; <gpatton@ci.novi.mi.us>; "Greg Clark" <gclark@ogsh.org>; "David Halteman" <haltemad@co.washtenaw.mi.us>; "Harvey Becker" <muskrivoutf@msn.com>; <heathers@michigan.gov>; "Herbert Rockwell" <hrockwell@plymouthtwppd.org>; <herkimer@tdi.net>; <hicksl@michigan.gov>; <hills911@frontiernet.net>; "Harriet Miller-Brown" <millerhr@michigan.gov>; <hwillia@ci.east-lansing.mi.us>; "Chris Schultz" <iscd911@chartermi.net>; "Jack Gabbard" <gabbardj@michigan.gov>; <jahepfer@aol.com>; <janders2@co.grand-traverse.mi.us>; "Janet Kaplan" <jkaplan@ci.novi.mi.us>; <jbuck@leo.gov>; <jceo@ci.saline.mi.us>; "Jeff Newton" <Newtonj@fraserdps.com>; "Jeff Vezina" <jvezina@dss-corp.com>; "Jessica Wheeler" <jesswheeler911@yahoo.com>; "Jim Twarog" <iosco911@charterinternet.com>; <jim.osborn@wcaa.us>; <Jim@sterlingyes.com>; <johncarnago@roecomm.com>; <jomegjoe@hotmail.com>; "Jonathon Uetrecht"

<uetrecht@cbpu.com>; "Joseph Heersche" <jheersche@efjohnson.com>; <joseph.d.cousineau@mail.ameritech.com>; <jsellinger@lpdmail.com>; <jsfish2001@yahoo.com>; <jshort@ci.novi.mi.us>; <jtdorsey@dorsey-pages.com>; <jturner@michiganpropertytax.com>; <jzapolnik@HVA.org>; "Karen Assaf" <kassaf@ci.novi.mi.us>; "Karen Jackson" <kjackson@ci.novi.mi.us>; "Karen Mora" <karen.mora@motorola.com>; <KBsuper911@aol.com>; <kc8mdb@yahoo.com>; <kchadwick@ci.lansing.mi.us>; <kdeyoung@CO.GRAND-TRAVERSE.MI.US>; "Kelly Rasmussen" <krasmussen@eatoncounty.org>; <kjmatthews@ejourney.com>; <kozgirl@earthlink.net>; <ksutherland@northvilletwppd.com>; <kunathr@co.oakland.mi.us>; "Kurt Spalding" <kspalding@countyofbranch.com>; <l_zabkowski@cityofsouthfield.com>; <larry.french@kentcounty.org>; "Leanne Summers" <lsummers@ci.novi.mi.us>; <leeroytodd@msn.com>; <llakers@freeway.net>; <lleinweber@newworldsys.com>; "Lloyd Fayling" <lrf@geneseecounty911.org>; <lstadt@ci.east-lansing.mi.us>; <lyndamarie@chartermi.net>; <macrad@libcoop.net>; <maierm@gardencitymi.org>; <malex@ci.farmington-hills.mi.us>; "Marc Larabel Sr" <gvpdispatch@hotmail.com>; "Marc McCullough" <mmccullough0@yahoo.com>; "Mark Jongekrijg" <mjongekrijg@occda.org>; <markim42@hotmail.com>; <markkooyers@tele-rad.com>; "Marybeth Ruth" <ruth@dwsd.org>; <marymodu@hotmail.com>; <mb@c-w-w.org>; <mbedtelyon@saginawcounty.com>; "David McCastle" <mccastled@dispatch.co.muskegon.mi.us>; <mcd911@tucker-usa.com>; <mdk911@earthlink.net>; "Melinda Strang" <strangm@porthuron.org>; <mgriffin@auburnhills.org>; "Mike Duvall" <duvallm@prodigy.net>; "Mike Whately" <mwhately@csi-inc.ws>; <mikem3791@comcast.net>; <mlash@shiawassee.net>; <mlong@hva.org>; <mmachuta@aol.com>; <mncd@t-one.net>; <mo911@voyager.net>; "Edward Hude" <mp_hude@Ingham.org>; <mrorabacher@canton-mi.org>; <msp2299@yahoo.com>; <murphyst@co.oakland.mi.us>; <nedfire11@aol.com>; <nelsonws@ci.troy.mi.us>; <newellt@michigan.gov>; <nmcclure@ctacommunications.com>; <norman807@msn.com>; <pagegb@michigan.gov>; "Pam Matelski" <e911@mackinaccounty.net>; "Pat Anderson" <patricia.e.anderson@ameritech.com>; "Pat Coates" <coatesp@co.oakland.mi.us>; "Patricia Kudla" <kudlap@co.oakland.mi.us>; "Paul Rogers" <progers@cablespeed.com>; <petel@co.newaygo.mi.us>; <phempel@csi-inc.ws>; <pistol928@aol.com>; <pklink@ci.dearborn.mi.us>; <rcramb@lpdmail.com>; <reisnerm@rochesterhills.org>; <rgarner@midlandcounty.org>; "Rich Rybicki" <rybickir@michigan.gov>; "Richard Nowakowski" <rnowakowski@co.montcalm.mi.us>; "Richard Oberle" <roberle@lpcitypd.com>; "Rick Uslan" <r.uslan@motorola.com>; <rick.kalm@co.macomb.mi.us>; <rjerman@isabellacounty.org>; "Roland Leonard" <rleonard@bisdigital.com>; "Ron McCord" <rmccord@core.com>; <ron_berns@monroemi.org>; "John Bawol" <roscommon911@voyager.net>; <rskotar@aol.com>; <rsky50@aol.com>; <rtroshak@novagate.com>; "David Hazlett" <ru4rfim@yahoo.com>; "Christina Russell" <russellc@co.oakland.mi.us>; <rvanhorn@ameritech.net>; <rwmitchell@m33access.com>; "Sandi Beemer" <sbeemer@sagchip.org>; "Sandra VanDenberg" <svandenburg@core.com>; <scheleskgn@ci.troy.mi.us>; <scott.r.temple@cingular.com>; <sdicicco@ci.novi.mi.us>; <seleskyj@michigan.gov>; <sgtoestman@aol.com>; <shade501@att.net>; <shayes@ci.southgate.mi.us>; "Sherry Levequews" <levequesj@ci.troy.mi.us>; <sirlbeck@dataradio.com>; <slwright@umich.edu>; <smccarthy@comcast.net>; "Steven Kleinlein" <skleinlein@botsford.org>; "Steven Perria" <steven.perria@fluor.com>; <STodd@cityofflint.com>; "Suzan Hensel" <shensel@midland911.org>; "Suzanne Stevens" <stevens@occda.org>; <tapperje@vbco.org>; <tccd911@tuscolacounty.org>; <terrichouinard@aol.com>; <themahoneys@comcast.net>; "Tracy Larson" <tlarson@co.montcalm.mi.us>; <trafficgard@earthlink.net>; <tsmith@berriencounty.org>; <vanoostjw@aol.com>; <vdenny@ioniacounty.org>; "Vic Martin" <vmartin@lapeercounty.org.>; <w8kpu@aol.com>; <w8qfx@aol.com>; <watsonk@michigan.gov>; <wellsl@co.oakland.mi.us>; "Wendy Charchan-Moore" <gcsd911@sbcglobal.net>; <wftroskey@aol.com>; <wmcpherson@shiawassee.net>; <yak911@shianet.org>; <yekulisj@co.washtenaw.mi.us>; "Berry Zeeman" <zeemanb@co.oakland.mi.us>

Sent: Monday, January 31, 2005 6:04 PM
Subject: Region 21 700 Mhz Plan

APCO Members,

The new Region 21 700 Mhz Plan in PDF version is now available on the website

http://www.miapco.org/

Click on Region 21 700 Mhz...

John

Region 21 700 MHz Planning Committee
Meeting Notice

The Region 21 700 MHz Regional Planning Committee meeting will be held on
Thursday, April 14, 2005
At 12:30 P.M
(Following the Michigan Public Safety Frequency Advisory Committee meeting)

At the Washtenaw County Sheriff Department EOC
2201 Hogback Road, Ann Arbor, MI
(Cross Street is Washtenaw Ave, east of US23)

Draft Agenda:

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Approval of Minutes of the January 18, 2005 meeting

V. Old Business
   A. Plan Revisions
      1. Frequency sort and electronic plan update
      2. Electronic Format
      3. Coordination with Adjacent Regions/Border Sharing Agreement
      4. Loading Criteria
      5. CAPRAD access
   B. 4.9 GHz
   C. Other

VI. New Business
   A. Other

VII. Next meeting date

VIII. Adjournment

Contact Information: Chairman Joseph M. Turner
Telephone: 989 793-7373 e-mail: jturner@michiganpropertytax.com

Region 21 700 MHz Planning Committee
Meeting Notice

The Region 21 700 MHz Regional Planning Committee meeting will be held on
Thursday, June 16, 2005
At Approximately 11:00 A.M
(Following the Michigan Public Safety Frequency Advisory Committee meeting)

At the Michigan State Police Communications Division
4000 Collins Road, Lansing, MI

Draft Agenda:

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Approval of Minutes of the April 14, 2005 meeting

V. Old Business
   A. Plan Revisions
      1. Coordination with Adjacent Regions/Border Sharing Agreement
      2. CAPRAD access
   B. Other

VI. New Business
   A. Other

VII. Next meeting date

VIII. Adjournment

Contact Information: Chairman Joseph M. Turner
Telephone: 989 793-7373 e-mail: jturner@michiganpropertytax.com

---

From: "Joy Alford" <Joy.Alford@fcc.gov>
To: <coatesp@co.oakland.mi.us>
Cc: <jturner@michiganpropertytax.com>
Sent: Friday, June 03, 2005 2:31 PM
Subject: RE: Region 21 700 MHz RPC Meeting Notice

Ms. Coates,

Thank you for this information about the June 16th Region 21 RPC meeting. We are unable to issue a Public Notice to announce this meeting since the meeting will occur less than 30 days from today. We will, however, post the information on our website. Future meetings can be announced by Public Notice if we receive the request at least 40 days prior to the meeting date. This allows both the 30-day announcement period and a sufficient amount of time for administrative matters involved with processing such requests.

Please feel free to contact me if additional information about requests for Public Notices are desired. Information about the Region 21 June 16th meeting will be posted on our website shortly.

Joy Alford/FCC
202.418.0694

-----Original Message-----
From: Patricia Coates [mailto:coatesp@co.oakland.mi.us]
Sent: Thursday, June 02, 2005 12:34 PM
To: Joy Alford
Subject: Region 21 700 MHz RPC Meeting Notice

Attached

Region 21 700 MHz Planning Committee
Meeting Notice

The Region 21 700 MHz Regional Planning Committee meeting will be held on
Thursday, August 11, 2005
At Approximately 11:00 A.M
(Following the Michigan Public Safety Frequency Advisory Committee meeting)

At the Michigan State Police Communications Division
4000 Collins Road, Lansing, MI

Draft Agenda:

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Approval of Minutes of the June 16, 2005 meeting

V. Old Business
   A. Plan Revisions
      1. Coordination with Adjacent Regions/Border Sharing Agreement
      2. CAPRAD access
   B. Other

VI. New Business
   A. Other

VII. Next meeting date

VIII. Adjournment

Contact Information: Chairman Joseph M. Turner
Telephone: 989 793-7373 e-mail: jturner@michiganpropertytax.com

Region 21 700 MHz Planning Committee
Meeting Notice

The Region 21 700 MHz Regional Planning Committee meeting will be held on
Friday, September 30, 2005
At Approximately 10:30 A.M
(Following the Michigan Public Safety Frequency Advisory Committee meeting)

At the Michigan APCO Fall Conference
Kettunen Center - Ford Room
14901 4H Drive, Tustin, MI

Draft Agenda:

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Approval of Minutes of the August11, 2005 meeting

V. Old Business
   A. Plan Revisions
      1. Coordination with Adjacent Regions/Border Sharing Agreement
      2. CAPRAD access
   B. Other

VI. New Business
   A. Other

VII. Next meeting date

VIII. Adjournment

Contact Information: Chairman Joseph M. Turner
Telephone: 989 793-7373 e-mail: jturner@michiganpropertytax.com

Region 21 700 MHz Planning Committee

Meeting Agenda

Friday, September 30, 2005
at 11:00 a.m.
Kettenun Center
Tustin, MI

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Approval of Minutes of August 11, 2005

V. Old Business
A. Regional Concurrences

VI. New Business
A. City of Detroit 700 MHz Application
B. Recommended changes to Regional Plan

VII. Next Meeting Date

VIII. Adjournment

Region 21 700 MHz Planning Committee
Meeting Notice

The Region 21 700 MHz Regional Planning Committee meeting will be held on
Wednesday, November 9, 2005
At Approximately 10:00 A.M

At the Michigan State Police Communications Division
4000 Collins Road, Lansing, MI

Draft Agenda:

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Approval of Minutes of the September 30, 2005 meeting

V. Old Business
   A. Plan Revisions
      1. Coordination with Adjacent Regions/Border Sharing Agreement
      2. CAPRAD access
   B. Other

VI. New Business
   A. Submittal of plan to FCC

VII. Next meeting date

VIII. Adjournment

Contact Information: Chairman Joseph M. Turner
Telephone: 989 793-7373 e-mail: jturner@michiganpropertytax.com

Region 21 700 MHz Planning Committee
Meeting Notice

The Region 21 700 MHz Regional Planning Committee meeting will be held on
Tuesday, January 10, 2006
At 10:00 A.M

At the Michigan State Police Communications Division
4000 Collins Road, Lansing, MI

Draft Agenda:

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Approval of Minutes of the November 9, 2005 meeting

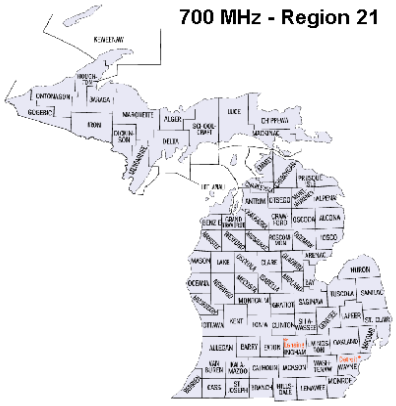
V. Old Business
   A. Plan Revisions
      1. Coordination with Adjacent Regions/Border Sharing Agreement
      2. CAPRAD access
   B. Other

VI. New Business
   A. Submittal of plan to FCC

VII. Next meeting date

VIII. Adjournment

Contact Information: Chairman Joseph M. Turner
Telephone: 989 793-7373 e-mail: jturner@michiganpropertytax.com



REGION 21 700 MHz PLANNING COMMITTEE

Joseph M. Turner, Chairman 2719 State Street
Saginaw, MI 48602 Tel 989 793-7373
e-mail: jturner@michiganpropertytax.com

March 31, 2006

Office of the Secretary
Marlene H. Dortch
445 12th Street, SW,
Washington, DC 20554

Reference: Region 21 700 MHz Plan - WTB Docket 02-378

Dear Ms. Dortch:

On behalf of all the members of Michigan's 700 MHz Regional Planning Committee (Region 21 RPC), I am pleased to submit the attached plan for coordination of 700 MHz frequencies.

We look forward to the FCC's review of the plan and would be pleased to respond to any questions you or the FCC staff may have.

Yours truly,

Joseph M. Turner

Joseph M. Turner, Chairman
Region 21 700 MHz Planning Committee
2719 State St.
Saginaw, MI 48602

cc: FCC Jeannie Benfaida,K. Bradshaw, P. Coates, members 700 MHz RPC and adjacent region RPCs

Plan Filed with FCC for Posting and Public Review

Federal Communications Commission

The FCC Acknowledges Receipt of Comments From …

Region 21 700 MHz RPC Joseph M. Turner Chairman

…and Thank You for Your Comments

Your Confirmation Number is: '2006331115099 '

Date Received:	**Mar 31 2006**
Docket:	**02-378**
Number of Files Transmitted:	**44**

DISCLOSURE

This confirmation verifies that ECFS has received and

by ECFS if it contains macros, passwords, redlining,

documents that is not included with your filing.
Filers are encouraged to retrieve and view their filing within

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updated 12/11/03

E-mail notice of September 29, 2006 Meeting

From: "Patricia Coates" <coatesp@co.oakland.mi.us>
To: "William S Nelson" <nelsonws@ci.troy.mi.us>; "Jim Fyvie" <fyviej@clinton-county.org>; "Michael Whately" <mewhat@csi-inc.ws>; "Lloyd Collins" <slpd@cablespeed.com>; "Dundas, Dan" <dundasda@tycoelectronics.com>; "Ken Palazzi" <palazzike@tycoelectronics.com>; "Ronald Berns" <ron.berns@monroemi.org>; "Rick Uslan" <R.Uslan@motorola.com>; "Beckman Karl" <Karl.Beckman@motorola.com>; "Mcdowell, Dennis" <mcdoweld@tycoelectronics.com>; "Richard Hoose" <richardh_atc@chartermi.net>; "Lloyd R. Fayling" <LRF@geneseecounty911.org>; "Al Eichenberg" <eichenba@michigan.gov>; "Al Nowakowski" <nowakowskia@michigan.gov>; "Joe Turner" <jturner@michiganpropertytax.com>; "Dean Alger" <algercomm@aol.com>; "Robert Andrus" <bandrus@ci.dearborn.mi.us>; "Louis Rutare" <rutarel@michigan.gov>; "Lt David Knezek" <dhpsa@dhol.org>; "Larry Hach" <larry_hach@nps.gov>; "William Carter (Region 54)" <bcarter@cityofchicago.org>; "Jim Lee" <jlee@mha.org>; "gress" <gress@pplant.msu.edu>; "Keith Bradshaw" <Keith.Bradshaw@macombcountymi.gov>; "Harry Warner" <gwingharry@cs.com>; "Rich English" <rfenglish@comcast.net>; "Mark Jongekrijg" <mjongekrijg@occda.org>; "Brent Williams" <emsradio@core.com>
Sent: Thursday, September 21, 2006 3:54 PM
Subject: Region 21 700 MHz meeting

The next meeting of the Region 21 700 MHz RPC will be at the Kettenun Center in Tustin, MI at approximately 10:30 a.m. on Friday, September 29th, in the Red Oak room. The meeting will follow the MPSFAC meeting.

Federal Communications Commission
Washington, D.C. 20554

January 31, 2007

DA 07-460

Joseph M. Turner, Chair
700 MHz Regional Planning Committee
Michigan Public Safety Frequency Advisory Committee
2719 State Street
Saginaw, MI 48602

Re: 700 MHz Regional Plan – Region 21 Michigan, WT Docket 02-378

Dear Mr. Turner:

This letter responds to the request for review of the Region 21 (Michigan)[1] 700 MHz Regional Planning Committee Plan. We have reviewed the Plan and identified several plan elements that are deficient. Accordingly, we are dismissing the Region 21 (Michigan) 700 MHz Plan without prejudice. As a result of our action, we suggest that Michigan submit a revised Plan that resolves the deficiencies discussed herein.

By way of background, the Commission adopted a band plan for the 700 MHz public safety band in 1998, and established a structure to allow regional planning committees (RPCs) optimal flexibility to meet state and local needs, encourage innovative use of the spectrum, and accommodate new and as yet unanticipated developments in technology and equipment.[2] There are fifty-five RPCs, and each committee is required to submit its plan for the General Use spectrum.[3] The Commission's role in relation to the RPCs is limited to (1) defining the regional boundaries; (2) requiring fair and open procedures, *i.e.*, requiring notice, opportunity for comment, and reasonable consideration; (3) specifying the elements that all regional plans must include; and (4) reviewing and accepting proposed plans (or amendments to approved plans) or rejecting them with an explanation.[4]

On April 10, 2006, Michigan submitted a request for Commission review and approval of its proposed Plan.[5] As has been the case with respect to Michigan's submission, it is customary for

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[1] The Region 21 (Michigan) 700 MHz regional planning area consists of the entire state of Michigan.

[2] *See* 47 C.F.R. § 90.527; *see also* Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communication Requirements through the Year 2010, WT Docket No. 96-86, *First Report and Order and Third Notice of Proposed Rulemaking*, 14 FCC Rcd 152 (1998) (*First Report and Order*); *Second Memorandum Opinion and Order*, 15 FCC Rcd 16844 (2000).

[3] A list of 700 MHz regional planning committees and region activities is available at http://wireless.fcc.gov/publicsafety/700MHz. Each regional plan must contain certain elements, and must be coordinated with adjacent regions. *First Report and Order*, 14 FCC Rcd at 193-94 ¶ 84, 195 ¶ 87.

[4] *First Report and Order*, 14 FCC Rcd at 195 ¶ 87.

[5] *See* Region 21 700 MHz Plan filed April 10, 2006, by Joseph M. Turner, Chairman, Region 21 (Michigan) Regional Planning Committee.

Commission staff to informally work staff-to-staff with regional planning committees to resolve any plan deficiencies and omissions, and to request supplemental submissions in order to establish a Plan that is a sufficiently compliant with Commission rules and policies for placement on public notice for comment. Following staff review, several deficiencies were identified in the Michigan plan; most importantly, the Plan did not include letters of concurrence and dispute resolution agreement from Michigan's adjacent regions: Region 13 (Illinois), Region 14 (Indiana), Region 54 (Southern Great Lakes), Region 33 (Ohio), and Region 45 (Wisconsin).[6]

On May 18, 2006, Chairman Turner provided a progress update resolving some, but not all, of the discrepancies, indicating that an amended version of the plan would be submitted in the near term. We have not received an amended Plan and, therefore, the April 10, 2006 Plan as submitted by the Region 21 (Michigan) Regional Planning Committee is DISMISSED without prejudice. We encourage the Region 21 700 MHz Regional Planning Committee to submit a revised Plan addressing all deficiencies at its earliest convenience.

Should you have any questions concerning this matter, please contact Jeannie Benfaida at (202) 418-2313 or Jeannie.Benfaida@fcc.gov.

This action is taken under delegated authority pursuant to Sections 0.191 and 0.392 of the Commission's rules, 47 C.F.R. §§ 0.191, 0.392.

FEDERAL COMMUNICATIONS COMMISSION

Dana Shaffer
Deputy Chief, Public Safety and Homeland Security Bureau

[6] The Plan did not identify, nor contain (1) adjacent region letters of concurrence and dispute resolution agreements from all adjacent regions, (2) the date of plan adoption, (3) copies of meeting announcements and meeting minutes with attendance records for all meetings held, (4) tribal government information (and explanation of efforts to include tribal governments in the regional planning process) and (5) Michigan (Upper and Lower Peninsulas) counties that share a border with Canada.

Region 21 700 MHz Planning Committee
Meeting Notice

The Region 21 700 MHz Regional Planning Committee meeting will be held on
Tuesday, April 24, 2007
At 1:00 P.M.

At the Michigan State Police Communications
4000 Collins Rd
Lansing, MI

Draft Agenda:

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Approval of Minutes of the July 11, 2006 meeting

V. Old Business
   A. Plan Status
      1. Submittal of Plan to FCC
      2. Coordination with Adjacent Regions
      3. Border Sharing Agreement
   B. CAPRAD
   C. Other

VI. New Business
   A. Submittal of plan to FCC

VII. Next meeting date

VIII. Adjournment

Contact Information: Chairman Joseph M. Turner
Telephone: 989 793-7373 e-mail: jturner@michiganpropertytax.com

brinkster 700 MHZ MAILING LIST

Read messages

Folder : Inbox (64 Message(s), 47 Unread) Go

Received: from mira01.co.oakland.mi.us ([66.100.26.46]) by sendmail3.brinkster.com (Brinkster Mail 3) with ESMTP id KKX38828 for <jturner@michiganpropertytax.com>; Fri, 20 Apr 2007 15:06:12 -0400

Received: from WS107273 ([172.16.128.91]) by mira01.co.oakland.mi.us (MOS 3.8.4-GA) with ESMTP id AGQ97146; Fri, 20 Apr 2007 15:05:44 -0400 (EDT)

From: "Pat Coates" <coatesp@oakgov.com> [+]

"William Nelson" <nelsonws@ci.troy.mi.us> [+], "Al Eichenberg" <eichenba@michigan.gov> [+], "Al Nowakowski" <nowakowskia@michigan.gov> [+], "Coates@Oakgov. Com" <coates@oakgov.com> [+], "Dan Dundas" <dundasda@tycoelectronics.com> [+], "Dennis McDowell" <mcdoweld@tycoelectronics.com> [+], "Heldd@Sbcglobal. Net" <heldd@sbcglobal.net> [+], "Jim Fyvie" <fyviej@clinton-county.org> [+], "Joe Turner" <jturner@michiganpropertytax.com> [+], "Karl Beckman" <Karl.Beckman@motorola.com> [+], "Keith Bradshaw" <Keith.Bradshaw@macombcountymi.gov> [+], "Lloyd Collins" <slpd@voyager.net> [+], "Michael Whately" <mwhately@rfsystems.org> [+], "Mjongekrijg@Occda. Org" <mjongekrijg@occda.org> [+], "R. Uslan@motorola. com" <R.Uslan@motorola.com> [+], "Robert Andrus"

To: <bandrus@ci.dearborn.mi.us> [+], "Steve Todd" <director@novagate.com> [+]

Subject: 700 MHZ RPC Meeting Draft Agenda

Date: Fri, 20 Apr 2007 15:05:46 -0400

Message-ID: <009101c7837e$e71d6610$5b8010ac@oaklandmi.net>

MIME-Version: 1.0

Content-Type: multipart/mixed; boundary="----=_NextPart_000_0092_01C7835D.600BC610"

X-Priority: 3 (Normal)

X-MSMail-Priority: Normal

X-Mailer: Microsoft Outlook, Build 10.0.6822

Thread-Index: AcaDfubTOGWLuRg7Qq27tSpuM+EcaA==

X-MimeOLE: Produced By Microsoft MimeOLE V6.00.2900.3028

Importance: Normal

X-Junkmail-Whitelist: YES (by domain whitelist at mira01.co.oakland.mi.us)

Move message to : Inbox (64 Message(s), 47 Unread) Move

Attached is the draft agenda for the Region 21 700 MHZ RPC meeting on Tuesday, April 24 at 1:00 PM at 400 Collins Rd, Lansing

Patricia Coates - ENP
CLEMIS
248-452.9947

700 MHz Meeting Notice 04242007.doc

Content-Type: application/msword name="700 MHz Meeting Notice 04242007.doc"
Content-Transfer-Encodings: base64
Length: 28.5 kB

Reply | Reply & Delete | Reply All | Forward | Redirect | Source | Full headers | Previous | Next | Delete | Print | Message - 14/64

Move message to : Inbox (64 Message(s), 47 Unread) Move

Documentation of U.S. Postal Mail Notice June 12, 2007 Meeting

Michigan Public Safety

FREQUENCY ADVISORY COMMITTEE

(MPSFAC) REGION 21 700 MHz Planning Committee

DIRECT ALL CORRESPONDENCE TO:

Joseph M. Turner, Chairman
2719 State St
Saginaw, MI 48602
(989) 793-7373

REPRESENTING:

Associated Public-Safety Communications Officers, Inc.
Michigan Association of Chiefs of Police
Michigan Sheriff's Association
Michigan Municipal League
State of Michigan

June 1, 2006

Notice of Upcoming 700 MHz Meeting

The United States Government, through its agency the Federal Communication Commission (FCC), is opening up a portion of the 700 Megahertz (MHz) electromagnetic spectrum for use by public safety agencies. In order for those frequencies to be legally allocated, each of the existing FCC designated geographic regions in the U.S. must create a plan for the use of 700 MHz frequencies. For purposes of allocating this new radio spectrum, all the lands within the State of Michigan have been designated as being within Region 21.

Since 2001, efforts to create a plan for Region 21 have been ongoing. A formal Planning Committee was created and the committee has drafted a Plan. The committee is formally known as **the Region 21 700 MHz Planning Committee**. An initial submission of the Plan was made to the FCC in calendar year 2006. That submission has been reviewed and modified. It is believed the plan is complete pending the receipt of certain signatures from the appropriate parties of FCC Regions adjacent to Region 21. Upon receipt of those signatures a filing will be made to the FCC requesting the approval of the Plan.

Many public hearings have been held over the past several years. Notification has been published on the web and notifications have been sent via the LEIN system and in other ways. An opportunity for public comment will be held on June 12, 2007 at 10 at a Michigan State Police Facility, located at 4000 Collins Road, Lansing, Michigan. While your organization or its members have been contacted in the past, you are being sent this communication as another attempt to let you know you are welcomed and encouraged to participate. A working draft of the Region 21 700 MHz Plan is available for review at the web page: http://www.mpsfac.org/4102006fccfiling.pdf

Sincerely yours,

Joseph M. Turner

Joseph M. Turner, Chairman
jturner@michiganpropertytax.com

FCC POSTING

Subject: Region 21 700 MHZ Deadline for written comments
From: "Pat Coates" <coatesp@oakgov.com>
Date: Tue, 12 Jun 2007 16:17:21 -0400
To: "'Jeannie Benfaida'" <Jeannie.Benfaida@fcc.gov>
CC: "'Joe Turner'" <jturner@michiganpropertytax.com>

Jeannie
The Region 21 700 MHZ RPC held a meeting today (agenda attached) for public comment on our revised plan. All appropriate parties, including officials of all indigenous tribes, were notified of the meeting. At that meeting we established a deadline of July 27th, 2007 at noon
for any additional written comments. We have posted the announcement (attached) on the MI APCO website. Even though this is not a “meeting announcement”, is it possible and appropriate for the FCC to post our request for written comments?

Patricia Coates - ENP
CLEMIS
248-452.9947

PurposeOfMeetingAmendedNoon2007June12.pdf	**Content-Type:** application/pdf **Content-Encoding:** base64

AGENDA 700 MHZ RPC MEETING2007June12.pdf	**Content-Type:** application/pdf **Content-Encoding:** base64

Subject: Region 21 700 MHZ Plan Deadline for Written Comments
From: "Pat Coates" <coatesp@oakgov.com>
Date: Tue, 12 Jun 2007 16:09:21 -0400
To: "'John Bawol'" <roscommon911@charterinternet.com>, "'Pete LeFavour'" <petel@co.newaygo.mi.us>
CC: "'Joe Turner'" <jturner@michiganpropertytax.com>

John
Could you please post the attached on the MI APCO web site? The deadline for written comments on the Region 21 700 MHz Plan
is noon on July 27th.

Patricia Coates - ENP
CLEMIS
248-452.9947

PurposeOfMeetingAmendedNoon2007June12.pdf	**Content-Type:** application/pdf **Content-Encoding:** base64

PURPOSE OF
700 MHZ RPC MEETING - JUNE 12, 2007

Location: Michigan State Police Facility
4000 Collins Road, Lansing, Michigan

This 700 MHz RPC meeting has been convened because, pending receipt of two signed Dispute Resolution agreements, Region 21 is prepared to re-submit its plan to the FCC.

That is, the Region 21, 700 MHz RPC will be re-submitting a 700 MHz frequency utilization Plan which is substantially and materially the same as the Plan submitted to the FCC in calendar year 2001. However, technically, a re-submission is considered a new plan. The differences between the resubmitted plan and those submitted in 2001 consists of additional concurrence documents and agreements reached with adjacent FCC designated regions. In addition, some documentation was clarified or included because it had been omitted from the original submission.

No major changes in the plan are contemplated, however, due to the need for a re-submission the Planning Committee decided it would be wise to make available another opportunity to the public for comment. Public comments have been routinely accepted beginning with the first 700 MHz RPC meeting May 3, 2000.

The plan as originally submitted may be found at the URL www.mpsfac.org

A bound copy of the tentative plan is available for your inspection at the head table today.

A final version will be posted on the web at www.mpsfac.org as soon as all signed agreements and any other documents are received.

THE PURPOSE OF TODAY'S MEETING IS TO ACCEPT ANY FURTHER COMMENT FROM THE PUBLIC REGARDING THE 700 MHz PLAN.

Written Comments

Written comments from the public including any organization or agency will be accepted until noon (E.D.T.) on July 27, 2007 unless otherwise decided at today's meeting. Comments may be sent via U.S. Mail, fax or e-mail.

Written comments May Be Sent To: Joseph Turner, Chairman
700 MHz RPC
2719 State St.
Saginaw, MI 48602

Fax Number: 989 792-4199 E-mail to: mpc@michiganpropertytax.com

AGENDA

700 MHZ RPC MEETING - JUNE 12, 2007

Location: Michigan State Police Facility
4000 Collins Road, Lansing, Michigan

Scheduled Start Time: 10 AM

1. Call meeting to order
2. Announce audio record being made - Committee self introductions
3. Announcement of Purpose of meeting and order of business
3. Roll call of agencies and groups specially notified of meeting
4. Business items
    a. Old Business
    b. New Business - comments from public
    c. Other business
5. Set date for submission and written comments from public including agencies
   12 ~~5 pm~~ End of business, July 27, 2007
   NOON Mail to: 700 MHz RPC, 2719 State St., Saginaw, MI 48602
   e-mail to: MPC@michiganpropertytax.com
6. Adjourn meeting

Subject: RE: Public Notice for Region 21 (Michigan) meeting
From: "Pat Coates" <coatesp@oakgov.com>
Date: Tue, 25 Sep 2007 10:14:31 -0400
To: "'Michele Woodfork'" <Michele.Woodfork@fcc.gov>
CC: "'Carol Simpson'" <Carol.Simpson@fcc.gov>, "'Joe Turner'" <jturner@michiganpropertytax.com>, "'Keith Bradshaw'" <Keith.Bradshaw@macombcountymi.gov>

Thank you

Patricia Coates - ENP
CLEMIS
248-452.9947

-----Original Message-----
From: Michele Woodfork [mailto:Michele.Woodfork@fcc.gov]
Sent: Tuesday, September 25, 2007 9:26 AM
To: coatesp@oakgov.com
Cc: Carol Simpson
Subject: Public Notice for Region 21 (Michigan) meeting

Ms. Coates,

The Public Notice announcing the Thursday, October 25, 2007, Region 21 (Michigan) Regional Public Safety planning meeting, appears in the September 24, 2007 Daily Digest.

Michele Woodfork
Federal Communications Commission
Policy Division, Public Safety and Homeland Security Bureau
michele.woodfork@fcc.gov
(202) 418-7058

Subject: 700 MHz and MPSFAC Meeting Notices
From: "Pat Coates" <coatesp@oakgov.com>
Date: Thu, 20 Sep 2007 15:45:50 -0400
To: "John Bawol" <roscommon911@charterinternet.com>
CC: "'Joe Turner'" <jturner@michiganpropertytax.com>

John
Could you please post the attached meeting notices on the MI APCO web site?
Thank you.

Patricia Coates - ENP
CLEMIS
248-452.9947

700 MHz Meeting Notice 10252007.doc	**Content-Type:** application/msword **Content-Encoding:** base64

MPSFAC Meeting Notice 102507.doc	**Content-Type:** application/msword **Content-Encoding:** base64

Region 21 700 MHz Planning Committee
Meeting Notice

The Region 21 700 MHz Regional Planning Committee meeting will be held on
Thursday, October 25th, 2007
At 10:00 A.M.

Zehnder's Restaurant – Keeping Room
730 S Main
Frankenmuth, MI

Draft Agenda:

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Public Comment

V. Approval of Minutes of the June 12, 2007 meeting

VI. Old Business
- A. Plan Status
  1. Submittal of Plan to FCC
  2. Coordination with Adjacent Regions
  3. Border Sharing Agreement
- B. CAPRAD
- C. Other

VII. New Business
- A. FCC Changes
- B. Frequency Sort
- C. Other

VIII. Next meeting date

IX. Adjournment

Contact Information: Chairman Joseph M. Turner
Telephone: 989 793-7373 e-mail: jturner@michiganpropertytax.com

Subject: RE: Public Notice for Region 21 (Michigan) meeting
From: "Pat Coates" <coatesp@oakgov.com>
Date: Tue, 25 Sep 2007 10:14:31 -0400
To: "'Michele Woodfork'" <Michele.Woodfork@fcc.gov>
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Thank you

Patricia Coates - ENP
CLEMIS
248-452.9947

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Michele Woodfork
Federal Communications Commission
Policy Division, Public Safety and Homeland Security Bureau
michele.woodfork@fcc.gov
(202) 418-7058

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Thank you.

Patricia Coates - ENP
CLEMIS
248-452.9947

700 MHz Meeting Notice 10252007.doc	**Content-Type:** application/msword **Content-Encoding:** base64

MPSFAC Meeting Notice 102507.doc	**Content-Type:** application/msword **Content-Encoding:** base64

Region 21 700 MHz Planning Committee
Meeting Notice

The Region 21 700 MHz Regional Planning Committee meeting will be held on Thursday, December 20th, 2007 At 10:00 A.M.

State of Michigan IT Department
4000 Collins Road, Lansing Michigan

Draft Agenda:

I. Call to Order

II. Introductions

III. Approval of Agenda

IV. Public Comment

V. Approval of Minutes of the October 25, 2007 meeting

VI. Old Business
- A. Plan Status
  1. Submittal of Plan to FCC
  2. Coordination with Adjacent Regions
  3. Border Sharing Agreement
- B. CAPRAD
- C. Other

VII. New Business
- A. FCC Changes
- B. Frequency Sort
- C. Other

VIII. Next meeting date

IX. Adjournment

Contact Information: Chairman Joseph M. Turner
Telephone: 989 793-7373 e-mail:
jturner@michiganpropertytax.com

PUBLIC NOTICE

Federal Communications Commission
445 12th St., S.W.
Washington, D.C. 20554

News media information 202 / 418-0500
Fax-On-Demand 202 / 418-2830
TTY 202 / 418-2555
Internet: http://www.fcc.gov
ftp.fcc.gov

DA 07-4538
November 6, 2007

PUBLIC SAFETY AND HOMELAND SECURITY BUREAU ACTION

REGION 21 (MICHIGAN) PUBLIC SAFETY REGIONAL PLANNING COMMITTEE TO HOLD 700 MHz REGIONAL PUBLIC SAFETY PLANNING MEETING

The Region 21 (Michigan) Public Safety Regional Planning Committee will hold its next meeting on Thursday, December 20, 2007, beginning at 10:00 a.m., at the State of Michigan IT Department, 4000 Collins Road, Lansing, Michigan.

The agenda for this meeting includes:

- Call to order
- Introductions
- Approval of agenda
- Public comment
- Approval of minutes of the October 25, 2007 meeting
- Old business
  - Plan status
  - Submittal of plan
  - Coordination with adjacent Regions
  - Border sharing agreement
  - Computer-Assisted Pre-coordination Resource and Database (CAPRAD)
  - Other
- New business
  - FCC changes
  - Frequency sort
  - Other
- Next meeting date
- Adjourn

The Region 21 700 MHz Public Safety Regional Planning Committee meeting is open to the public. All eligible public safety providers whose sole or principal purpose is to protect the safety of life, health, or property in Region 21 may utilize these frequencies. It is essential that public safety agencies in all areas of government, including state, municipality, county, and Native American Tribal, and non-governmental organizations eligible under Section 90.523 of

the Commission's rules, be represented in order to ensure that each agency's future spectrum needs are considered in the allocation process. Administrators who are not oriented in the communications field should delegate someone with this knowledge to attend, participate, and represent their agency's needs.

All interested parties wishing to participate in planning for the use of public safety spectrum in the 700 MHz band within Region 21 should plan to attend. For further information, please contact:

Joseph M. Turner, Chairman
Region 21 700 MHz Public Safety Regional Planning Committee
2719 State Street
Saginaw, Michigan 48602
(989) 793-7373
jturner@michiganpropertytax.com

- FCC -

End of General Announcements to Public
Begin Special Notifications

APPENDIX E

Notifications

This Section Of Appendix E Contain Special Mailings

Including those to native American entities and representatives of public bodies and agencies

These pages area a Summary Document of Notification Efforts up to 2003

Certification Summary

700 MHz RPC Contacts

September 2003

(Includes Indigenous Peoples)

3rd Announcement of First Meeting via LEIN Service

Includes distribution to Native Americans

We should go to this Meeting KB 1DD

A LEIN 58194 03/28/00 1049 GBDC1.
A ELOP GBDC.

ADMINISTRATIVE MESSAGE FROM MSP SPEC OPERATIONS DIV

GBDC #43

ATTN: ALL PUBLIC SAFETY AGENCIES

NEW REGIONAL PLANNING THRUST
FIRST PLANNING MEETING
RICHARD S. DEMELLO, CONVENER FOR 746-806 MHZ REGION 21 PLAN

MASONIC TEMPLE 2875 W. LIBERTY ROAD, ANN ARBOR, MI
WEDNESDAY, MAY 3, 2000 10:00 A.M. - 3:00 P.M.

MEETING IS FOR SPECTRUM ALLOCATION OF THE 700 MHZ FREQUENCIES.

THE FCC HAS ESTABLISHED THE PUBLIC SAFETY NATIONAL COORDINATION COMMITTEE (NCC), PURSUANT TO THE PROVISION OF THE FEDERAL ADVISORY COMMITTEE ACT, TO ADVISE THE COMMISSION ON A VARIETY OF ISSUES RELATING TO THE USE OF THE 24 MHZ OF SPECTRUM IN THE 764-776/794-806 MHZ FREQUENCY BANDS.

IT IS VERY IMPORTANT THAT THE PUBLIC, PARTICULARLY THE PUBLIC SAFETY COMMUNITY, PARTICIPATE IN THE NCC. THE 24 MHZ OF SPECTRUM IN THE 700 MHZ BAND REPRESENTS THE LARGEST ALLOCATION OF SPECTRUM FOR PUBLIC SAFETY USE THE FCC HAS EVER MADE. IT PRESENTS A ONCE-IN-A-LIFETIME OPPORTUNITY FOR BIG PICTURE THINKING ABOUT HOW THIS SPECTRUM RESOURCE CAN BEST SERVE THE NATION'S PUBLIC SAFETY AND EMERGENCY RESPONSE NEEDS.

DISCUSS:

1. HISTORY, HOW WE GOT TO WHERE WE ARE.
2. INTEROPERABILITY.
3. NATIONAL PLANNING REQUIREMENTS.
4. NEW PLANNING THRUST AND DISCUSSION OF NEEDS AND OR USES OF THE SPECTRUM.

QUESTIONS, CONTACT BILL FOLSKE (734)741-1346, ERICA THOMAS (517)373-8048 OR RICHARD DEMELLO (517)335-3266.

PLEASE RSVP VIA THE INTERNET TO THOMASEN@STATE.MI.US.

AUTH: HARRY WARNER, MICHIGAN STATE POLICE., COMMUNICATIONS DIVISION

MSP OPERATIONS
LT ALLAIRE
OPR OLGER

People Contacted for 700 MHz Meetings
Region 21

Sheriff's Assoc.
Gladwin Co. Sheriff's Office
501 W Cedar
Gladwin, MI 48624
Attn: Michael Hargrave
(517) 426-9284

MI Township Assoc.
Larry Merill
512 Westshire Drive
Lansing, MI 48908
(517) 321-6467

Tod Wagner
FBI
(313) 237-4195
(313) 237-4009 Fax

Chief's Assoc.
Lloyd T. Collins
South Lyon P.D.
(248) 437-1773
slpd@voyager.net

Rick Kramer
MDOT

Susan Anderson
Bus Communications & Safety

Carolee Mikulcik
Education

Bette Rinehart
NCC
c18923@lmpsil02.comm.mot.com

Chris Goeschel
MI Hospital Assoc.
Cgoeschel@lans.mha.org

Linda Burns
Dept. of Health

Paul M. Mayer
Ohio Department of Administrative Services
MARCS Project Office
1320 Arthur E. Adams Drive, Room 402
Columbus, OH 43221
(614) 995-0063
(614) 995-0071 Fax
paul.mayer@das.state.oh.us

Ray Smith
State of Ohio
Region 33 Committee Chair
(614) 863-2808
Rsmith4@insight.rr.com

Tim Hetzler
Special Projects Manager for Ohio State Highway Patrol

Sgt. David Strauss
Ann Arbor Police Department
(734) 994-4172
Dstrauss@ci.ann-arbor.mi.us

Pat Coates
County of Oakland
1200 N Telegraph, Bldg 49W
Pontiac, MI 48341
(248) 452-9947
(248) 452-0828 Fax
coatesp@co.oakland.mi.us

Keith M. Bradshaw
Macomb County Technical Services

Lt. David Knezek
Dearborn Heights Police Department
Dhpsa@dhol.org

Chief William Corbett
Port Huron Police Department
(Larry Osborn at cphmang@porthuron.org responded for Chief William Corbett)

Ron Berns
Monroe Co Central Dispatch
Ron_Berns@MONROEMI.ORG

Philip M. Hempel
Senior Consultant – CEO
Communications Systems, Inc.
Communications Systems Consultants for Better Results
Box 74
Berrien Center, MI 49102
(616) 471-5277
(616) 471-7336 Fax
phempel@communicationssystems.com
office@communicationssystem.com
Mike Whately also attended meetings with Philip Hempel

Craig Swenson
(734) 971-8400 ext. 1297
(734) 971-7296 Fax
Swensonc@co.washtenaw.mi.us

Bob Andrus
Radio Technician
City of Dearborn
Communications Department
16087 Michigan Ave
Dearborn, MI 48126
(313) 943-2082
bandrus@mi.ci.dearborn.us
DrBob363@aol.com

Harry Herkimer
Herkimer Radio Service
(734) 242-0806
herkimer@tdi.net

Ron Haraseth
Ron posted meeting notices on the APCO web page

Bill Folske
APCO Frequency Adv
(734) 741-1346
(734) 741-1846 Fax
wfolske@worldnet.att.net

Dennis Betz
Washtenaw County Central Dispatch
(734) 971-8400 ext. 1298
(734) 971-7296 Fax

betzd@co.washtenaw.mi.us

Stephen Todd

Rick Uslan
Motorola
925 Alexandria Dr
Lansing, MI 48917
(517) 323-9770
(517) 321-2382 Fax
R.Uslan@motorola.com

Lloyd Fayling
Genesse County
LRF911@voyager.net

Dean Alger
MDCIS-EMS
Alger Communications
4290 Cascade Rd
Grand Rapids, MI 49546
(616) 954-9000
(616) 954-9001 Fax
algercomm@aol.com

Michael Whately
CSI
1709 W Lyons
Mt. Pleasant, MI
(989) 773-0368
(989) 773-6340 Fax
mewhat@attglobal.net

Joseph Turner
turnerj@juno.com
(517) 797-3816

Harry Warner
MSP
(517) 336-6623
warnerh@state.mi.us

Louis Rutare
DNR
(517) 335-4597
(517) 373-0784 Fax

rutarel@state.mi.us

Bob Ogden
DNR
(517) 373-2172
(517) 373-0784 Fax
ogdenr@state.mi.us

John Grant
Lansing School District
(517) 325-6125
(517) 325-6129 Fax
jgrant@lsd.k12.mi.us

Thomas Altland
Mason Oceana 911
(231) 873-8868
(231) 873-0095 Fax
mo911@voyager.net

Robert Andrus
City of Dearborn
(313) 943-2082
(231) 943-3055 Fax
bandrus@ci.dearborn.mi.us

Richard DeMello

Huron Manistee National Forest
Jim Schuler, Forest Supervisor
1755 South Mitchell St.
Cadillac, Michigan 49601
TX (231) 775-2421
jschuler@fs.fed.us

Hiawatha National Forest
Clyd Thompson, Forest Supervisor
2727 N Lincoln Rd.
Escanaba, Michigan 49829
TX (906) 789-3327
cnthompson@fs.fed.us

Ottawa National Forest
Phyllis Green, Forest Supervisor
E 6248 US Hwy 2
Ironwood, Michigan 49938

TX (906) 932-1330
pagreen@fs.fed.us

Pictured Rocks National Lakeshore
Larry Hach, Chief Ranger
PO Box 40
Munising, Michigan 49862
TX (906) 387-2607
larry_hach@nps.gov

Sleeping Bear Dunes National Lakeshore
Allen Haeker, Chief Ranger
PO Box 277
Empire, Michigan 49630

Seney National Wildlife Refuge
HCR #2, Box 1
Seney, Michigan 49883
TX (906) 586-9851

Saginaw Chippewa Indian Tribe
Attn: Tribal Police
7070 East Broadway
Mount Pleasant, MI 48858

Saginaw Inter-Tribal Council
Attn: Executive Director
PO Box 7005
3175 Christy-Way
Saginaw, MI 48603-2210

Grand Traverse Band of Ottawa and Chippewa Indians
Attn: Tribal Manager, Jolanda Murphy
2605 NW Bayshore Drive
Sutton Bay, MI 49682

Gun Lake Tribe
Attn: Chairman, David K. Sprague
PO Box 218
1743 142nd Ave
Dorr, MI 49323

Hannahville Potawatomi Indian Community
Attn: Public Safety Director
N-14911 Hannahville, B-1 Rd
Wilson, MI 49896-9717

Attn: Executive Director, Gary A. Shawa
6461 E. Brutus Rd
PO Box 206
Brutus, MI 49716

Subject: Certification of Notice
From: Joe Turner <jturner@michiganpropertytax.com>
Date: Tue, 05 Jun 2007 11:41:03 -0400
To: Karen Chadwick <kchadwick@ci.lansing.mi.us>, William S Nelson <nelsonws@ci.troy.mi.us>, William Barnwell <bbarnwell@co.montcalm.mi.us>, Dale Berry <dberry@hva.org>, Keith Bradshaw <Keith.Bradshaw@macombcountymi.gov>, Allen Eichenberg <EichenbA@michigan.gov>, Al Nowakowski <NowakowskiA@michigan.gov>, jturner <jturner@michiganpropertytax.com>, Patricia Coates <coatesp@oakgov.com>, Dave Held <heldd@sbcglobal.net>, Lloyd Collins <slpd@cablespeed.com>, Jim Fyvie <fyviej@clinton-county.org>, Mark Jongekrijg <mjongekrijg@occda.org>, Michael Whately <mwhately@csi-inc.ws>, Jeannie Benfaida <Jeannie.Benfaida@fcc.gov>

Dear 700 MHz RPC Members:

While filing with the FCC and our 700 MHz RPC secretary, I thought I'd pass along this comment on notification to indigenous peoples to each of you.

In addition to the routine public 700 MHz meeting notification procedures, I certify that via first class U.S. mail, on June 1, 2007, the following Native American groups and agencies were sent a formal notification of our upcoming June 12, 2007 meeting.

1. Bureau of Indian Affairs, Sault Ste. Marie, MI
2. Bay Mills Community, Brimley, MI
3. Grand Travers Bay Band of Ottowa and Chippewa, Suttons Bay, MI
4. Hannahville Indian Community, Wilson, MI
5. Huron Potawatomi Inc., Fulton, MI
6. Keeweenaw Bay Indian Community, Baraga, MI
7. Lac Vieux Desert Band, Watersmeet, MI
8. Little River Band of Ottowa, Manistee, MI
9. Little Traverse Band, Harbor Springs, MI
10. Match-E-Loe-Nash-She-Wish Pokagon Band, Dorr, MI
11. Pokagon Band of Potawatimi, Dowagiac, Mi
12. Saginaw Chippewa, Mt. Pleasant, MI
13. Sault Ste Marie Tribe of Chippewa, Sault Ste. Marie, MI

In addition, I certified that the same notices were sent via e-mail on June 1, 2007 to the Chief Executive Officer of: Michigan Municipal League, Michigan Association of Counties and the Michigan Townships Association.

Joseph M. Turner, Chairman
Region 21 700 MHz RPC

NoticeJune122007Mtg.pdf	**Content-Type:** application/pdf **Content-Encoding:** base64

Subject: Indian Tribe Contact
From: "Keith Bradshaw" <Keith.Bradshaw@macombcountymi.gov>
Date: Mon, 05 Nov 2007 09:39:13 -0500
To: "Robert Andrus" <bandrus@ci.dearborn.mi.us>, "Bill Nelson" <nelsonws@ci.troy.mi.us>, "Jim Fyvie" <FYVIEJ@clinton-county.org>, <coatesp@co.oakland.mi.us>, "Brent Williams" <emsradio@core.com>,<mew@csi-inc.ws>, <lrf@geneseecounty911.org>, "Dale Berry" <dberry@hva.org>, "Kasey Mlujeak" <Mlujeakl@Mi.gov>, <EichenbA@michigan.gov>, "Joe Turner" <jturner@michiganpropertytax.com>, <Karl.Beckman@motorola.com>, "Mark Jongekrijg" <mjongekrijg@occda.org>, <heldd@sbcglobal.net>, "Lloyd Collins" <slpd@voyager.net>

Hello Everyone,

Attached, please find a copy of an invitiation that will go out in the mail today to each of the 12 Federally recognized Indian Tribes in Michigan. Also find a list of these tribes from the State of Michigan. I will mail out a copy of the agenda, meeting notice and invite letter, all of which can be included in the plan.

Keith

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www.michigan.gov
(To Print: use your browser's print function)

Release Date: February 22, 2002
Last Update: April 03, 2002

Federally Recognized Tribes

Michigan's 12 federally recognized Tribes are listed below.

Bay Mills Chippewa Indian Community
12140 W. Lakeshore Drive
Brimley, MI 49715
(906) 248-3241

Grand Traverse Bay Band of Ottawa and Chippewa Indians
2300 Stallman Road
Suttons Bay, MI 49682
(231) 271-4906

Hannahville Potawatomi Indian Community
N-15019 Hannahville
B-1 Road
Wilson, MI 49896-9717
(906) 466-9230

Huron Potawatomi-Nottawaseppi Huron Band of Potawatomi
2221-1 1/2 Mile Road
Fulton, MI 49052
(616) 963-2620

Keweenaw Bay Indian Community
107 Beartown Road
Baraga, MI 49908
(906) 353-8160
Ojibwa Tribe

Lac Vieux Desert Band of Lake Superior Chippewa Indians
23950 Choate Road
P.O. Box 249
Watersmeet, MI 49969
(906) 358-4940

Little River Band of Odawa Indians
1762 U.S. 31 South
Manistee, MI 49660
(231) 723-8288

Little Traverse Bay Band of Odawa Indians
1345 U.S. North
P.O. Box 246
Petoskey, MI 49770
(616) 439-3809

Match-e-be-nash-she-wish Band of Potawatomi Indians of Michigan
P.O. Box 218
1743 142nd Avenue
Dorr, MI 49323
(616) 681-8830

Pokagon Band of Potawatomi Indians
901 Spruce Street
P.O. Box 180
Dowagiac, MI 49047
(616) 782-4141
Pokagon Band of Potawatomi Indians

Saginaw Chippewa Indian Tribe
7070 E. Broadway
Mt. Pleasant, MI 48858
(517) 775-4000

Sault Ste. Marie Tribe of Chippewa Indians
2864 Ashmun Street
Sault Ste. Marie, MI 49783
(906) 635-6050
Sault Ste. Marie Tribe of Chippewa Indians

Invite to Meeting on 12_20_07.doc	**Content-Type:** application/msword **Content-Encoding:** base64

Federally Recognized Tribes.htm	**Content-Type:** text/html **Content-Encoding:** quoted-printable

End documentation of special notice to Native Americans

Begin documentation of special notice to public bodies

Subject: 700 MHz Public Meeting
From: Joe Turner <jturner@michiganpropertytax.com>
Date: Fri, 01 Jun 2007 10:26:41 -0400
To: Larry@michigantownships.org, dgilmartin@mml.org, mcguire@micounties.org, Patricia Coates <coatesp@oakgov.com>

Michigan Public Safety

REGION 21 700 MHz Planning Committee

DIRECT ALL CORRESPONDENCE TO:

Joseph M. Turner, Chairman

2719 State St

Saginaw, MI 48602

(989) 793-7373

REPRESENTING:

Associated Public-Safety Communications Officers, Inc.

Michigan Association of Chiefs of Police

Michigan Sheriff's Association

Michigan Municipal League

State of Michigan

Reference: Special Courtesy Notice

Gentlemen:

Over the past half decade, work has been done on completing a Plan to allocate certain new radio frequencies for local government, public safety and other qualifying agencies. The work has been performed by representatives from various law enforcement agencies, state and local government representatives and representatives from private enterprise.

The attached meeting notice is hopefully, a final invitation for your organization to participate in a public hearing which has been set aside for comments regarding a Plan to assigned new radio frequencies for public safety and other qualifying agencies within the state of Michigan.

If your members are interested in this issue, we ask that you review the notice. A representative or your organization is welcome to attend this public hearing.

Best regards,

Joseph M. Turner, Chairman
Region 21 700 RPC

NoticeJune122007Mtg.pdf	**Content-Type:** application/pdf **Content-Encoding:** base64

Courtesy Notice to MAC, MML and MTA

Michigan Public Safety

FREQUENCY ADVISORY COMMITTEE

(MPSFAC) REGION 21 700 MHz Planning Committee

DIRECT ALL CORRESPONDENCE TO:

Joseph M. Turner, Chairman
2719 State St
Saginaw, MI 48602
(989) 793-7373

REPRESENTING:

Associated Public-Safety Communications Officers, Inc.
Michigan Association of Chiefs of Police
Michigan Sheriff's Association
Michigan Municipal League
State of Michigan

June 1, 2006

Notice of Upcoming 700 MHz Meeting

The United States Government, through its agency the Federal Communication Commission (FCC), is opening up a portion of the 700 Megahertz (MHz) electromagnetic spectrum for use by public safety agencies. In order for those frequencies to be legally allocated, each of the existing FCC designated geographic regions in the U.S. must create a plan for the use of 700 MHz frequencies. For purposes of allocating this new radio spectrum, all the lands within the State of Michigan have been designated as being within Region 21.

Since 2001, efforts to create a plan for Region 21 have been ongoing. A formal Planning Committee was created and the committee has drafted a Plan. The committee is formally known as **the Region 21 700 MHz Planning Committee**. An initial submission of the Plan was made to the FCC in calendar year 2006. That submission has been reviewed and modified. It is believed the plan is complete pending the receipt of certain signatures from the appropriate parties of FCC Regions adjacent to Region 21. Upon receipt of those signatures a filing will be made to the FCC requesting the approval of the Plan.

Many public hearings have been held over the past several years. Notification has been published on the web and notifications have been sent via the LEIN system and in other ways. An opportunity for public comment will be held on June 12, 2007 at 10 at a Michigan State Police Facility, located at 4000 Collins Road, Lansing, Michigan. While your organization or its members have been contacted in the past, you are being sent this communication as another attempt to let you know you are welcomed and encouraged to participate. A working draft of the Region 21 700 MHz Plan is available for review at the web page: http://www.mpsfac.org/4102006fccfiling.pdf

Sincerely yours,

Joseph M. Turner

Joseph M. Turner, Chairman
jturner@michiganpropertytax.com

Subject: Meeting Notice
From: Joe Turner <jturner@michiganpropertytax.com>
Date: Fri, 01 Jun 2007 10:10:51 -0400
To: Karen Chadwick <kchadwick@ci.lansing.mi.us>, William S Nelson <nelsonws@ci.troy.mi.us>, William Barnwell <bbarnwell@co.montcalm.mi.us>, Dale Berry <dberry@hva.org>, Keith Bradshaw <Keith.Bradshaw@macombcountymi.gov>, Allen Eichenberg <EichenbA@michigan.gov>, Al Nowakowski <NowakowskiA@michigan.gov>, jturner <jturner@michiganpropertytax.com>, Patricia Coates <coatesp@oakgov.com>, Dave Held <heldd@sbcglobal.net>, Lloyd Collins <slpd@cablespeed.com>, Jim Fyvie <fyviej@clinton-county.org>, Mark Jongekrijg <mjongekrijg@occda.org>

June 1, 2007

Dear Members:

I am about to send this communication to the various Tribal Councils across the state, the Michigan Municipal League, the Michigan Townships Association and the Michigan Association of Counties.

Would you take a minute to review it, and if corrections are needed or if it can be made better is some way, please let me know?

Also, if you find it sufficient for "notice" purposes and would like to use it as a communication to an organization you represent or feel should be notified, please feel free to use this notice.

Joe

NoticeJune122007Mtg.pdf	**Content-Type:** application/pdf **Content-Encoding:** base64

Region 21 700 MHz RPC
Keith M. Bradshaw, Secretary
21930 Dunham Road
Mount Clemens, MI 48043
Telephone: 586-469-6433
Fax: 586-783-0957

November 5, 2007

To Whom it May Concern,

You are cordially invited to attend a meeting of the Region 21 700 MHz Regional Planning Committee. The meeting will be held at the State of Michigan Department of Information Technology building located on 4000 Collins Road, Lansing Michigan at 10:00 on the morning of December 20, 2007. The Committee will be discussing the 700 MHz Regional Plan prior to submitting the Plan to the Federal Communications Commission for approval. Your participation in this meeting is welcomed and would be appreciated.

A draft of the Region 21 700 MHz Plan is available for viewing and download at the Michigan APCO website at www.miapco.org.

If you have any questions or require further information, please do not hesitate to contact me at the above address and phone number.

Sincerely,

Keith M. Bradshaw, Secretary
Region 21 700 MHz Regional Planning Committee

Notice to every county and major population area

From: "John Bawol" <roscommon911@voyager.net>

To: "Zenon Cardenas Jr" <zcardenas@ioniacounty.org>; "Tom McIntyre" <911@saginawcounty.com>; "Ann Farquhar" <a_farquhar@cityofsouthfield.com>; <aa3725@wayne.edu>; "Gene Adamczyk" <adamczye@michigan.gov>; <adamsdist@provide.net>; "April Heinze" <aheinze@co.eaton.mi.us>; "Andrea Hine" <ahine@ioniacounty.org>; "Dean Alger" <algercomm@aol.com>; "David Cromell" <algershf@jamadots.com>; "Andrew Felde" <andrew@drewwireless.com>; "Anna Scott" <myns6@webtv.net>; "Barbara Fritz" <bfritz@ci.novi.mi.us>; "Barbara Wolfe" <barbaraw@ci.royal-oak.mi.us>; "Bill Charon" <bcharon@ioniacounty.org>; "Brian DeGrande" <bdegrande@ci.farmington-hills.mi.us>; "Angie Beals" <bealsa@clinton-county.org>; "Becky Shatney" <rshatney@occda.org>; "Bernie Gerencer" <bernie@co.newaygo.mi.us>; <beroff@livoniapd.com>; "Bruce Gaukel" <bgaukel@ci.lansing.mi.us>; <billa@voyager.net>; "Brianna Machuta" <bmachuta@interactsys.com>; "Bonnie Morton" <bmorton@isabellacounty.org>; "Bridget Schooley" <bmschooley@aol.com>; "Barry Nelson" <bnelson@saginawcounty.com>; "Bob Currier" <bobcurrier@comcast.net>; "Bonnie Bowman" <bonniebowman@hotmail.com>; "Borys Melnyk" <bmelnyk@visteon.com>; "Brandy Bunker" <bbunker@co.montcalm.mi.us>; "Gary Brozewski" <bro911bro@hotmail.com>; "Elizabeth Brown" <brownlr@michigan.gov>; <bs2@usol.com>; "Barbara Scott" <bs271@aol.com>; <bstites@allenparkpolice.org>; <carls@co.oakland.mi.us>; "'Carrie Perialas'" <cperialas@voyager.net>; "Cathrene Behrens" <cbehrens@walledlake.com>; "Bob Bradley" <cce100@yahoo.com>; "Chad Cole" <ccole026@msn.com>; "Charles Marsh" <cdm911@hotmail.com>; "Charlie Nystrom" <chasnice@voyager.net>; "Chris Deluge" <cdeluge@aol.com>; "Catherine Gracia-Lindstrom" <clindstr@ci.walker.mi.us>; "Clint Soldan" <clint.soldan@onstar.com>; "Duane Vosburg" <comoshop551@hotmail.com>; "Cornelia Shepperd" <conshep@juno.com>; "George Cool" <cool@wayne.edu>; "Craig Swenson" <CDSwenson@aol.com>; <CSWAINSTON@co.montcalm.mi.us>; "David Agens" <dagens@berriencounty.org>; "Dale Marsh" <dmarsh1@ameritech.net>; "Dana LaForest" <kingfluff2@aol.com>; "Daniel Miller" <millerd@ci.wayland.mi.us>; "Darrell Hogston" <darrell.hogston@postman.org>; "Dave Rice" <drice@midland911.org>; "Dave Schroeder" <dave.schroeder@verizon.com>; "David Held" <daveheld@compuserve.com>; "David Marshall" <davesway@wowway.com>; "David Rapalz" <dafchf1@aol.com>; "Dawn Cubitt" <dcubitt@sanilaccounty.net>; "Dale Berry" <dberry@hva.org>; "DC Croy" <dcroy@ci.novi.mi.us>; "Dave Ackley" <dca@geneseecounty911.org>; "Debra Wormwood" <dwormwood@new.rr.com>; "Dee Ann Summersett" <summersett911@tuscolacounty.org>; "Donald Hammond" <dhammond13@aol.com>; "Dawn Adams" <dmadams@dispatch.co.muskegon.mi.us>; "David Moore" <dmoore@newworldsys.com>; "David Nelson" <dn5683@ameritech.com>; "Doreen Olko" <dolko@auburnhills.org>; "Don Glasgow" <dtglasgow@core.com>; "Donna Torrance" <dtorrance@newworldsys.com>; "Dan Dundas" <dundasda@tycoelectronics.com>; "Ellen Deview" <edeview@ci.birmingham.mi.us>; "Allen Eichenburg" <Eichenba@michigan.gov>; "Ellen Guinn" <guinne@clinton-county.org>; <enigma0402@yahoo.com>; <fenwayprd@aol.com>; <foisyv@rochesterhills.org>; "Bill Folske" <wfolske@comcast.net>; "Fred Harris" <fharris@wexfordcounty.org>; <fyviej@clinton-county.org>; "Gary Albrecht" <galbrecht@stclaircounty.org>; <gdavies@rcoc.org>; "David Gignac" <giggys@chartermi.net>; "George Morehouse" <gmorehou@shelbytwpfd.com>; "Andy Goldberger" <goldbergera@stjosephcountymi.org>; <goralczym@ci.troy.mi.us>; <gould@wmis.net>; <gpatton@ci.novi.mi.us>; "Greg Clark" <gclark@ogsh.org>; "David Halteman" <haltemad@co.washtenaw.mi.us>; "Harvey Becker" <muskrivoutf@msn.com>; <heathers@michigan.gov>; "Herbert Rockwell" <hrockwell@plymouthtwppd.org>; <herkimer@tdi.net>; <hicksl@michigan.gov>; <hills911@frontiernet.net>; "Harriet Miller-Brown" <millerhr@michigan.gov>; <hwillia@ci.east-lansing.mi.us>; "Chris Schultz" <iscd911@chartermi.net>; "Jack Gabbard" <gabbardj@michigan.gov>; <jahepfer@aol.com>; <janders2@co.grand-traverse.mi.us>; "Janet Kaplan" <jkaplan@ci.novi.mi.us>; <jbuck@leo.gov>; <jceo@ci.saline.mi.us>; "Jeff Newton" <Newtonj@fraserdps.com>; "Jeff Vezina" <jvezina@dss-corp.com>; "Jessica Wheeler" <jesswheeler911@yahoo.com>; "Jim Twarog" <iosco911@charterinternet.com>; <jim.osborn@wcaa.us>; <Jim@sterlingyes.com>; <johncarnago@roecomm.com>; <jomegjoe@hotmail.com>; "Jonathon Uetrecht"

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Sent: Monday, January 31, 2005 6:04 PM
Subject: Region 21 700 Mhz Plan

APCO Members,

The new Region 21 700 Mhz Plan in PDF version is now available on the website

http://www.miapco.org/

Click on Region 21 700 Mhz...

John

APPENDIX F - REGION 21 700 MHz PLAN

This Appendix Contains

1. Minutes of Meetings

2. Meeting Sign In Sheets

Return to list of Appendices

APPENDIX F

Minutes

This Section Of Appendix F Contain the Minutes of Meetings

Notes for 700 MHz RPC Organizational Meeting

May 3, 2000

Note sources: Joe Turner, Committee Member and Bette Rinehart, invited speaker

An organizational meeting was convened by Richard DeMello of the MPSFAC group. The group met at a Masonic Temple, 2875 W. Liberty in Ann Arbor, Michigan

Meeting began at approximately 10 AM

The meeting Agenda was as follows:

1 Discuss the history of how a need for a 700 MHz planning committee evolved
2. Discuss Interoperability issues
3. Outline national planning requirements
4. Discuss new planning thrust and needs or uses of the spectrum

About 30 individuals were present. Sgt. Andre' Brooks of the Detroit Police Department agreed to be the Chairperson. Four committees were formed: a committee to survey users and others who might be affect; an Interoperability committee to research interoperability issues; a funding committee to secure necessary funds for planning purposes and a writing committee.

Mr. DeMello and Mr. Folske provided information to the group. Ms. Bette Rinehart also provided information. The group members individually participated in various activities including general discussions of the issues and how best to proceed.

The group enjoyed a lunch provided by Mr. Folske and reconvened after lunch. More general discussion was held. The group adjourned about 3 pm after agreeing to meet again soon.

12 October, 2000

Regular meeting of the Region 21 700 MHZ Public Safety Band
Regional Planning Committee
Masonic Temple, 2875 W. Liberty, Ann Arbor, MI

Mr. Richard S. DeMello convenes the meeting at 10:20 am.

Chairman Andre' T. Brooks asks for a volunteer to be temporary Secretary. Keith M. Bradshaw volunteers and is appointed temporary Secretary.

By Laws: The Chair directs members refer to the "Bylaws Template". **Chair asks for a voice vote to approve name of "BYLAWS FOR REGION 21". Name approved with one (1) dissenting vote, S. Todd.**

The Chair directs members attention to ARTICLE I, and asks that '21' be inserted in paragraph 1.1. Paragraph 1.1 to read in part, "…The name of this region shall be Region 21…." Approved by consensus.

The Chair directs members review Article II, paragraphs 2.1 through 2.6. Discussion concerning definition of membership and voting rights follows. The Chair directs members review paragraphs 2.1 through 2.12. Further discussion.

Motion R. DeMello, to include the definitions of PUBLIC SAFETY and PUBLIC SERVICE as defined by the FCC on a separate page of the bylaws. Support Joe Turner. Motion approved by voice vote.

Motion S. Todd to approve bylaws as previously amended. Discussion. **Motion withdrawn.**

Discussion of paragraph 2.6 follows.

Motion R. DeMello, to amend paragraph 2.6 Annual Meetings to read "The annual meeting of the members shall be held in conjunction with the annual meeting of the Michigan Chapter of the Association of Public Safety Communication Officials held in October of each year. If an annual meeting is not held as herein provided…". Motion approved by consensus.

Motion R. DeMello to add paragraph 2.13 "Consensus" to bylaws. Discussion. **Motion withdrawn.**

Motion S. Todd to tentatively approve bylaws as amended. Final approval is to await the next regular meeting of the committee. Support, Mac Dashney.
Call the Question S. Todd. **Motion approved by voice vote.**

Regular meeting of the Region 21 700 MHZ Public Safety Band Regional Planning Committee continued.

Election of Officers: Mr. R. DeMello calls for nominations for the positions of Vice-Chairman, Treasurer, and Permanent Secretary. Mr. Stephen Todd accepts nomination for Vice-Chairman. Ms. Pat Coates accepts nomination for position of Treasurer. Mr. Keith M. Bradshaw accepts nomination for position of Permanent Secretary. **Motion John Grant to accept nominations and install these officers. Support, Joe Turner. Motion carried by voice vote.**

Mr. DeMello discusses need for web page development. Discussion of website follows. Mr. DeMello suggest the Writing Committee should use the 800 MHZ Regional Plan as a guide to writing the 700 MHZ plan. Chairman Brooks calls for members to fill a Website Committee.

Motion R. DeMello to approve the NCC planning documents as presented with final approval deferred until the next regular meeting. Support W. Folske. Motion carried by voice vote.

The next regular meeting of the Region 21 Planning Committee will be held in Lansing, Michigan on January 16th, 2001.

We adjourn at 12:30 pm.

Respectfully submitted by Keith M. Bradshaw.

31 January, 2001
Regular Meeting of the Region 21 700 MHZ Public Safety Band
Regional Planning Committee
Lansing School District Hill Center
5815 Wise Road
Lansing, MI 48911

The Interoperability and Bylaws sub-committee working groups meet from 10:00am to 12:40pm.

The regular meeting is called to order at 12:40pm by the acting chairperson S. Todd.

Minutes of 10-12-2000 meeting: **Motion D. Alger, Support D. Betz to approve minutes as presented. Motion carried by voice vote.**

We adjourn for lunch at 12:50. The acting chair reconvenes the meeting at 1:15pm.

Approval of Bylaws: The chair presents the revised by-laws for approval. The bylaws are read to the members present.
Motion D. Betz, Support D. Alger to approve revised by-laws as presented by the Bylaws Committee. Motion carried by voice vote.

Discussion follows. Proposal to amend paragraph 1.1 to read "The name of this Regional Planning Committee shall be Region 21 700 MHZ Planning Committee." The eligibility of persons engaged in frequency coordination to be voting members of the committee is questioned. By consensus, such persons are eligible.

Motion D. Betz to approve by-laws with the above amendment to paragraph 1.1. Support, D. Alger. Motion carried by voice vote.

Mr. R. DeMello discusses his work with the National Coordinating Committee. A $2500.00 grant is available from the National Public Safety Telecommunications Council (NPSTC) to fund the operating expenses of the Region 21 700 MHZ committee. 700 MHZ equipment should be designed for superior performance to minimize interference from commercial operations.

Motion D. Betz, Support J. Turner to accept the report of Mr. DeMello as information. Motion carried by voice vote.

Motion Betz, Support Andrus, to instruct Mr. R. DeMello to apply for the NPSTC grant of $2500.00. Motion carried by voice vote.

Interoperability Subcommittee Report: Mr. J. Turner.

Motion Grant, Support, Betz to accept the report of the Interoperability Subcommittee. Motion carried.

The next meeting is to be held on April 25, 2001 in Saginaw, Michigan.

Motion Betz, Support Alger to adjourn at 2:20pm. Motion carried.

Respectfully submitted by Keith M. Bradshaw.

Minutes of the January 30, 2001 "Interoperability Committee" Meeting
(A sub-committee of the Region 21 700 MHz Planning Committee)

The meeting began at approximately 10 AM, at the Lansing School District, Hill Center in Lansing, Michigan. Members in attendance were: Dean Alger, MDCIS-EMS; Bob Andrus, City of Dearborn; Dennis Betz, Washtenaw County Central Dispatch; Bill Folske, APCO; John Grant, Lansing School District DPS; Paul Mayer, State of Ohio liaison and Chairman, Joe Turner, City of Saginaw. Mr. Rick Usian, Motorola Company, joined as an observer. From time-to-time, the Committee sought the assistance of Dick DeMello.

This was the first official meeting of the sub-committee. Is first order of business was to:

- Identify the role of interoperability in the contemplated 700 MHz plan.
- Review the goals of interoperability within a telecommunications network
- Create a strategy to accomplish those goals.
- Identify problems current radio users have with multi-agency interaction

These issues were address by open discussion and debate. It was decided to look to the existing 800 MHz Band plan treatment of interoperability as a potential template for 700 MHz.

Results of the day's discussions appeared in several ways. A list of factors to be considered in the interoperability planning was created. An e-mail communication address book was distributed. Listed factors to consider included:

- Communications loading with the following components:

① Population density
② number and type of travel routes for hazardous materials transportation
③ number of type of facilities or sites with potential for widespread damage
④ prevalence of natural hazard incidents (forest fires, tornadoes, etc.)
④ other factors

Of the 36 channels allocated for interoperability, two unencrypted calling channels were potentially identified for initial state wide and intra-state interoperability. Two data channels were reserve for future standardization of technology which would permit interoperability. The remaining thirty two channels were set aside for future disposition.

Respectfully submitted,

Joseph M. Turner, Chairman

25 April, 2001

Regular Meeting of the Region 21 700 MHZ Public Safety Band Regional Planning Committee
Saginaw County 911 Center
618 Cass Street
Saginaw, Michigan

Present are: Stephen Todd, Chairperson, Ottawa County 911; Pat Coates, Treasurer, Oakland County; Keith Bradshaw, Secretary, Macomb County Technical Services; Bill Folske, APCO Frequency Advisor; Richard DeMello, Convener; Lloyd Fayling, Genesee County; Joe Turner, Dennis Betz Washtenaw County; Dean Alger, MDCIS-EMS; Rick Uslan, Motorola

Also Present are: Paul M. Mayer, Ohio Department of Administrative Services; Ray Smith, Region 33 (Ohio) Chairman.

Mr. DeMello reviews decisions of NIJ frequency pre-coordination database committee.

The Interoperability and Writing sub-committee working groups meet from 11:00am to 12:15pm.

The regular meeting is called to order at 12:30pm by the chair.

Minutes of the 31 January meeting: **Motion Folske, support Betz, to accept the minutes of the meeting held on 31 January, 2001 as presented. Motion carried by voice vote.**

Vacant Positions: **Motion Alger, support Coates, to nominate J. Turner as Vice-chair, Stephen Todd to assume duties of chair. Motion carried unanimously.**

Addition of Counties to Region 21: Mr. DeMello wishes the committee consider moving some region 54 counties into region 21.

Motion Fayling, support Turner, to add the counties of Muskegon, Kent, Ottawa, Kalamazoo, St. Joe, and Alleghan into Region 21 for the purposes of 700 MHZ planning. Discussion.

Motion Fayling, support Turner, to amended the previous motion to include the county of Van Buren. Motion carried by voice vote.

Adoption of Incident Command System standards: Chairman Todd discusses changes made to the draft document entitled 'Public Safety National Coordination Committee (NCC) Interoperability Subcommittee, Operational Standards Working Group #2, Recommendations Concerning use of the Incident Command System (ICS)'. Discussion follows. Changes incorporated into the document; under Part XI, paragraph 7, "…or other clearly defined position." to read "…or other clearly defined position, as may be appropriate

within the jurisdiction." Under Part XII, paragraph 1, "It is this subcommittees recommendation that the NCC advise the FCC to mandate the use of ICS on the 700 MHz interoperability spectrum." to read "It is this Subcommittee's Recommendation that use of ICS on the 700 MHz interoperability spectrum be implemented when appropriate." Part XII, paragraph 3, strike all of Paragraph 3.

Motion Fayling, support Betz, to accept the amended Incident Command System Document as part of the Region 21 Plan. Motion carried by voice vote.

We adjourn for lunch at 1:10pm. We reconvene at 1:15pm.

Interoperability sub-committee: Mr. Turner presents the interoperability subcommittee report. **Motion Turner, support Folske, to adopt recommendations of the sub-committee.** Discussion follows. **Motion carried by voice vote.**

Memorandum of Understanding (MOU): Mr. Todd discusses changes to the draft document entitled, 'Appendix C, Memorandum of understanding for Operating the 700 MHz Interoperability Channels". Under paragraph "The APPLICANT…" "To monitor the calling channel(s) and coordinate the use of the Tactical Channels." to read "To monitor the Calling Channel(s)." Add as a separate sentence, "To coordinate the use of the Tactical Channels". "To identify inappropriate use and mitigate the same from occurring in the future" to read "To identify and eliminate inappropriate use." "To relinquish secondary Trunked operation of approved interoperability channels to requests for primary conventional access with the same or higher priority" To read "To relinquish secondary Trunked operation of interoperability channels to requests for primary conventional access." "To mitigate contention for channels by exercising the Priority Levels identified in this MOU" to read "To grant access to channels according to the Priority Levels identified in this MOU." Paragraph beginning with "To resolve contention within the same priority…" to read "To resolve contention within agencies with the same priority shall be determined by the highest level of on scene authority, or the State Interoperability Executive Committee, or RPC.

Motion Betz, support Turner to adopt the proposed changes. Motion carried by voice vote.

Presentation of the MATRIX sub-committee: Ms. Coates discusses application matrix. Original regional 21 point matrix language to be kept, except for channel loading…every mobile data unit to be considered as one-half a mobile unit. Appeals procedure with extensive changes to be presented later. MPSFAC to remain the regional plan update committee.

Motion Coates, support DeMello, to accept the report of this subcommittee. Discussion. **Motion carried by voice vote.**

25, April, 2001
Regular Meeting of the Region 21 700 MHZ Public Safety Band Regional Planning Committee, cont. (3 of 3)

We adjourn at 2:10pm.

Next meeting 9/26/2001 at 1:00pm, location in Kettenun Center in Tustin, Michigan.

Respectfully submitted by Keith M. Bradshaw, Secretary.

September 19, 2001

Regular Meeting of the Region 21 700 MHZ Public Safety Band Regional Planning Committee
Oakland County MIS
1200 N. Telegraph Road, 49 W
Pontiac, Michigan 48341

The meeting is called to order by Patricia Coates (acting chair) at 10:10 am.

Present are: Patricia Coates, Treasurer, Oakland County Clemis; Keith M. Bradshaw, Secretary, Macomb County; Richard S. DeMello, FCCA, Convener; Michael Whately, CSI; Rick Uslan, Motorola; Robert Andrus, City of Dearborn; Dean A. Alger, MDCIS-EMS; Karl Beckman, Motorola

Also Present are: Paul Mayer and Ray Smith, State of Ohio

NCC Report: Mr. DeMello relates that the NCC did not meet. Our plan is ready to be proof read for grammar, logic, etc. we should form a plan review committee.

Minutes of 25 April Meeting: **Motion Betz, support Folske to approve minutes as presented. Motion approved by voice vote.**

Treasurers report: **Motion DeMello, support Betz to approve. Motion approved by voice vote.**

We divide into Process and Writing sub-committees for Plan review at 10:40 am.

We break for Lunch from 11:45am to 12:40pm. Reconvene sub-committees at 12:45 pm.

Next meeting scheduled for 1:00 pm, October 18, 2001 in conjunction with the Michigan Apco meeting in Frankenmuth Michigan.

We adjourn at 2:55 pm.

Respectfully submitted by
Keith M. Bradshaw

18 October, 2001

Regular Meeting of the Region 21 700 MHZ Public Safety Band Planning Committee
Zehnder's Restaurant
Frankenmuth, MI

We begin at 1:25 pm.

Present are: Richard DeMello, Convener; Patricia Coates, Oakland County, Secretary; Harry Warner, MSP; Dean Alger, MDCIS-EMS; Bill Folske, APCO Frequency Advisor; Karl Beckman, Rick Uslan, Motorola; Mike Whately, Phil Hempel, CSI; Robert Andrus, City of Dearborn; Keith Bradshaw, Macomb County, Secretary; Lloyd Fayling, Genesee County

Mr. Bradshaw presents the latest changes to the draft plan to the committee. Discussion.

We notice that Appendix T is the improper version. We must include the proper version. Secretary to update this.

Add to page 12 under the heading "Coverage", language asserting that TIA TR 8.8 standard is to be used.

If possible, we should include the federal form "S-160" in Appendix O.

Motion Folske, support Beckman, to adopt draft plan with changes as mentioned above. Motion approved by voice vote.

Motion DeMello, support Coates, to authorize the purchase of flat bed scanner software for the purpose of rendering the plan with appendices into electronic format. Motion approved by voice vote.

Motion Alger, support Andrus, to thank Mr. DeMello, Ms. Coates and Mr. Bradshaw for their efforts in preparing the draft for presentation at this meeting. Motion approved.

We adjourn at 2:23pm.

January 4, 2002

Regular Meeting of the Region 21 700 MHZ Public Safety Band Regional Planning Committee
Macomb County Sheriff Department
43565 Elizabeth
Mount Clemens, Michigan 48043

Vice chairman Turner calls the meeting to order at 10:10am.

Present are: Joe Turner, City of Saginaw (Ret.), Keith Bradshaw, Macomb County Technical Services, Bill Nelson, City of Troy Fire Department, Pat Coates, Oakland County Clemis, Dick DeMello, FCC, Rick Uslan, Motorola, Bill Folske, APCO, Larry Zabkowski, City of Southfield, Mike Whately, CSI, Dale Berry, Huron County Ambulance, Joe Palazzola, Fraser PS.

Treasurer's Report: Ms. Coates presents the Treasurer's report. **Motion by Folske to accept the Treasurer's report, second Uslan. Motion carried.**

Minutes of October, 2001 meeting: Meeting minutes were unavailable. These minutes will be distributed via list server.

Ms. Coates passes out latest revisions to the Plan, including new appendices U and V, changes to appendix T, a new table of contents. Mr. Turner goes over the new documents.

Mr. DeMello: We need to add the first meeting notice with a correct date to appendix B. We need to add the new members present today to the membership list. We also need a front page identifying the chairperson. We should include a list of officers, committees etc. Mr. DeMello will be talking to the NIJ that they should put our plan on line for review by other regions using their database.

Mr. Turner suggests we add to Appendix A a list of the plan drafters i.e. an executive committee composed of those who were involved in drafting the plan.

Mr. DeMello suggests we add the correspondence to the FCC regarding our consolidation of Region 21 as the whole state of Michigan.

We review the body of the plan. Revisions are as follows:

page 1: "To the members of Region 21 Planning Committee (see Appendix A)..."
page 3: new table of contents containing appendices U and V.
page 4: "The FCC announced allocation of 24 MHZ in the 700 MHZ radio spectrum..."
Remove heading "Purpose"
page 5: delete "...radio communication systems." Move heading "regional plan priority" to page 6.
page 6: add a footnote "At the April 15, 2001 planning committee meeting pursuant to FCC

notice DA 01-58 of January 10, 2001, the committee discussed modification of the region 21 boundaries. After consultation with region 54, the planning committee informed the FCC of its desire to modify region 21 boundaries to include the entire state of Michigan." The relevant documents are to be added to appendix F. Add to appendix K a property value assessment.

page 9: paragraph 3, delete sentence "Where smaller conventional systems..." Replace "...the higher technology..." with "The trunked radio system is considered the most efficient technology at this time. The Region also places great emphasis..."

page 10: first paragraph, "This will be dependent upon the hierarchy of levels of government as listed on page 12, the geographic coverage..."

page 11: first sentence, BOLD type for entire first sentence.

page 12: item 5 change to, "Single City, village, township, or other eligible systems."
Under "Coverage", "Coverage parameters are to be consistent with TR 8.8 standards and the Region 21 821 MHZ plan:"
Modify heading "Coverage" to read "Coverage and Interference", delete "Interference" from page 13. Modify table of contents to reflect this.

page 14: change first sentence, first paragraph, "An applicant will be required to provide loading information consistent with this plan."

page 15: add after "...most unusual cases,..." change "Similarly, agencies shall not "farm down" or otherwise make available, frequencies to other radio services within their political structure."
After the word "reassignment". a new sentence: Consideration will be given to agencies expanding existing 806 MHz and 821 MHz systems.

edit minutes

page 16: after the bullet "explain and certify" and before the bullet "821 MHz", add

- Applicants must provide proof they communicated an announcement of their intent to seek new 700 MHz frequencies and offered an invitation to the MSP, the county or counties within which the proposed system is located and local governmental units within their county of residence, to participate in a discussion of interoperability issues.

page 18: change first sentence under "Allotment Process", "In performing the allotment process the Michigan Public Safety Frequency Advisory Committee (MPSFAC)..."

page 20: change "Special Emerg." to "Special Emerg./EMS"

page 21; add to "...special emergency...", "..special emergency/ems..." in first paragraph, capitalize "Tribal Nations". change deduct section.

page 22: bold first two sentences in first paragraph.

page 24: add "..or otherwise made available..." delete "Farming down is utilized to ..."

page 25: tense

page 26: change "An applicant who decides to appeal a rejection should initiate that appeal within ten (10) business days after receiving the decision."

Appendix A: update

Appendix B: update

Appendix E: add "All agencies served by Michigan LEIN"

Appendix F: update with letters, communications etc. and minutes
Appendix K: update with property value data
Appendix L: add a statement recognizing the ICS documents worth and that it meets our regions needs as amended.
Appendix Q: add survey results if available
Appendix S: add new industry Canada document to
Appendix T: update
Appendix U: correct document to make MEPS acronym consistent. And RACES/ARES information.

Motion DeMello, second Coates to amend plan to reflect the aforementioned changes. Motion carried by voice vote.

Motion DeMello, second Nelson to adjourn. Motion carried by voice vote.

We adjourn at 2:35 pm.

Respectfully submitted by Keith M. Bradshaw.

1 July, 2002

Region 21 700 MHZ Public Safety Band Planning Committee
Conference Call

Call to Order: We begin at 10:15 am.

Present on Call are: Patricia Coates, Treasurer, Oakland County; Harry Warner, MSP; Bill Folske, APCO Frequency Advisor; Karl Beckman, Motorola; Keith Bradshaw, Macomb County, Secretary; Bill Nelson, City of Troy; Larry Zabkowski, City of Southfield; Joe Turner, Vice-Chairperson, Acting Chairperson

Approve Agenda: Members present resolve to accomplish business of committee as if a quorum were present. The committee realizes that the actions taken today are tentative, awaiting approval of the committee as a whole. **Motion Coates, support Folske to approve agenda. Motion carried.**

Approve minutes of January 4, 2002 meeting: **Motion Coates, support Zabkowski, to approve the minutes as submitted. Motion carried.**

New Business:
Appointment of Vice-Chair to Chairperson: Mr. Todd appears to have resigned defacto his position as Chairman. The committee invokes the mechanism within our bylaws and appoints Mr. Joe Turner as Chairperson.

Election of Vice-Chairperson: Ms. Coates nominates Mr. William Folske for the position of Vice-Chairperson.
Motion Beckman, support Warner, to close nominations. Motion approved by voice vote.

Motion Coates, support Zabkowski, to appoint William Folske Vice-Chairperson of the Region 21 700 MHz Planning Committee. Motion approved by voice vote.

Dedication Page: **Motion Folske, support Nelson, to include a dedication to Mr. DeMello in the Region 21 Plan. Motion approved unanimously.**

Other: Mr. Folske advises the Committee that the frequency sort has been completed. The two advisors will be traveling to Denver Colorado for instructions on the frequency database.

Old Business:
Review of Draft Plan: Draft plan is ready for dissemination.

Next Steps for Submission of Plan: List is to be compiled and disseminated to committee of the documents in the plan not currently available in electronic format. These to be posted on the APCO website when available. In the interest of time, adjoining states will be mailed a paper copy of the plan for their review. We set a target date of July 14, 2002 for shipping copies of the plan to adjoining states. We will receive comments until September 15, 2002. We will submit plan to the FCC on October 1, 2002. These dates are contingent on compliance with NCC guidelines.

Other: A final public hearing will be held at the APCO fall conference in Tustin on September 26, 2002.

Next Meeting Date: Next meeting is to be held at Ann Arbor on August 1, 2002. Time and place TBA.

Adjournment: **Motion Coates, support Turner, to adjourn at 11:00 am. Motion carried.**

1 August, 2002

Regular Meeting of the Region 21 700 MHZ Public Safety Band Planning Committee
Huron Valley Ambulance Authority
2215 Hogback Road
Ann Arbor, MI

We begin at 10:15 am.

Present are: Patricia Coates, Oakland County, Treasurer; Joe Turner, Chairman; Bill Folske, Vice-Chairman; Rick Uslan, Motorola; Mike Whately, CSI; Keith Bradshaw, Macomb County, Secretary; Al Nowakowski, State of Michigan; Ray Smith, Region 33 Chairman; Dennis Betz, Washtenaw County; Dale Berry, Huron Valley Authority; Bill Nelson, City of Troy; Larry Zabkowski, City of Southfield

Minutes of 1 July, 2002 Conference Call: **Motion Folske, support Nelson to accept minutes of conference call as presented.**

New Business: **Motion Folske Support Betz to accept resignation of Stephen Todd. Motion approved by voice vote. Motion Betz, support Zabkowski to appoint Joe Turner as permanent Chairperson. Motion approved by voice vote. Motion Betz, support Coates to appoint Bill Folske as Vice-Chairperson. Motion approved by voice vote.**

We discuss addition of dedication page to plan.

Motion Zabkowski, support Whately to donate remaining Region 21 funds to the Michigan APCO Chapter to support sending Bill Folske and Keith Bradshaw to Denver Colorado for 700 MHz frequency database training. Motion approved by voice vote.

Old Business: We discuss the remaining appendices to be reduced to electronic form. Discussion to include 420 MHz interoperability document in plan.

Motion Folske, support Nelson to proceed with distribution of plan to adjacent states. Motion approved by voice vote.

One copy of the Region 21 plan is hand delivered to Mr. Ray Smith. We discuss the possibility of having a final informational public hearing at the fall conference at Tustin. It is decided to have an informational public meeting at Tustin.
We decide to notify every member of MPSFAC, as well as the local Indian Nations of the final meeting.

Next Meeting: Meeting to be held at 1:00 p.m. Thursday, September 26, 2002 at Tustin Michigan.

Miscellaneous: Discussion as to target date of 1 October, 2002 for submitting plan to FCC.

Motion to adjourn at 11:13 am by Betz, support Coates. Motion approved by voice vote.

September 26, 2002

Region 21 700 MHz Regional Planning Committee
Public Hearing
Kettunen Center
Tustin, Michigan

Present are: Joe Turner, Chairman; Pat Coates, Treasurer; Keith Bradshaw, Secretary; Karl Beckman, Motorola; Rick Uslan, Motorola; Bill Folske, MI Frequency Advisor; Chris Stirrett, Huron County; Craig Enderle, Huron County; Rich Rybicki, MSP; Gene Adamczyk, MSP; Pam Matelski, Mackinaw County; Bob Andrus, City of Dearborn; Mike Whately, CSI;

Chairman Turner opens the hearing at 1:00pm. The Chairman opens the hearing for public comments at 1:05pm. There being no public comments, the public comment portion of the meeting is closed at 1:08pm.

We discuss reply made to Carl Guse, Region 54 convener.

Ms. Coates has drafted correspondence to adjoining regions.

Public Hearing closed by Chairman Turner at 1:18pm.

Respectfully Submitted by
Keith M. Bradshaw

Introductory comments for 700 MHz Public Hearing Tustin, Michigan September 26, 2002

Welcome to the final public hearing of the Region 21, 700 MHz Planning Committee.

This committee was formed pursuant to a recommendation of the Michigan Public Safety Advisory Committee. The Public Safety Advisory Committee guides the assignment of public safety frequencies within the state of Michigan. Its membership consists of representatives from the Michigan State Police, the Michigan Department of Transportation, the Michigan Department of Natural Resources, the Michigan Municipal League, the Michigan Police Chief's Association, the Michigan Sheriff's Association and technical representatives from APCO.

The 700 MHz Planning Committee, first convened under the leadership of Mr. Richard De Mello, on May 3, 2000 in Ann Arbor, Michigan. The purpose of this first meeting was to decide how to create a formal 700 MHz planning committee, adopt a set of By-Laws for it, efficiently generate a plan and properly notify the public and appropriate agencies.

The organizational meeting was followed by a meeting held on October 12, 2000 in Ann Arbor and again Chaired by Mr. De Mello. At that meeting the Region 21 700 MHz Planning Committee was formally created, elected officers and adopted By-Laws.

Six subsequent public meetings were held in various cities across the state including, Ann Arbor, Lansing, Mt. Clemons and Tustin. Information regarding the planning process including documents related to the plan as it has been developed were posted at the APCO website and disseminated in several other ways. A number of individuals representing public agencies, private businesses and simply interested parties have attended those meetings. In addition to parties from the state of Michigan, individuals from the State of Ohio have been in attendance.

Copies of the prospective plans have been distributed to states adjacent to Michigan including: Ohio, Indiana, Illinois, Wisconsin and Minnesota.

Today's public hearing is being held to accept final comments about the plan from the public. Those comments are being recorded by audio tape and notes will be taken by myself and others. Comments submitted today will be distributed to Planning Committee members and taken under consideration. It is the intent of this committee to submit its final plan to the Federal Communications Commission on October 1, 2002. DEPENDING UPON LETTER OF CONCURRENCE FROM ADJACENT STATES.

It is now my pleasure to open the floor to comments. I note for the record that we are accepting public comments at 1:08 PM o'clock. We ask that you limit your comments to no more than five minutes in duration and that all participants remain courteous in their conduct. As is common practice for public hearings, the Chair retains its discretion to terminate the participation of individuals who may disrupt these proceedings. The committee welcomes any written materials you may wish to submit. Written documents must be submitted within fifteen minutes of the close of today's meeting. (Close Meeting - and note time of closure) THERE BEING NO COMMENTS FROM THE FLOOR, PUBLIC ORAL COMMENTS WERE CLOSED AT 1:08. A LETTER CARL GUSE, WI. COORDINATOR IL. BILL CARTER OHIO INDIANA, OK. SOME DISCUSSION ON

Region 21 700 MHz Planning Committee
Meeting Minutes
Monday, June 23, 2003
12:00 p.m.
Huron Valley Ambulance
2215 Hogback Road, Ann Arbor

OK

Members Present

Joseph Turner - Chairperson	Michigan Municipal League
William Folske - Vice Chairperson	Michigan APCO
Patricia Coates - Secretary	Michigan APCO
Keith Bradshaw	Michigan Frequency Coordinator
William Nelson	Michigan Association of Fire Chiefs
Al Nowakowski	State of Michigan - MPSCS
Karl Beckman	Motorola
Andre Brooks	Detroit PD
David Held	Retired - State of Michigan
Dennis McDowell	M/A COM
Steve Lasher	Motorola
Harry Warner	Retired - State of Michigan
Michael Whately	CSI

I. **Call to Order**

Mr. Turner called the meeting to order at 12:05 p.m.

II. **Frequency Sort**

Mr. Bradshaw stated that the frequency sort has been received from NIJ and is channelized at 12.5 KHz. CAPRAD is the application that will be used to write the Plan and manage the frequency database. In addition to Plan Managers, there will be levels of access for vendors and consultants. The Regional Committee will be responsible for CPARAD training. Motion by Folske, supported by Beckman, to appoint Mr. Bradshaw as the Region 21 Plan Manager. Motion carried unanimously. Mr. Bradshaw will contact NIJ to Make certain that adjacent regions were considered in the sort.

III. **Funding**

Mr. Bradshaw advised the Committee that another round of funding is available. Interoperability must be addressed. Ms. Coates will request that the Michigan Chapter of APCO receive any funds on behalf of the Region 21 Committee. An Interoperability Subcommittee will be formed, including Mr. Beckman, Mr. Held, and Mr. Brooks.

IV. **Channelization**

The Committee discussed the definition of a "channel" (6.25, 12.5 or 25 KHz) in relation to the 100 user per "channel" requirement. Contours and service area must also. Mr. Folske suggested that the Committee cjeck to see how the State applications were made.

V. **FCC Submission**

The FCC now requires that plans be submitted in electronic format. Mr. Bradshaw has most portions in Word, and some in hard copy. Mr. Turner will reformat the Plan into PDF format. Mr. Turner requested

that the minutes and attendance of this and any future meetings continue to be added to the Plan.

VI. Next meeting

The date of the next meeting will be September 26th, 2003, in Tustin, immediately following the MPSFAC meeting. Ms. Coates will coordinate times.

VII. Adjournment

The meeting adjourned at 1:10 p.m.

Region 21 700 MHz Regional Planning Committee
Meeting Minutes
2:30 p.m.
September 26, 2003
Tustin, MI

Attendees
Joseph Turner - Chairperson
Keith Bradshaw - Secretary
Patricia Coates - Treasurer
Chief William Nelson - Troy Fire Department
David Held - State of Michigan
Karl Beckman - Motorola
James Fyvie - Clinton County

I. Call to order
The meeting was called to order by Mr. Turner at 2:40 p.m.

II Introductions
Attendees introduced themselves. Mr. Turner announced that the meeting would be taped for public record

II. Approval of Agenda
The agenda was approved by consensus

III. Approval of Minutes
Motion by Nelson, supported by Held, to approve the minutes of the previous meeting. Motion carried unanimously

IV. Old Business

A. Frequency Sort
Mr. Bradshaw announced that the frequency sort is available on line, and that he has a hard copy.
Mr. Bradshaw stated the need to designate alternate manager. He stated that the Michigan Alternate Coordinator has not been trained yet. The next training is in October and November, and Mr. Bradshaw has advised the alternate to call APCO to schedule training.

.

B. CAPRAD training
Mr. Bradshaw intends to go back through the training, and will be ready to conduct training by Frankenmuth.

C. **Interoperability and Coordination with Adjacent Regions**
Mr. Bradshaw stated that there are mutual aid and calling channels included in the sort. Region 21 needs to coordinate with adjoining regions. The actual frequencies don't matter , but all regions need them to concur at the borders. Region 21 needs to tell the other regions what we are doing for interoperability. Modeling after 800 plan, but backwards, Region 21 needs to run its diagonals backwards as storms move Southeast to Northwest in this area. The Committee could assign lower half of state half, or give all the channels to all the counties, and so forth. EMS, fire and law each get eight, and wide band data is also on interoperability list. Mr. Turner inquired about national needs for interoperability. Mr. Held stated that users would turn to the State EMD for long range communications. Mr. Bradshaw stated that the national calling channels are already addresses.
Motion by Coates, supported by Beckman that all channels be assigned statewide, and the adjacent regions be notified. Motion carried unanimously.
The appendix from Region 54 and Region 21 sign off was discussed. Mr. Held recommended the addition that any coordination within 70 miles of the State of Michigan must be coordinated with Region 21. There

is concern with lake borders versus political boundaries. The Committee should reach a decision by email before Frankenmuth

D. Frequency channelization

Mr. Bradshaw asked if the Region 21 plan channelizes at 6.25 KHz. The consensus was to stay with loading requirements – 400 mobiles for 25k, 200 for 12.5k, etc. The Plan will use 6.25. Mr. Bradshaw stated he believe that refarming at 800 MHz will eventually occur.

V. **New Business**

A. Border Sharing Agreement

Mr. Bradshaw recommends adoption.

B. 4.9 GHz

Mr. Bradshaw advised of the need to have a formal announcement at the Frankenmuth meeting regarding 4.9 GHz . A formal plan is not required, it is necessary to announce it. The FCC has made this the responsibility of the 700 MHz Planning Committees.

VI. Next Meeting

The next meeting will be October 23 in Frankenmuth.

VII. Adjournment

Motion by Bradshaw, supported by Held to adjourn the meeting. Motion carried unanimously. Meeting adjourned at 3:10 p.m.

Introductory comments for 700 MHz Public Hearing Tustin, Michigan September 26, 2003

Welcome to this public hearing of the Region 21, 700 MHz Planning Committee.

This committee was formed pursuant to a recommendation of the Michigan Public Safety Advisory Committee. The Public Safety Advisory Committee guides the assignment of public safety frequencies within the state of Michigan. Its membership consists of representatives from the Michigan State Police, the Michigan Department of Transportation, the Michigan Department of Natural Resources, the Michigan Municipal League, the Michigan Police Chief's Association, the Michigan Sheriff's Association and technical representatives from APCO.

The 700 MHz Planning Committee, first convened under the leadership of Mr. Richard De Mello, on May 3, 2000 in Ann Arbor, Michigan. The purpose of this first meeting was to decide how to create a formal 700 MHz planning committee, adopt a set of By-Laws for it, efficiently generate a plan and properly notify the public and appropriate agencies.

The organizational meeting was followed by a meeting held on October 12, 2000 in Ann Arbor and again Chaired by Mr. De Mello. At that meeting the Region 21 700 MHz Planning Committee was formally created, elected officers and adopted By-Laws.

Six subsequent public meetings were held in various cities across the state including, Ann Arbor, Lansing, Mt. Clemons and Tustin. Information regarding the planning process including documents related to the plan as it has been developed were posted at the APCO website and disseminated in several other ways. A number of individuals representing public agencies, private businesses and simply interested parties have attended those meetings. In addition to parties from the state of Michigan, individuals from the State of Ohio have been in attendance.

Copies of the prospective plans have been distributed to states adjacent to Michigan including: Ohio, Indiana, Illinois, Wisconsin and Minnesota.

Today's public hearing is being held to accept comments about the plan from the public. Those comments are being recorded by audio tape and notes will be taken by myself and others. Comments submitted today will be distributed to Planning Committee members and taken under consideration. It is the intent of this committee to submit its final plan to the Federal Communications Commission.

It is now my pleasure to open the floor to comments. I note for the record that we have opened the meeting and are accepting public comments at 11:30 am. We ask that you limit your comments to no more than five minutes in duration and that all participants remain courteous in their conduct. As is common practice for public hearings, the Chair retains its discretion to terminate the participation of individuals who may disrupt these proceedings. The committee welcomes any written materials you may wish to submit. Written documents must be submitted within fifteen minutes of the close of today's meeting.

Region 21 700 MHz Regional Planning Committee
Meeting Minutes
11:00 a.m.
October 23, 2003
Frankenmuth, MI

Attendees
Joseph Turner - Chairperson
William Folske - Vice Chairperson
Keith Bradshaw - Secretary
Patricia Coates - Treasurer
David Held - State of Michigan
Dale Berry - MAAS
Karl Beckman - Motorola
Lloyd Fayling - Genesee County
Michael Whately - CSI, Inc
Al Nowakowski - MDIT
Al Eichenberg - MPSCS
Robert Andrus - City of Dearborn
Steve Lasher - Motorola

I. Call to order
The meeting was called to order by Mr. Turner at 11:07 a.m..

II Introductions
Attendees introduced themselves. Mr. Turner announced that the meeting would be taped for public record, and an attendance sheet distributed

III. Approval of Agenda
Mr. Bradshaw requested the addition of item E under Old Business, Reconciling the Plan with FCC requirements. Mr. Nowakowski requested the addition under New Business of an item regarding the relationship of region 21 with region 54 and the exchange of observers. Mr. Eichenberg requested the addition under New Business of an item regarding two pieces of pending legislation.
Motion by Berry, supported by Held. to approve the agenda as modified. Motion carried unanimously.

IV. Approval of Minutes
Motion by Eichenberg, supported by Beckman, to approve the meeting minutes of September 23, 2003.. Motion carried unanimously. Mr. Turner express the Committee's thanks to Steve Todd and Michigan APCO for supplying the meal at the Tustin meeting

V. Old Business

A. Frequency Sort and Plan Update
Mr. Bradshaw stated that the Plan is posted on the Michigan APCO web site, but a PDF rather than document format is needed for FCC filing. A link to the CAPRAD web site is also needed. Mr. Beckman suggested the Committee ask NIPSTIC for PDF format. Mr. Bradshaw confirmed that NPSTIC had made such an offer, and stated that use of PDF will also save printing costs; publicly distributed copies should be CD ROM. MR. Beckman concurred that both the Plan and frequency tables should be on the web site, and that CDs can be mailed for less than $.80. Mr. Whately volunteered to convert the document to PDF and to scan the attachments; Mr. Bradshaw will send the files to Mr. Whately.

B. CAPRAD
Mr. Bradshaw stated that he had been unable to retake the training and cannot conduct training, but will be ready to do so by next meeting. He further stated that the Committee needs to decide on a system administrator, one other administrator, and levels of access. CAPRAD can do all searches, applications, etc on line. NLECTC in Denver developed this for NPSTIC.

Motion by Beckman, supported by Whately, to name Held as Assistant Administrator, and identify Turner and Folske as secondary on the list. Motion carried unanimously.

C. Interoperability and Coordination with Adjacent Regions

The Committee discussed the NYS plan for statewide channels, which Mr. Bradshaw recommended be used as a template. Mr. Held described the document as an engineer's delight, in that it defines terms, measurements and levels, but stated that it is very complicated for "lay" administrator. The NYS plan also no "teeth" for enforcement. Mr. Held stated that he prefers the Ohio plan, although it is still too wordy, and suggested that Region 21 draft its own. The Region 21 plan should request notification of any application within 70 miles, and failure to respond within 20 days considered concurrence. This would leave it more open, although Mr. Held agreed with the grievance procedure. Mr. Bradshaw inquired why this is needed this for state frequencies. Mr. Held replied that this to protect entire band, not just state frequencies. Mr. Beckman supported the simplicity concept. Mr. Bradshaw stated that these are geographic licenses that can be moved any time. Mr. Held stated that this apparently applied to state frequencies only, and that the Committee should defer to state. Mr. Nowakowski advised that the state will take it under advisement. Mr. Bradshaw stated that Canada has indicated verbally they are willing to set aside channel 68 for use at the border, but the Committee still needs to deal with US TV stations. **Motion** by Beckman, supported by Bradshaw, to table this item to the next meeting. Motion carried unanimously. Mr. Bradshaw will continue to work on the issue, and Mr. Turner will email the Ohio plan to all members.

D. Channelization

Mr. Bradshaw stated that the channelization as approved at the last meeting, 100 users at 6.25 MHZ, is still appropriate. Mr. Beckman expressed concern that 40% of public safety mobiles are not in use and "loaded" at any time. Mr. Whately inquired as to what happens in a disaster. Mr. Beckman replied that the systems degrade. Mr. Held expressed concern for small agencies. Mr. Beckman suggested that the first channel could use 70, and subsequent channels could have higher standard of 125. Mr. Berry asked why isn't system usage and busies more important than user per channel. Mr. Beckman stated that the FCC does not allow planning committee to go back and add post construction requirements. All current plans count units. Mr. Whately suggested a sliding scale for larger, more efficient trunked systems. As an example, conventional at 100, trunked at 125 initially, any additional channels must show useage and busies. Mr. Lasher replied that usage is intangible, varying based on usage for a day, a month, or a year. Such a scale would be a burden to administer. Mr. Berry expressed concern for ambulances with multiple radios. Mr. Beckman suggest 1 to 10 channels/100 users, 11 to 15channels/125 users, 16 to 20 channels/150 users.

The discussion was tabled by consensus to the next meeting. Mr. Beckman and Mr. Whately will prepare a draft.

E. FCC reconciliation

Mr. Bradshaw informed the Committee that the original planning "suggestions" are now in the part 90 rules. This was not the case when the Region 21 Plan was developed. Mr. Bradshaw listed some of the deficiencies of the Region 21 Plan:

1. It has a map of counties, needs a list of cities
2. Needs a description of effect of additional of 700 channels and interoperability
3. Needs an overview of public safety agencies in the region
4. Needs a Regional Plan summary
5. Needs guidelines and procedures for protection of incumbent TV stations during transition.
6. Needs an interoperability plan (current one may be satisfactory)
7. Needs spectrum agreements with adjacent regions
8. Needs a description of pre allocation at borders
9. Needs a description of pre-coordination at borders
10. Needs to describe utilization of interoperability channel usage
11. Trunked and conventional channels identified.

The Committee discussed the licensing of interoperability channels; the state did not license two calling channels, but may have retained authority to do so. The deadline was December of 2001; if not met, reverted to RPC. Mr. Eichenberg will find out status.

It was determined that the next meeting needs to be a working session. Proposed dates were November 20th or 18th at 10:00 at Huron Valley.

VI. New Business

A. 4.9 GHz

Discussion focused on the need for a public hearing and a letter to the FCC regarding Plan administration. Mr. Beckman stated that this could be very simple, based on geographic licenses. As propagation is short, the Plan should set an ERP and height limitation, and specify that the 4.9 GHz is not to be used as links except within licensee borders (possibly a 3 mile limit?). If Region 21 does not develop a plan, it becomes unlicensed spectrum, and will only come back to the Committee for interference issues. Mr. Bradshaw sees this spectrum for very localized wireless downloads of data, although video for helicopters could be an issue. Proposed rules are in 90.1211 and establish a deadline of six months from the report and order adoption, dated June 23rd.

Motion by Berry, supported by Bradshaw to send a letter to FCC that Region 21 intends to draft a 4.9 GHz plan. Mr. Turner to develop the letter. Motion carried unanimously.

B. Region 24 relationship to Region 21

Mr. Nowakowski stated that Region 21 consolidated the entire state in one region and pulled out of region 54 when 700 plan was developed. At the last Region 54 meeting, the Chair Mr. Carter suggested that each committee send mutual attendees to each other's meetings. Mr. Beckman suggested Region 54 be added to the region 21 mailing list. Region 54 meets about twice per year, and Mr. Nowakowski attends when possible. Discussions include border issues and propagation across Lake Michigan.

Motion by Nowakowski, supported by Fayling, to have Mr. Nowakowski attend Region 54 meetings as the Region 21 representative, and add Region 54 to the Region 21 notification list. Motion carried unanimously.

C. Pending Legislation

Mr. Eichenberg informed the Committee of various groups attempting to get support for keeping C block of 700 MHz off the auction block, an additional 10 MHz of spectrum. Representative Stupeck proposes auctioning the spectrum and giving the proceeds to public safety, while Representative Upton wants to move TV stations off as part of Heroes Act. A “Preparers Act” is also being discussed to provide funding to states – HB 3151. For agencies that would not use 700 MHz, cash may be better. This is for informational purposes only at this time. The extra 10 MHz would be for ultra broad band. One system is already running on experimental licenses.

VII. Next Meeting Date

The next meeting will be November 18, or an alternate of November 20, depending upon room availability, in Ann Arbor.

VIII. Adjournment

The meeting adjourned at 11:30 a.m.

IX. **New Business**

A. Border Sharing Agreement

Mr. Bradshaw recommends adoption.

B. 4.9 GHz

Mr. Bradshaw advised of the need to have a formal announcement at the Frankenmuth meeting regarding 4.9 GHz . A formal plan is not required, it is necessary to announce it. The FCC has made this the responsibility of the 700 MHz Planning Committees.

X. Next Meeting

The next meeting will be October 23 in Frankenmuth.

XI. Adjournment

Motion by Bradshaw, supported by Held to adjourn the meeting. Motion carried unanimously. Meeting adjourned at 3:10 p.m.

Region 21 700 MHz Regional Planning Committee
Meeting Minutes
November 20, 2003
Ann Arbor, MI

Attendees
Joe Turner – Chairperson
William Folske – Vice Chairperson
Patricia Coates – Secretary/Treasurer
David Held
Harry Warner
Al Eichenberg
Bill Nelson
Al Nowakowski
Richard Uslan
Karl Beckman
Mike Whately
Sean McCarthy
Robert Andrus
Carl Betz

I. **Call to Order**
The meeting was called to order by Mr. Turner at 10:10 a.m.

II. **Introductions**
Self introductions and a sign in sheet was distributed

III. **Approval of Agenda**
Item III, change the month on approval of minutes of previous meeting from September to October – Agenda approved as amended by consensus

IV. **Approval of Minutes of October 23, 2003**
Motion by Folske, supported by Eichenberg to approve the minutes. Motion carried unanimously

V. **Old Business**

A. **Plan Revisions**
None were completed

B. **Frequency Sort and electronic plan update**
Mr. Folske advised the committee that, per Mr. Bradshaw, the frequency sort has been posted on the web site and some members, including Mr. Folske and Mr. Bradshaw, have limited access

C. **Electronic Format**
Mr. Whately and Mr. Turner each have developed a PDF file of the basic plan

D. Coordination with adjacent

Ms. Coates advised that Region 54 had been added to the notification list, as determined at the last meeting. Mr. Held inquired if there was a need for subcommittee. The Committee determined this would require only a few paragraphs in the Plan, and an agreement with each adjacent region. Coordination with Canada may be beyond the Committee's level, although. Informal attempts have been made in past to resolve interference issues with Canada

E. Channelization and Loading

Documents by Mr. Beckman and Mr. Whately were distributed. Mr. Whately discussed his studies and calculations, determining that small users (1-5 channels) need at least 6 channels for 3% grade of service Mr Beckman stated that 700 MHz needs to be compatible with 821 MHz systems, or merged systems will drop to a 75 unit loading requirement. Mr. Turner asked for a definition of grade of service. Mr. Whately explained by example: at 5% grade of service, from 100 PTTs the user experiences a busy 5 time. CSI recommends a public safety grade of service of 2%. Mr. Turner stated that, not from technical side but from municipal side, cost is an issue. Mr. Beckman and Mr.Eichenberg suggested the Committee consider the 821 plan and disappearing resources; can 700 MHz afford to have smaller, disparate systems? Mr. Turner inquired about data. Mr Beckman replied that stepping loading down could cause congestion. Turner inquired about the anticipated use and impact in south-east Michigan, to which Mr. Eichenberg replied that this was addressed in 821 by defining primary zone. Three quarters of the spectrum allocated for Michigan has been used in south-east Michigan, contributing to issues with adjacency and short spacing. Ms. Coates stated that factors other than loading contribute to issues in south-east Michigan, and while three-quarters of the channels have been used there, three-quarters of the population lives there. Mr. Folske explained that Detroit has exacerbated the problem, since originally it requested no channels, then came in later and asked for many channels. M. Held stated that in original discussions, 100 per channel loading was mandated Federally, so the RPC did not have the flexibility it has now. Mr. Held agreed with Mr. Whately regarding 75 users per channel for smaller systems, giving them the ability to build modern systems. Mr. Beckman suggested that his proposal be used for the primary zone only, and Mr. Whately's suggestion for the rest of state Mr. Held expressed concern that a system in Grand Rapids should have 2 more channels than Troy. Mr. Turner suggested that the Committee must consider demographics, movement of population, etc. Mr. Andrus stated that the Committee should not tell cities that they cannot have small, independent systems, but Mr. Eichenberg stated the Committee should discourage small systems. Mr. Beckman stated that loading is for exclusive use of a channel, and that sharing and short spacing still allowed. Mr. Eichenberg stated that the sort itself will allocate so many channels per county, and the RPC needs to craft sort based on population. Mr. Beckman will merge his and Mr.

Whately's reports into one document for the next meeting. Mr. Andrus suggested the RPC create a chart for clarification to applicants. Chief Nelson expressed concern about the fire service and the manner in which Mr. Beckman's formula counts mobiles, portables, data, etc on one vehicle. Mr Eichenberg and Ms. Coates concurred that any device should count as a radio, not based on how it will be used. This will be more of an issue with combined voice and data, and the FCC states that voice and data should be treated the same. Mr. Eichenberg expressed concern about section 3, stating that the language this may not meet new technologies such as TDMA, and rewards systems that are less efficient and require a dedicated channel The discussion was tabled by consensus.

F. 4.9 GHz

Mr. Eichenberg explained that the licenses are geographic in nature and, if granted, can be used without restriction in that geographic range. For eg, if the State wanted to use this in helmets to helicopter, and if a county has deployed in same band, it could be catastrophic. Different vendors wiuld be deployed, using different modulations.

Mr. Beckman stated the RPC needs to notify the FCC by end of year; if region does not want the responsibility, it falls back on coordinators. Mr. Turner stated that the intent to plan was included in letter on broadband over power lines.

Motion by Mr. Held moves, supported by Mr. Betz, to have the Chair send the letter of intent to plan. Mr. Turner proposed a friendly amendment to include a paragraph that identifies the region 21 group and experience. Amendment was accepted, and the motion carried unanimously.

G. Other

There was no other old business

VI. New Business

A. Frequency Coordinator

Dave Held was announced as another alternate coordinator, training financed by MI APCO. Mr. Turner expressed thanks to both Mr. Held and Mr. Folske.

VII. Next meeting

The next meeting will be December 4 at Ann Arbor following MPSAFAC

VIII. Adjournment

The meeting adjourned at 11:45

Region 21 700 MHz Regional Planning Committee
Meeting Minutes
December 4, 2003
Ann Arbor, MI

Attendees:

Joseph Turner – Chairperson	Michigan Municipal League
William Folske – Vice Chairperson	Alternate Michigan Frequency Coordinator
Patricia Coates – Secretary	Michigan Chapter of APCO
Dale Berry	Michigan Ambulance Association
Michael Whately	CSI
Al Nowakowski	State of Michigan DIT
Al Eichenberg	State of Michigan DIT
Rick Uslan	Motorola
Harry Warner	Buford Goff & Associates
Steve Lasher	Motorola
Dave Held	Alternate Michigan Frequency Coordinator
Robert Andrus	City of Dearborn
Karl Beckman	Mootorola

I. **Call to Order**
The meeting was called to order by Mr. Turner at 11:55 a.m.

4. **Approval of Agenda**
Motion by Beckman, supported by Folske, to approve the agenda. Motion carried unanimously

4. **Approval of the Minutes of the November 20, 2003 Meeting**
Motion by Beckman, supported by Held, to approve the minutes as written. Motion carried unanimously.

IV. **Old Business**

A. Plan Revision

1. Frequency sort and electronic plan update
Mr. Eichenberg presented \information from the NPSTC web page, illustrating that the, national sort model is significantly different than those used in the past. NPSTC developed a spectral needs assessment to do a better job of frequency allocation. The model is based on a county level, and considered population shifts, and population versus other needs. The model divided 700 MHz band into two sections, wide and narrow band (120channels for data, 480 for voice). It employed a new method from PSWAC for police, fire, EMS and general government, and considered population per square mile in relation to the number of police and fire users. Previous models had considered all public safety as one group. The study found that original PSWAC estimates were off, so NPSTC crafted a new scheme to deploy frequencies. Mr. Eichenberg displayed several graphs and maps that show how the population per square mile was used. The model also allocated a minimum of 5 25 kHz blocks for each county, each set spaced 250 kHz apart for combiners. Contours for channel reuse included terrain data for the first time. Interregional concurrence is mandated. The model allows no consideration of television stations. Mr. Turner asked if a map could be developed to show the MPSCS in the same terms, for Emergency Management purposes. Mr. Beckman felt this would be irrelevant, since the MPSCS is not the primary service provider in many densely populated areas. The actual data sets are part of CAPRAD system. The 96 statewide channels are not included in this sort; a separate sort was done for those channels. Interoperability channels with Canada and Mexico need to go through the FCC international group.

2. The need for an electronic format was mentioned

3. Border sharing was discussed

4. Loading Criteria

Mr. Beckman distributed a merged document combining the two loading criteria documents distributed at the November meeting. Mr. Whately questioned the number of users for smaller system. Mr. Beckman stated that the Grade of Service for the MPSCS is 5%. Mr. Whately stated that CSI recommends 2%. Primary zone traditionally was Wayne, Macomb, Oakland, Saginaw et al. The Committee discussed whether this s still relevant, or should Kent be added. The committee also discussed whether the new information from Mr. Eichenberg's presentation be used. There was discussion of a "break point" for a primary zone, as certain counties may have shifted categories. NPSTIC did not use grade of service as a criteria. Mr. Eichenberg suggested the committee wait for national recommendations before defining primary zones. Mr. Beckman suggested the committee define a break point, then look at counties with more than "x" number of channels assigned as the primary zone. Mr. Folske offered to send copy of the Beckman/Whately combined document to Steve Devine, National 700 MHz chairman, for review and comment. Mr. Held stated that the sort is already far ahead of the 821 plan since geography was used. Mr. Eichenberg noted that the actual need and users also depends on consensus plan and what happens to 800 MHz. Discussion followed regarding the advisability of forcing small systems to join larger systems. Motion by Beckman, supported by Held. to table the loading criteria discussion. Motion carried unanimously.

B. 4.9 GHz
Mr. Turner will complete the letter stating the Region 21 Committee's intent and will electronically send it to the Committee members. With their concurrence, Mr. Turner will mail the document.

V. **New Business**
none

VI. **Next Meeting Date**
The next meeting will be held on January 15, 2004, immediately following MPSFAC

VII. **Adjournment**
The meeting adjourned at 1:10.

Region 21 700 MHz Regional Planning Committee
Meeting Minutes
January 15, 2004
Ann Arbor, MI

Members Present:	
Keith Bradshaw - Secretary	APCO Region 21 Frequency Advisor Patricia
Patricia Coates - Treasurer	MI APCO
Al Nowakowski	State of Michigan
Mike Whately	CSI
Dennis McDowell	MA COM
Ken Palazzi	MA COM
Robert Andrus	City of Dearborn
Harry Warner	BGA
Jim Lee	Michigan Health and Hospital Association
Rick Uslan	Motorola
Steve Lasher	Motorola
Dave Held	MI APCO
Al Eichenberg	State of Michigan

I. **Call to Order**
The meeting was called to order by Mr. Bradshaw at 12:35 PM

II. **Introductions**
Attendees introduced themselves and an attendance sheet was distributed

III. **Approval of Agenda**
Motion by Held, supported by Coates, to approve the agenda as written.
Motion carried unanimously.

IV. **Approval of minutes of 12/4/03**
Motion by Warner, supported by Nowakowski, to approve the minutes of the December 4, 2003 meeting as written.
Motion carried unanimously.

V. **Old Business**

A. **Frequency Sort**
The RPC discussed the options of accepting the sort as presented, or of modifying the sort. Mr. Eichenberg states that the sort does not address vendor specific issues for coordination. Mr. Held commented that the RPC cannot foresee all conditions in the future. The general consensus is to follow the NPSC sort.

B. **Electronic format**
No update. Karl Beckmen is handling, and was not in attendance. (3D Plan)

C. **Coordination of Adjacent Regions / Border sharing**
The consensus of the RPC was to submit plan with language that states: "Any application within 113 km of the border must be coordinated with adjacent region."

D. **Loading**
Motion by Andrus, supported by Coates, to eliminate the primary and secondary zones for loading. Motion carried unanimously.

The RPC discussed adoption of the scaled loading plan stipulating that the first set of channels authorized are grand fathered, i.e., the user with five channels and 75 users per channel must get an additional 125 user to obtain the next channel. A final decision was tabled pending the opinion of Steve Devine in Missouri.

E. **Other**
1. The RPC discussed county population census data. Mr. Bradshaw compared the NPSC sort to 2000 census data and they agree. There 63 counties with population less than 100,000.

2. The RPC needs to address the issue of TV stations. Translators are secondary to Public Safety. When the plan is approved the RPC can assign channels North of Houghton Lake. Mr. Bradshaw to draft language for the TV sharing.

3. 4.9 GHz
Letter was submitted to FCC stating that the Region 21 700 MHz RPC will coordinate the 4.9 GHz assignments.

VII. New Business

A. Consensus Plan
Mr. Nowakowski brought up the issue that the band plan may change depending on the consensus plan.

VIII. Next Meeting Date
Motion by Coates supported by Whately that next 700 MHz meeting be at the next APCO chapter meeting in March 25, 2004, after the Chapter presentation, with a subsequent meeting May 27, 2004 at the chapter meeting in Bay City. Motion carried unanimously.

IX. Adjournment
Motion by Eichenberg, supported by Uslan, to adjourn. Motion carried unanimously. Meeting adjourned by Mr. Bradshaw at 1:20 P.M.

Region 21 700 MHz Regional Planning Committee
March 25, 2004
1:00 PM
Williamston, MI

Attendees:

Joe Turner – Chairperson	Michigan Municipal League
Patricia Coates – Secretary/Treasurer	MIAPCO/Oakland County
Robert Andrus	City of Dearborn
Karl Beckman	Motorola
Keith Bradshaw	Macomb County
Al Eichenberg	State of Michigan
Lloyd Fayling	Genesee County/MIAPCO
Dave Held	MIAPCO
Dennis McDowell	MA COM
Bill Nelson	Michigan Association of Fire Chiefs
Christina Russell	Oakland County Sheriff
Rick Uslan	Motorola
Mike Whately	CSI, Inc

I. Call to order

The meeting was called to order by Mr. Turner at 1:35 p.m. Mr. Turner advised that the meeting would be voice recorded, and an attendance sheet distributed.

II. Approval of agenda

Mr. Held requested that an n item be added under new business, a "definition of curves". The agenda as amended was approved by consensus.

III. Approve of minutes of January 15, 2004 meeting

Mr. Held questioned whether the actions of the January meeting had been incorporated into Mr. Bradshaw's review. Mr. Bradshaw stated that some had been, but that adjacent channels and border sharing are not.

Motion to approve as modified by Held, supported by Nelson. Motion carried unanimously.

IV. **Old Business**

A. Plan Revisions

1. Frequency sort and electronic plan

Mr. Bradshaw stated that he did go through plan to reconcile it with FCC part 90 (copy distributed), and that during his research he noticed logical inconsistencies. As examples, Mr. Bradshaw cited inconsistencies regarding county by county interoperability on page 8 of the "old" plan, a two stage frequency allocation process that includes population on page 18, and the evaluation matrix on page 19. Mr. Bradshaw reviewed his recommendations for a revised document page by page. On page 7 he

recommended language that the regional committee reserves the right to move frequencies and to reserve frequencies. Ms. Coates expressed concern that if the committee moves frequencies and does not adhere to the sort; it will result in the same problems that exist with the 821 frequencies. Mr. Eichenberg stressed the need to develop strict criteria for moving frequencies, consistent with those in the FCC Part 90. He further stated that these criteria must include resorting and republishing the new sort on a regular basis. Mr. Beckman suggested an alternative would be to ask the State to contribute some of the 2.5 MHz of its frequencies and each county hold back a portion of their allocation. Mr. Turner questioned whether this would apply to both voice and data, and asked about a migration plan and the implications of Line A.
Motion by Bradshaw, supported by Held, to retain the frequency sort "as is", and to delete the language from the word "however" on bottom of page 6 through end of paragraph. In discussion, Mr. Held reminded the committee that there is still language in the plan to reconvene and make changes. Mr. Eichenberg confirmed that NPSTIC has procedures and models for changes as needs change. Motion carried unanimously.

The committee discussed the proposed SIEC and interoperability; if there are any conflicts with the plan, the SIEC rules prevail.Mr. Held asked for a definition of interoperability. Ms. Coates inquired whether the FCC would allow SIEC rules to take precedence over the region plan. Mr. Turner suggested a list of definitions, including interoperability, in the appendix. Ms. Coates will research the State plan and their definition of interoperability. Mr. Bradshaw will research how this was handled in Missouri and California.

After reviewing page 6, the group approved by consensus the language that any translators, low power television, or other secondary assignments will not be guaranteed any interference protection

2. Coordination with Adjacent Regions
Mr. Bradshaw provided a copy of the adjacent region map with a 25mile zone for NPSPAC. Region 21 has no assurance that adjacent states will also stick to the sort. It was suggested that the committee examine language adopted at the last meeting regarding "113 km". The committee determined that if any assignments are made within 25 miles of the border other than the initial sort, Region 21 will notify adjacent states, and should expect adjacent states to do the same.

Mr. Held offered to start email discussions with technical members regarding coverage and interference, and bring recommendations back to the committee. Mr. Eichenberg suggested this include a discussion of masks, and aggregation of contiguous channels. Mr. Whately commented that such recommendations must avoid being vendor specific.

The committee discussed the removal of all references to trunked systems, and agreed by consensus to do so, referring only to FCC rules.

The committee discussed elimination of the application "windows", and agreed by consensus to do so. Applications will be processed in the order that they are received by this committee and accepted by the committee. An application will not be considered accepted until all requirements of this plan have been met. Methods for receipt were discussed, i.e. hard copy, email, CAPRAD, etc. United States Mail with a specific post mark appeared to be the most universally available and definitive method.

B. 4.9 GHz

Mr. Beckman advised that he had not had time to do a draft plan. He stated that the committee must complete it within 12 months of the rules having been published in federal register (July 2003).

V. New Business

A. Definition of curves

Mr. Held will facilitate an initial definition and bring it to the committee.

B. Other

None

VI. Next Meeting Date

The next meeting date will be May 27th in Bay City, following the APCO Chapter meeting.

VII. Adjournment

Motion by Nelson, supported by Whately, to adjourn. Motion carried unanimously. Mr. Turner adjourned the meeting at 3:45 p.m.

Region 21 700 MHz Regional Planning Committee
Meeting Minutes
May 27, 2004
Bay City, MI

Attendees:

Joseph Turner – Chairman	Michigan Municipal League
Patricia Coates – Secretary/Treasurer	MIAPCO/Oakland County
Robert Andrus	City of Dearborn
Keith Bradshaw	Macomb County
Al Eichenberg	State of Michigan
Dave Held	MIAPCO
Dennis McDowell	MA COM
Bill Nelson	Michigan Association of Fire Chiefs
Mike Whately	CSI
Brent Williams	Michigan Association of Ambulances

I. Call to Order

The meeting was called to order by Mr. Turner at 1:23 p.m.

II. **Introductions**

Attendees introduced themselves and a sign in sheet distributed. Mr. Turner stated that the proceedings would be recorded.

III. Agenda

The agenda was approved as written by consensus

IV. Approval of Minutes of the March 25, 2004 meeting

Motion by Held, supported by Eichenberg, to approve the minutes of March 25, 2004, as written.
Motion carried unanimously.

V. Old Business

A. Plan Revisions

Mr. Bradshaw distributed a document of suggested changes and reviewed it with the Committee page by page:

1. Appendix G.

Mr. Held discussed his suggestions for definition of curves and coverage parameters. Other plans were looked at, using TSB88 as the method with 50/50 (50% of locations 50% of the time) density. Mr. Bradshaw stated that he ran some sample curves using R 6602 with a 9 dB correction factor. Ms. Coates asked if federal groups used similar parameters in the TR8.18 working group, described in appendix N. Mr. Eichenberg discussed the use of the 5o/50 in the curves. The Committee discussed –40 dbu contours versus service contours. Mr. Bradshaw stated that terrain is not accounted for this plan, but Mr. Eichenberg and Mr.

Whately stated that there are mechanisms to consider terrain (Anderson 2A). Mr. Bradshaw suggested adopting simpler language as California did, allowing flexibility addressed by "this may vary depending upon circumstances" language. The FCC is looking for adjacent channel coupler module is what FCC wants to see, and can compromise for all vendors. The Plan needs language that gives flexibility, if detailed engineering can demonstrate that the applicant can pass contours initially based on mileage contours with consideration of manufacturers specifications and/or terrain. Add to page 11. If there is a dispute, the applicant must comply with applicable portions of TSB88 and its addendum, per Mr. Whately's suggested addendum to appendix G. Mr. Bradshaw asked if the adjacent language be removed, as it is not included in TSB88. Mr. Held suggested TSB88 with conditions (miles of separation, co-channel, etc.).

2. Page 4.
The SIEC prevails if conflict. Ms. Coates advised that both Mr. Blair and Mr. Tarrant at the State had been reminded of the Region 21 committees and the need for its involvement in SIEC planning.

3. Appendix L
Mr. Turner stated that appendix L, addressing population and, should be appendix K, not L. He suggested adding channels 60 –69 on page 5 after Analog TV. Correct taxable value

4. Page 7, added "web page postings"

5. Page 8 –Adjacent regions language. The FCC has rejected other plans for language used in this section. The Committee discussed adding time constraints (e.g. if no answer in 30 days, concurrence assumed?) in obtaining concurrence from adjacent regions. Mr. Bradshaw stated this would not be acceptable, and that Region 21 must receive actual concurrence from adjacent regions.

Mr. Turner discussed the goals of this plan as interoperability, with priority to government (public safety or public service). He recommended deletion of the paragraph on priority of technology and functionality

6. Page 11
The Committee reached consensus on added language on interoperability if the State does not build.

7. Pg. 13 - Loading
Mr. Held stated that an applicant not get additional channels unless the first allotment is loaded to 100 per channel. Mr. Eichenberg cautioned that no vendor makes 6.25 equipment, and Ms. Coates suggested that the plan be flexible for all future equipment. Mr. Bradshaw suggested deletion of all loading, accepting applications on a case by case basis per applicable FCC rules. Mr. Bradshaw will

incorporate language that a county plan on file with committee must address how others will be accommodated

Return to pool – give backs. At the time of application, the applicant must provide a letter of intent to return specific frequencies to the frequency pool, and an anticipated date. When the applicant files the system completion notification with the FCC, the applicant must provide documentation to the Committee that the identified licenses have been relinquished.

8. Page 16
Mr. Williams the questioned methodology used in sort. Mr. Bradshaw explained that population alone was not criteria, but "projected" calls in statistical areas.

Mr. Bradshaw asked the committee to review the matrix for contested applications.

Mr. Bradshaw reviewed other semantic changes and deletions on Block numbers (page 22) and the appeal process in appendix H.

Motion by Whately, supported by Eichenberg, to adopt all changes approved at this meeting. Mr. Bradshaw stated that he would incorporate today's changes and post on the CAPRAD and APCO sites, so everyone has current version. Mr. Bradshaw also thanked everyone for going through the page by page process. Motion carried unanimously.

B. Other
No other old business

VI. New Business

A. Other

1. Pyramid Communications is asking to reserve certain channels for low powered in vehicle repeaters; Mr. Bradshaw believes this is already addressed by the plan.

VII. **Next meeting Date**
The next meeting will be July 29 in Oakland County.

VIII. Adjournment
Motion by Bradshaw, supported by Whately, to adjourn. Motion carried unanimously. The meeting was adjourned at 4:00 PM.

Region 21 700 MHz Regional Planning Committee
Meeting Minutes
July 29,2004
Oakland County, MI

Members Present:

Joseph Turner- Chairperson	Michigan Municipal League
Patricia Coates – Secretary/Treasurer	APCO/Oakland County
Keith Bradshaw	Macomb County
Mark Jonkreig	Ottawa County
Mike Whately	CSI, Inc
Bill Nelson	Michigan Association of Fire Chiefs
Bob Andrus	City of Dearborn
Brent Williams	State of Michigan – Community Health

I. **Call to Order**
The meeting was called to order by Mr. Turner at 10:38 a.m.

II. **Introductions**
Attendees introduced themselves, and a sign in sheet was distributed. Mr. Turner announced that the meeting would be taped. Mr. Turner expressed thanks to Oakland County for hosting the meeting.

III. **Approval of the Agenda**
Mr. Bradshaw requested that "permission from TIA" be added under "Other".
Motion by Whately, supported by Andrus to approve the agenda as modified. Motion carried unanimously.

IV. Approval of the minutes of the May 27, 2004 meeting
The affiliation for Mr. Williams was corrected to "contractor, State of Michigan, Department of Community Health". On the top of Page 2 correction to Anderson 2D, the FCC reference to "coupler module" was corrected to "coupled power method", and the typographical error on 50/50 removed regarding the 40 dbu contours an page 3.
Motion by Bradshaw, supported by Nelson, to approve the minutes as corrected. Motion carried unanimously.

V. Old Business

A. Frequency Sort and Electronic Plan Update
Mr. Bradshaw stated that he is not comfortable with local county planning committees as the language is vague and needs to be fleshed out. He asked how to recover spectrum from counties that don't plan, potentially wasting resources that could be used in other parts of state. The Committee assumed that counties that are motivated and funded will build, and considered a two year time frame. Ms. Coates argued that the frequencies are already allocated for use throughout the State, and that lack of use by one County is not a wasted resource elsewhere, as the frequencies are already reused. To change the sort or impose deadlines would result in the same problem already existing with 821's – frequencies did not stay sorted, and everyone lost. The committee discussed whether counties could voluntarily "give up" frequencies, and Mr. Williams expressed concern that the counties lack the expertise to make such a decision. Mr. Andrus inquired whether frequencies could be licensed conditionally if taken from another county, as grants, etc. may make funding available later, even for rural counties. Mr. Turner stated that the job of the RPC is to be caretakers for spectrum, and the FCC has already allocated by county. We have guidance from the FCC on allocation – how do we meet future demand for service? Ms. Coates suggested criteria demonstrating suitable notice to entities within a county (public hearing, publication, letters to public safety agencies, etc.). Mr. Andrus concurred that the RPC has always encouraged joining systems, but some larger systems see it as money-making opportunity. The consensus was an announcement of a public hearing under Open

Meetings Act with three weeks notice with minutes taken, with a posting to each major entity (chief elected official county, city, village, central dispatch authority where applicable, and public safety officials). The RPC will draft a template letter to be used for notification. Mr. Turner suggested a letter to the Municipal League , MAC. And MAT asking for their input into this requirement.

B. Loading criteria

6.25 per 100 units – keith. Talk path equivalencies does not work. Minimum guideline is 100 per channel for 12.5 bob – loading by "block", since sort is in blocks of 6.25 – what WILL FCC ACCEPT? If applicant can show that 100 per channel is burdensome, not an acceptable grade of service, or does not work with applications/technology, the committee may grant exceptions to the guideline.. Wide band data channels should have no loading criteria? Coates – future 100 per 6.25, 200 per 12.5, 400 per 25. Nelson – what about TDMA? Whately – not an acceptable grade of service for public safety. Bob – east side of state will not build for many years, and technology will already be developed.

C. Interoperability

The Committee discussed MEPSS, Point to Point, and the inability of the MPSCS to talk to VHF fire, which are the majority of First Responders in the State.

D. Notification of Adjacent Regions

The original hard copy to the adjacent regions should be followed up by electronic copy. The Committee discussed whether a copy should be sent to Industry Canada also. The timing of notification should be after the public hearing on October 1. If the RPC does not receive concurrence from the adjacent regions in a reasonable time frame (90 days?), the Committee should ask the FCC if they will accept no response as concurrence., as the RPC – must wait for concurrence ask fcc what they will accept (90 days implies concurrence?)

E. 4.9 GHz

The Committee had received no report from Mr. Beckman. Mr. Turner advised that he had received a letter from Packet Hop as part of an industry coalition, asking to come before committee. Mr. Whately stated that other vendors have inquired. Coordination needs to go through regional committee. Mr. Whately stated that the Committee may be out of time, as we had a year to do the plan. Mr. Turner will ask for an extension.

E. Other old business

1. TSB88

   Mr. Bradshaw stated that TIA is the author of the document, and advised the Committee that he has contacted them, and received verbal permission to use the document. He tried to follow up with email, but has had no response.

VI. New business

A. **Other**

1. Low power repeater channels

Low power repeater channels are in the national channel allocation, but not in the plan. The Committee determined that they are addresses by default.

2. ICS

Chief Nelson asked whether any appendices need to be updated now that Incident Command is NIMS (National Incident Management System)

VII. Next meeting Date

The next meeting will be September 14, 2004 in Ann Arbor following MPSFAC

VIII. Adjournment

Motion by Bradshaw, supported by Whately, to adjourn. Mr. Turner adjourned the meeting at 12:25 p.m.

Region 21 700 MHz Regional Planning Committee
Meeting Minutes
September 14, 2004
Ann Arbor, MI

Members Present:

Joseph Turner - Chairperson	Michigan Municipal League
Dale berry – Vice Chairperson	Michigan Association of Ambulances
Patricia Coates – Treasurer	MI APCO/Oakland County
Keith Bradshaw - Secretary	APCO Frequency Advisor/Macomb County
Dave Held	Alternate Frequency Advisor
Al Eichenberg	State of Michigan
Mark Jonkriejg	Ottawa County
Karl Beckman	Motorola
Karen Chadwick	Lansing/Ingham County
Mike Whately	CSI
Bill Nelson	Michigan Association of Fire Chiefs/Troy Fire
Harry Warner	BGA

I. **Call to Order**

The meeting was called to order by Mr. Turner at 12:35 p.m.

II. Introductions

Attendees introduced themselves. Mr. Turner announced that the meeting would be recorded via audio recorder.

III. **Approval of the Agenda**

Motion by Beckman, supported by Nelson, to approve the agenda a presented. Motion carried unanimously.

IV. **Approval of the Minutes**

Motion by Bradshaw, supported by Whately, to approve the minutes of the July 29, 2004 meeting as written. Motion carried unanimously.

IV. Old Business

A. Plan Revisions

Mr. Bradshaw distributed a revised copy of the plan incorporating all of the changes discussed at the two previous meetings.

Mr. Held stated that discussions in Montreal at APCO indicated that the Southern California Regional Plan has been approved. All plans submitted have been sent back to the RPCs several times, usually for lack of signed document from adjacent regions. The FCC is also looking for an inter-region dispute process signed by all adjacent regions.

Mr. Bradshaw reviewed all changes as proposed by the committee at previous meetings page by page. The Committee approved several modifications by consensus during the review.

The loading criteria on page 12 remain a concern for Mr. Held, who stated that 12.5 and 100 implies 50 when the 12.5 becomes 6.25. Motion by Bradshaw, supported by Beckman, to keep the language on loading but move the criteria to an appendix. Motion carried unanimously.

Motion by Beckman, supported by Eichenberg, to add the language “per agency” to the list of frequencies under the Reassignment of Frequencies (“give back”) criteria. Motion carried unanimously.

Should any committee members wish to suggest additional changes, they should do so by email.

B. CAPRAD Access

Mr. Bradshaw brought forward the need to replace Mr. Folske as secondary administrator. Ms. Coates suggested Mr. Held. Mr. Held accepted the position.

Mr. Bradshaw asked whether commercial access and other levels of access would need to be approved on a case by case basis? Mr. Whately asked if "read only" access would be permitted until the final plan is adopted. Mr. Turner suggested that no commercial users be permitted to create applications prior to approval of plan by FCC. The Committee determined by consensus that no application will be considered valid unless it is submitted after the date the Plan is approved by the FCC. Additionally, licensees applying for frequencies in HDTV, border or formerly protected areas may not submit applications before the FCC removes frequency restrictions.

B. 4.9 GHz

4.9 GHz had been discussed at the MPSFAC meeting immediately preceding the 700 RPC meeting.

C. Other

No other old business

V. New Business

A. Public Hearing date

The public hearing on the Plan will be October 1, 2004 at Tustin, MI at 10:30 a.m..

B. Other

No other new business

VI. Adjournment

Motion by Beckman, supported by Whately, to adjourn. Motion carried unanimously. Mr. Turner adjourned the meeting at 1:55 p.m.

October 1, 2004

700 MHz Regional Planning Committee
Public Hearing held at APCO Fall Conference,
Tustin, MI

Mr. Turner opens the meeting at 10:31AM.

Members Present: Keith Bradshaw, County of Macomb; Joe Turner, MML; Pat Coates, Oakland County; Bob Andrus, City of Dearborn; Michael Whately, CSI; Al Eichenberg, State of Michigan

Approval of Agenda.
Motion Bradshaw, support Eichenberg. Motion carried by voice vote.

Approval of Minutes of September 14, 2004.
Motion Eichenberg, support Bradshaw. Motion carried by voice vote.

Comments by Andrus as to Motorola wireless accessories in band.

Review of 700 plan.

Public comments.

Comment; In lieu of SIEC adopting I/O language, we should move I/O section of plan to appendix. RPC discussion. We decide that plan language vis SIEC is sufficient.

Comment; Multiple users - counties that share common borders, can they use all the freqs in each county? answ: will probably be decided on a case by case basis by committee.

Next meeting date November 16, 2004. To be held at Ann Arbor or Oakland County.

Motion to adjourn Bradshaw, support Whately. Motion carried by voice vote.

We close the meeting at 11:50.

Respectfully Submitted by
Keith M. Bradshaw

November 16, 2004 Meeting
No Quorem

From: "Patricia Coates" <coatesp@co.oakland.mi.us>
To: "Joe Turner" <jturner@michiganpropertytax.com>; "Dale Berry" <dberry@hva.org>; "Keith Bradshaw" <Keith.Bradshaw@macombcountymi.gov>
Sent: Wednesday, November 17, 2004 3:56 PM
Subject: 700 MHz

Only two of us showed up at the 700 MHz meeting yesterday, so we obviously did not have a quorum.

For our next meeting, 6 weeks falls in the week between Christmas and New Year, so I doubt that we would have much of a turn out. The following week (first week of January), I cannot make the 3rd or the 5th.

I would be happy to host here at Oakland.

January 18, 2005

Regular Meeting of the Region 21 700 MHz Planning Committee
Washtenaw County Sheriff Department EOC
2201 Hogback Road
Ann Arbor, Michigan

The meeting was called to order by the Chairperson at 12:40 pm.

Attendees introduced themselves at the behest of the Chair. Present were: Patricia Coates, Oakland County;Stephen Todd, City of Flint;Brent Williams,Michigan Department of Community Health;Dale Berry, MAAS;Bill Nelson,MAFC;Harry Warner,Buford Goff Associates;Bob Andrus,City of Dearborn;Al Eichenberg,MPSCS;Al Nowakowski,MPSCS;Mike Whately,CSI, Inc.;Steve Irlbeck, Dataradio;Keith Bradshaw, Macomb County;David Held,MI APCO;JoeTurner,MML;Lloyd Fayling,Genesee County

There was no Agenda available, so no motion was entertained to approve.

The previous meeting was cancelled due to sparse attendance, therefore there were no minutes from the previous meeting.

Mr. Bradshaw stated that the Regional Plan had been converted to PDF format but formatting errors within the document needed to be addressed before presentation of the plan to the surrounding regions. Mr. Whately related the FCC's decision to forgo the requirement for Regional Committees to prepare a plan for the 4.9 GHz band.

The committee is in receipt of the Region 45 (Wisconsin) Plan. This document needs to be carefully considered. Copies to be distributed by email. Correspondence between members via email with approval letter to be drafted and sent out by next meeting date.

Next meeting to be held on April 14, 2005 following MPSFAC.

Motion Whately, Support Williams to adjourn at 12:55pm.

Respectfully submitted by Keith M. Bradshaw.

April 14, 2005

Regular Meeting of the Region 21 700 MHz Planning Committee
Washtenaw County Sheriff Department
2201 Hogback Road
Ann Arbor, Michigan

Attendance: Joe Turner, Pat Coates, Brent Williams, Karl Beckman, Michael Whately, Al Nowakowski, Al Eichenberg, Harry Warner, Lloyd Fayling, Bill Nelson, Dale Berry,Keith Bradshaw

Call to Order: 11:55 am

Agenda Approved

Minutes of January 18 Approved motion Williams, support Eichenberg

Adjacent Region Interoperability We will develop language to address
Motion Bradshaw The Committee chairperson appoints Eichenberg, Whately,Beckman, Warner,Bradshaw to develop language in response to the region 45 proposal for inter border cooperation and further to request that our language be conssidered by region 45 (and all other adjacnet regions) to form the basis of a multi-rfegional consensus. Supports Eichenberg.

Motion carried unanimously.

4.9Ghz

Motion Beckman committee agrees to abandon develop of plan as the FCC has removed the requirement that regional committees develop plans. Support Coates.

Next June 16, 2005 4000 Collins Road

Motion adjourn Berry Support Fayling

We adjourn at 12.25 pm.

We reconvene due to attendees arriving at 12:30

Further attendees include:

Chairman Motion to approve earlier reccomendations, Support Eichenberg.
Unam.

Motion Eichenberg, Supprot Warner to approve 4.9 Ghz language.
Unam.

Adjourn Eichenberg, Support Beckman

WE adjourn at 12:33pm.

700 MHz region 21 Regional Planning Committee
June 16, 2005

Collinsville, Lansing

Same attendees	
Joseph Turner – Chairperson	Michigan Municipal League
Karen Chadwick	Ingham County/APCO
Patricia Coates	Oakland County/CLEMIS/APCO
Al Eichenberg	State of Michigan
Lloyd Fayling	Genesee County/APCO
Al Nowakowski	State of Michigan
Mike Whately	CSI
Brent Williams	MI Department of Community Health

I. **Call to order**
The meeting was called to order by Mr. Turner at 11:06 a.m. Mr. Turner advised that the meeting will be audio recorded

II. **Introductions**
Members introduced themselves

III. **Approval of Agenda**
Motion by Fayling, supported by Whately, to approve the agenda as presented. Motion carried unanimously.

III. **Approval of Minutes**
The minutes of the previous meeting were not available

IV. **Old Business**

A. Plan revisions - no report
B. Coordination with adjacent regions - no report
C. CAPRAD access - no report
Other - no report

V. **New Business**
A. Request for "interference problem form" (a MPSFAC issue). Revisions presented by Mr. Turner will be posted on the MI APCO and MDIT web sites. Mr. Turner to send in PDF
B. Mr. Nowakowski advised that there has been movement in congress regarding 700 MHz. He will provide draft language for letter of support to the two bill sponsors.

VI. **Next Meeting Date**
The nexy meeting will be August 11, 2005 at approximately 11:00 am in Lansing

VII. **Adjournment**
Motion by Whately, supported by Chadwick, to adjourn.
Meeting adjourned at 11:12.

August 11, 2005

Regular Meeting of the Region 21 700 MHz Planning Committee
State of Michigan Department of Information Technology
4000 Collins Road
Lansing, Michigan

CALL TO ORDER: The meeting was called to order by acting Chairperson, Dale Berry at 12:00pm.

INTRODUCTIONS: In attendance were:Dave Held, Michigan APCO Local Advisor;Keith Bradshaw, Michigan APCO Local Advisor;Allen Eichenberg, State of Michigan DIT;Karl Beckman, Motorola;Dale Berry,MAAS;Patricia Coates, Oakland County;Al Nowakowski, State of Michigan DIT;Brent Williams,MDCH;Mike Whately,RF Systems. Karen Chadwick was also present, but did not sign the attendance sheet.

APPROVAL OF AGENDA: Agenda approved by consensus.

APPROVAL OF MINUTES OF JUNE 16, 2005: **MOTION Bradshaw, SUPPORT Held to approve minutes of the June 16, 2005 meeting.** Motion carried.

OLD BUSINESS: Mr. Beckman relates that the Wisconsin RPC has not responded to our request, nor have any of the other RPC's. He further states that a Border Sharing Agreement may be announced next week.

NEW BUSINESS: None.

NEXT MEETING DATE: September 30, 2005 at 11:00am. Meeting to be held at the APCO Fall Conference in Tustin Michigan.

ADJOURNMENT: **MOTION Coates, SUPPORT Eichenberg to Adjourn at 12:20 pm.** Motion carried.

Respectfully submitted by Keith M. Bradshaw

September 30, 2005

Regular Meeting of the Region 21 700 MHz Planning Committee
Kettenun Center
14901 4 H Drive
Tustin, Michigan

CALL TO ORDER: The meeting was called to order by the Chair at 11:35 a.m.

INTRODUCTIONS: In attendance were: Keith M. Bradshaw, Secretary, Michigan APCO Local Advisor;Dave Held, Michigan APCO Local Advisor;Brent Williams, MDCH;Karl Beckman,Motorola;Stephen Todd, City of Flint;Theresa McCuean,City of Detroit;Bette Rinehert,Motorola;Theron Shinew,MPSCS;Robert Andrus,City of Dearborn;Al Nowakowski,MPSCS;Patricia Coates,Treasurer,Oakland County;Joeseph Turner,Chairperson,MML;Al Eichenberg,MPSCS;Michael Whately,RF Systems Engineering;Mark Jongekrieg,Ottawa County

APPROVAL OF AGENDA: (Agenda not previously available to Committee) **MOTION Eichenberg, SUPPORT Coates to approve impromptu Agenda.** Motion Carried.

Approval of Minutes of August 11, 2005 MOTION Beckman, SUPPORT Whately to approve minutes of August 11, 2005. Motion Carried.

OLD BUSINESS:

A. Regional Concurrences Mr. Beckman reports that he has received no adjacent region concurrences to this date. He has written and distributed an "Inter-Regional Coordination Agreement" for adoption by the Great Lakes Regions and others as desired.

NEW BUSINESS:

A. City of Detroit 700 MHz Application The City of Detroit has presented to the Committee an application for 700 MHz frequencies. As the Regional Plan has not been approved by the FCC, the Committee respectfully declines to review the application at this time.

B. Recommended changes to Regional Plan Bette Rinehert has reviewed the work of other Regional Planning Committees and has made recommendations for changes to the Regional Plan in light of plans already accepted by the FCC. **MOTION Beckman, SUPPORT Turner, to accept the following changes to the plan: addition of "Certification of Public Participation" signature page and relevant language;Appendix W.** Motion Carried.

NEXT MEETING DATE: November 9, 2005 at 4000 Collins Road

ADJOURNMENT: **MOTION Whately, SUPPORT Eichenberg to adjourn at 12:10 p.m. Motion Carried.**

Minutes of the Regular Meeting of the
Region 21 700 MHz Regional Planning Committee
4000 Collins Road, Lansing MI
November 9, 2005

I. Call to Order: The meeting was called to order by the chair at 10:15 am.

II. Introductions: The attendees introduced themselves. Present were Keith Bradshaw, Secretary;Dave Held,APCO;Robert Andrus,City of Dearnborn;Brian Aprill ,State of Michigan;Al Nowakowski, State of Michigan;Patricia Coates, Oakland County;Karl Beckman, Motorola;Al Eichenberg;MPSCS; Joe Turner, Chairman,MML

III. Approval of Agenda: **Motion Coates, Support Beckman to approve agenda as presented. motion Carried.**

IV. Approval of Minutes of September 30, 2005: **Motion Held, Support,Coates to approve minutes of September 30, 2005 meeting. Motion Carried.**

V. Old Business:

A. Plan Revisions : Mr. Bradshaw to revise plan with inclusion of Certification that meetings were open to the public under Appendix W and post revised Plan on CAPRAD.

1. Coordination with Adjacent Regions: Ohio Plan is to be approved by our Committee.

2. CAPRAD Access: Mr. Held informs the Committee that Mr. Dave Funk is waiting for Mr. Bradshaw to sign and return the access request form to the NLECTC. Mr. Bradshaw will do so and firm up the application process. Discussion about who will be allowed access to CAPRAD and can the RPC charge a fee for administration?

B. Other: No additions under Other.

VI. New Business:

A: Submittal of Plan to FCC: The suggestion is made to submit the plan without the adjacent region concurrences. Mr. Bradshaw to contact Ms. Joy Alford to see if the Commission will accept the Plan without the letters.

VII. Next meeting Date: The next meeting of the Region 21 700 MHz RPC will be Tuesday, January 10, 2006 at 4000 Collins Road Lansing Michigan at 10:00am.

VIII. The Chair calls for a motion to adjourn. **Motion Coates, Support, Held to adjourn at 11:20am. Motion Carried.**

March 7, 2006

Regular Meeting of the Region 21 700 MHz Planning Committee
4000 Collins Road
Lansing, Michigan

CALL TO ORDER: The meeting was called to order by the Chair at 10:20 a.m.

INTRODUCTIONS: In attendance were: Keith M. Bradshaw, Secretary, Michigan APCO Local Advisor;Dave Held, Michigan APCO Local Advisor;Brent Williams, MDCH;Karl Beckman,Motorola;Al Nowakowski,MPSCS;Patricia Coates,Treasurer,Oakland County;Joeseph Turner,Chairperson,MML;Al Eichenberg,MPSCS;Mark Jongekrieg,Ottawa County 911;Jim Fyvie, Clinton County 911

APPROVAL OF AGENDA: (Agenda not previously available to Committee) **MOTION Eichenberg, SUPPORT Coates to approve impromptu Agenda. Motion Carried.**

Approval of Minutes of January 10, 2006 MOTION Held, SUPPORT Beckman, to approve minutes of January 10, 2006. Motion Carried.

OLD BUSINESS:

A. Regional Concurrences. The Committee drafts language of a Resolution to concur with Regional plans of regions adjacent to Region 21 for use of the 700 MHz spectrum in areas adjoining Region 21. The resolution to read;
"If there is a variance to the original CAPRAD sort within 70 miles of the boundary of Region 21, the Region 21 Committee will ask to review the application. The Region 21 Committee may ask for additional information including engineering studies to show the impact of the proposed system in Region 21."
MOTION Held, SUPPORT Williams, to approve language of the resolution and send it to the adjacent RPCs. Motion Carried.

B. CAPRAD Access. Mr. Turner to post the application for CAPRAD access on the MPSFAC website. Applications for CAPRAD access are to be approved by a Region 21 frequency advisor.

C. Regional Plan Submission. Mr. Turner will look for the best and most current revision of the plan, including the required statement that all meetings were open to the public and upload plan to Ms. Joy Alford at his convenience. Appendices in electronic format will be searched for by Mr. Beckman and Mr. Eichenberg and will be compiled and uploaded to Ms. Alford by Mr. Bradshaw.

NEW BUSINESS: None

NEXT MEETING DATE: May 11, 2006 at Clinton County Courthouse, Board of Commissioners Room, Clinton County Michigan at 9:30 am. 700 RPC meeting to be held before the regular meeting of the Michigan Chapter of APCO.

ADJOURNMENT: **MOTION Beckman, SUPPORT Eichenberg to adjourn at 11:10 a.m. Motion Carried.**

June 13, 2006

Regular Meeting of the Region 21 700 MHz Planning Committee
4000 Collins Road
Lansing, Michigan

CALL TO ORDER: The meeting was called to order by the Chair at 11:20 a.m.

INTRODUCTIONS: In attendance were: Keith M. Bradshaw, Secretary, Michigan APCO Local Advisor;Dave Held, Michigan APCO Local Advisor;Al Nowakowski,MPSCS;Patricia Coates,Treasurer,Oakland County;Joeseph Turner,Chairperson,MML;Al Eichenberg,MPSCS;Lloyd Collins,South Lyon PD

APPROVAL OF AGENDA: **No items on Agenda.**

APPROVAL OF MINUTES OF MARCH 7, 2006: Approval of minutes deferred until next regular meeting.

OLD BUSINESS: None.

NEW BUSINESS: None

NEXT MEETING DATE: September 29, 2006 at Kettenun Center.

ADJOURNMENT: **MOTION Collins, SUPPORT Eichenberg to adjourn at 11:30 a.m. Motion Carried.**

September 29, 2006

Meeting of the Region 21 700 MHz Planning Committee
Kettenun Center
Tustin, Michigan

CALL TO ORDER: The meeting was called to order by the Chair at 11:00 a.m.

INTRODUCTIONS: In attendance were: Keith M. Bradshaw, Secretary, Michigan APCO Local Advisor;Dave Held, Michigan APCO Local Advisor;Karl Beckman,Motorola;Al Nowakowski,MPSCS;Patricia Coates,Treasurer,Oakland County;Joeseph Turner,Chairperson,MML;Al Eichenberg,MPSCS;Jim Fyvie, Clinton County 911;Steve Leaming,MPSCS;Rick uslan,Motorola

APPROVAL OF AGENDA: (Agenda not previously available to Committee) **MOTION Eichenberg, SUPPORT Coates to approve impromptu Agenda. Motion Carried.**

APPROVAL OF MINUTES OF MARCH 7, 2006: **MOTION Held, SUPPORT Beckman, to approve minutes of March 7, 2006. Motion Carried.**

OLD BUSINESS:

Regional Concurrences. Mr. Turner discusses state of adjoining region concurrences. FCC deadline is approaching and the hope is they will allow a "date beyond".

NEW BUSINESS: Mr Nowakowski discusses the Cyren Call proposal.

NEXT MEETING DATE: At the Call of the Chair.

ADJOURNMENT: **MOTION Fyvie, SUPPORT Coates to adjourn at 11:55 a.m. Motion Carried.**

April 6, 2007 Multi-state Conference Call Notes

North Central RPC Members

Subject: North Central RPC Members
From: "bill carts" <wizard61@hotmail.com>
Date: Fri, 06 Apr 2007 20:17:06 +0000
To: ckspire@grundy911.org, carterb@apco911.org, bob.stephens@ky.ngb.army.mil, Gary.cochran@isp.state.il.us, jturner@michiganpropertytax.com, mike.jeffres@cio.ne.gov, paul.mayer@das.state.oh.us, rmoon@khp.ks.gov, rhessinger@state.nd.us, hester@dps.state.ia.us, rschreiner@ci.sheboygan.wi.us, Steve.devine@mshp.dps.mo.gov, steve.pott@co.washington.mn.us, todd.dravland@state.sd.us, astantz@isp.state.in.us
BCC:

The following regional members were on the conference call of 4-6-07, North Central Regional RPCs, Please make any corrections and advise if any additions to the EMAIL list are required.

William Carter, Region 54
Chris Kindlespire, Region 54
Gary Cochran, Region 13
Richard Hester, Region 15
Steve Devine, Region 24
Randy Moon, Region 16
Steve Pot, Region 22
Mike Jeffres, Region 26
Paul Mayer, Region 33
Carl Guse, Region 45
Keith Bradshaw, Region 21
Al Nowakowski, Region 21
Karl Beckworth, Region 21 / 33 Motorola

Discussions during the call were concerns about the effect the sudden move and oversight of the CAPRAD data base might or will have on the Regional Committees and possible action by the Regions to correct these issues.

Steve Devine is penning some issues and will send it to the NC members for comment and review.

Next Call is TBA, but would probably before the end of April.

Bill Carter

DRAFT

April 24, 2007

Regular Meeting of the Region 21 700 MHz Planning Committee
State of Michigan DIT
4000 Collins Road
Lansing, MI

I. The meeting was called to order by the Chairperson at 1:20 pm.

II. Attendees introduced themselves at the behest of the Chair. Present were: Patricia Coates, Oakland County;Bill Nelson,MAFC;Al Eichenberg,MPSCS;Al Nowakowski,MPSCS;Mike Whately,RF Systems Engineering;Keith Bradshaw, Macomb County;David Held,MI APCO;JoeTurner,MML;Karl Beckman, Motorola

III. Motion Whately;Support Held to approve agenda. Motion carried.

IV. Motion Beckman;Support Coates to approve Minutes of July 11, 2006 meeting. Motion carried.

V. Mr. Turner discusses the status of the Regional Plan. Since the plan was dismissed without prejudice, we can resubmit as soon as we receive the concurrence from Indiana. The FCC expressed some concern with the format as submitted and Mr. Turner will reformat the plan document for re-submission. There are some questions as to whether the inter-regional dispute resolution document in the plan is acceptable as an appendix, or if we need each adjacent region to approve this. The FCC has requested that we have meeting minutes explicitly showing plan approval. This meeting will be scheduled for June 12, 2007. Mr. Turner will have the plan ready for public comment by the June meeting.

VI. A public meeting is to be held on June 12, 2007 for discussion of the plan as it is to be re-submitted to the FCC. Indian nations are to be notified/invited for comment. Notification of meeting for public comment to be sent to other organizations such as Police and Fire Chiefs Association, etc. Plan to be re-submitted to the FCC by July 2007.

VII. Next meeting to be held on June 12, 2007.

VIII. Motion Whately; Support Eichenberg to adjourn at 2:14 pm. Motion carried.

Respectfully submitted by Keith M. Bradshaw.

June 12, 2007

Regular Meeting of the Region 21 700 MHz Planning Committee
State of Michigan DIT
4000 Collins Road
Lansing, MI

I. Call to Order: The meeting was called to order by the Chairperson at 10:24 am.

II. Introductions: Attendees introduced themselves at the behest of the Chair. Present were: Patricia Coates, Oakland County;Al Eichenberg,MPSCS;Al Nowakowski,MPSCS;Keith Bradshaw, Macomb County;David Held,MI APCO;JoeTurner,MML;Karl Beckman, Motorola

III. Approval of Agenda: Motion Held;Support Bradshaw to approve agenda. Motion carried.

IV. Purpose and Order of Business: Mr. Turner announces that the purpose of the meeting is to take Public Comment on the 700 MHz plan as it is to be resubmitted to the FCC. In particular, comment is sought from agencies specifically identified by the FCC for notification of the pending 700 plan submittal. The following agencies were notified by US Mail of the time and location of this meeting:
Bureau of Indian Affairs, Sault Ste. Marie, MI
Bay Mills Community, Brimley, MI
Grand Traverse Bay Band of Ottowa and Chippewa, Suttons bay, MI
Hannahville Indian Community, Wilson, MI
Huron Potawatomi Inc,. Fulton, MI
Keeweenaw Bay Indian Community, Baraga, MI
Lac Vieux Desert Band, Watersweet, MI
Little River Band of Ottowa, Manistee, MI
Little Traverse Band, Harbor Springs, MI
Match-E-Loe-Nash-She-Wish Pokagon Band, Dorr, MI
Pokagon Band of Potawatimi, Dowagiac, MI
Saginaw Chippewa, Mt. Pleasant, MI
Sault Saint Marie Tribe of Chippewa, Sault Ste. Marie, MI
Mr. Turner further announces that an audio tape recording of the proceedings will be made.

VI. Old Business: Discusses the status of the Inter-Regional Dispute Resolution documents. Ohio and Indiana have not returned the signed agreements as of this date.

VI. New Business: Mr. Turner invites comments from the public. As no one form the public in general or any of the agencies contacted via mail are present, this portion of the meeting is closed.

VI. Other Business: None.

VII. Date of Plan Submission: Motion Coates, Support Eichenberg to submit the new Region 21 700 MHz Plan, which will consist of the "old plan" as submitted to the FCC in April of 2006 with revisions as recommended by the FCC along with other minor changes as needed, by 12 o'clock noon of 27 July, 2007. Motion Carried.

VIII. Motion Coates; Support Eichenberg to adjourn at 10:50 am. Motion carried.

Respectfully submitted by Keith M. Bradshaw.

PURPOSE OF
700 MHZ RPC MEETING - JUNE 12, 2007

Location: Michigan State Police Facility
4000 Collins Road, Lansing, Michigan

This 700 MHz RPC meeting has been convened because, pending receipt of two signed Dispute Resolution agreements, Region 21 is prepared to re-submit its plan to the FCC.

That is, the Region 21, 700 MHz RPC will be re-submitting a 700 MHz frequency utilization Plan which is substantially and materially the same as the Plan submitted to the FCC in calendar year 2001. However, technically, a re-submission is considered a new plan. The differences between the resubmitted plan and those submitted in 2001 consists of additional concurrence documents and agreements reached with adjacent FCC designated regions. In addition, some documentation was clarified or included because it had been omitted from the original submission.

No major changes in the plan are contemplated, however, due to the need for a re-submission the Planning Committee decided it would be wise to make available another opportunity to the public for comment. Public comments have been routinely accepted beginning with the first 700 MHz RPC meeting May 3, 2000.

The plan as originally submitted may be found at the URL www.mpsfac.org

A bound copy of the tentative plan is available for your inspection at the head table today.

A final version will be posted on the web at www.mpsfac.org as soon as all signed agreements and any other documents are received.

THE PURPOSE OF TODAY'S MEETING IS TO ACCEPT ANY FURTHER COMMENT FROM THE PUBLIC REGARDING THE 700 MHz PLAN.

Written Comments

Written comments from the public including any organization or agency will be accepted until noon (E.D.T.) on July 27, 2007 unless otherwise decided at today's meeting. Comments may be sent via U.S. Mail, fax or e-mail.

Written comments May Be Sent To: Joseph Turner, Chairman
700 MHz RPC
2719 State St.
Saginaw, MI 48602

Fax Number: 989 792-4199 E-mail to: mpc@michiganpropertytax.com

Draft

October 25, 2007

Minutes of the Regular Meeting of the Region 21 700 MHz Planning Committee
Zehnder's Restaurant
Frankenmuth, MI

I. Call to Order: The meeting was called to order by Chairman Turner at 10:10 am.

II. Introductions: Attendees introduced themselves at the behest of the Chair. Present were: Patricia Coates, Oakland County;Al Eichenberg,MPSCS;Al Nowakowski,MPSCS;Keith Bradshaw, Macomb County;David Held,MI APCO;JoeTurner,MML;Jim Fyvie, APCO; Bill Nelson, Troy FD;Vicki Wolber, Macomb County EM;Bob Andrus, City of Dearborn;Brent Williams,MDCH;Karen Chadwick,APCO;Mark Jongekrijg,Ottawa County;Kathy Vosburg,Macomb County.

III. Approval of Agenda: Motion Eichenberg; Support Held to approve agenda. Motion carried.

IV. Public Comment: Chairman Turner opens the meeting for Public Comment. As no members of the public are present, there are no Public Comments.

V. Approval of Minutes of the June 12, 2007 Meeting: Motion Coates; Support Held to approve the minutes of the June 12, 2007 meeting as submitted. Motion carried.

VI. Old Business:

A. Plan Status:

1. Submittal of Plan to FCC: The Committee discusses a tentative date for re-submittal of the plan. The plan must include the new sort. Al Eichenberg, Keith Bradshaw and Dave Held are asked to prepare or acquire a sort complying with the current band plan. Chairman Turner requests that the Plan be ready to submit to the FCC before the end of the year.

2. Coordination with Adjacent Regions: Chairman Turner relates that all adjacent regions have approved our plan. Further, the plan has received compliments from the adjacent region chairs for being well written and thorough. However, one region has not as of today's date, returned the Inter-Regional Dispute Resolution document.

3. Border Sharing Agreement: Chairman Turner requests feedback from committee members on the border-sharing plan as proposed by Karl Beckman. The Chairman wishes to present the FCC with comments on the Border Sharing Agreement from Region 21. However, no one on the committee seems to have reviewed the document as of yet, so no advice can be given to the Chair at this time. Committee members are to review the proposed Agreement before the 20 December 2007 meeting to offer comments for filing with the FCC.

B. CAPRAD: Chairman Turner relates the CAPRAD (Computer Assisted Pre-Coordination Reference and Database) system is up and running and will be maintained by the Texas Sheriff's Association.

C. Other: No items.

VII. New Business:

A. FCC Changes: Brent Williams relates to the Committee information he gleaned from the NPTSC meeting held in Denver relevant to the National Broadband Trust. This body will hold the national broadband license for the 700MHz broadband frequencies.

B. Frequency Sort: This was discussed under Old Business A.1.

C. Other: Chairman Turner discusses the receipt of an application, dated August 9, 2005, for the allocation of 700MHz channels by the City of Detroit. As of today's date, the Region 21 700MHz Plan has not been approved by the FCC. Applications for 700MHz channels will not be accepted by the Committee until the plan has been approved by the FCC. **Motion Bradshaw; Support Andrus to return this application to the City of Detroit. Motion Carried.**

Draft

Minutes 10-25-07 700RPC cont.

VIII. <u>Next meeting date:</u> The next meeting of the Region 21 700MHz RPC will be held at the State of Michigan IT Department building at 4000 Collins Road, Lansing Michigan on 20 December 2007 at 10:00 am.

IX. Motion Eichenberg; Support Fyvie to adjourn at 11:04 am. Motion carried.

Respectfully submitted by Keith M. Bradshaw.

Draft

December 20, 2007

Minutes of the Regular Meeting of the Region 21 700 MHz Planning Committee
4000 Collins Road, Lansing MI

I. Call to Order and Introductions: The meeting was called to order by Chairman Turner at 10:21am.

Attendees introduced themselves at the behest of the Chair. Present were: Patricia Coates, Oakland County;Al Eichenberg,MPSCS;Al Nowakowski,MPSCS;Keith Bradshaw, Macomb County;David Held,MI APCO;JocTurner,MML; Bill Nelson, Troy FD;Brent Williams,MDCH; Karl Beckman, Motorola; Tom Riggs, MDOT; Michael Whately, RF Systems Engineering.

II. Approval of Agenda: Motion Bradshaw; Support Eichenberg to modify agenda to add approval of minutes of October 25, 2007 minutes. Motion Carried. Approval of Minutes of October 25, 2007 to be added as number II. Other items to be renumbered sequentially.

III. Approval of Minutes of the October 25, 2007 Meeting: Motion Coates; Support Beckman to approve minutes of October 25, 2007 meeting. Motion Carried.

IV. Old Business:
a. Update on Plan Chairman Turner discusses the purpose of the meeting and presents language of a resolution for committee approval to forward the Plan to the FCC. Chairman Turner states that he needs clean copies of agendas, meeting notices, etc. for inclusion in the Plan document.
b. Other Discussions Chairman Turner suggests that the Plan be posted on a website (to be identified at a later time) that is well maintained and provide a link to that website.
c. Verify Agendas and Minutes Chairman Turner requests the assistance of Mr. Bradshaw to re-read the plan and check for missing information, page numbering, etc. and other housekeeping type corrections.

V. New Business:
a. Resolution to File with FCC: Motion Beckman; Support Eichenberg to file the Region 21 700 MHz Plan with the FCC in accordance with the Resolution introduced by Chairman Turner:

700 MHz RPC Resolution to file its plan with the FCC

Whereas, the Region 21 700 MHz Planning Committee has diligently crafted a plan for the use of radio communication in the 700 MHz electromagnetic spectrum since May 3, 2000; and

Whereas, various state agencies and entities, local governmental units and agencies, Native American entities and the public at-large have been invited to attend meetings of the 700 MHz Planning Committee over the past six years; and

Whereas a plan for the use of the 700 MHz radio spectrum by public safety agencies has been crafted; and

Whereas, concerned citizens and interested agencies and entities have contributed to the formation of the plan; and

Whereas the plan has been submitted to and approved by the appropriate parties in Federal Communication Commission designated regions lying adjacent to Region 21; therefore

By those here present at 4000 Collins Road, Lansing, Michigan on this 20th day of December 2007 be it resolved, the Region 21 RPC Chairman is hereby instructed to submit the Region's 700 MHz Plan to the FCC for its approval.

Motion Carried.

b. Resolution to Dissolve the 700 RPC upon approval of the Regional Plan by the FCC: Motion Beckman; Support Coates to Dissolve RPC upon filing of the Regional Plan in accordance with the Resolution presented by Chairman Turner. Lengthy Discussion. Mr. Beckman Calls the Question. There is support. **Vote on the Resolution presented by Chairman Turner: three (3) Ayes, seven (7) Nays with Chairman Turner abstaining. Motion fails.**

c. Other New Business: There is no other New Business.

B. CAPRAD: Chairman Turner relates the CAPRAD (Computer Assisted Pre-Coordination Reference and Database) system is up and running and will be maintained by the Texas Sheriff's Association.

C. Other: No items.

V. Other Business:

a. Next Meeting Date: The next meeting of the Region 21 700 RPC will be at the Call of the Chairman.

VI. Adjournment: Motion Whately; Support Coates to adjourn at 11:41 am. Motion carried.

Respectfully submitted by Keith M. Bradshaw, Secretary
Region 21 700 MHz RPC

APPENDIX F

Sign-In Sheets

This Section Of Appendix F Contain Sign-in Sheets

Michigan Regional 700 MHz Planning Session
May 3, 2000

NAME	ORGANIZATION	ADDRESS	PHONE	FAX	E-MAIL	SUBCOMMITTEE
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CRAIG SWENSON	WASHTENAW CONTRACT	2201 HOGBACK ANN ARBOR	ext 1271 7349718400	7349719274	SWENSONC@co.washtenaw.mi.us	
DAVID SAMSON	MACOMB COUNTY TECH SERVICES	21730 DUNHAM RD CLINTON TWP 48036	810-469-5888			
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Michigan Regional 700 MHz Planning Session
May 3, 2000

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Keith M. Branham	Malcolm County/ Technical Srvcs	21950 Dunham Mt. Clemens	810 469-6433			
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Michigan Regional 700 MHz Planning Session
May 3, 2000

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Michigan Regional 700 MHz Planning Session
May 3, 2000

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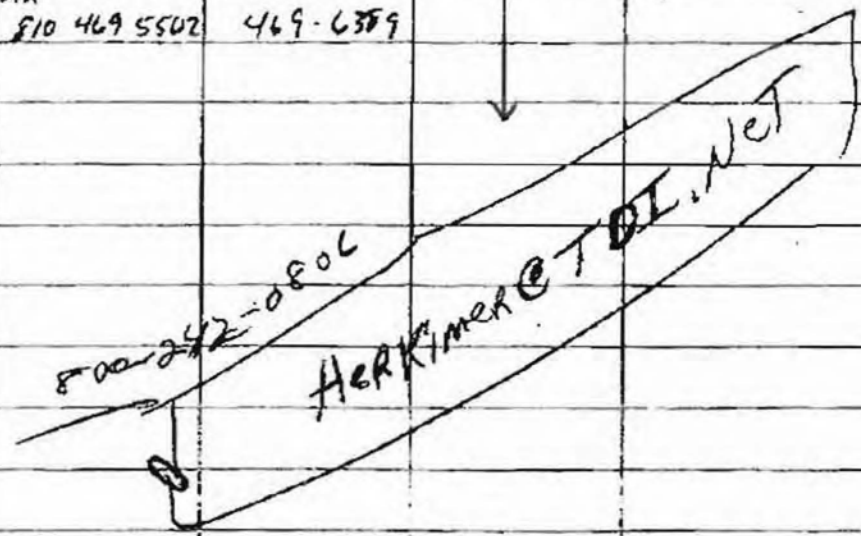
RON GEMC	MACOMB CO-Sheriff	43565 Elizabeth Mt. Clemens MI	810 469 5502	469-6359		



SIGN-IN SHEET 4/25/01

Joe Turner	989-797-3816	TURNERJE JCNO.com
Dennis Betz	734-971-8400 Ext 1298	BetzD@co.WASHTENAW.MI.US
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1-04-2002

SIGN IN SHEET 700 MHz PLAN COMMITTEE

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Send Plan updates to R. Uslan asap.

APPENDIX G - REGION 21 700 MHz PLAN

This Appendix Contains

1. Technical requirements for coverage power densities and contours

2. Co-Channel assignment methodology

3. System Loading requirements

4. “Return to Pool” stipulations for less than fully loaded Channels

Appendix G - COVERAGE REQUIREMENTS

Coverage parameters are to be consistent with TR 8.8 and NCC Planning Committee guidelines. That is, the designed mean signal strength shall not exceed +40 dBμ (+40 decibels above one microvolt per meter as measured using a λ/4 antenna at five (5) feet above ground level see Appendix I) at a uniform distance from the boundary of the applicant's service area of:

i) three (3) miles for RURAL areas,
ii) four (4) miles for SUBURBAN areas and
iii) five (5) miles for URBAN areas.

Co-channel assignments may be made using the modified R-6602 contour (with 9 dBμ correction factor) as described in TIA/EIA TSB88-A1 as; the interfering 11 dBμ (50,50) co-channel contour will be allowed to touch, but not overlap the 40 dbμ (50,50) contour of the incumbent station.

Adjacent channel assignments may be made when the interfering systems 60 dBμ (50,50) contour does not overlap the incumbent stations 40 dBμ (50,50) contour. The interfering contour may touch the incumbent contour. In cases where the 60 dB (50,50) contour is considered too restrictive, the applicant can make a showing based on good engineering practice that the ACCPR would not exceed 65 dB.

For purposes of frequency coordination, contours are to be predicted using either method described in TIA/EIA TSB88 – A1; the modified Carey R-6602 curves , or the Okumura – Hata – Davidson radial method, whichever describes the worst case.

APPENDIX G - LOADING

Each applicant for a trunked system shall certify that a minimum of 100 mobiles for each 12.5 kHz channel block will be placed in service within five years of the initial plan approval date. If that is not the case, then less than fully loaded channels shall be returned to the allotment pool and the licensee shall modify their license accordingly. Conventional channels shall be loaded to 100 mobile stations per 12.5 kHz channel block. Where an applicant does not load a 12.5 kHz channel block to 70 mobile radios, the channel block will be available for assignment to other licensees. Mobile, portable and control stations will be considered as mobile units. An applicant will be required to provide loading information consistent with this plan. If an applicant is unable to reach minimum loading criteria, and should a system licensed to a higher level of government be available in the area, the applicant must consider utilizing this system. As the higher-level systems reach their capacity, the smaller systems in the public safety service must then consider uniting their communications efforts to formulate one large system, when feasible.

APPENDIX G - REQUIRED SUBMITTALS

Each application must contain the following:

- FCC ULS 601 Form(s) and PSCC FDR3 (formally APCO FDR3):
- Statement of need for installing a new 700 MHz system. Statement to include justification for requested frequencies based on loading criteria in this Appendix.
- Details of engineering surveys showing radio coverage will *not* exceed applicant's minimum requirements. System engineering is to conform with the Coverage Requirements section of this Appendix.
- Explain any budget commitment that has been made for the proposed system; include agency budgets and/or agency resolution(s).
- Explain your systems future growth for all agencies involved in the system.
- Local Interoperability Plan explaining and certifying that applicant's agency will comply with interoperability requirements.
- Frequency Give Back Plan to include:
  - List of agencies transitioning to the 700 MHz system
  - Reference copies of FCC licenses held by these agencies
  - List of frequencies used by these agencies to be returned to frequency pool.

- Applicants must provide proof they communicated an announcement of their intent to seek new 700 MHz frequencies and offered an invitation to the State of Michigan, the county or counties within which the proposed system is located and local governmental units within their county of residence, to participate in a discussion of interoperability issues.

- 821 MHz systems that are expanded to 700 MHz shall explain how they plan to meet the interoperability requirements of both plans.
- Stipulate the PW frequency coordinator you desire to have coordinate your license application: AASHTO, APCO, FCCA, or IMSA.
- The application shall provide a complete review of matrix issues, including what the applicant feels their point score is for the MPSFAC to review in case there is a competing application.

Return to list of Appendices

APPENDIX H - REGION 21 700 MHz PLAN

This Appendix Contains

1. The Plan’s Appeal Process

Appeal Procedure

Appeals from decisions made with respect to a variety of matters regulated by the Regional Planning process and MPSFAC will be heard. The formal requirements of the appeal process are set out below.

In order to ensure that the appeal process is open and understandable to the public, the Regional Committee has developed this procedure. Those involved in the appeal process can expect the Committee and its members to follow the procedures. Where any matter arises during the course of an appeal that is not dealt with in this document, the Committee will do whatever is necessary to enable it to be resolved fairly, effectively and completely on the appeal. The Committee may dispense with any part of this procedure where it is appropriate to do so.

The MPSFAC will make every effort to process appeals in a timely fashion and issue decisions expeditiously.

Appeals Committee

Members

The MPSFAC Chairman may organize the Committee into Sub-Committees, each comprised of one or more members.

Where an appeal is scheduled to be heard be a Sub-Committee the chair is determined as follows:

(a) if the chair of the Committee is on the Sub-Committee they are the chair:
(b) if the chair of the Committee is not on the Sub-Committee but the vice-chair is than the vice-chair will be the chair; and
(c) if neither the chair nor the vice-chair is on the Sub-Committee, the MPSFAC Committee will designate one of the members to be the chair.

Withdrawal or Disqualification of a Committee Member on the Grounds of Bias

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

THE APPEAL PROCESS

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

How to appeal

A notice of appeal must be served upon the MPSFAC. The notice of appeal may be “delivered” by mail, courier, or hand delivered to the office of the Chair and all Members

of the Committee. See page 18 for information. The Committee will also accept a notice of appeal by electronic means to the Chair and Secretary with the original paper copy of the notice of appeal served as indicated above.

Certain things must be included in a notice of appeal for it to be accepted. The notice of appeal **must** include:

1. the name and address of the appellant;
2. the name of the person, if any, making the request for an appeal on behalf of the appellant;
3. the address for service of the appellant;
4. the grounds for appeal (a detailed explanation of the appellant's objections to the determination – describe errors in the decision);
5. a description of the relief requested (what do you want the MPSFAC/Committee/Sub-Committee to order at the end of the appeal);
6. the signature of the appellant or the appellant's representative; and data.

Time limit for filing the appeal

To appeal a determination or allocation the entity must deliver a notice of appeal within 10 business days after receiving the decision. If a notice of appeal is not delivered within the time required, the right to an appeal is lost. However, the Committee is allowed to extend the deadline, either before or after its expiration based upon a 2/3 majority of the Committee.

Rejection of a notice of appeal

The Committee may reject a notice of appeal if:

(a) it is determined that the appellant does not have standing to appeal; or
(b) the Committee does not have jurisdiction over the subject matter or the remedy sought.

Before a notice of appeal is rejected, the MPSFAC will inform the appellant of this in writing, with reasons. The appellant an opportunity to make submissions within 10 business days.

Appeal Meeting

The MPSFAC and/or established Sub-Committee will set a meeting date to review the appeal documents submitted by the applicant and meet with them to discuss the issue in an open meeting. The MPSFAC will arrive at a decision based upon the documents presented, FCC rules, NCC requirements, and the regional plan and advise the applicant of the decision.

Committee members will not contact a party on any matter relevant to the merits of the appeal, unless that member puts all other parties on notice and gives them an opportunity to participate.

Note: All applicants ultimately have a right to appeal directly the Federal Communications Commission

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APPENDIX I - REGION 21 700 MHz PLAN

This Appendix Contains

1. The Plan’s reference for field strength measurements

APPENDIX I

RADIATED EMISSIONS MEASUREMENT SYSTEMS TUTORIAL

BY
MICHAEL A. NICOLAY

INTRODUCTION

Measuring radiated electromagnetic emissions first requires a measurement system. A basic measurement system usually contains a minimum of an antenna and a receiver. To measure very small signal levels may require the addition of a pre-amplifier to the receiver system. Figure 1 shows a typical receiver system block diagram *including a pre-amplifier*. Figure 1 will be used for the following discussion.

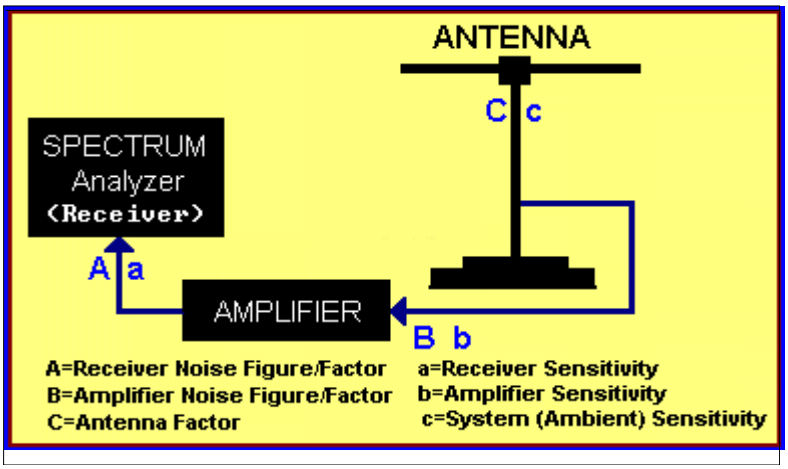

FIGURE 1. RECEIVER SYSTEM BLOCK DIAGRAM

It is beyond the scope of this text to address in detail such measurement errors as receiver detection mode errors, radio frequency pre-selection (RF) filtering, or tuner overload errors. Peak detection of continuous waves (CW) will mainly be discussed.

There are many *terms* currently used to define radiated electromagnetic energy. Some common terms used are non-ionizing radiation (NIR), electromagnetic fields (EMFs), radiated emissions, and broadcast signals. In this paper, "emissions" will be used to describe radiated electromagnetic energy.

Electromagnetic measurement systems are used to measure power densities, or power spectral densities, of electromagnetic fields at a point in space. Power density is defined as the "power per unit area normal to the direction of propagation usually expressed in units of Watts per square meter W/m^2), or for convenience in units such as milliwatts per square meter (mW/m^2), or even in microwatts per square centimeter (μW/cm^2)." Plane-waves, power densities, electric field strengths (E), and magnetic field strengths (H) are related by *free space* loss, i.e, 377 ohms (Ω). Electric field strengths and magnetic field strengths are expressed in units of Volts per meter (V/m) and Amperes per meter (A/m), respectively. A field strength is therefore defined as:

$$E = \text{Square Root } (120\pi P)$$

where,

E = rms value of field strength in Volts/meter
P = power density in watt/meter^2
120 = impedance of free space in ohms

Power density (P_D) is related to the electric field strength (E) and the magnetic field strength (H) as:

$$P_D = E^2/377\Omega = 377\Omega H^2$$

Again, the rate at which electromagnetic energy (power) is propagated by a wave -- power density -- is usually specified in Watts per square meter (W/m^2). The power density equation is:

$$P_D = P_T/4\pi r^2$$

where,

P_D = power density in watts/meter^2
P_T = transmitted power in Watts
r = distance in meters

Radiated electromagnetic fields -- radiated emissions -- are produced from many sources. Sources of electromagnetic energy range from

manmade sources such as commercial broadcast stations and automobile ignition systems to natural sources such as galactic noise and lightning. To further complicate matters, these emissions can drastically differ in frequencies and in their magnitudes.

Because of the potential wide range of measurement requirements special measurement systems are sometimes necessary. These systems must be well-planned or inaccurate measurements may result. Important design specifications should include *system selectivity* and *system sensitivity*. These terms will be defined and demonstrated in the following sections.

THE ANTENNA

Measuring radiated emissions, or electromagnetic energy, begins with the antenna. Antennas are devices that receive (capture) electromagnetic energy traveling through space. Antennas can also
be used for transmitting electromagnetic energy. There are many different types of antennas, some are designed to be "broad-banded," to receive or transmit over a large frequency range, and some are designed to receive or transmit at specific frequencies. In any case, all receive antennas are intended to capture "off-air" electromagnetic energy and to deliver these "signals" to a receiver. For this discussion, electric fields (E) will mainly be addressed.

Because antennas can only capture a small portion of the radiated power, or energy, a correction factor must be added to the detected emission levels to accurately determine the radiated power being measured. The actual power received by an antenna is determined by multiplying the *power density* of the emission by the receiving area of the antenna, A_e. This antenna correction factor is called the "antenna factor."

To further understand antenna factors see Figure 2. Below are the antenna factor derivation equations.

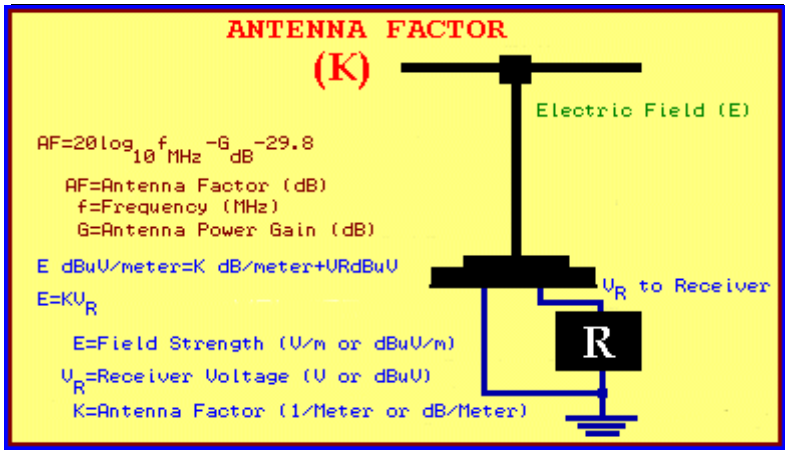

FIGURE 2. ANTENNA FACTOR

$$A_e = \lambda^2/4\pi \text{ (Meters}^2\text{)}$$

The power received by the antenna is then defined by:

$$P_r = PA_e = PG\lambda^2/4\pi \text{ (Watts)}$$

where,

P = power density in Watts/meter²
G = antenna (power) gain
λ = wavelength in meters

Combining these equations with the field strength equation yields:

$$P_r = E^2G\lambda^2/480\pi^2$$

also,

$$P_r = V_r^2/Z_o$$

where,

V_r = received voltage
Z_o = receiver input impedance

then,

$$V_r^2/Z_o = E^2G\lambda^2/480\pi^2$$

APPENDIX I

Knowing that:

$$\lambda = 300 \text{ meters/second}/f_{(MHz)}$$

since an antenna factor is defined as:

$$E = (V_r f\pi/50\Omega)(\text{Square Root } (30/Z_o G))$$

we can simplify and rearrange terms to yield:

$$K = E/V_r$$

then,

$$K = (f\pi/50\Omega)(\text{Square Root}(30/Z_o G))$$

or in logarithmic form [*for* Z_o = 50 Ω (ohm) system]:

$$K = 20\log_{10} f_{MHz} - G_{dB} - 29.78 \text{ (dB)}$$

THE RECEIVER AND AMPLIFIER

A receiver is an electro-mechanical device that receives electromagnetic energy captured by the antenna and then processes (extracts) the information, or data, contained in the "signal."

The basic function of all receivers is the same regardless of their specific design intentions, broadcast radio receivers receive and reproduce commercial broadcast programming, likewise, TV receivers detect and reproduce commercial television broadcasting programming. Special, or unique, receivers are sometimes needed to detect and measure all types of radiated, or transmitted, electromagnetic emissions. These specialized receivers may be called tuned receivers, field intensity meters (FIMs), or spectrum analyzers.

Radiated emissions that receiver systems may be required to measure can be generated from intentional radiators or unintentional radiators. The information contained in intentionally radiated signals may contain analog information, such as audio, or they may contain digital data, such as radio navigation beacon transmissions. Television transmissions, for example, contain both analog and digital information. This information is placed in the transmitted emission, called the "carrier," by a process called "modulation." Again, there are many different types of modulation, the most common being amplitude modulation (AM) and frequency modulation (FM). Receivers detect, or extract, the information/data from radiated emissions by a process called "demodulation", the reverse of modulation.

Many radiated emissions requiring measurements do not contain any useful information or data at all. As an example, radiated emissions from unintentional radiators, such as computer systems, are essentially undesired byproducts of electronic systems and serve no desired or useful purpose. These undesired emissions can, however, cause interference to communications system, and *if strong enough*, they can cause interference to other unintentional radiating devices. Radiated signals (if strong enough) can also present possible health hazards to humans and animals. Because these emissions must be measured to determine any potential interference problems or health hazard risks, specialized receiver systems must be used.

An important parameter for any receiver is its *noise figure*, or *noise factor*. This parameter will basically define the *sensitivity* that can be achieved with a particular receiver.

An amplifier, usually called a pre-amplifier, is sometimes required when attempting to measure very small signals or emission levels. Because these devices amplify signals, they will also amplify ambient electromagnetic noise. If improperly used, amplifiers can detract from the overall system's sensitivity as well as possibly causing overloading to the receiver's tuner input stage. Overloading a tuner's input stage is simply supplying a larger signal amplitude than the receiver's tuner input circuitry is capable of handling, thus, saturating the tuner's input stage.

Just as with the receiver, it is important to know what the *noise figure*, or *noise factor*, of the selected amplifier is when designing or specifying a measurement system containing a pre-amplifier.

The noise figure (N_{fig}) for a device (receiver or amplifier) is defined as:

$$N_{fig} = 10\log_{10} N_o - 10\log_{10} G_d - (-174 \text{ dB} + 10\log_{10} B_r)$$

where,

N_o = measured noise in milliwatts
G_d = device power gain - linear ratio
B_R = receiver bandwidth in Hz

The use of these parameters for designing or specifying measurement systems will be explained and demonstrated in the following section.

SPECIFYING OR DESIGNING RADIATED MEASUREMENT SYSTEMS

When specifying or designing any measurement receiver system, one should consider that the "system" will include other devices such as antennas, amplifiers, cabling, and possibly filters.

Because a receiver's selectivity, the ability to select frequencies or frequency bands, is primarily a function of the receiver's tuner design, and will

be chiefly dependent on the individual receiver selection, selectivity will not be specifically addressed in this text. Receiver system *sensitivity*, however, presents one of the greatest difficulties, or challenges, when designing or specifying receiver measurement systems. Therefore, the sensitivity of the two basic types of receiver systems, *one with a pre-amplifier* and *one without a pre-amplifier*, will be addressed in some detail.

Because antennas are not perfect devices and have associated "losses," the following examples will include explanations for these error corrections. As mentioned previously, amplifiers will not only amplify the emissions being measured but they will also amplify ambient electromagnetic noise. These ambient conditions can drastically change the overall sensitivity of a measurement system. Another potential problem associated with using amplifiers is that they also generate internal electromagnetic noise. Being active devices they will introduce their own internal electromagnetic noise into the receiver system, again having an influence on the total system's noise level, thus, its sensitivity.

Some corrections for the above mentioned problems are necessary to accurately calculate both the receiver's signal input sensitivity and (more importantly) the total system's *ambient* sensitivity. Without knowing the total measurement system's *ambient sensitivity*, measurements may not be possible down to anticipated emission levels.

In electromagnetic measurement systems terms such as ambient sensitivity, system sensitivity, and receiver sensitivity have been used interchangeably. More confusing expressions commonly used are terms such as "receiver noise floor," or "system noise floor."

In this text, the term "system sensitivity" will be defined as ambient electromagnetic noise level seen by, and at, the antenna for 0 dB *Signal-to-Noise* ratio at the receiver's intermediate- frequency (I-F) stage. System sensitivities defined herein are for *far-field* conditions.

The following are general terms and definitions that will be used in describing and calculating the following receiver/system parameters:

General Definitions:

1. N_{fig} (dB) = Noise Figure = $10\log_{10}$ Noise Factor (NF)
2. A_e (dB) = Effective Capture Area = $10\log_{10}$ ($\lambda^2/4\pi$) - for *unity gain*
3. T (dB) = Average Room Temperature = $10\log_{10}$ 290°K
   (K=degrees Kelvin)
4. B_R (dB) = $10\log_{10}$ Receiver Bandwidth (Hertz)
5. K (dB) = Boltzman's Constant
   = $10\log_{10}$ 1.4 x 10^{-23} Watts/K/Hz
6. S_e (dBm/m^2) = System Sensitivity = N_{fig}-174+B_R-A_e

THE RECEIVER AND ANTENNA SYSTEM SENSITIVITY

Receiver sensitivity is one of the most important design parameters to consider when designing or specifying any measurement system. This parameter will determine the lowest signal level that the receiver will be capable of detecting or measuring. However, when designing a system to measure radiated radio frequency (RF) emissions (signals), it is important to go further in your analysis. The sensitivity level at the receiver may be considerably different than the sensitivity level at the antenna, especially if a pre-amplifier is attached between the antenna and the receiver. If not considered, measuring the "noise floor" of the *receiver system*, itself, instead of the anticipated radiated emissions levels may result. The following measurement system discussion will be as shown in Figure 1, *without the use of the pre-amplifier*.

Receiver sensitivity (S_R) is defined as the RF noise power level generated within the receiver. It may also be defined as the co-channel interference level for 0 dB *signal-to-noise ratio*, defined as:

$$S_R = NF\ K\ T\ B_r\ (Watts)$$

or in logarithmic form:

$$S_R=10\log_{10}NF+10\log_{10}K+10\log_{10}T+10\log_{10}B_R\ (dBW)$$

where,

K = Boltzman's Constant = 1.4 x 10^{-23} Watts/K/Hz
T = temperature in degrees Kelvin
B_R = receiver I-F bandwidth in Hertz
NF = receiver noise factor

Note: *Noise figures and noise factors are different ways of specifying noise. In this text, noise factors will be used to describe linear ratios, and noise figures will be used to describe logarithmic ratios.*

Again, a receiver's selectivity, the ability to select frequencies or frequency bands, is chiefly dependent on the receiver's tuner design, which is mainly the function of the receiver selection. Because receiver system sensitivity presents one of the greatest challenges, sensitivity will be ddressed in detail.

For simplicity, a *spectrum analyzer* will be used as the receiver for this discussion. We will first determine the receiver's sensitivity from its indicated power level. The indicated power level of a spectrum analyzer is essentially the base-line trace observed on its cathode-ray tube (CRT) display,
usually expressed in dBm. It may be more useful to convert this unit (dBm) to a more useful unit such as dBV. In a 50Ω system this conversion is

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done by adding 107 dB to the indicated power level displayed on the analyzers CRT display. As an example, an indicated power level of -90 dBm (on the CRT display) is equivalent to an electric plane-wave of 17µV. **Note:** *The 107 dB factor is only applicable in a 50Ω system.*

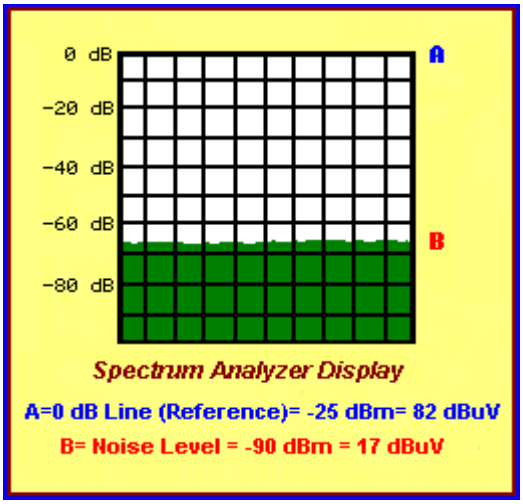

FIGURE 3. SPECTRUM ANALYZER DISPLAY

Converting the *receiver's sensitivity* into a plane-wave field strength equivalency, ambient field strength reference at the antenna, is not difficult but may be confusing at first because of the unit conversions and the concept of equivalent field strengths. As shown above, it may be easier to first convert the receiver's indicated sensitivity power level (dBm), to a plane-wave equivalent voltage (dBµV). After this conversion, the equivalent field strength sensitivities can be easily calculated in units of dBµV/m or V/m. This conversion can be accomplished using "antenna factors."

The antenna factor (dB/m) when added to the indicated sensitivity level (dBµV) of the receiver will produce the equivalent field strength sensitivity referenced at the antenna (dBµV/m), referenced to an isotropic antenna. For example, an indicated field strength of 17 dBµV plus an antenna factor of 25 dB/m is equal to a field strength of 42 dBµV/m.

Because the *antenna factor* does not include any losses such as cable losses and filter losses, these losses will have to be accounted for to accurately calculate equivalent field strengths or field strength sensitivities.

For ease in calculating, these losses (in dB) can be added to the antenna factor. This resultant number, when added to the indicated receiver sensitivity, in dBµV, will yield an equivalent ambient field strength or electric plane-wave sensitivity. **Note:** *This will only be true for a particular antenna at a specific frequency. Each antenna factor will be different for each measurement frequency.*

Using the following measurement receiver (*spectrum analyzer*) system specifications as an example:

System Specifications:

1. Receiver sensitivity (indicated) = -90 dBm
2. The antenna factor at 45.50 MHz = 25 dB
3. The cable loss at 45.50 MHz = 2 dB

By performing the following steps the measurement system's plane-wave equivalent sensitivity, in dBµ V/m, would be:

Step 1. First, converting the indicated receiver sensitivity level from a power (dBm) to an equivalent voltage (dBµV), assume a 50Ω system, would yield:

$$\mathbf{S_R = -90\ dBm + 107\ dB = 17\ dB\mu V}$$

Step 2. Correcting for cable losses and antenna factors, the system sensitivity (S_e) would be:

$$\mathbf{S_e = 17\ dB\mu V + 25\ dB/m + 2\ dB = 44.0\ dB\mu V/m}$$

Step 3. By taking the antilog of the sensitivity level calculated in step 2, the equivalent, or effective, plane-wave electric field strength sensitivity (S_e) in µV/m will be:

$$\mathbf{S_e = 44.0\ dB\mu V/m = 10^{(44.0 dB\mu V/m/20)} = 158.49\ \mu V/m}$$

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THE RECEIVER, PRE-AMPLIFIER, AND ANTENNA SYSTEM SENSITIVITY

Now that the sensitivity of a receiver system with just an antenna has been defined, the sensitivity of a measurement system *including a pre-amplifier* will be explained -- *without the use of antenna factors*. This will be slightly more complicated than a measurement system containing only a receiver and an antenna.

Again, the system's sensitivity will be defined as the minimum ambient signal level, power density, or field strength that the system can detect or measure referenced at the receive antenna.

To determine the overall system sensitivity the total system's noise factor must be calculated using the noise factors of each active device within the system. If the manufacturer of each device has not specified these parameters they can be measured and/or calculated.

To calculate the system noise factor the following equation is used when a preamplifier is included in the measurement system:

$$NF_S = NF_1 + ((NF_2-1)/G))$$

where,

NF_s = noise factor of the system
NF_1 = noise factor of the preamplifier
NF_2 = noise factor of the receiver
G = Gain of the Preamplifier (Power)

Because antenna factors will not be used, there are two other parameters that will be needed to complete the overall system sensitivity calculations, the *measurement frequency* must be defined and the antenna gain must be known. The frequency is important because the *effective capture area* (A_e) of the antenna must be known. This calculation is based on the equation $\lambda^2/4\pi$; Lambda (λ) being the emission wavelength specified in meters. The antenna gain is important because it obviously effects the system's sensitivity.

To make the system sensitivity calculations easier, logarithmic expressions will be used in most cases. Again, noise figures will be used to express noise factors in logarithmic form.

The system sensitivity (S_e) of the measurement system can be calculated using the following:

$$S_e = N_{fig}-174^{*}+B_r-A_e \ (dBW/m^2)$$

where,

N_{fig} = system noise figure (dB)
B_R = receiver bandwidth, in Hertz (dB)
A_e = antenna effective capture area (dB)
* = 10 $\log_{10}$ Boltzman's Constant x 290 °K + 30 dB

As an example, the following will demonstrate how to calculate the system's sensitivity (S_e) using the following device parameters:

Device Parameters:

1. Receiver I-F Bandwidth = 9 kHz
2. Receiver Noise Figure = 15 dB
3. RF Preamplifier Power Gain = 26 dB
4. Preamplifier Noise Figure = 4.15 dB
5. Measurement Frequency = 635 MHz

First, the receiver sensitivity (S_R) is equal to:

$$S_R = 15+(-228.5)+24.6+39.5=-149.4 \ (dBW)$$
$$= \mathbf{-119.4 \ (dBm)}$$

(For convenience in later comparisons, *dBW* was converted to *dBm*. You will notice (later) the difference between the *receiver sensitivity* and the ambient *system's sensitivity*.)

Next, we must calculate the system noise figure (N_{fig}). This will be more complicated because we must obtain the answer in *logarithmic form* from calculations done in a *linear manner*:

1. NF_1 = 4.15 dB=$10^{(4.15/10)}$= **2.6**
2. NF_2 = 15 dB=$10^{(15/10)}$= **31.6**
3. G = 26 dB=$10^{(26/10)}$= **398**
4. NF_3=2.6+((31.6-1)/398)=**2.68**

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then,

$$N_{fig} = 10\log_{10} 2.68 = \mathbf{4.3\ dB}$$

The effective capture area of the antenna, A_e, will now be calculated as follows (for unity gain antenna):

1. λ= 300 m/s ÷ frequency (MHz)
   = 300 / 635 = **.47 meters**
2. $A_e = \lambda^2 / 4\pi$
   = .472 / (4 x 3.1415)
   = **.0176 meters^2**
   = 10 $\log_{10}$ .0176 = **-17.5 dB**

The receiver bandwidth (B_R) calculation will be:

1. B_R = 10 $\log_{10}$ Frequency (Hz)
2. B_R = 10 $\log_{10}$ 9000 Hz = **39.5 dB**

Finally, using equation $S_e = N_{fig}-174+B_r-A_e$, we can calculate the total system sensitivity. The system sensitivity (power density) will be:

$$S_e = 4.3-174+39.5-(-17.5) = \mathbf{-112.7\ dBm/m^2}$$

Now that the system sensitivity (S_e) is known, defined in power density units (dBm/m^2), it may be more useful to convert further to more commonly used units such as field strengths. Again, the units of measurement for field strengths are Volts per meter (V/m), or for convenience dBµV/m (decibel ratio of V/m referenced to 1 microvolt).

For ease in understanding, and for simplicity in calculating, it is recommended that unit changes be done by first converting power densities (dBm/m^2) to milliwatts per square centimeter (mW/cm^2), then converting to field strength units such as V/m or dBµV/m. In converting *power densities* to *field strengths* the following conversion factors will be helpful:

1. Units/**cm^2** (square centimeters) = units/**m^2** - 40 dB
2. Volts/meter (**V/m**) = Square Root (mW/**cm^2** x 3763.6Ω)

Using the above conversion factors (1 and 2), the equivalent field strength sensitivity would be:

1. -112.7 dBm/m^2 = -152.7 dBm/cm^2
2. -152.7 dBm/cm^2 = $10^{(-152.7dBm/10)}$ = 5.4 x 10^{-16} mW/cm^2
3. Square Root (5.4 x 10^{-16}mW/cm^2 x 3763.6Ω) = 1.4 x 10^{-6}V/m
4. 20$\log_{10}$1.4 x 10^{-6}V/m = **2.9dBµV/m**

Some additional helpful conversion factors for radiated measurement units are:

dBW/m^2 = dBV/m-25.8
dBW/m^2 = dBµV/m-145.8
dBm/m^2 = dBµV/m-115.8
dBm/cm^2 = dBµV/m-155.8
dBm/cm^2 = dBV/m-35.8
dBW/m^2 = dBm/m^2-30.0
dBW/m^2 = dBW/cm^2+40.0
dBW/m^2 = dBm/cm^2+10.0

The measurement system's sensitivity has now been calculated and defined. It is important to note, however, that the system may not be capable of measuring all ambient signal levels down to this level. As mentioned earlier, ambient noise levels may be higher than the measurement system sensitivity. This will result in the ambient noise levels masking potential measurements down to these levels.

These potential problems can be resolved with proper system pre-selection (RF input filtering) and receiver I-F bandwidth adjustments.

SUMMARY

In summary, designing or specifying receiver systems requires that each system be designed or specified for its particular application. Two important design parameters that must be addressed are the system's selectivity and its sensitivity. This can become demanding because measurement systems may be required to detect and measure radiated emissions comprised of narrow-band and/or wide-band signals, they may also be required to measure radiated signal strengths varying from very small to very large amplitude levels.

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Selectivity, the ability to tune (select) to a frequency or a band of frequencies, is primarily dependent on the particular tuner (receiver) selection in addition to any radio frequency (RF) input
filtering, called pre-selection. By filtering undesired input RF emissions, and with proper receiver intermediate-frequency (I-F) filter adjustments, it is possible to measure very low emission amplitudes present in frequency bands containing much higher amplitude emissions or noise levels. These filter selections will be based on the emission types being measured and on the ambient conditions under which the measurements are made.

Sensitivity, the lowest rf amplitude levels that a receiver system will be capable of measuring, is dependent on several variables. These variables are involved with specific antenna selections, receiver noise figures/factors, pre-amplifier gains and noise figures/factors (if used), and the system's filtering and cabling. If not properly planned, all these devices can detract from the overall system's performance.

The first step in designing or specifying a measurement system is to understand the actual measurement requirements. This should include the emission frequencies, their bandwidth's, and probable emission amplitude levels. This information will determine any required RF and I-F filtering and, in particular, the overall system's sensitivity needs.

The second step should be to calculate the total system parameters to include all the devices selected to be used in the measurement system. Any pre-selection required can usually be
accomplished using passive high-pass, low-pass, or band-pass filters. These types of filters can greatly assist in removing any undesired ambient noise or signals removed from the intended measurement frequency or frequency band of interest.

The RF filtering will primarily determine the "*carrier-to-noise ratio*" of the system. RF filtering will also prevent possible overloading to the system's pre-amplifier or to the receiver if a pre-amplifier is not used. Overloading, exceeding the maximum allowed input levels, to the system's pre-amplifier or receiver input levels can result in creating intermodulation products within these devices and may result in inaccurate measurement results.

The I-F filtering selection will primarily determine the "*signal-to-noise ratio*" within the receiver itself.

The overall system sensitivity will thus be dependent on the noise figure of the selected receiver, the noise figure and gain of the preamplifier (if used), the system cabling losses, and the gains of the selected antennas.

For high-gain systems, used for measuring low signal levels, extreme caution should be taken to ensure that the combination of the antenna gains and amplifier gains will not produce signal levels that exceed the maximum input levels allowed for the selected receiver. Again, because of the importance, saturating an amplifier or a receiver's input stage may create intermodulation products and may result in inaccurate measurements.

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APPENDIX J - REGION 21 700 MHz PLAN

This Appendix Contains

1. The Plan's reference for Pre-Assignment Rules

Note: The Region 21 Plan through this Appendix J adopts the recommendations advanced by the National Coordination Committee (NCC) through its Implementation Subcommittee. These recommendations are identified by the NCC document IM00039-20010510 as NCC Appendix O. NCC Appendix O becomes this Plan's Appendix J

REGION 21 - APPENDIX J

NPSTIC APPENDIX 0

APPENDIX O
SIMPLIFIED 700 MHZ PRE-ASSIGNMENT RULES RECOMMENDATION

APPENDIX O
Simplified 700 MHz Pre-assignment Rules Recommendation

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.

For co-channel assignments, the 40 dB 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 5 dB will be allowed to touch but not overlap the 40 dB contour of the system being evaluated. All contours are (50,50).

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

Discussion

The FCC limits the maximum field strength to 40 dB relative to 1 V/m (customarily denoted as 40 dB). 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 dB 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 dB corresponds to a signal of -92.7 dBm, received by a half-wavelength dipole ($\lambda/2$) 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.

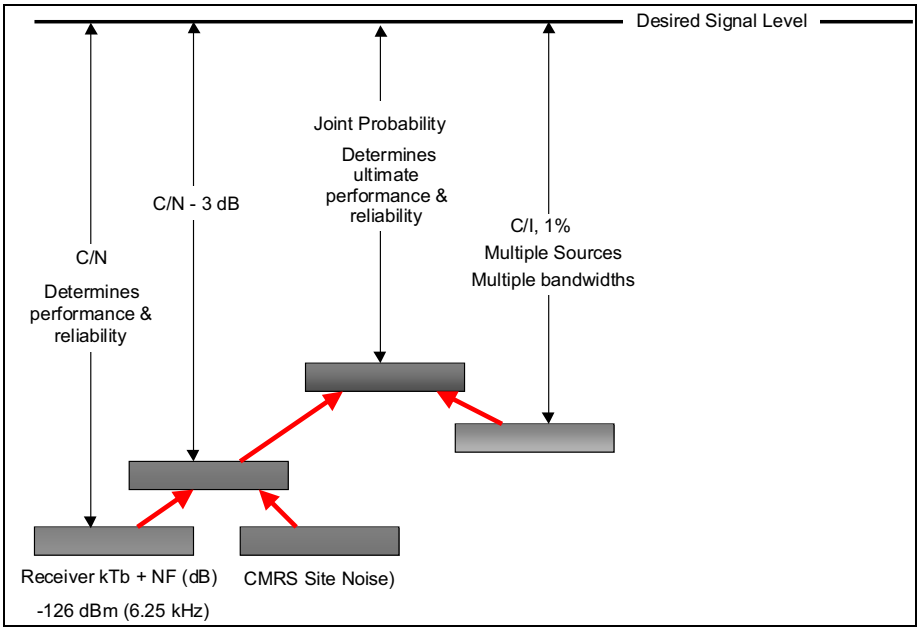


Figure 1 - Interfering Sources Create A "Noise" Level Influencing Reliability

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.[1]. 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 dB 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.

[1] See Appendix A for an explanation of how the 1% interference value is defined and derived.

Comparison of Joint Reliability for various configurations				
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				

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 dB must be able to fall outside the edge of the service area. From the analysis, recommendations of how far the 40 dB 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 dB 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)

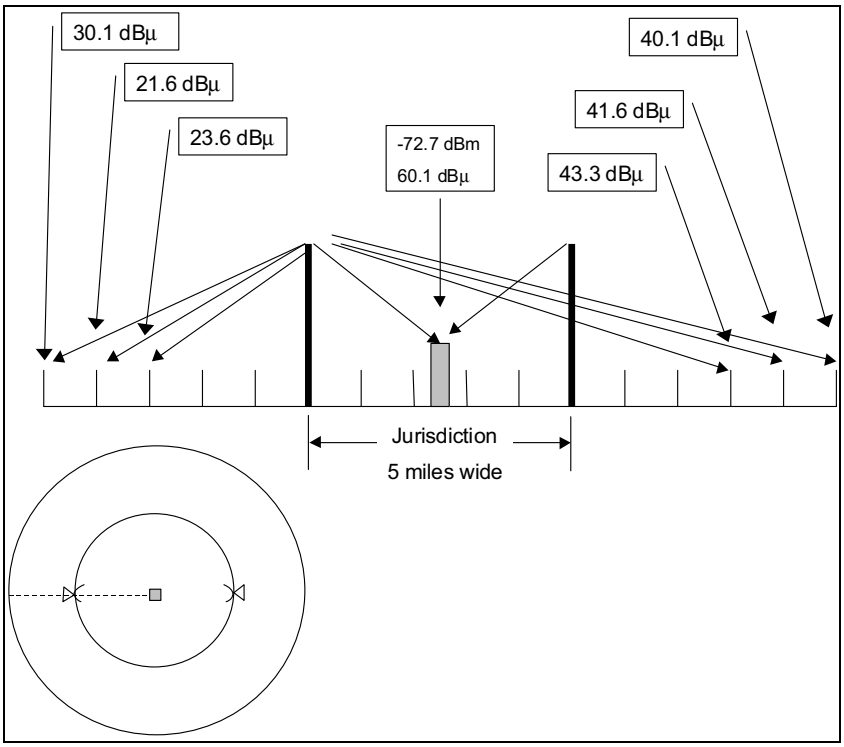


Figure 2 - Field Strength From Left Most Site.

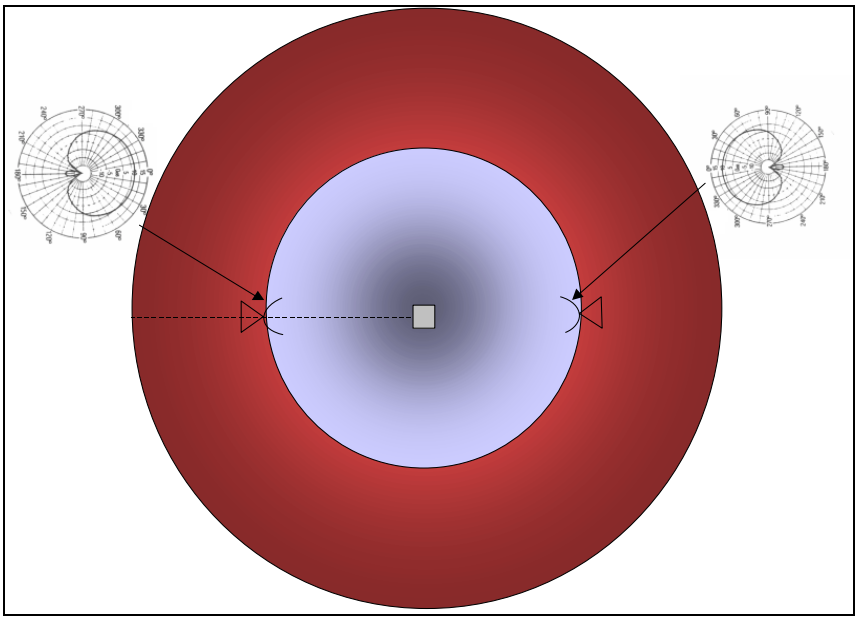


Figure 3 - Antenna Configuration Required To Limit Field Strength Off "Backside"

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 opriented toward the center of the service area (Figure 3). In this case, at 5 miles beyond the edge of the service area, the sites would produce a composite field strength of approximately 40 dB . 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 optomistic due to back scatter off local obstructions in urbanized areas. However, use of antennas on the sides of buildings can assist in achieving better F/B ratios and the initial planning is not precise enough to prohibit using the full 20 dB.

The use of a single site at the center of the service area is not normally practical. To provide the necessary signal strength at the edge of the service area would produce a field strength 5 miles beyond in excess of 44 dB . 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.

Downtilting of antennas to control the 40 dB 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.

Estimated Performance at 3.5 miles from each site				
Channel Bandwidth	6.25 kHz	12.5 kHz	12.5 kHz	25.0 kHz
Receiver Noise Floor (dBm)	-126.20	-126.20	-124.50	-118.50
Signal at 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%

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

Estimated Performance at 5.0 miles from each site				
Channel Bandwidth	6.25 kHz	12.5 kHz	12.5 kHz	25.0 kHz
Receiver Noise Floor (dBm)	-126.20	-126.20	-124.50	-118.50
Signal at 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%

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 (dB)	20 dB F/B (dB)
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 surbanized 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 dB Field Strength

The 40 dB can then be constructed based on the defined service area without having to perform an actual prediction. Since the 40 dB 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 dB (50,50) to extend beyond the edge of the defined service area by the distance indicated in Table 6.
- Allow the Interfering 5 dB (50,50) to intercept but not overlap the 40 dB contour.

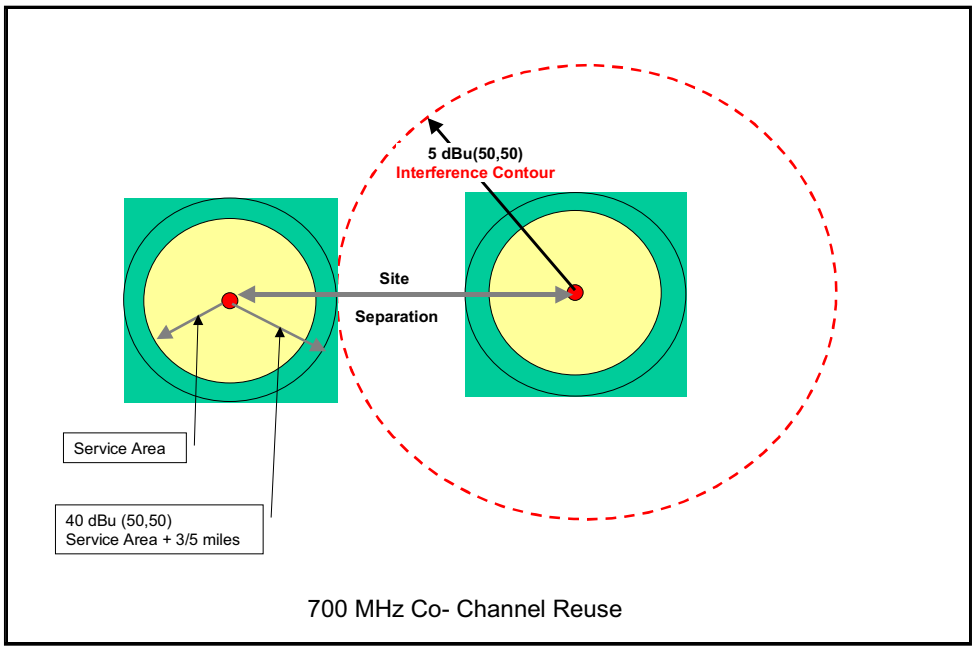


Figure 4 - Co-Channel Reuse Criterion

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 spacings, as the typical receiver filter is less than the channel bandwidth.

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 spacings as the noise is rapidly falling off. At greater spacings, 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 dB 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.

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.

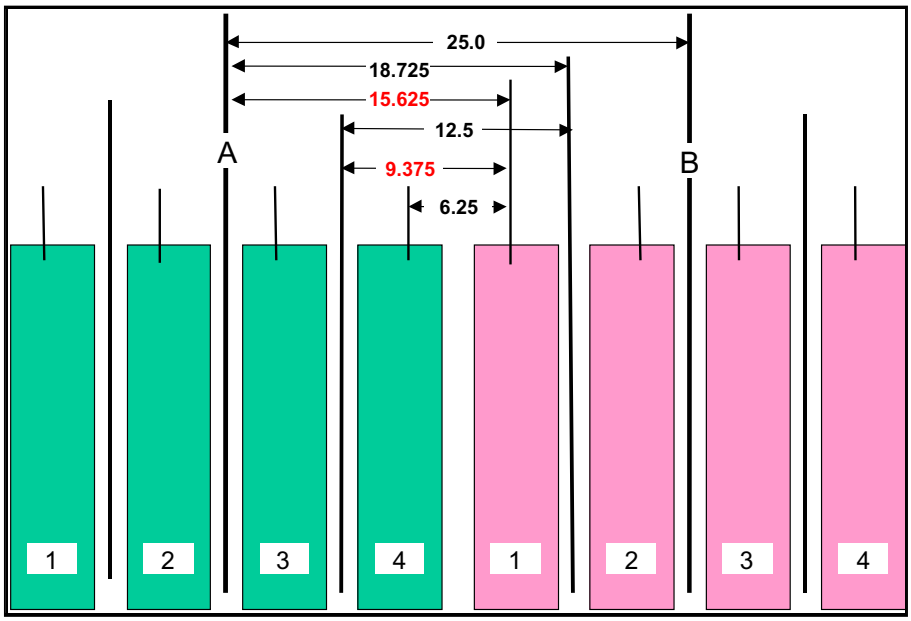


Figure 5, Potential Frequency Separations

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 dB contour, 60 dB .

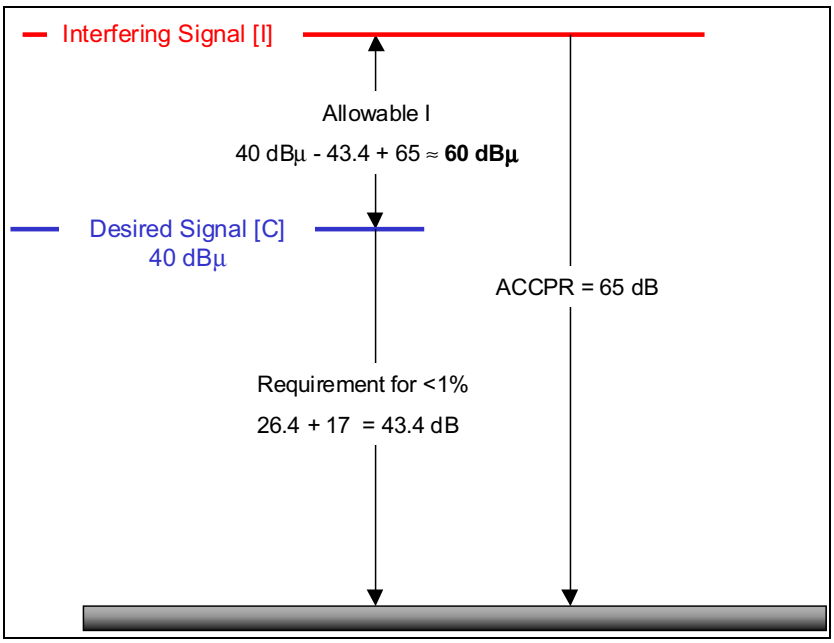


Figure 6 - Adjusted Adjacent 25 kHz Channel Interfering Contour Value

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

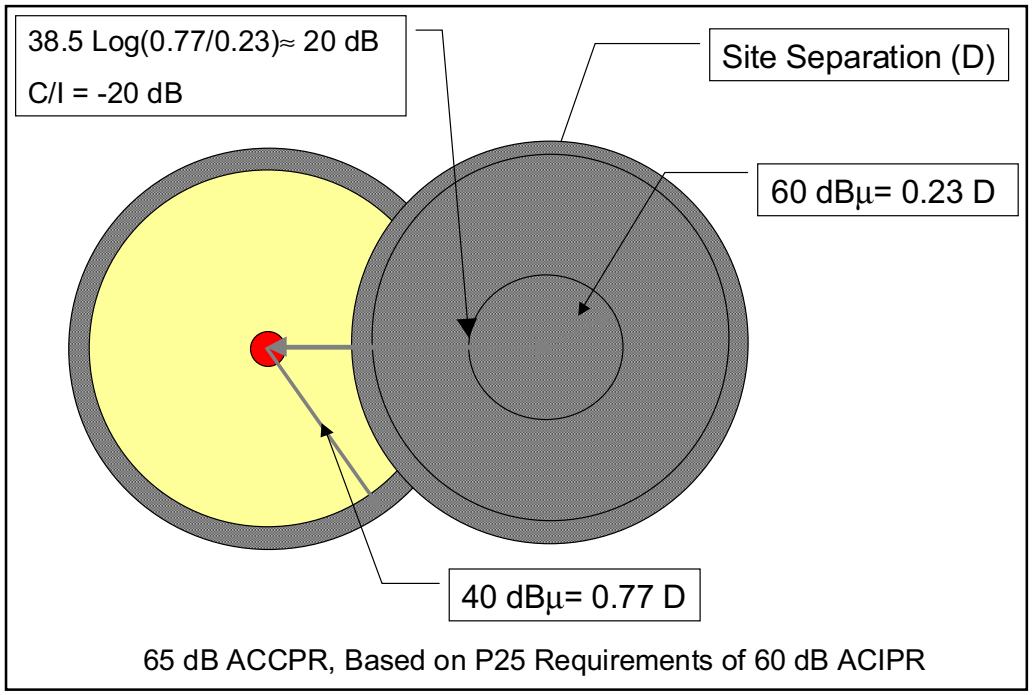


Figure 7 - Example Of Adjacent/Alternate Overlap Criterion

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

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

In those cases, evaluation of base to base as well as mobile to mobile interference should be considered and evaluated.

Appendix A

Carrier to Interference Requirements

There are two different ways that Interference is considered.

- Co Channel
- Adjacent and Alternate Channels

Both involve using a C/I ratio. The C/I ratio requires a probability be assigned. For example, 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.

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

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, $Z = 1.28$.

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

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

Location Standard Deviation ( ) 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

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

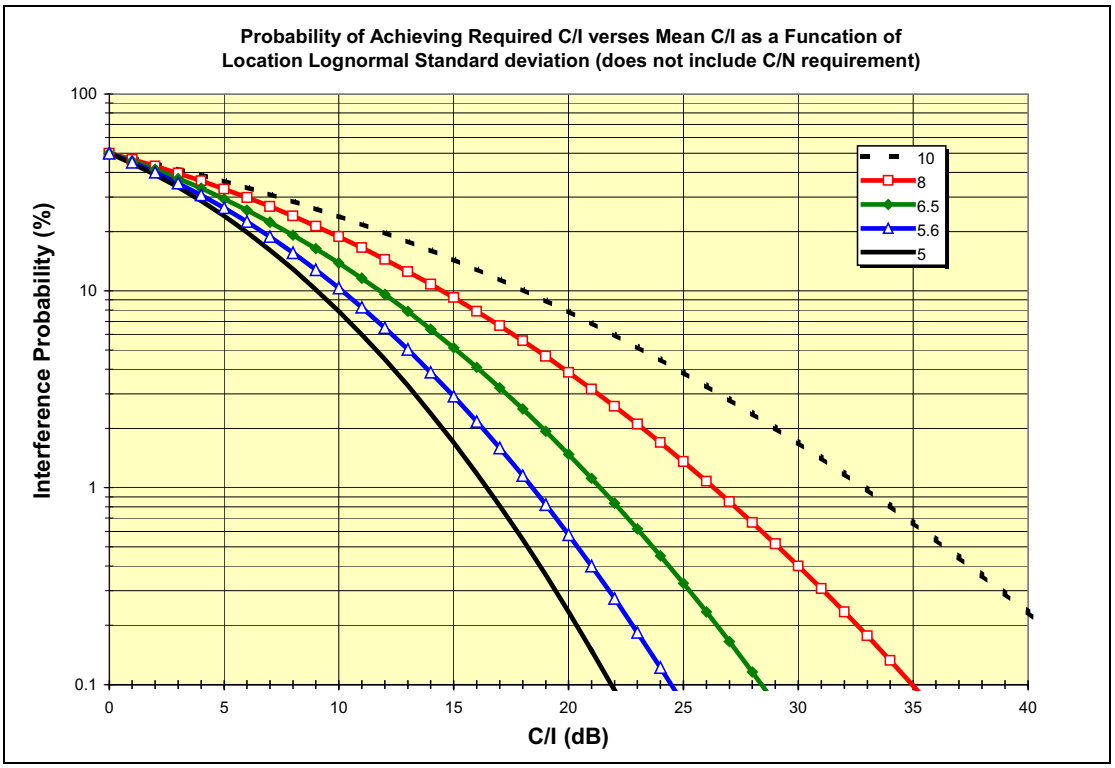


Figure A1, Probability Of Achieving Required C/I As A Function Of Location Standard Deviation

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

The 8 dB value for lognormal location standard deviation is reasonable when little information is available. Later when a detailed design is required, additional details and high-resolution terrain and land usage databases will allow a lower value to be used. The TIA recommended value is 5.6 dB. 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%

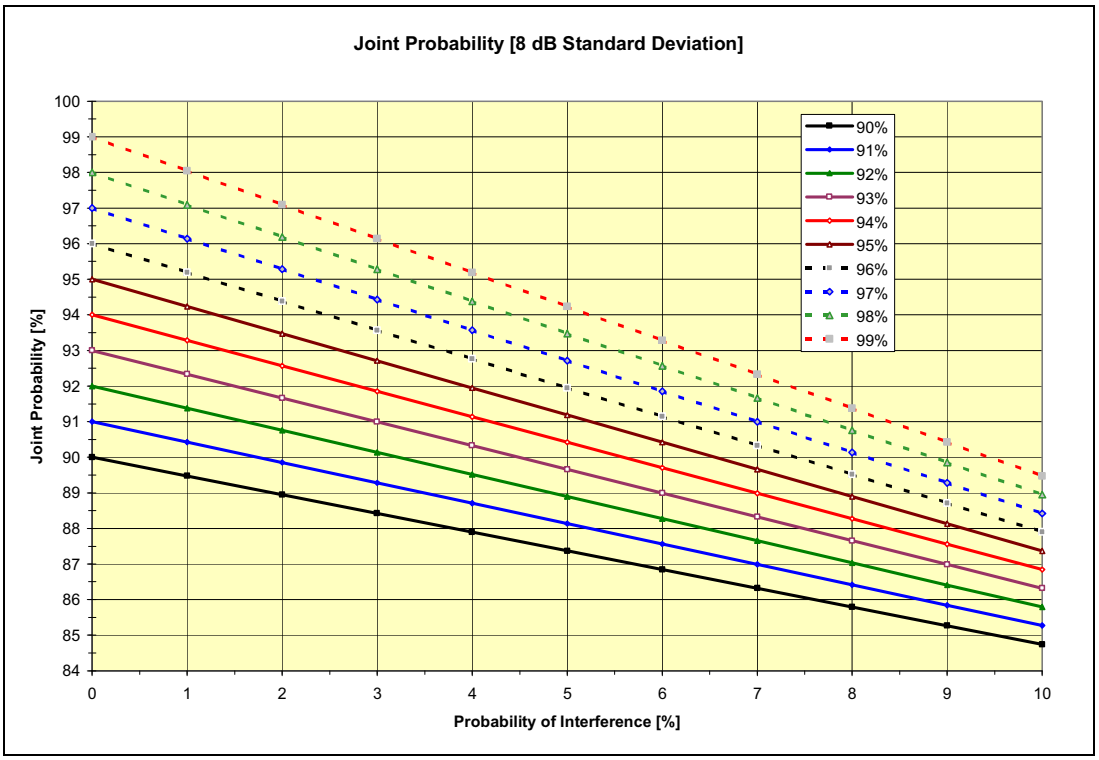


Figure A2 - Effect Of Joint Probability On The Composite Probability

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.

Return to list of Appendices

APPENDIX K - REGION 21 700 MHz PLAN

This Appendix Contains

1. The Plan's reference to a funding request form

Note: The Region 21 Plan through this Appendix K incorporates the National Coordination Committee (NCC) Implementation Subcommittee's Appendix L as the Region 21 Plan's Appendix K. NCC Appendix L is also identified as the NCC document IM00036-20010510

APPENDIX L
FUNDING REQUEST FORM

Invoice # 37009

Date:	
Host Organization:	
RPC Chair/Convener:	
State / Region #	
Phone:	
Address:	
City, State, Zip:	
Alternate Contact:	
Alt Phone:	
Fax:	

Charged to the National Law Enforcement and
Corrections Technology Center - Rocky Mountain
c/o The University of Denver 800-416-8086
2050 E. Iliff Ave. , Denver CO 80208

Amount Due: $2,500.00
Terms: Net 45

OPTION 1

Signature: _____

I am requesting PRELIMINARY FUNDING. I understand and agree to comply with authorized expenditure limitations. I agree to submit to the NLECTC an annual financial summary report specifying each area of expenditure until all such funds are depleted.

(OR)

OPTION 2

Signature: _____

I am requesting REIMBURSEMENT FUNDING. I understand and agree to comply with authorized expenditure limitations. I agree to submit to the NLECTC an accurate financial summary report specifying each area of expenditure requested for reimbursement.

APPENDIX L - REGION 21 700 MHz PLAN

This Appendix Contains

1. An indicator of the number of people directly affected by the Region 21 700 MHz Plan in the form of a summary of the population of the state of Michigan and its 83 counties.

2. A summary of the known value of property protected by public safety agencies within the state of Michigan (Region 21). The value stated does not account for public properties such as public highways, local roads, infrastructure such as publicly owned water, sewer and electrical transmission grids, public buildings such as court houses and city halls, nor other public properties such as libraries, parks and preserves.

Population for Counties in Michigan: 1990 and 2000

Note: Data not adjusted based on the Accuracy and Coverage Evaluation. For information on confidentiality protection, sampling error, nonsampling error, and definitions, see http://factfinder.census.gov/home/en/datanotes/expplu.html

Geographic area	Population		Population change, 1990 to 2000	
	2000	1990	Number	Percent
United States	281,421,906	248,709,873	32,712,033	13.2
Michigan	9,938,444	9,295,297	643,147	6.9
Alcona County	11,719	10,145	1,574	15.5
Alger County	9,862	8,972	890	9.9
Allegan County	105,665	90,509	15,156	16.7
Alpena County	31,314	30,605	709	2.3
Antrim County	23,110	18,185	4,925	27.1
Arenac County	17,269	14,931	2,338	15.7
Baraga County	8,746	7,954	792	10.0
Barry County	56,755	50,057	6,698	13.4
Bay County	110,157	111,723	-1,566	-1.4
Benzie County	15,998	12,200	3,798	31.1
Berrien County	162,453	161,378	1,075	0.7
Branch County	45,787	41,502	4,285	10.3
Calhoun County	137,985	135,982	2,003	1.5
Cass County	51,104	49,477	1,627	3.3
Charlevoix County	26,090	21,468	4,622	21.5
Cheboygan County	26,448	21,398	5,050	23.6
Chippewa County	38,543	34,604	3,939	11.4
Clare County	31,252	24,952	6,300	25.2
Clinton County	64,753	57,883	6,870	11.9
Crawford County	14,273	12,260	2,013	16.4
Delta County	38,520	37,780	740	2.0
Dickinson County	27,472	26,831	641	2.4
Eaton County	103,655	92,879	10,776	11.6
Emmet County	31,437	25,040	6,397	25.5
Genesee County	436,141	430,459	5,682	1.3
Gladwin County	26,023	21,896	4,127	18.8
Gogebic County	17,370	18,052	-682	-3.8
Grand Traverse County	77,654	64,273	13,381	20.8
Gratiot County	42,285	38,982	3,303	8.5
Hillsdale County	46,527	43,431	3,096	7.1
Houghton County	36,016	35,446	570	1.6
Huron County	36,079	34,951	1,128	3.2
Ingham County	279,320	281,912	-2,592	-0.9
Ionia County	61,518	57,024	4,494	7.9
Iosco County	27,339	30,209	-2,870	-9.5
Iron County	13,138	13,175	-37	-0.3
Isabella County	63,351	54,624	8,727	16.0
Jackson County	158,422	149,756	8,666	5.8
Kalamazoo County	238,603	223,411	15,192	6.8
Kalkaska County	16,571	13,497	3,074	22.8
Kent County	574,335	500,631	73,704	14.7
Keweenaw County	2,301	1,701	600	35.3
Lake County	11,333	8,583	2,750	32.0
Lapeer County	87,904	74,768	13,136	17.6
Leelanau County	21,119	16,527	4,592	27.8
Lenawee County	98,890	91,476	7,414	8.1
Livingston County	156,951	115,645	41,306	35.7
Luce County	7,024	5,763	1,261	21.9
Mackinac County	11,943	10,674	1,269	11.9

1990 census counts are as published in 1990 census reports and thus do not include any changes published subsequentially due to boundary changes or to the Count Question Resolution program.

Source: U.S. Census Bureau, Census 2000 Redistricting Data (P.L. 94-171) Summary File, Tabls PL1. and 1990 census.

Compiled by: Michigan Information Center.

Population for Counties in Michigan: 1990 and 2000

Note: Data not adjusted based on the Accuracy and Coverage Evaluation. For information on confidentiality protection, sampling error, nonsampling error, and definitions, see http://factfinder.census.gov/home/en/datanotes/expplu.html

Geographic area	Population		Population change, 1990 to 2000	
	2000	1990	Number	Percent
Macomb County	788,149	717,400	70,749	9.9
Manistee County	24,527	21,265	3,262	15.3
Marquette County	64,634	70,887	-6,253	-8.8
Mason County	28,274	25,537	2,737	10.7
Mecosta County	40,553	37,308	3,245	8.7
Menominee County	25,326	24,920	406	1.6
Midland County	82,874	75,651	7,223	9.5
Missaukee County	14,478	12,147	2,331	19.2
Monroe County	145,945	133,600	12,345	9.2
Montcalm County	61,266	53,059	8,207	15.5
Montmorency County	10,315	8,936	1,379	15.4
Muskegon County	170,200	158,983	11,217	7.1
Newaygo County	47,874	38,202	9,672	25.3
Oakland County	1,194,156	1,083,592	110,564	10.2
Oceana County	26,873	22,454	4,419	19.7
Ogemaw County	21,645	18,681	2,964	15.9
Ontonagon County	7,818	8,854	-1,036	-11.7
Osceola County	23,197	20,146	3,051	15.1
Oscoda County	9,418	7,842	1,576	20.1
Otsego County	23,301	17,957	5,344	29.8
Ottawa County	238,314	187,768	50,546	26.9
Presque Isle County	14,411	13,743	668	4.9
Roscommon County	25,469	19,776	5,693	28.8
Saginaw County	210,039	211,946	-1,907	-0.9
St. Clair County	164,235	145,607	18,628	12.8
St. Joseph County	62,422	58,913	3,509	6.0
Sanilac County	44,547	39,928	4,619	11.6
Schoolcraft County	8,903	8,302	601	7.2
Shiawassee County	71,687	69,770	1,917	2.7
Tuscola County	58,266	55,498	2,768	5.0
Van Buren County	76,263	70,060	6,203	8.9
Washtenaw County	322,895	282,937	39,958	14.1
Wayne County	2,061,162	2,111,687	-50,525	-2.4
Wexford County	30,484	26,360	4,124	15.6

1990 census counts are as published in 1990 census reports and thus do not include any changes published subsequentially due to boundary changes or to the Count Question Resolution program.

Source: U.S. Census Bureau, Census 2000 Redistricting Data (P.L. 94-171) Summary File, Tabls PL1, and 1990 census.

Compiled by: Michigan Information Center.

APPENDIX L - Market Value of Property Protected
Sources: State of Michigan Department of Treasury
Mich. DOT, Private Vendors, Public Records

2007 STATE TOTALS BY CLASS

REAL PROPERTY

CLASSIFICATION	ASSESSED VALUATION	STATE EQUALIZED VALUATION
Agricultural	$17,651,367,157	$17,651,875,255
Commercial	$62,008,144,737	$61,995,642,365
Industrial	$25,812,439,326	$25,813,944,908
Residential	$317,546,567,668	$317,605,998,910
Timber Cutover	$365,738,542	$366,013,213
Developmental	$648,117,644	$648,117,644
TOTAL REAL PROPERTY	$424,032,374,884	$424,083,591,295
TOTAL PERSONAL PROPERTY	$29,025,193,279	$29,025,118,279
TOTAL REAL and PERSONAL PROPERTY	$453,057,567,663	$453,108,709,574

Estimates of Additional Values protected

109,875 miles of paved county and city roadway @ $500,000 per lane mile
9,675 miles of major highway @ $900,000 per lane mile
86 Hospitals
533 City and Township Government Centers
83 County Court Houses
13 Passenger Airports
Public Safety Telecommunications Infrastructure
TOTAL (Approximately Thirty-Seven Billion Dollars)

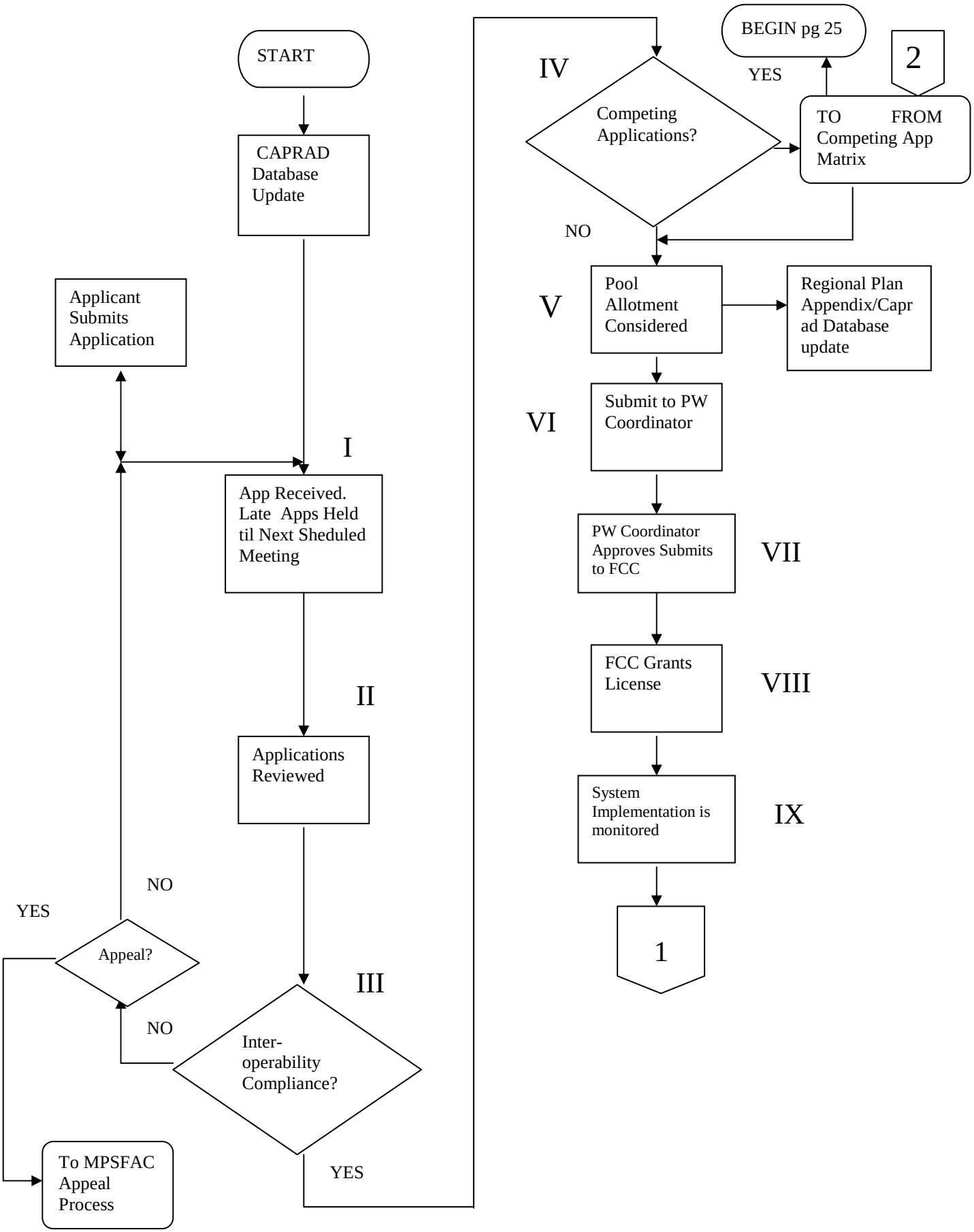
APPENDIX M - REGION 21 700 MHz PLAN

This Appendix Contains

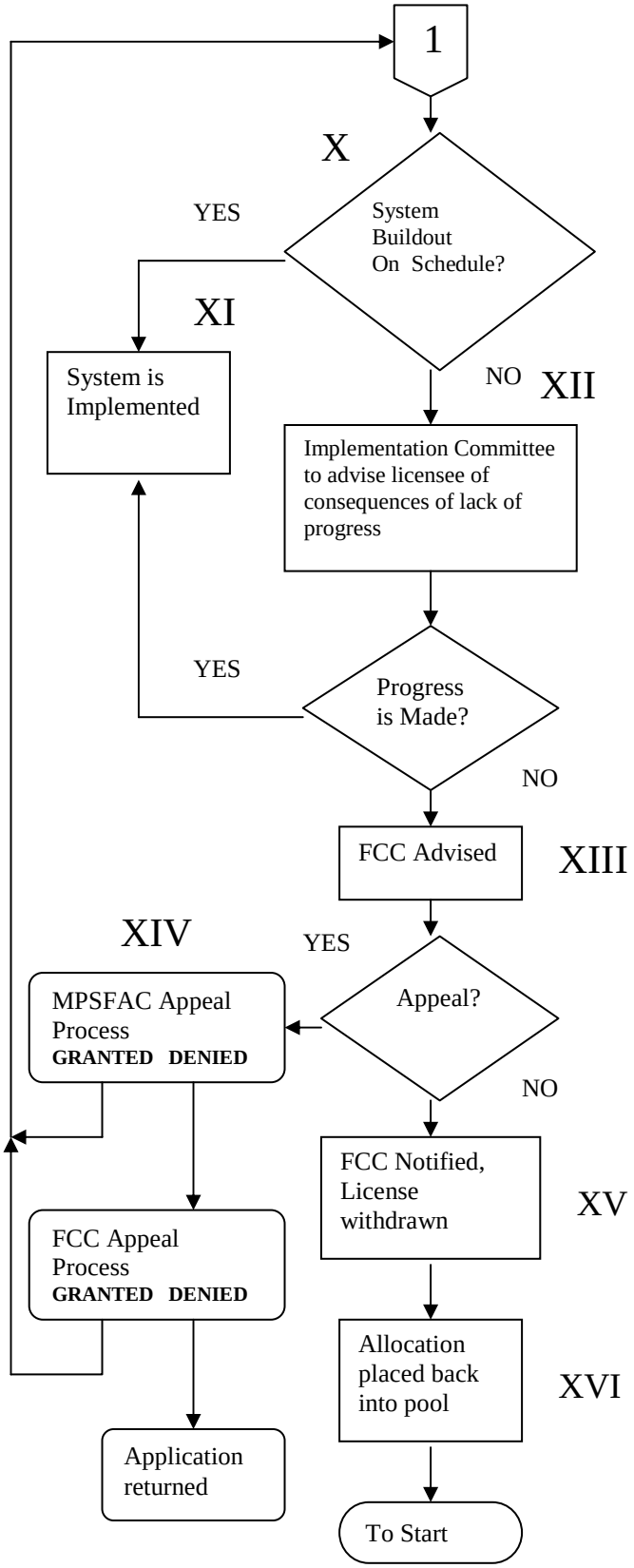
1. A matrix outlining this Plan’s application procedure

2. A matrix outlinging this Plan’s procedure when two or more applications compete for spectrum

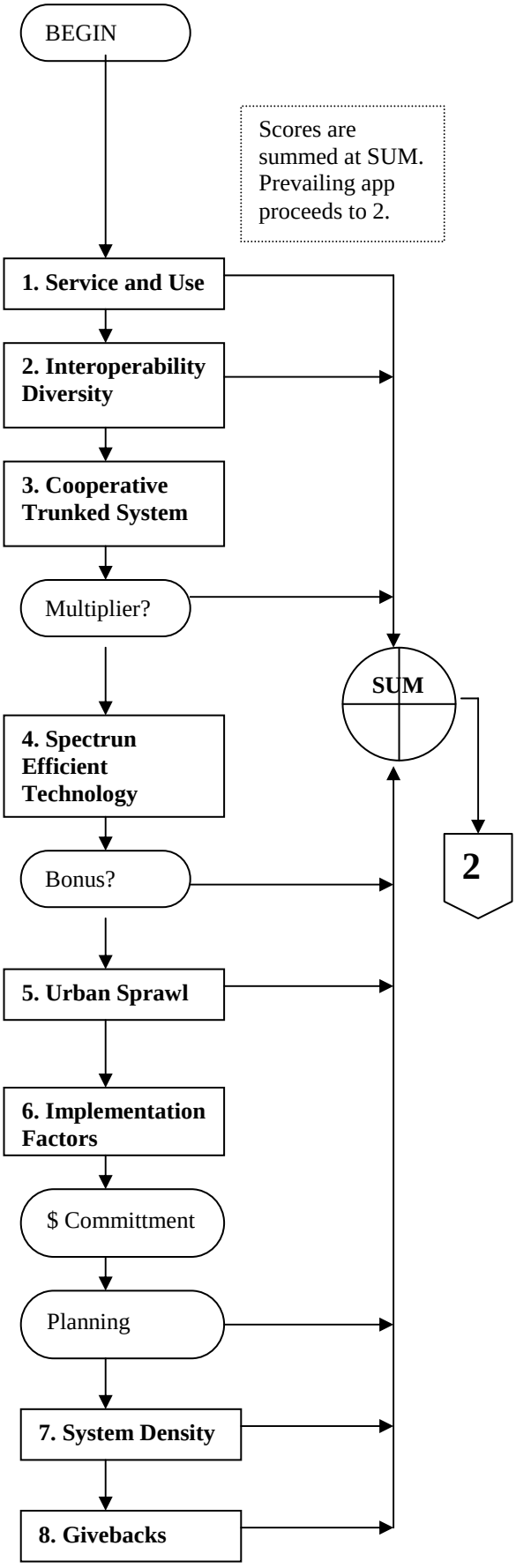
Application Submission and Approval Matrix



Application Submission and Approval, cont



Competing Application Matrix



APPENDIX N - REGION 21 700 MHz PLAN

This Appendix Contains

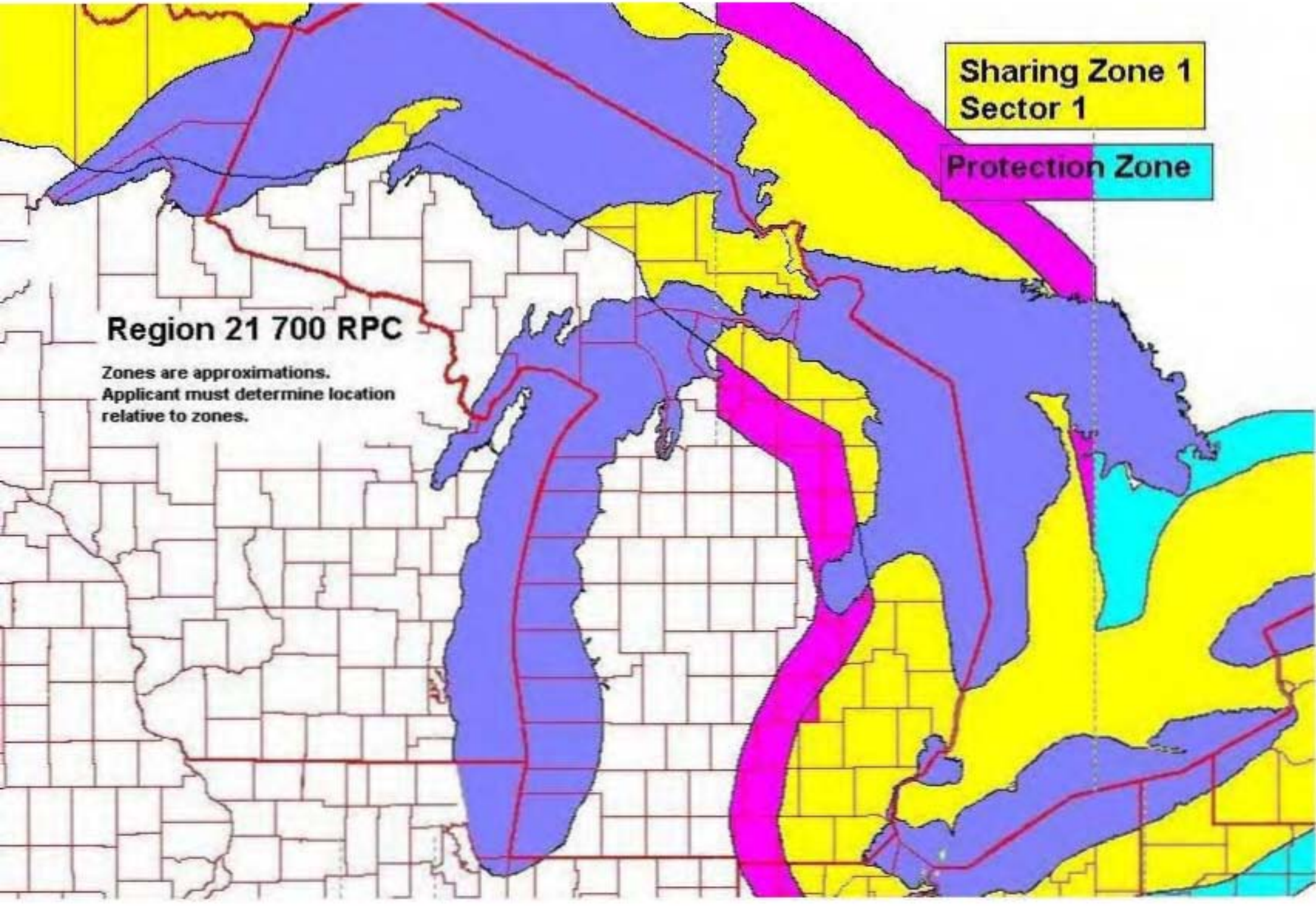
1. Spectrum allotment criteria in the form of a matrix outlining channel assignments by county along with relevant channel width and channel usage

2. A map illustrating international border regions relevant to spectrum allotment within this plan

Appendix N
Spectrum Allotment

Canada/US Border Sharing Zone 1 Sector 1 Channels Highlighted in Red. Channels in Protection Zone Highlighted in Blue.

See map and chart which follow


Sharing Zone 1
Sector 1
Protection Zone
Region 21 700 RPC
Zones are approximations.
Applicant must determine location
relative to zones.

Region 21 - Michigan
Allotments by FCC Channel

FCC Channel Notation	Bandwidth	Mobile Frequency	Base Frequency	County
13-16	25.00 KHz	799.087500 MHz	769.087500 MHz	Baraga Bay Cass Charlevoix Delta Ingham Mecosta St. Clair
17-20	25.00 KHz	799.112500 MHz	769.112500 MHz	Dickinson Gogebic Kent Keweenaw Leelanau Luce Mason Presque Isle Roscommon Wayne
41-44	25.00 KHz	799.262500 MHz	769.262500 MHz	Emmet Houghton Muskegon Ogemaw Saginaw Schoolcraft Washtenaw
45-48	25.00 KHz	799.287500 MHz	769.287500 MHz	Alpena Chippewa Grand Traverse Huron Kalamazoo Macomb Marquette Montcalm
49-52	25.00 KHz	799.312500 MHz	769.312500 MHz	Cheboygan Clare Genesee Iosco Ontonagon Ottawa
53-56	25.00 KHz	799.337500 MHz	769.337500 MHz	Antrim Berrien Calhoun Delta Gratiot Monroe Sanilac
57-60	25.00 KHz	799.362500 MHz	769.362500 MHz	Bay Dickinson Kent Luce Montmorency

81-84	25.00 KHz	799.512500 MHz	769.512500 MHz	Oakland Wexford Allegan Crawford Gogebic Ingham Isabella Keweenaw Mackinac St. Clair
85-88	25.00 KHz	799.537500 MHz	769.537500 MHz	Alpena Grand Traverse Marquette Oceana Saginaw Wayne
89-92	25.00 KHz	799.562500 MHz	769.562500 MHz	Chippewa Clare Iosco Jackson Lapeer Ottawa
93-96	25.00 KHz	799.587500 MHz	769.587500 MHz	Antrim Huron Kalamazoo Mason Menominee Monroe Shiawassee
97-100	25.00 KHz	799.612500 MHz	769.612500 MHz	Alger Cheboygan Houghton Kent Midland Oakland Wexford
121-124	25.00 KHz	799.762500 MHz	769.762500 MHz	Bay Crawford Delta Ingham Keweenaw Macomb Newaygo
125-128	25.00 KHz	799.787500 MHz	769.787500 MHz	Branch Dickinson Genesee Grand Traverse Isabella Luce Presque Isle
129-132	25.00 KHz	799.812500 MHz	769.812500 MHz	Cass Eaton Emmet Muskegon Ontonagon Roscommon Sanilac

133-136	25.00 KHz	799.837500 MHz	769.837500 MHz	Wayne Allegan Alpena Antrim Chippewa Lake Lenawee Marquette Saginaw
137-140	25.00 KHz	799.862500 MHz	769.862500 MHz	Calhoun Cheboygan Houghton Huron Missaukee Montcalm Oakland Schoolcraft
161-164	25.00 KHz	800.012500 MHz	770.012500 MHz	Bay Jackson Kalkaska Keweenaw Mackinac Macomb Newaygo
165-168	25.00 KHz	800.037500 MHz	770.037500 MHz	Genesee Iosco Isabella Kalamazoo Manistee Menominee Presque Isle
169-172	25.00 KHz	800.062500 MHz	770.062500 MHz	Emmet Hillsdale Iron Kent Luce Roscommon Wayne
173-176	25.00 KHz	800.087500 MHz	770.087500 MHz	Alcona Grand Traverse Ingham Mecosta Tuscola
177-180	25.00 KHz	800.112500 MHz	770.112500 MHz	Alger Berrien Branch Charlevoix Midland Oakland Ottawa
201-204	25.00 KHz	800.262500 MHz	770.262500 MHz	Allegan Chippewa Gratiot Huron Macomb Marquette Otsego

205-208	25.00 KHz	800.287500 MHz	770.287500 MHz	Calhoun Genesee Houghton Iosco Muskegon Wexford
209-212	25.00 KHz	800.312500 MHz	770.312500 MHz	Alpena Antrim Delta Gladwin Sanilac Van Buren Wayne
213-216	25.00 KHz	800.337500 MHz	770.337500 MHz	Gogebic Jackson Kent Missaukee Saginaw
217-220	25.00 KHz	800.362500 MHz	770.362500 MHz	Alcona Alger Baraga Benzie Charlevoix Isabella Oakland Oceana St. Joseph
241-244	25.00 KHz	800.512500 MHz	770.512500 MHz	Berrien Branch Huron Livingston Mackinac Marquette Mason Midland Otsego Ottawa
245-248	25.00 KHz	800.537500 MHz	770.537500 MHz	Clinton Grand Traverse Houghton Macomb Ogemaw
249-252	25.00 KHz	800.562500 MHz	770.562500 MHz	Alpena Bay Delta Emmet Kalamazoo Mecosta Washtenaw
253-256	25.00 KHz	800.587500 MHz	770.587500 MHz	Chippewa Genesee Iosco Iron Kent Manistee
257-260	25.00 KHz	800.612500 MHz	770.612500 MHz	Calhoun Cheboygan

				Gratiot Keweenaw Menominee Oceana Roscommon Sanilac Schoolcraft Wayne
281-284	25.00 KHz	800.762500 MHz	770.762500 MHz	Berrien Eaton Huron Mackinac Marquette Mason Midland Oakland Otsego Ottawa
285-288	25.00 KHz	800.787500 MHz	770.787500 MHz	Arenac Grand Traverse Houghton Montcalm
289-292	25.00 KHz	800.812500 MHz	770.812500 MHz	Alger Crawford Kalamazoo Muskegon Saginaw Washtenaw
293-296	25.00 KHz	800.837500 MHz	770.837500 MHz	Chippewa Dickinson Gogebic Hillsdale Iosco Isabella Leelanau Macomb
297-300	25.00 KHz	800.862500 MHz	770.862500 MHz	Baraga Cass Delta Emmet Kent Livingston Manistee Roscommon Sanilac
321-324	25.00 KHz	801.012500 MHz	771.012500 MHz	Clare Clinton Huron Mackinac Ontonagon Otsego Ottawa Wayne
325-328	25.00 KHz	801.037500 MHz	771.037500 MHz	Alpena Bay Grand Traverse Jackson

				Keweenaw Oceana St. Clair Van Buren
329-332	25.00 KHz	801.062500 MHz	771.062500 MHz	Barry Genesee Luce Marquette Mecosta Ogemaw
333-336	25.00 KHz	801.087500 MHz	771.087500 MHz	Charlevoix Gratiot Macomb Missaukee St. Joseph
337-340	25.00 KHz	801.112500 MHz	771.112500 MHz	Dickinson Kent Mason Montmorency Washtenaw
341-344	25.00 KHz	801.137500 MHz	771.137500 MHz	Antrim Berrien Calhoun Chippewa Delta Isabella Lapeer
345-348	25.00 KHz	801.162500 MHz	771.162500 MHz	Iron Leelanau Lenawee Muskegon Oscoda Saginaw
349-352	25.00 KHz	801.187500 MHz	771.187500 MHz	Alger Arenac Cheboygan Kalamazoo Montcalm Oakland Wexford
353-356	25.00 KHz	801.212500 MHz	771.212500 MHz	Alcona Ingham Midland
357-360	25.00 KHz	801.237500 MHz	771.237500 MHz	Cass Houghton Newaygo Presque Isle Roscommon Schoolcraft Tuscola
361-364	25.00 KHz	801.262500 MHz	771.262500 MHz	Clinton Manistee Menominee Wayne
365-368	25.00 KHz	801.287500 MHz	771.287500 MHz	Alpena Jackson Kalkaska

				Mackinac Ottawa St. Clair
369-372	25.00 KHz	801.312500 MHz	771.312500 MHz	Barry Clare Genesee Gogebic Marquette Monroe
373-376	25.00 KHz	801.337500 MHz	771.337500 MHz	Branch Emmet Gratiot Iosco Lake Luce Macomb
377-380	25.00 KHz	801.362500 MHz	771.362500 MHz	Bay Crawford Dickinson Kent Keweenaw Washtenaw
381-384	25.00 KHz	801.387500 MHz	771.387500 MHz	Berrien Delta Eaton Grand Traverse Lapeer Mecosta
385-388	25.00 KHz	801.412500 MHz	771.412500 MHz	Allegan Chippewa Gladwin Livingston Montmorency Oceana
389-392	25.00 KHz	801.437500 MHz	771.437500 MHz	Alger Antrim Ionia Iron Lenawee Osceola Sanilac
393-396	25.00 KHz	801.462500 MHz	771.462500 MHz	Calhoun Leelanau Midland Oakland Oscoda
397-400	25.00 KHz	801.487500 MHz	771.487500 MHz	Arenac Cheboygan Newaygo Schoolcraft Shiawassee
401-404	25.00 KHz	801.512500 MHz	771.512500 MHz	Huron Kalamazoo Roscommon
405-408	25.00 KHz	801.537500 MHz	771.537500 MHz	Alcona Benzie Charlevoix

				Menominee Muskegon Ontonagon Saginaw Wayne
409-412	25.00 KHz	801.562500 MHz	771.562500 MHz	Ingham Isabella Kalkaska Presque Isle St. Clair Van Buren
413-416	25.00 KHz	801.587500 MHz	771.587500 MHz	Baraga Barry Emmet Genesee Iosco Luce Manistee
417-420	25.00 KHz	801.612500 MHz	771.612500 MHz	Bay Crawford Dickinson Gogebic Washtenaw
421-424	25.00 KHz	801.637500 MHz	771.637500 MHz	Clare Clinton Keweenaw Lapeer Ottawa St. Joseph
425-428	25.00 KHz	801.662500 MHz	771.662500 MHz	Lake Livingston Mackinac Marquette Otsego
429-432	25.00 KHz	801.687500 MHz	771.687500 MHz	Grand Traverse Houghton Kent Lenawee Tuscola
433-436	25.00 KHz	801.712500 MHz	771.712500 MHz	Alger Alpena Calhoun Gladwin Oakland Oceana
437-440	25.00 KHz	801.737500 MHz	771.737500 MHz	Antrim Cass Iron Monroe Montcalm
441-444	25.00 KHz	796.762500 MHz	766.762500 MHz	Branch Chippewa Huron Montmorency Shiawassee Wexford
445-448	25.00 KHz	801.787500 MHz	771.787500 MHz	Allegan

449-452	25.00 KHz	801.812500 MHz	771.812500 MHz	Arenac Charlevoix Macomb Mecosta Menominee Ontonagon Ingham Missaukee Muskegon Sanilac
453-456	25.00 KHz	801.837500 MHz	771.837500 MHz	Schoolcraft Genesee Iosco Isabella Kalamazoo Leelanau
457-460	25.00 KHz	801.862500 MHz	771.862500 MHz	Presque Isle Bay Berrien Dickinson Gogebic Newaygo
461-464	25.00 KHz	801.887500 MHz	771.887500 MHz	St. Clair Washtenaw Baraga Benzie Emmet Ionia Luce Roscommon
465-468	25.00 KHz	801.912500 MHz	771.912500 MHz	St. Joseph Jackson Lapeer Mason Midland Ottawa
469-472	25.00 KHz	801.937500 MHz	771.937500 MHz	Barry Cheboygan Delta Grand Traverse Ogemaw Wayne
473-476	25.00 KHz	801.962500 MHz	771.962500 MHz	Alpena Houghton Lenawee Osceola Saginaw
477-480	25.00 KHz	801.987500 MHz	771.987500 MHz	Gladwin Kent Mackinac Manistee Marquette Oakland
481-484	25.00 KHz	802.012500 MHz	772.012500 MHz	Otsego Alcona Grand Traverse Keweenaw

				Mackinac Muskegon Saginaw Van Buren
485-488	25.00 KHz	802.037500 MHz	772.037500 MHz	Wayne Delta Eaton Isabella Lapeer Mason
489-492	25.00 KHz	802.062500 MHz	772.062500 MHz	Otsego Bay Houghton Kent Luce Missaukee
493-496	25.00 KHz	802.087500 MHz	772.087500 MHz	Monroe Benzie Iosco Kalamazoo Livingston Marquette
497-500	25.00 KHz	802.112500 MHz	772.112500 MHz	Mecosta Sanilac Cheboygan Gladwin Ionia Lenawee
501-504	25.00 KHz	802.137500 MHz	772.137500 MHz	Macomb Oceana Gogebic Ingham Oscoda Schoolcraft
505-508	25.00 KHz	802.162500 MHz	772.162500 MHz	St. Joseph Tuscola Wexford Baraga Chippewa Gratiot
509-512	25.00 KHz	802.187500 MHz	772.187500 MHz	Hillsdale Leelanau Menominee Oakland Ottawa Alpena
513-516	25.00 KHz	802.212500 MHz	772.212500 MHz	Barry Berrien Emmet Ontonagon Osceola Jackson
517-520	25.00 KHz	802.237500 MHz	772.237500 MHz	Montcalm Ogemaw St. Clair Alger Allegan

				Clare Genesee Montmorency
521-524	25.00 KHz	802.262500 MHz	772.262500 MHz	Arenac Iron Keweenaw Mackinac Manistee Muskegon Washtenaw
525-528	25.00 KHz	802.287500 MHz	772.287500 MHz	Delta Roscommon Shiawassee
529-532	25.00 KHz	802.312500 MHz	772.312500 MHz	Alcona Grand Traverse Kent Lapeer Monroe
533-536	25.00 KHz	802.337500 MHz	772.337500 MHz	Bay Charlevoix Lake Livingston Marquette Van Buren
537-540	25.00 KHz	802.362500 MHz	772.362500 MHz	Calhoun Houghton Isabella Kalkaska Luce Macomb Presque Isle
541-544	25.00 KHz	802.387500 MHz	772.387500 MHz	Benzie Clinton Dickinson Lenawee Newaygo Oscoda
545-548	25.00 KHz	802.412500 MHz	772.412500 MHz	Cheboygan Gogebic Huron Kalamazoo Missaukee Oakland Schoolcraft
549-552	25.00 KHz	802.437500 MHz	772.437500 MHz	Antrim Ingham Mason Menominee Midland Ottawa
553-556	25.00 KHz	802.462500 MHz	772.462500 MHz	Berrien Branch Emmet Ionia Tuscola Wayne Wexford

557-560	25.00 KHz	802.487500 MHz	772.487500 MHz	Alger Allegan Clare Montmorency St. Clair
561-564	25.00 KHz	802.512500 MHz	772.512500 MHz	Chippewa Iron Manistee Muskegon Ogemaw Saginaw St. Joseph Washtenaw
565-568	25.00 KHz	802.537500 MHz	772.537500 MHz	Delta Eaton Mecosta Otsego
569-572	25.00 KHz	802.562500 MHz	772.562500 MHz	Alpena Gladwin Grand Traverse Hillsdale Keweenaw Mackinac Oceana Sanilac Shiawassee
573-576	25.00 KHz	802.587500 MHz	772.587500 MHz	Crawford Marquette Montcalm Van Buren
577-580	25.00 KHz	802.612500 MHz	772.612500 MHz	Calhoun Houghton Lapeer Luce Osceola Presque Isle
581-584	25.00 KHz	802.637500 MHz	772.637500 MHz	Bay Charlevoix Kent Livingston
585-588	25.00 KHz	802.662500 MHz	772.662500 MHz	Baraga Clinton Huron Lake Leelanau Lenawee Macomb Oscoda Schoolcraft
589-592	25.00 KHz	802.687500 MHz	772.687500 MHz	Genesee Isabella Kalamazoo Kalkaska Menominee Ontonagon
593-596	25.00 KHz	802.712500 MHz	772.712500 MHz	Cheboygan Iosco

597-600	25.00 KHz	802.737500 MHz	772.737500 MHz	Jackson Newaygo Benzie Berrien Roscommon Tuscola Wayne
601-604	25.00 KHz	802.762500 MHz	772.762500 MHz	Alcona Alger Emmet Ingham Iron Mason Midland Ottawa St. Clair St. Joseph
605-608	25.00 KHz	802.787500 MHz	772.787500 MHz	Arenac Ionia Monroe Wexford
609-612	25.00 KHz	802.812500 MHz	772.812500 MHz	Allegan Alpena Antrim Chippewa Clare Dickinson Hillsdale Keweenaw Oakland Oceana
613-616	25.00 KHz	802.837500 MHz	772.837500 MHz	Cass Delta Manistee Montcalm Ogemaw Sanilac
617-620	25.00 KHz	802.862500 MHz	772.862500 MHz	Barry Gogebic Luce Osceola Otsego Saginaw Washtenaw
621-624	25.00 KHz	802.887500 MHz	772.887500 MHz	Gladwin Grand Traverse Lapeer Marquette Van Buren
625-628	25.00 KHz	802.912500 MHz	772.912500 MHz	Branch Houghton Huron Kent Livingston Montmorency Schoolcraft
629-632	25.00 KHz	802.937500 MHz	772.937500 MHz	Charlevoix

				Clinton Lake Lenawee Macomb
633-636	25.00 KHz	802.962500 MHz	772.962500 MHz	Baraga Genesee Iosco Isabella Kalamazoo Leelanau Mackinac Menominee
637-640	25.00 KHz	802.987500 MHz	772.987500 MHz	Bay Eaton Missaukee Muskegon Ontonagon Presque Isle Wayne
661-664	25.00 KHz	803.137500 MHz	773.137500 MHz	Benzie Cheboygan Gogebic Ingham Keweenaw Luce Mecosta Tuscola Van Buren
665-668	25.00 KHz	803.162500 MHz	773.162500 MHz	Kalkaska Kent Marquette Mason Midland Oakland
669-672	25.00 KHz	803.187500 MHz	773.187500 MHz	Alpena Calhoun Chippewa Houghton Osceola Sanilac
673-676	25.00 KHz	803.212500 MHz	773.212500 MHz	Berrien Delta Grand Traverse Ogemaw Ottawa Saginaw Washtenaw
677-680	25.00 KHz	803.237500 MHz	773.237500 MHz	Emmet Huron Kalamazoo Macomb Montcalm
701-704	25.00 KHz	803.387500 MHz	773.387500 MHz	Antrim Bay Eaton Gogebic Keweenaw

				Mecosta Menominee Wayne
705-708	25.00 KHz	803.412500 MHz	773.412500 MHz	Alger Baraga Cheboygan Iosco Kent Missaukee St. Clair
709-712	25.00 KHz	803.437500 MHz	773.437500 MHz	Alpena Benzie Chippewa Ingham Isabella Oceana Tuscola Van Buren
713-716	25.00 KHz	803.462500 MHz	773.462500 MHz	Delta Houghton Ionia Oakland
717-720	25.00 KHz	803.487500 MHz	773.487500 MHz	Dickinson Emmet Jackson Luce Ogemaw Ottawa Saginaw Wexford
741-744	25.00 KHz	803.637500 MHz	773.637500 MHz	Arenac Genesee Kalamazoo Leelanau Lenawee Marquette Osceola Presque Isle
745-748	25.00 KHz	803.662500 MHz	773.662500 MHz	Berrien Crawford Kent Keweenaw Midland Schoolcraft Wayne
749-752	25.00 KHz	803.687500 MHz	773.687500 MHz	Alcona Chippewa Grand Traverse Ingham Iron Mecosta Tuscola
753-756	25.00 KHz	803.712500 MHz	773.712500 MHz	Gladwin Ionia Mason Oakland Otsego

757-760	25.00 KHz	803.737500 MHz	773.737500 MHz	Alpena Baraga Calhoun Delta Monroe Muskegon Saginaw Wexford
781-784	25.00 KHz	803.887500 MHz	773.887500 MHz	Charlevoix Clare Genesee Houghton Iosco Manistee Ottawa
785-788	25.00 KHz	803.912500 MHz	773.912500 MHz	Kalamazoo Kalkaska Menominee Montcalm Presque Isle Wayne
789-792	25.00 KHz	803.937500 MHz	773.937500 MHz	Alger Arenac Eaton Emmet Iron Osceola St. Clair
793-796	25.00 KHz	803.962500 MHz	773.962500 MHz	Berrien Chippewa Crawford Kent Keweenaw Tuscola Washtenaw
797-800	25.00 KHz	803.987500 MHz	773.987500 MHz	Cheboygan Gladwin Grand Traverse Macomb Marquette Oceana Shiawassee
821-824	25.00 KHz	804.137500 MHz	774.137500 MHz	Hillsdale Huron Mackinac Manistee Midland Muskegon Oakland Otsego
825-828	25.00 KHz	804.162500 MHz	774.162500 MHz	Delta Houghton Ingham Leelanau Mecosta Ogemaw St. Joseph

829-832	25.00 KHz	804.187500 MHz	774.187500 MHz	Dickinson Emmet Gratiot Ottawa Sanilac Wayne Wexford
833-836	25.00 KHz	804.212500 MHz	774.212500 MHz	Baraga Chippewa Clare Genesee Iosco Kalamazoo Mason
837-840	25.00 KHz	804.237500 MHz	774.237500 MHz	Alger Alpena Bay Gogebic Grand Traverse Jackson Kent Keweenaw Macomb
861-864	25.00 KHz	804.387500 MHz	774.387500 MHz	Alcona Allegan Antrim Hillsdale Lake Mackinac Midland Oakland
865-868	25.00 KHz	804.412500 MHz	774.412500 MHz	Ingham Marquette Presque Isle Roscommon Tuscola
869-872	25.00 KHz	804.437500 MHz	774.437500 MHz	Charlevoix Gratiot Houghton Ottawa Wayne Wexford
873-876	25.00 KHz	804.462500 MHz	774.462500 MHz	Chippewa Genesee Kalamazoo Mecosta Ogemaw
877-880	25.00 KHz	804.487500 MHz	774.487500 MHz	Bay Berrien Cheboygan Grand Traverse Kent Macomb Menominee Schoolcraft
901-904	25.00 KHz	804.637500 MHz	774.637500 MHz	Allegan Keweenaw

				Leelanau Mackinac Monroe Osceola Oscoda Saginaw
905-908	25.00 KHz	804.662500 MHz	774.662500 MHz	Calhoun Huron Kalkaska Marquette Muskegon Oakland Presque Isle
909-912	25.00 KHz	804.687500 MHz	774.687500 MHz	Alcona Charlevoix Clare Gogebic Manistee Shiawassee Van Buren
913-916	25.00 KHz	804.712500 MHz	774.712500 MHz	Crawford Delta Montcalm Tuscola Washtenaw
917-920	25.00 KHz	804.737500 MHz	774.737500 MHz	Berrien Cheboygan Eaton Houghton Luce Macomb Midland Ottawa Wexford
941-944	25.00 KHz	804.887500 MHz	774.887500 MHz	Genesee Isabella Kalamazoo Oceana Ontonagon Otsego Schoolcraft
945-948	25.00 KHz	804.912500 MHz	774.912500 MHz	Alpena Bay Chippewa Grand Traverse Hillsdale Kent Marquette Wayne

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APPENDIX O - REGION 21 700 MHz PLAN

This Appendix Contains

1. A document for reference purposes which addresses spectrum management and other issues of importance with respect to the development of any 700 MHz Plan.

   Note: The referenced document is identified was produced by the New York State Technology Enterprise Corporation and presented to the National Public Safety Telecommunications Council (NPSTC) and is dated August 7, 2001

Contents

List of Figures

Introduction

The NYSTEC/SRC team is pleased to present this proposal to the National Public Safety Telecommunications Council (NPSTC). The purpose of the proposal is to illustrate the need for, and the issues relating to, the generation of initial 700-MHz general-pool frequency allotments. It outlines a proposed conceptual methodology for generating these pre-allotments, and identifies areas that may require further discussion with the stakeholders within the process. The NYSTEC/SRC team is uniquely qualified to address these issues through innovative approaches and the application of advanced modeling concepts and tools.

The New York State Technology Enterprise Corporation, NYSTEC[1], is a private not-for-profit technology-engineering company whose mission is to provide systems engineering and technical assistance to government clients on a wide range of information and communication technologies. NYSTEC prides itself on remaining independent from manufacturers and system integrators, which allows it to be an independent trusted partner for its clients. Since its founding in 1995, NYSTEC has developed proven skills in working in diverse, multi-agency environments at the state, local, and federal levels. NYSTEC has a strong focus on the public-safety land-mobile radio market and is well versed in radio propagation measurement and analysis as well as the regulatory aspects. NYSTEC has a staff of about 45 people and is headquartered in Rome, New York.

The other member of the team is NYSTEC's sister company, Syracuse Research Corporation (SRC)[2]. SRC is also a not-for-profit, independent R&D organization serving both government and industry since 1957. The unique expertise of SRC scientists and engineers lies in their ability to analyze complex technological problems and to develop innovative, practical solutions. SRC's approximately 340 staff members hold more than 100 advanced degrees in 40-plus technical disciplines. SRC is headquartered in North Syracuse NY and maintains 10 offices across the US to serve a wide range of federal agencies.

NYSTEC and SRC are affiliates of SRC Management, Inc. (SMI). SMI is a separate not-for-profit corporation that provides general and administrative support services and acts as a holding company for NYSTEC and SRC. The three corporations all share a common Board of Trustees and Corporate Officers, so they are tightly linked together enabling strong partnerships on projects.

As this proposal will discuss, the NYSTEC/SRC team recommends that NPSTC work towards the generation of nationwide geographic pre-allotments for the general-use 700-MHz public-safety spectrum and that these allotments be used to populate the NPSTC pre-coordination database. NYSTEC/SRC have gone through considerable review of this proposed effort with the NPSTC Database Subcommittee, and the methodologies proposed herein reflect the consensus of the subcommittee in regards to this undertaking.

[1] More information can be found at the Web site http://www.nystec.com
[2] More information can be found at the Web site http://www.syrres.com

Pre-Allotment of 700-MHz Spectrum

The 700-MHz spectrum has never before been available for use by land-mobile radio operations. Because of this, it offers many exciting possibilities for creating new paradigms in the way that it is allotted, and used. In particular, the use of more detailed models within the pre-allotment and regulatory realms could allow for a higher level of spectral efficiency than has previously been achievable.

Regulatory and Rule-making procedures for the 700-MHz Public Safety Narrowband spectrum are drawing near completion. Once these processes are completed, many areas of the country will be able to make immediate use of the 700-MHz spectrum (pending equipment availability). In addition to this, state-wide reserve allocations of this spectrum might be made available for licensing later this year. Because of these factors, there is a genuine need for pre-allotment of the spectrum, especially for frequency coordination and Regional Planning purposes. Pre-allotment produces "pools" of channels that may be used in a given area. As actual application data is received from Regional Planning Committees, the process can be run again to re-optimize the "pool" allotments that would remain available within a Planning Region.

The Need for Pre-Allotment

NPSTC has made a pre-allotment database available to all authorized frequency coordinators for the new 700-MHz narrowband public-safety spectrum. In order to maximize the utility of NPSTC's pre-coordination database, and to effectuate its use within frequency coordination and regional planning, it is imperative to completely populate the database as soon as possible. In order to accomplish this, it will be necessary to perform the allotments on a national basis.

This database is in its final stages of acceptance — from both NPSTC and its intended user base — and therefore is nearly ready to be populated with initial "pool" allotments. It was anticipated that the allotments would be provided over time on a regional basis — but with input required from around 55 individual regional planning committees. NYSTEC/SRC propose that the allotments be developed all at once, on a national basis, and without the need for massive collaborative efforts from the individual regional committees – many of which have not yet formed. However, NYSTEC/SRC also propose that actual allotment application data from those 700 MHz Regional Planning committees, which have already been formed, should be solicited early in the pre-allotment process.

Pre-Allotment Boundaries

In general, the geographical structure of the 700-MHz Regional Planning Committees (RPCs) will be based upon state borders, and will be similar to the structure shown in Figure 1 (depicting the 800-MHz National Public Safety Planning boundaries). Note that some large states are broken into multiple regions.

Site-specific parameters are generally not available during the pre-allotment process. However, the spectrum must be allotted based upon some type of bounded area. An obvious choice (and with precedent set from past processes) is to allot the spectrum based upon county-type boundaries. It is the recommendation of the NYSTEC/SRC team that the 700-MHz narrowband spectrum be pre-allotted according to these boundaries — especially since *most* public-safety usage falls naturally into these subdivisions. A map of the suggested county-type divisions is shown as Figure 2. Note that, while the figure mainly depicts county boundaries, many cities that are not incorporated within counties are also depicted. These will be treated as their own individual allocable areas.

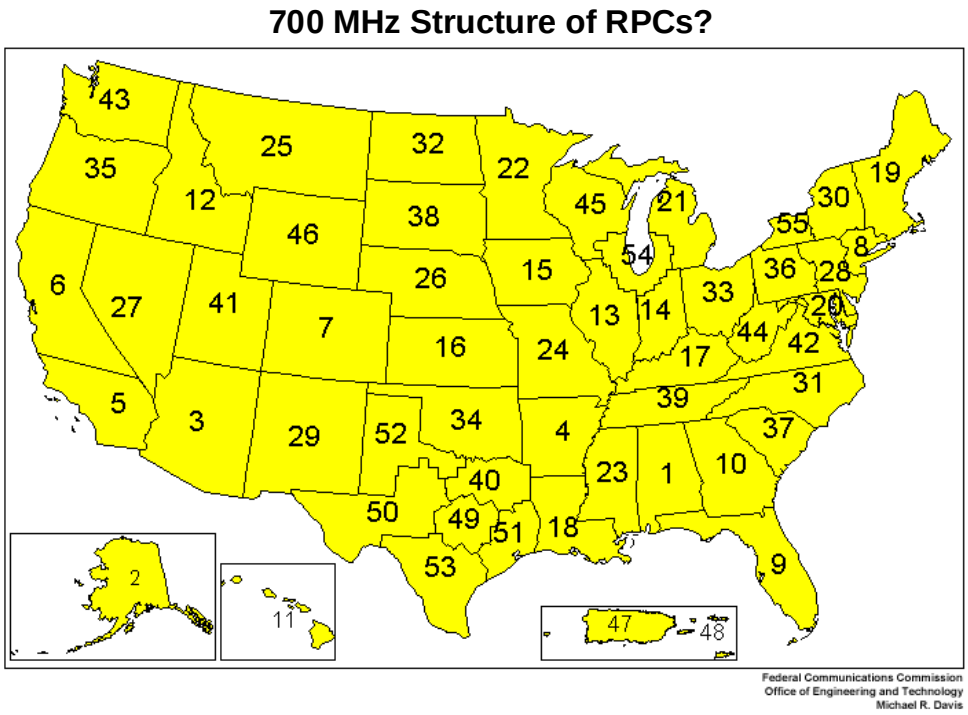


Figure 1, Regional Boundaries

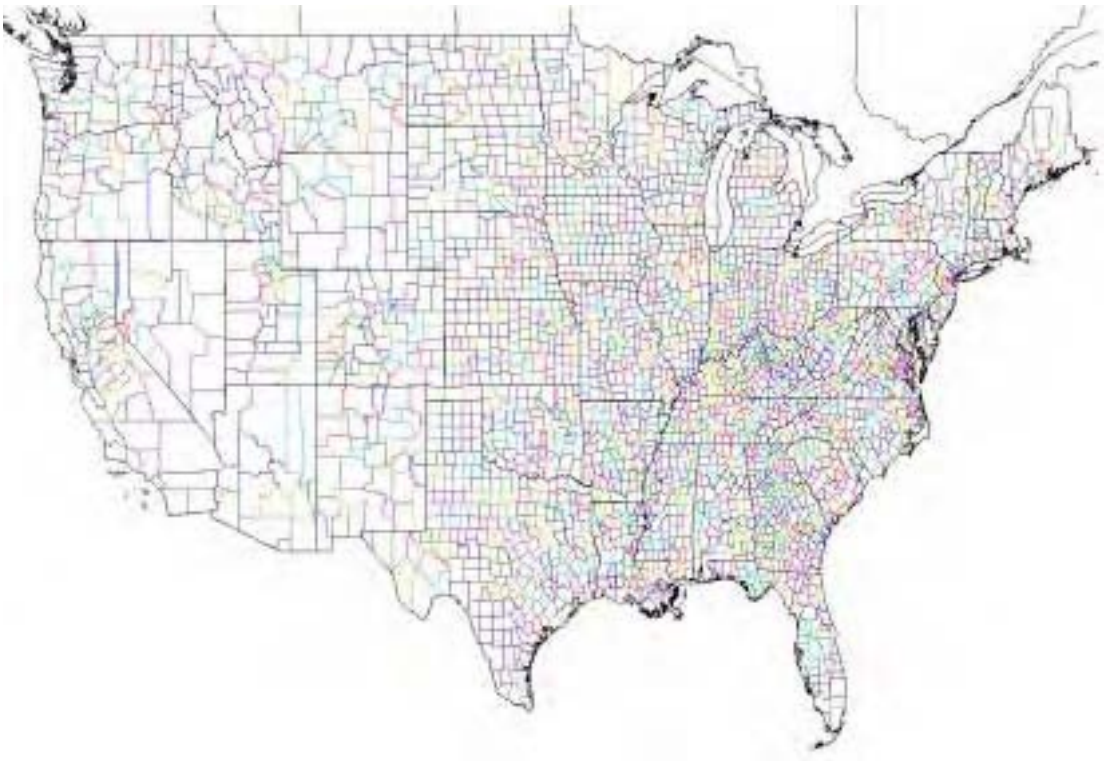


Figure 2, County and Large Municipal Boundaries

Proposed Methodology

It should again be stressed that the opportunity exists for implementing more detailed models and processes when allocating the spectrum. This allows for a higher level of spectral efficiency than has been possible in past efforts of this nature.

Spectral Needs Assessment

Based upon discussions with the NPSTC database subcommittee, it has been decided that each indicated county/area receive some minimum allotment (e.g., three 25 kHz channel pairs for voice, and one 25 kHz channel pair for data - see Allotted Bandwidth Section on pages 8-9), regardless of aggregate capacity needs. Beyond this, the pre-allotment process will provide additional spectrum based upon some measure of individual capacity needs. In the past, this additional capacity assessment was based solely on population. This proposal recommends that the past approach be modified.

In the NYSTEC/SRC team's analysis of public-safety capacity needs within New York, it was found that these needs varied tremendously across the State. It was clear that there was a strong correlation between population and public-safety capacity needs. However, it was also found that, when only considering county populations, a large number of public-safety and public service users were not accurately represented in the rural areas. This is illustrated in Figure 3.

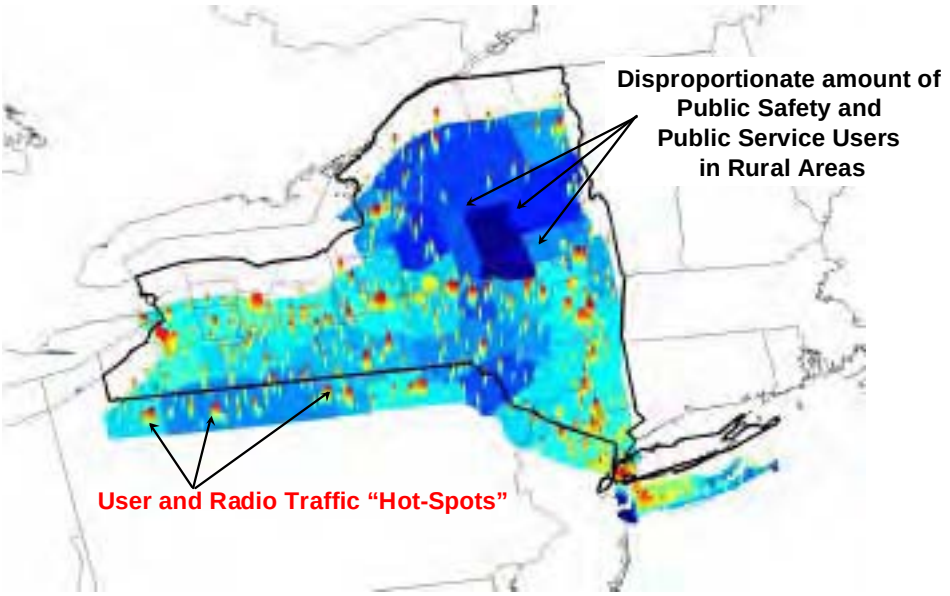


Figure 3, Distribution of Spectral Needs

The NYSTEC/SRC team proposes an approach similar to PSWAC's approach, in which both population and population-density are used to predict the total number of public-safety users within a specific area to be allotted spectrum. The most recent population data available will be used, and can be projected out to a future date (such as 2010). Modifications to PSWAC's models will need to be incorporated — since the original models incorporated little data from rural areas. This algorithm would be submitted for approval to NPSTC. In addition to this, a statewide law-enforcement component must also be integrated into the models. Similar models, developed by SRC/NYSTEC, are shown in Figure 4.

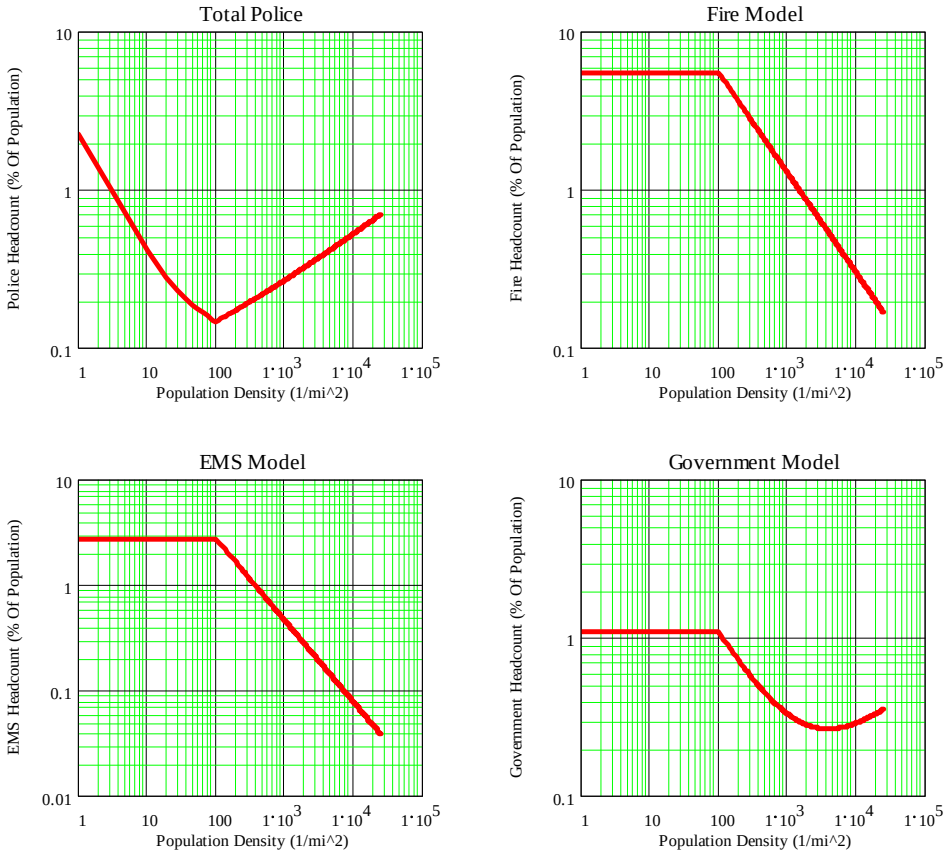


Figure 4, Modified PSWAC User Density Models

Once public-safety and public service user populations are projected for a given area, they will be used to distribute the spectrum pre-allotments, normalized by the total amount of available spectrum (with reuse), and by the total national public-safety user projections.

It should be noted that more detail could be included in the capacity-assessment models by applying service-based usage and voice/data penetration levels to the projected user group populations. By using service-group-based models in summing the resulting Erlang loads, estimates of aggregate capacity needs can created for all of the various user groups. These will then provide Erlang load projections that could be incorporated with traffic models[3] to estimate channel needs.[4] After this process, similar normalization methods would be applied.

Service Area Evaluation and Interference Prediction

It is clear that accurate modeling of coverage and interference effects allows for tighter site/frequency "packing" and greater spectral efficiency. Again, since this frequency band is a new allocation, the ability exists to utilize more accurate methods of assessing these effects during the pre-allotment stages of spectrum planning and plan development. The NYSTEC/SRC team has experience in developing innovative techniques for spectral assignment processes, and continues to work with Telecommunications Industry Association (TIA) TR-8.18's working groups in developing the next generation of coverage- and interference-assessment methodologies.

For the 700 MHz pre-allotments, the service area/contour for each of the counties will be represented by a bounding polygon that extends beyond the county border by 3 to 5 miles. This actual

[3] For example, Erlang-C, or extended-Erlang-B for trunked networks, Erlang-B or Engset/Molina for conventional networks.

[4] This process was followed in New York State, and culminated in the generation of a statewide 250x250-meter resolution traffic-density/capacity grid. Details available upon request.

distance from the county border can be a uniform decision, affecting all service areas, or can be individually based upon population-density metrics (TIA recommendations call for 3 miles for rural areas and 5 miles for urban areas).

There are several possibilities for generating the interference contour(s), all utilizing some measures of local terrain characteristics. From Figure 5 it is apparent that there is a tremendous variance in terrain roughness in the US (Northwest US shown). It is also clear that utilization of terrain features allows for a much more accurate representation of signal propagation and interference prediction, especially when compared to simple "rule-of-thumb" reuse distances.

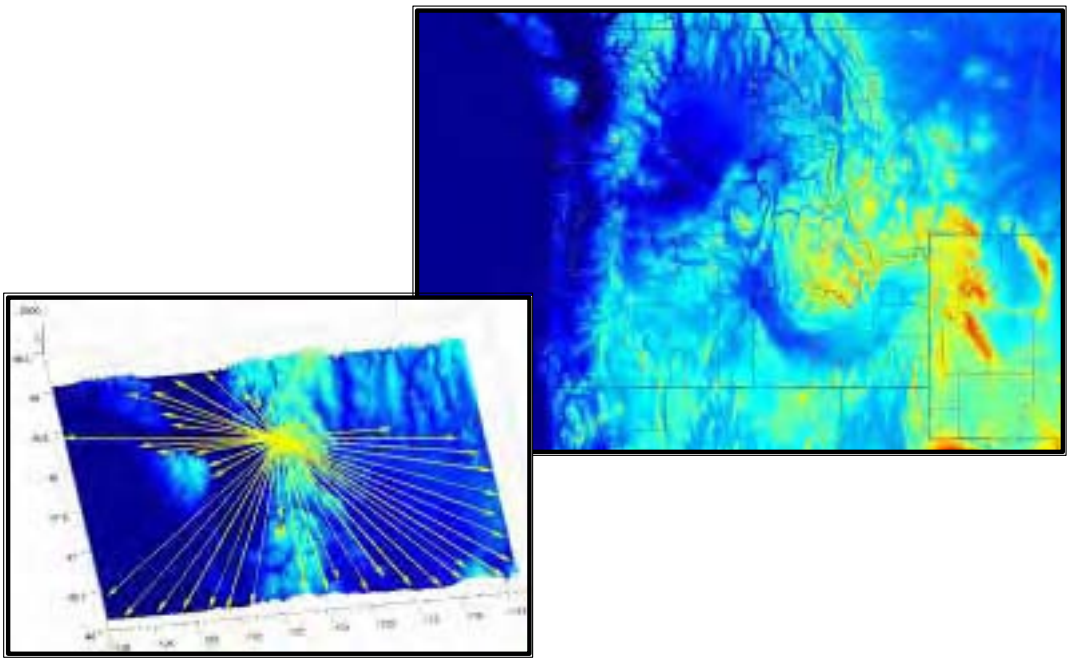


Figure 5, National Terrain Variance and Increased Accuracy through the use of Terrain Features

With no site-specific information available, several options are possible for predicting frequency reuse parameters. An example, shown in Figure 6, places a site location at the highest terrain elevation within a given county, then uses directional height above average terrain (HAAT) calculations to compute the interference range in each direction outward from the site. The model used to compute these distances can be Okumura-Hata-Davidson-based (as in NPSPAC), Carey-based (i.e. R6602, F(50,50)), or new models, such as the "TIA-6602" method (proposed modification to FCC R-6602) under consideration by TR-8.18.[5] Examples of the Okumura-based contours are shown in this figure, with ray-traced radio horizon limits included for reference.

[5] All interference contours utilizing standard values (such as 5 dBu), and with all contours being median levels (i.e. 50,50).

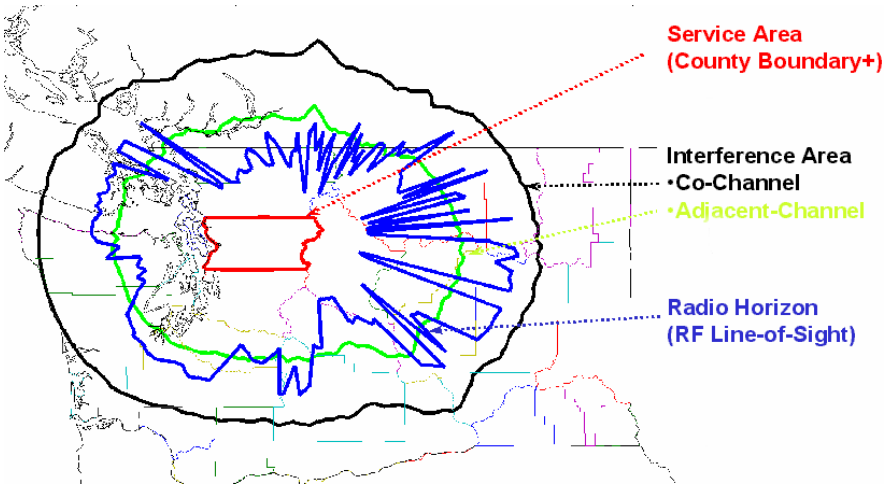


Figure 6, Example of a Possible Contour Methodology

Allotment Approach

NYSTEC and SRC also have experience in generating spectrally efficient frequency assignment methodologies - as evidenced by recent work generating spectrum plans for a statewide wireless network, and generating and proposing alternative Digital Television Transition plans for Canada[6].

Basic Allotment Process

The recommended spectrum-allotment approach is based upon the non-intersection of contours — an approach familiar to regulators and frequency coordinators alike. Specifically it will apply rules within the allotment process that specify that service and interference contours for co-channel frequency allotments cannot intersect. In addition to this, it may specify that adjacent-channel interference contours cannot intersect the service contours on an adjacent-channel examination.[7] The program could iterate, so that, if not enough spectrum is available to meet the recommended levels of any given county, it will spread the load over all counties involved within the allotment process. This ensures that every county reaches a similar level of capacity - relative to its projected needs.

This process provides the ability to pack the spectrum geographically to a very large degree, as illustrated in Figure 8. Note that the NYSTEC/SRC team can also provide periodic re-packing of the spectrum, once site-specific licenses are issued and more detailed models can be applied. Note that, *when* site-specific parameters are available, it is important to populate the database with contours that represent coverage and interference parameters as accurately as possible. For this, a tile-based contouring (such as the NYSTEC/SRC team has proposed to TIA[8]) method is recommended.

[6] These Canadian plans would completely eliminate the need for 700 MHz DTV allotments, and essentially align 700 MHz spectrum on both sides of the US/Canadian border.

[7] TIA's recommendations of 60 dBu contour values for adjacent-channel interference (based upon 65 dB ACCPR into a 6.0 kHz) may render the adjacent-channel consideration within this process unnecessary.

[8] Details available upon request.

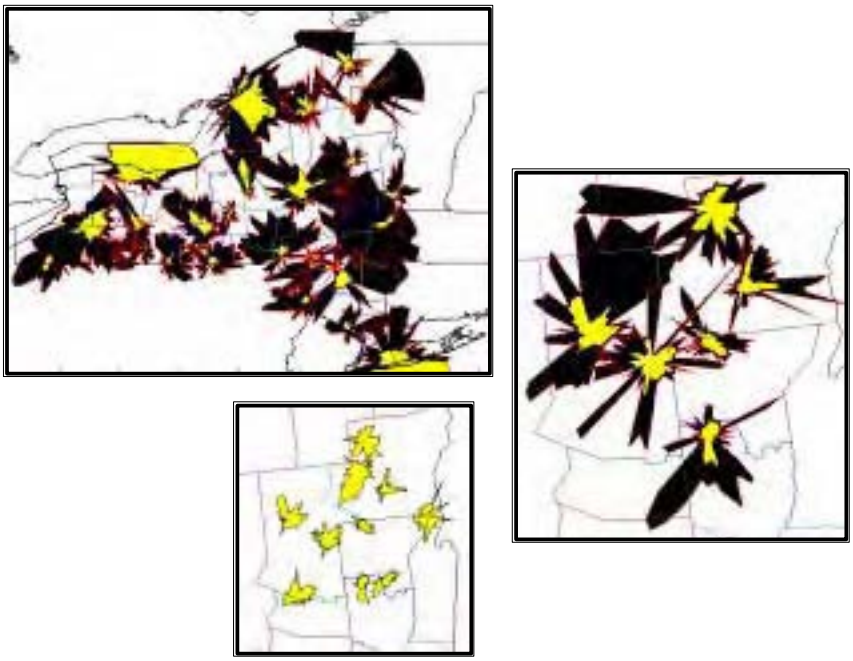


Figure 7, Contour-Intersection Methodologies

Allotted Bandwidth

One very important parameter of the pre-allotment process is the bandwidth of the pre-allotted voice and data channels. This has proved to be a strongly debated topic of discussion.

Figure 8 shows a portion of the 700-MHz narrowband spectral layout. The potential for many diverse technologies within the same spectrum is troublesome in regards to determining the smallest building blocks to allot. It is clear to see that the spectrum may be allotted in either 6.25-kHz (allowing the use of future FDMA technologies) allotments, 12.5-kHz (allowing the use of current FDMA and future TDMA technologies) "bundles", and 25-kHz “blocks” (allowing the use of 25 kHz TDMA technologies). The inherent problem is that allotting anything smaller than 25-kHz blocks precludes the future use of 25-kHz technologies on the pre-allotted channel sets. Presently, no US 25-kHz TDMA technology product is available for operation in this band, although FCC Rules allow such operation.

NPSTC and TIA have previously recommended that 25-kHz blocks be pre-allotted for both voice and data applications. At the May 2001 NCC meeting it was proposed that three (3) 25-kHz voice channels and one (1) 25-kHz data channel would be the minimum default allotments in the absence of actual specific applications for channel allotment. This would permit different technologies to be implemented using 6.25, 12.5, or 25 kHz channel widths at some future date. Therefore, the pre-allotments will be generated based upon aggregating 25-kHz blocks of spectrum.

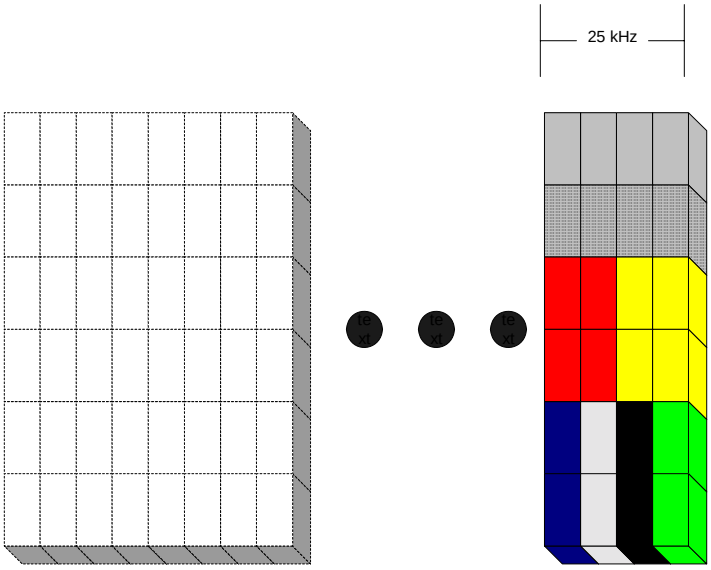


Figure 8, Channel Allotment Possibilities

The pre-allotment process will also account for realistically achievable multi-coupler spacing. For this reason, all-individual pre-allotment channel sets will have an internal separation of no less than 250 kHz.

Geographic Boundaries and Regional Penetration of Pre-allotments

NPSTC has previously recommended that the pre-allotments be performed only along the borders of each region. After discussions with the NYSTEC/SRC team, it was seen that better spectral efficiency could result from allotting all areas of all regions during the pre-allotment process. Pre-allotment of all areas, even within regions, can also result in significantly faster availability of channels to an applicant, since the regional planning process has already taken place. Otherwise one might have to wait for a regional planning process to follow an application.

NYSTEC/SRC proposes that the pre-allotments be performed throughout all of the regions, but that allotments outside of the border areas could be modified without restriction by individual regional planning committees without the need for inter-regional coordination. However, if such change results in an interference contour impact upon any adjacent region, inter-regional concurrence is required.

Treatment of Television Services

There are many additional constraints that can be imposed upon the pre-allotment process; most are based upon the existence of current and future television broadcast services within the 700-MHz band. These include incumbent US analog stations as well as US digital allotments that occur in certain areas of the nation. Aggravating the problem is the uncertainly related to international broadcast services (in particular Canada and Mexico) that may claim protection from, and cause interference to, US operations within the spectrum. An illustration of this is in Figure 9, where the locations of primary-class 700-MHz digital and analog broadcast television services within 400 km of the US/Canadian border are depicted.

While it is possible to alter the allotment process to take all of these broadcast services into account, the final result will not provide the same spectral efficiency that would otherwise be possible. It is also possible that consideration of all of the stations may over-constrain the problem, generating inefficient results for no valid reason. An example of the process of considering these television services is illustrated in Figure 10, where similar tools were used to generate spectrum assignments in New York, while working around existing and proposed television services from both the US and Canada.

The actual selection of allotment criteria and stations to consider during the allotment process depends on many factors — among them US 700-MHz spectrum availability; the DTV transition timelines

of the US, Mexico, and Canada; and international negotiations and treaties. The NYSTEC/SRC team has a firm understanding of these issues, and would be pleased to assist in any discussions regarding their resolution — or in recommending the best course of action to take for the pre-allotment process. However, for the purposes of this proposal, NYSTEC/SRC propose that no consideration be given to allotting spectrum based upon broadcast television services emanating from within the US or abroad.

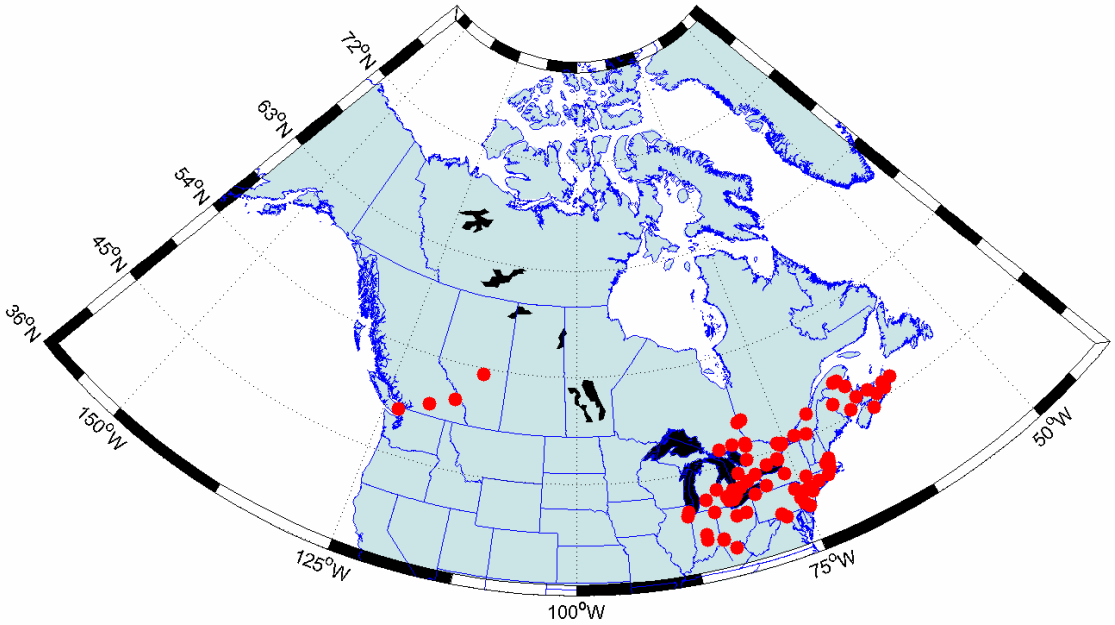


Figure 9, Canadian Border Area Television, Channels 62 through 69

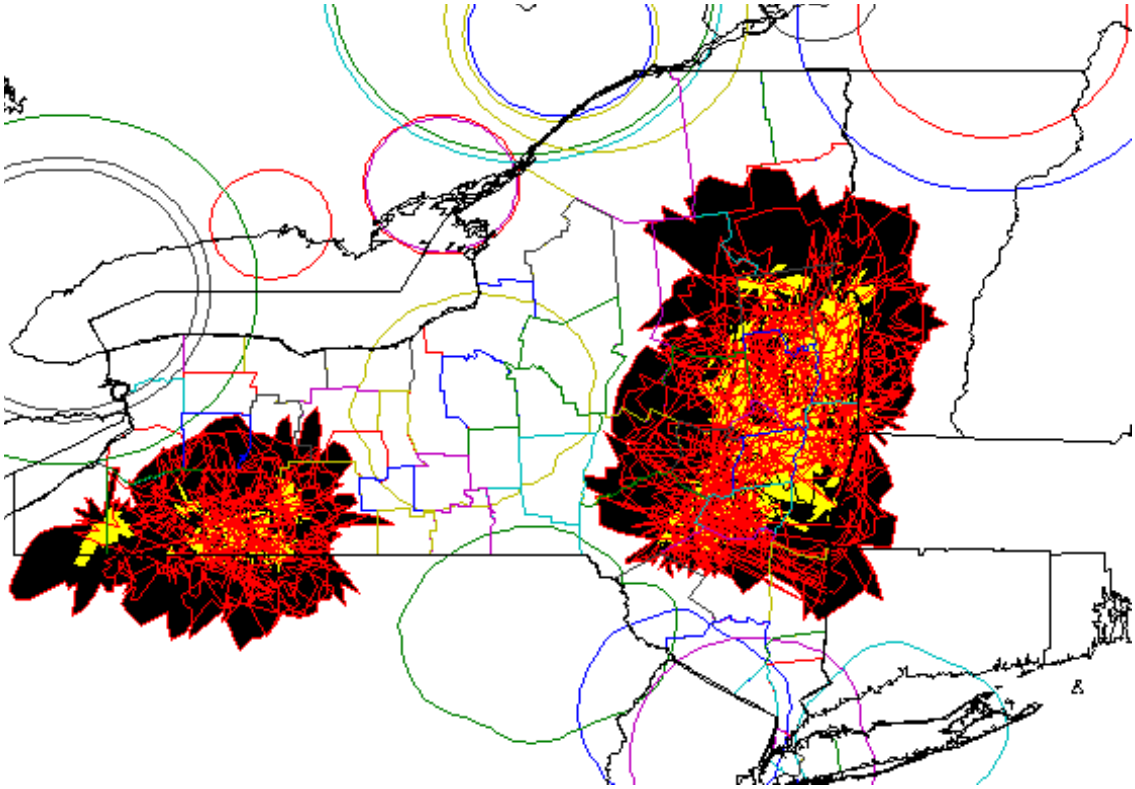


Figure 10, Example of Consideration of Analog and Digital Television Factors

Consideration of Regional Planning Committee Efforts

It must be noted that many 700 MHz regional Planning Committees (RPCs) have now formed and commenced their meetings. Therefore, it is appropriate to solicit input from the 700 MHz Regional Planning committees that have already been formed; and that this should be done at the very beginning of the pre-allotment process.

NYSTEC/SRC will assist NPSTC in the solicitation of this information, and will attempt to utilize any efforts completed by the RPCs. If possible, NYSTEC/SRC will alter the allotment process to better conform to the needs of these individual RPCs. However, note that this may lead to essentially unbounded efforts that cannot be defined at this point. These will need to be carefully considered, and will require further discussion between NPSTC and NYSTEC/SRC to resolve scope and compensatory issues relating to these portions of the re-allotment efforts.

Summary

The NYSTEC/SRC team believes that, in order to maximize the utility of NPSTC's 700-MHz public safety pre-coordination database, and to effectuate its use for regional planning and frequency coordination in a multiple vendor environment, it is imperative to completely populate the database as soon as possible. In order to accomplish this with optimal spectral efficiency, it will be necessary to perform the allotments on a national basis, and to utilize accurate models and spectral assignment strategies.

A summary of the proposed methodologies is as follows:

- Utilize population and population density characteristics in the evaluation of capacity needs. Employ PSWAC-like capacity requirement models to introduce increased accuracy in the modeling process.
- Utilize terrain data for service area evaluation and interference prediction. This will allow greater accuracy in the pre-allotment process, and will result in better 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.
- Solicit input from the 700 MHz Regional Planning committees that have already formed. NYSTEC/SRC will assist NPSTC in the solicitation of this information, and will use Regional Planning Committee allotment application data where available. Such data will specify the channel bandwidth (6.25, 12.5, or 25 kHz)
- Pre-allot "pool" channels in aggregate 25 kHz blocks around any initial Regional Plan allotments. 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, and normalized by the spectrum available (considering reuse).
- Upon request at a later time, re-run the program in order to update it with additional Regional Planning Committee allotment application data, and revise the "pool" pre-allotments within those regions accordingly.
- Allot all areas. Pre-allotments may be altered without the need for inter-regional coordination as long as adjacent regions are not impacted. Changes that impact adjacent region(s) can only be made with inter-regional concurrence(s).
- When considering allotable spectrum blocks, do not attempt to work around either US or International broadcast-television services. Many of these station assignments are either temporary, or subject to change, and working around them will result in allotment inefficiencies.

NYSTEC/SRC will be pleased to provide NPSTC with a separate Statement of Work and Cost Proposal that addresses the entire scope of this effort.

APPENDIX P - REGION 21 700 MHz PLAN

This Appendix Contains

1. A template (“SHARING AGREEMENT TEMPLATE”) which addresses spectrum management in situations where multiple users may be requesting spectrum

2. A template for a Memorandum of Understanding (M.O.U.) For Operating the 700 MHz Interoperability Channels

Appendix P

SHARING AGREEMENT TEMPLATE

(Agency letterhead of Licensee)

TO: (recipient person and title)
(recipient agency)

FROM: (authorizing person and title)
(authorizing agency)

DATE: (mm/dd/yyyy)

SUBJECT: Sharing Agreement

_____(grantor) authorizes _____(grantee) to operate _____ (quantity) mobile (vehicular or hand-held) radios. Such operation shall be per the following parameters.

Call Sign	Frequency(ies)	Max. Power	Channel Description
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

(Use additional attachments as necessary for more frequencies/channels)

This written agreement applies to operations in cooperation and coordination with activities of the licensee per Region (#) Plan, FCC Rules 47 CFR Parts 2.102(c), 2.103 and 90.421 and Part 7.12 of the NTIA Manual. Furthermore, grantor reserves the right to effectively eliminate the possibility of unauthorized operation, which ultimately could result in terminating this written agreement.

_____ (typed or printed name of authorized signer)
_____ (authorized signer identified above)
_____ (date)
_____ (agency name)
_____ (agency address)
_____ (agency address)
_____ (agency address)
_____ (signer's phone)
_____ (signer's email address, if available)

Michigan Public Safety Frequency Advisory Committee

Region 21 Public Safety National Plan
Application Review

MEMORANDUM OF UNDERSTANDING

TO: (signer of application and title)
(agency name)

FROM: (name), Chairman

DATE: (mm/dd/yyyy)

SUBJECT: Memorandum of Understanding for Operating the 700 MHz Interoperability Channels

This memorandum of understanding (hereafter referred to as MOU) shall be attached to the application when submitting it. By virtue of signing and submitting the application and this MOU, (agency name) (hereafter referred to as APPLICANT) affirms its willingness to comply with the proper operation of the Interoperability (interoperability) channels as dictated by the Region Planning Committee (here after referred to as RPC) as approved by the Federal Communications Commission (hereafter referred to as FCC) and by the conditions of this MOU.

The APPLICANT shall abide by the conditions of this MOU which are as follows:

- To operate by all applicable State, County, and City laws/ordinances.
- To utilize “plain language” for all transmissions.
- To monitor the Calling Channel(s) as may be appropriate.
- To coordinate use of the Tactical Channels.
- To identify and eliminate inappropriate use.
- To limit secondary Trunked operation to the interoperability channels specifically approved on the application and limited to channels listed below.
- To relinquish secondary Trunked operation of interoperability channels to requests for primary conventional access.
- To grant access to channels according to the Priority Levels identified in this MOU.

The preceding conditions are the primary, though not complete, requirements for operating in the interoperability channels. Refer to the Region Plan for the complete requirements list.

Priority Levels:

1. Disaster or 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.

To resolve contention within the same priority, the channel should go to the organization with the wider span of control/authority. This shall be determined by the State Interoperability Executive Committee or RPC for the operation or by the levels of authority/government identified in the contention.

For clarification purposes and an aid to operate as authorized, any fixed base or mobile relay stations identified on the license for temporary locations (FCC station class FBT or FB2T, respectively) shall remain within the licensed area of operation. Similarly, vehicular/mobile repeater stations (FCC station class MO3) shall remain within the licensed area of operation. Federal agencies are permitted access to interoperability channels only as authorized by 47 CFR 2.102 (c) & 2.103 and Part 7.12 of the NTIA Manual.

Any violation of this MOU, the Region Plan, or FCC Rule shall be addressed immediately. The first level of resolution shall be between the parties involved, next the State Interoperability Executive Committee or RPC, and finally the FCC.

Secondary Trunked Channels

GTAC5 - Channel 54 & 55
GTAC7 - Channel 134 & 135
GTAC9 - Channel 214 & 215
GTAC11 - Channel 294 & 295
GTAC13 - Channel 374 & 375
GTAC35 - Channel 534 & 535
GTAC37 - Channel 614 & 615
GTAC39 - Channel 694 & 695
GTAC41 - Channel 774 & 775
GTAC43 - Channel 854 & 855

_____ (typed or printed name of authorized signer)
_____ (authorized signer identified above and consistent with application)
_____ (date)
_____ (agency name)
_____ (agency address)
_____ (agency address)
_____ (agency address)
_____ (signer's phone)
_____ (signer's email address, if available)

Note: MPSFAC membership includes but is not limited to the following entities: City of Detroit APCO representative, EMS Service Providers, FCCA, Michigan APCO Frequency Advisor, Fire Department Representative, Michigan Association of Chiefs of Police, Michigan Department of Natural Resources, Michigan Department of Public Health, Michigan Department of Transportation, Michigan Municipal League, Michigan

Sheriff's Association, Michigan State Police and at-large APCO representatives from city and county public safety agencies

APPENDIX P S-160

S-160 refers to the use of frequencies that are licensed under Part 90 of the FCC rules by federal Government radio stations for intercommunication with non-Government radio stations. Any frequency authorized under Part 90 may be used by the Government, provided that a suitable, mutually approved, agreement has been reached between the FCC, the Government agency involved, and the affected non-Governmental user.

The conditions and terms of operation under an S-160 assignment are given in the NTIA Manual, section 7.12 and 8.3.3.

Return to list of Appendices

APPENDIX Q - REGION 21 700 MHz PLAN

This Appendix Contains

1. The Plan's reference for a proper methodology to establish the Region 21 700 MHz RPC and the Region 21 Plan

NOTE: The state of Michigan did not establish a formal "State Interoperability Executive Committee" (SIEC) pursuant to federal requirements and guidelines. This plan anticipates some of the responsibilities which would have been delegated to a formal SEIC will devolve to the 700 MHz Plan administrators.

IV. NATIONAL/REGIONAL PLAN TEMPLATE OUTLINE FOR 764-776/794-806 NATIONAL/REGIONAL PLANS

1. REGIONAL CHAIRPERSON

The Regional Planning Committee shall designate a Chairperson. The plan shall include the chairperson's name, title, address, phone number, agency affiliation, e-mail address and/or any additional contact information.

2. RPC MEMBERSHIP

The Plan shall list all RPC members and include agency affiliation and contact information such as: mailing addresses, phone numbers, email addresses (if available), etc. The officers of the RPC shall be noted , such as Secretary, 1st Vice Chairperson, etc.

3. DESCRIPTION OF THE REGION

This section of the plan shall include the following information:

- Definition of the region and its boundaries, a list of the counties and cities within the boundaries.
- Description of existing interoperability contracts, compacts, mutual aid agreements, etc.[1]
- Description of the effect of the addition of 700 MHz channels and interoperability requirements will affect existing plans.[2]
- Overview of public safety entities that have jurisdiction within or over any or all portions of the region (e.g. state agencies, federal agencies).
- Description of the types of public safety, law enforcement, government, public service, or other entities (federal, county, regional, city, town, etc.) that are included in the region.

4. NOTIFICATION PROCESS

This section shall contain a complete description of the process used by the Regional Planning Committee to notify the eligible entities within the region. This section shall contain at a minimum:

- The dates and publications in which the meetings were announced

[1] In the 4th R&O in Docket 96-86, the FCC decided that each State would to be responsible for administering the I/O channels and gave a deadline of 12/31/01 for each State to notify the Commission whether it would accept that responsibility. If notification from the state is not received by 12/31/01, the administration of the I/O channels reverts to the RPC on 1/01/02. The NCC recommends that States who choose to administer the 700 MHz I/O channels use the recommendations provided in the Guidelines for 764-776/794-806 Regional Planning Committees, Document IM0020-H-20010322-(P009-H). If the State is administering the I/O channels, the RPC need not include this information. A statement to the effect that the State is administering the I/O channels will suffice. If administration of the I/O channels has reverted to the RPC, this information must be included in the Regional Plan.

[2] Ibid.

- The dates and websites on which the meetings were announced.
- A description of the process by which comments were solicited from all eligible parties
- Copies of all notices, comments and submissions obtained through the process
- A description of the process used to consider the comments submitted by concerned parties,

5. REGIONAL PLAN SUMMARY

This section shall include:

- The guidelines and procedures for operation of the RPC;
- The procedures for requesting channels;
- The procedures for frequency coordination;
- Guidelines and procedures for protection of incumbent TV/DTV stations within the Region or near the Region's border during the DTV transition period.
- Descriptions of the region's applicable interoperability plans and interoperability requirements[3]
- Bylaws
- Spectrum Utilization agreements with other regions
- Description of the pre-coordination allocation method used at the region's borders.
- An overview of the "700 MHz Public Safety Frequency Coordination Database" and application flowchart

6. UTILIZATION OF INTEROPERABILITY CHANNELS[4,5]

[PLEASE NOTE: This section is updated as I/O sub-committee changes verbiage of IO-0062. Current verbiage is per IO-0062D020010118.]

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 current proposal, adopted by the NCC, is to use the ANSI/TIA 102 Standards (i.e., Project 25 digital protocols) as the Digital Interoperability Standard for the conventional-only mode of operation on the narrowband voice & data interoperability channels. [6]

[3] Ibid.
[4] Ibid.
[5] The FCC adopted many, but not all, the NCC's recommendations for the I/O channels and incorporated those recommendations into the 700 MHz rules. The FCC encouraged States (or RPCs) to follow the NCC recommendations that were not included in Part 90.
[6] Voice and Data Interoperability standards were decided in the 4th R&O ini 96-86 and can be found in Part 90 of the Code of Federal Regulations (CFR). Voice I/O standard documents are listed in 90.548(a)(i); data I/O standard documents are listed in 90.548(a)(ii).

There are 2 Calling channel sets and 30 Tactical channel sets. Channel Sets are comprised of two 6.25 kHz channels each.

The Tactical channel sets are subdivided into the following recommended categories: [7]

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

Calling Channels

Because the 700 MHz band will be initially encumbered by broadcast television, two of the interoperability channels sets are reserved as "Calling Channels".[8] The State (or RPC)[9] must 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 “7CALL A” and “7CALLB”[10] must be monitored, as appropriate, by licensees who employ interoperability infrastructure in the associated channel group .[11] When calling channels are integrated into infrastructure, their coverage must at least match the coverage of the other interoperability channels in the system. In addition to the usual calling channel functions, the calling channels may to be used to notify users when a priority is declared on one or more of the tactical interoperability channels

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, 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.

[7] In the 4th R&O, the Commission declined to adopt the NCC’s recommended channel designations into the rules. The categories listed above were recommended by the Interoperability Subcommittee (IOSC) . The Implementation Subcommittee supports the IOSC’s recommendations.

[8] The 764-776 and 794-806 MHz spectrum was re-allocated from television broadcasting (channels 63, 64, 68, & 69) to Public Safety. Until incumbent broadcasters move out of this spectrum, Public Safety may be blocked from implementing systems. Therefore, two channel groups have been established, 63 paired with 68 and 64 paired with 69. Anticipating that one of these channel groups may become available prior to the other, two Calling Channels were defined, one in each channel group.

[9] See Footnote 1.

[10] The 700 MHz calling channels are listed in 90.531(b)(1)(ii)

[11] In the 4th R&O, the FCC declined to mandate monitoring or other administrative requirements for the I/O channels. Instead, the State (or RPC) is tasked with addressing those issues.

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 AAAAA Project 25 DES encryption protocol. [12]

Deployable Systems
General Public Safety Services Channels labeled 7TAC01 through 7TAC07, 7TAC15 through 7TAC21, or both, shall be made available for "deployable" equipment used during disasters and other emergency events that place a heavy, unplanned burden upon in-place radio systems. States (or Regional Planning Committees)[13] shall consider the need for both "deployable trunked" and "deployable conventional" systems and make those channels available to all entities in their State/region.

Trunking on the Interoperability Channels
Trunking the Interoperability channels on a secondary basis shall be limited to operation on eight specific 12.5 kHz channel sets, divided into two subsets of four 12.5 kHz channels. One subset is defined by 7TAC01 through 7TAC07 and the other by 7TAC15 through 7TAC21.[14]

Any licensee implementing base station operation in a trunking mode on Interoperability Channels shall provide and maintain on a continuous (24 hr x 7 day) basis at its primary dispatch facility the capability to easily remove one or more of these interoperability channels, up to the maximum number of such trunking channels implemented, from trunking operation when a conventional access priority that is equal to or higher than their current priority is implemented.[15]

While it may be desirable for the States (or Regional Planning Committees)[16] 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 Interoperability Subcommittee recommends that States (or Regional Planning Committees)[17] limit the number of Interoperability channels that may be integrated into any single trunked system to the following amounts:

[12] Prohibition of encryption on the calling channels and the encryption protocol to be used on the other I/O channels was determined in the 4th R&O. Information on encryption may be found in 90.553 of the CFR.
[13] See Footnote 1.
[14] Trunking recommendations adopted in the 4th R&O. A list of the channels that may be used for secondary trunking may be found in 90.531(b)(1)(iii)
[15] In the 4th R&O, the FCC stated it was 'appropriate to require such monitoring' but delegated to the States (or RPCs) the task of determining how monitoring would be accomplished.
[16] See Footnote 1.
[17] Ibid.

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.

States (or Regional Planning Committees)[18] may consider allotting 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.[19]

The channels (two 6.25 kHz pairs) in Reserve Spectrum immediately adjacent to the 7TAC 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 channel pair in a trunked system[20] and will be administered by the State (or RPC)[21]. If a State (or Regional Planning Committee)[22] elects to permit 25 kHz trunking on interoperability channels, these Reserve Spectrum guard channels would become part of those trunking channels. In making a decision to allow 25 kHz trunking on these interoperability channels, States (or Regional Planning Committees)[23] must consider the impact on the channels adjacent to these 25 kHz trunking channels. Additionally, the State (or RPC)[24] must consider the impact to the ability of these 25 kHz trunking channels to be immediately reverted to 12.5 kHz conventional interoperability use.

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"[25] communications is recommended[26] as follows:[27]

[18] Ibid.

[19] See 90.531(b)(1)(iii).

[20] In the 4th R&O, the FCC adopted this recommendation. See 90.531(b)(7).

[21] See Footnote 1.

[22] Ibid.

[23] Ibid.

[24] Ibid.

[25] Mission critical use shall not include nor imply administrative or non-mission critical applications.

[26] In the 4th R&O the FCC declined to adopt the NCC's recommended priority access procedures. The state (or RPC) should develop priority access procedures and resolve disputes. The Priority Access procedures recommended by the NCC are presented here as a model for use by the States (or RPCs).

[27] These access priorities are taken from the §4.1.21 of the Final Report of the Public Safety Wireless Advisory Committee dated September 11, 1996.

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.[28]

[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 State (or RPC)[29] must 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. States (or RPCs)[30] must also determine whether a wide-area I/O conversation has priority over a local I/O conversation.

Standardized Nomenclature

Standardized nomenclature is recommended nationwide such that all 700 MHz public safety subscriber equipment using an alphanumeric display only be permitted to show the recommended label from the Table in Appendix A when the radio is 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" appended to the end of the label is recommended.[31]

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 channel sets. One set is defined by 7DTAC13 and the other by 7DTAC51. [32]

Wideband Data Standards

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.

[PLEASE NOTE: The Technology Subcommittee has determined that there is no existing wideband standard that could be recommended for interoperability. The Technology Subcommittee has asked the Telecommunications Industry Association (TIA) to develop a wideband data standard. TIA TR-8 subcommittee is currently working on the development of a wideband data standard.]

[28] This fourth priority would allow shedding traffic long in duration or overloading the non-interoperable system; but is not "two or more different entities" as defined in paragraph 76 of FCC 98-191. Overloading conditions should identify a potential need for expansion of the associated non-interoperable system.

[29] See Footnote 1.

[30] Ibid.

[31] In the 4th R&O, the FCC declined to require labeling nomenclature on radios with alphanumeric labeling. NCC was directed to consider developing an industry standard for display labeling. The NCC's recommendations are offered here as a model for State (or RPC) planning.

[32] See 90.548(a)(ii) for data interoperability standard documents.

State Interoperability Executive Committees [33]

State Interoperability Executive Committees should be formed to administer a State Interoperability Plan in each state or territory. These plans should include, but not be limited to, interoperability operations on the 700 MHz interoperability channels. These committees should include an equal number of representatives each providing regional representation from state, county/parish (where applicable), and local governments, with additional representation from special districts and federal agencies, as appropriate. Such committees may represent all disciplines, in which case emergency medical, fire, forestry, general government, law enforcement, and transportation agencies from each level of government shall be represented equally. Alternatively, Committees may represent a single discipline in which case it is only necessary to have membership from the different levels of government previously described.

The state or states within a region or multiple regions should use the Incident Command System (ICS) as a guideline in developing their regional interoperability plans. (See Appendix N) In the event that the state will not accept this responsibility, the RPC shall develop such plans.

The individual States may hold licenses on interoperability channels for all infrastructure and subscriber units within their state. In the event that a State declines to do so, it may delegate this responsibility to the RPC. [34]

The State (or RPC)[35] would have oversight of the administration and technical parameters of the infrastructure for the interoperability channels within their state (or region)[36].

Recommended templates for a *Memorandum of Understanding for Operating the 700 MHz Interoperability Channels* and a *Sharing Agreement* are attached. The MOU shall be typed on appropriate committee letterhead and the Sharing Agreement on agency letterhead.[37] (See Appendices B&C)

Minimum Channel Quantity

The minimum channel quantity for Calling and tactical channel sets requires 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 programmed for I/O purposes. Backbone issues are deferred to the SIECs and/or RPCs.[38] Subscriber units, which routinely roam through more than one jurisdiction up to nationwide travel will require more than the minimum channel quantity.

[33] In the 4th R&O, the FCC determined that administration of the I/O channels should be done at the state level. While it supported the concept of SIECs, the Commission did not mandate that they be formed if a state already had a similar structure in place. See 90.525(a)
[34] See 90.525(b)
[35] See Footnote 1.
[36] Ibid.
[37] In the 4th R&O the FCC endorsed but did not require the use of the recommended MOU and Sharing Agreement templates.
[38] See Footnote 1

The "CALL"ing channel sets (7CALLA and 7CALLB) 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, 7CALLA shall be attempted first, then 7CALLB. Attempts shall be made on the repeater mode first then on the direct (simplex) mode.

A minimum set of "TAC"tical channels shall be implemented in every voice subscriber unit in the direct (simplex) mode. Specific channel sets are shown below (SIECs or RPCs[39] will have the option to exceed this minimum requirement.)

- 7TAC11 & 7TAC49 channel sets (previously known an OTAC33 and 63)
- 7TAC09 & 7TAC47 channel sets (previously known as MTAC23 & 53)
- 7TAC29 & 7TAC59 channel sets (previously known as GTAC31 & 61)

NOTE: Selection of the above TAC channels based on revised Table of Interoperability Channels. Channel labels are compromise between 4th R&O and IO-0062D-20010118.

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

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.

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 Network Access Code (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. This should apply to tactical, vice, or other mutual aide 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. Any common channel access parameters not provided shall be programmed accordingly. These parameters include the following:

[39] Ibid.

P25 Network Access Code - $293 (default value)
P25 Manufacturers ID - $00 (default value)
P25 Designation ID - $FFFFFF (designates everyone)
P25 Talkgroup ID - $0001 (default value)
P25 Message Indicator $000000…0, out to 24 zeros (unencrypted)
P25 Key ID - $0000 (default value)
P25 Algorithm ID - $80 (unencrypted)

Any deviation from $293 will not be permitted unless the SIEC (or the RPC)[40] can demonstrate in Plan amendment through the FCC-approved process that the intent of $293 will be preserved on ALL conventional voice I/O channels – transmit and receive.

7. ADDITIONAL SPECTRUM SET ASIDE FOR INTEROPERABILITY WITHIN THE REGION

An individual region shall have the ability to assign additional spectrum within that region for Interoperability. The spectrum will only be available for use within that Region. The RPC must designate which channels will be used out of the General Use spectrum, and must update the NIJ database. The RPC shall justify the assignment of this additional spectrum and include operational guidelines as well as user criteria with eligibility requirements. A Region requesting additional Interoperability spectrum must get concurrence from adjoining regions and must include a letter of concurrence from the adjoining regions.

8. ALLOCATION OF GENERAL USE SPECTRUM

This section shall contain a list of requirements and/or limitations including spectrum utilization, agreements with adjacent 700 MHz RPCs, slow growth, pre-coordination, re-assignment, recovery, etc See Guidelines, Item 8 for details.

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

A methodology shall be adopted to evaluate applicants when there is not enough spectrum to satisfy all requests. See guidelines, Item 9 for a suggested matrix.

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

Define how and where eligibles submit requests and/or applications for frequencies. When and where public review of applications takes place. Documentation of how the Region applied the matrix developed in Item 9, especially to mutually exclusive applications.

[40] See Footnote 1

11.ADJACENT REGION COORDINATION

The RPC shall describe the process by which their plan was coordinated with adjacent regions. The description shall include the method of contact, letters of understanding, agreements, correspondence, and all pertinent documents. If an adjacent region has not yet formed, the Region must use the pre-planning methods outlined in Item 11 of the Guidelines. If this method is used, the Region will be exempt from adjacent region concurrence until such time as the adjacent region forms and develops its own plan.

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

The plan shall describe the measures taken to ensure that applicants designed their systems to minimize coverage beyond their borders, e.g., only cover their jurisdictions. Applicants should be required to design their systems to maximize spectrum utilization, e.g., utilize simulcast or spectrum efficient technology. The 700 MHz FCC rules require trunking when using 6 or more channels unless the applicant can demonstrate that conventional use of the channels was at least as efficient as trunking. Multiple users within a given political subdivision should be required to use a common system whenever possible.

13. A DETAILED DESCRIPTION OF THE FUTURE PLANNING PROCEDURES

The plan shall include the future planning process, database maintenance and dispute resolution process selected. See Guidelines #13 for details.

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 _____

APPENDIX R - REGION 21 700 MHz PLAN

This Appendix Contains

1. A copy of a web based survey made available via the internet to any interested party and copies of related e-mails establishing the survey hosted by the city of Saginaw.

2. A copy of the 700 MHz RPC Membership Application

Survey For New Regional Planning Thrust

Welcome to the Survey For New Regional Planning Thrust!

Please fill out all of the fields and, when you are finished, click the Submit button.

Name

Title

Entity

Radio band you are now using:

Interoperability major focus for major incident:

Plans for the next 5 years:

New system tracking county wide: Yes ○ No ◉

Data terminals: Yes ○ No ◉

Video: Yes ○ No ◉

Security System: Yes ○ No ◉

Snap Shot Functions:

Point to Point Functions:

Functions:

Point to Multi-point Functions:

Remote Control Systems:

Time to serve on committee:

APPENDIX S - REGION 21 700 MHz PLAN

This Appendix Contains

1. The Plan's reference for technical information related to potential interference issues

NOTE: The Region 21 700 MHz Plan's Appendix "S" may also be identified as "Motorola's Interference Technical Appendix Issue 1.21 (November 2000)"

MOTOROLA' S INTERFERENCE TECHNICAL APPENDIX

1 INTRODUCTION

With the advent of cellular type system deployments in the 800 MHz band and the future 700 MHz band, system operators are faced with having to create highly reliable communications for noise limited systems while interference limited systems are interspersed in the design service area. At this time we are seeing an increasing number of subscriber coverage holes when the radios are in close proximity to high density SMR or cellular base station sites. As more and more radio systems are fielded with varying channel bandwidths and different types of modulation, the prevention, identification and remediation of interference is increasingly important.

- With the newer digital radio systems, interference is often reported as a loss of coverage or no coverage in areas where good coverage was predicted.
- With analog radios, the interference often audibly manifests itself, making the identification somewhat easier.
- Interference can be intermittent or constant. Intermittent interference is more difficult to identify and remedy due to its inconsistent appearance.
- Trunking systems make this more difficult as often interference is for a specific channel and that channel may or may not be assigned while the interference mechanism is active. When the trunking system' s control channel is interfered with, system access and Grade of Service on alternate system resources may be affected.
- For data systems, interference from other systems may cause increased loading and response times due to the additional retires, and may affect subscriber roaming.
- The introduction of new radio systems in an existing coverage area may cause a critical point to be reached and suddenly cause degradation of system performance or complete loss of coverage in specific areas.

The purpose of this document is to sensitize system designers and maintenance personnel to these issues. First, there is a review of how the history of various band plans and hardware changes have increased the probability of interference. Next, the various mechanisms that can produce interference are defined. Common scenarios are provided to aid in identification of interference. The document closes with recommendations of hardware, procedures and actions that can greatly reduce the probability of interference both initially and in the future.

2 BACKGROUND

2.1 BAND STRUCTURE

In the early days of Land Mobile Radio there was only Low Band (25 - 50 MHz) followed later by High Band (132 - 174 MHz). The use of mobile relay (repeater) operation was quite restricted in low band, and simplex operation was the most common configuration. Simplex operation creates a higher potential for base station to base station interference, even with large physical separation. To prevent this type of interference, many systems went to two-frequency simplex, transmitting on one frequency while receiving on a second frequency. This minimizes the base-to-base interference, but prevents mobile units from being able to monitor the channel for activity prior to transmitting. This requires a highly disciplined system, as a dispatcher is the only one that can relay messages between mobile units. Unfortunately, because the mobile units can' t monitor the channel before transmitting, they cause intra system interference when more than one radio at a time contends for the channel.

High band operation had more opportunities for mobile relay operation. Unfortunately the band wasn't developed in a standardized fashion. Over time this resulted in mobile relay operation with some systems using reversed frequency plans relative to the other systems. This mixed with various combinations of "close and wide spaced" mobile relay configurations made frequency coordination and interference prevention a difficult process. In fact, before the introduction of the higher frequency bands, much of the system engineering involved designing sites to accommodate the nearly incompatible frequencies and configurations.

The UHF, 450 - 470 MHz, band was an opportunity to organize the new spectrum and prevent many of the problems systemic to the older bands. However at that time the state of the art for mobile and portable transmitter bandwidth was around 6 MHz. So it was decided to organize the band in such a manner that mobile relay systems would be quite common and that mobile radios could switch to the base station transmit frequency and talk directly to another mobile radio in close proximity (talk-around). This allows radios that are out of range of the repeater to still communicate in a simplex mode on the base station talk-out frequency. The protocol was quite simple. The first mobile to transmit would simply switch to the talk-around mode and transmit. The other mobile was already monitoring the correct frequency so the initiating mobile would simply tell the receiving mobile to switch to talk-around. Once accomplished, they could communicate in a simplex mode. No matter what they did, they were always monitoring the base talk-out frequency.

To facilitate this, the band was organized into four 5 MHz blocks with three interfaces between base transmitters and mobile transmitters. Figure 1 shows how the band was organized.

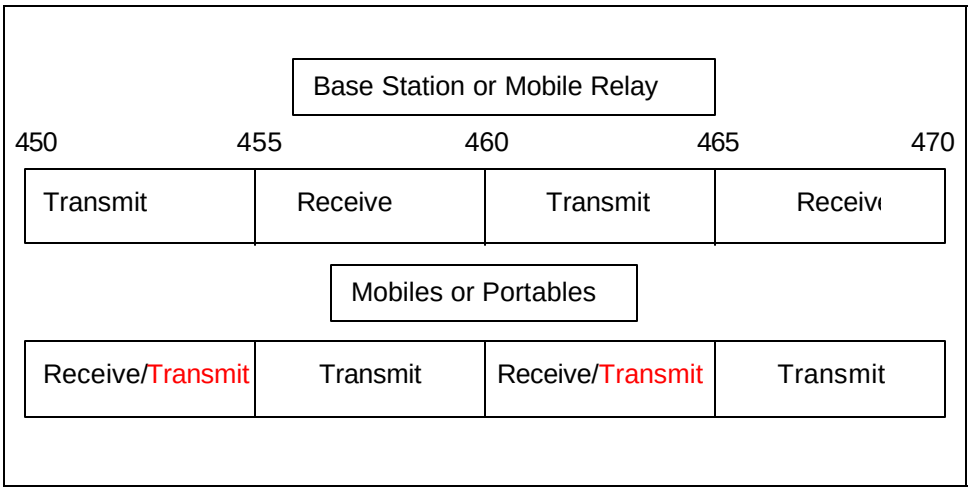


Figure 1 450 MHz Band

Later the UHF band was expanded to include sharing with UHF TV channels 14 through 20 (470 MHz - 512 MHz) in the top 13 US markets. Initially, the top ten markets got 2 TV channels each while the next three received a single TV channel. There have been additional allocations for Public Safety in Los Angeles, and some Canadian border issues preclude deployment. See CFR 47 §90.303 for specifics. To handle the different blocks of spectrum, each TV channel's band was divided in half, with land mobile base transmitters on the low half and base receivers on the high half. As a result the transmitter to receiver spacing is only 3 MHz in this portion of the band.

The next band to be allocated was the "take back" of UHF TV channels 70 - 83. This created large amounts of spectrum for private land mobile systems and for the new cellular industry. Once again, lessons from the older bands were incorporated to minimize interference potential. Transmitter/Receiver spacing was standardized at 45 MHz. To minimize the cost of subscriber units, the band was inverted from the 450 MHz band with the subscriber units transmitting on the low portion of the band.

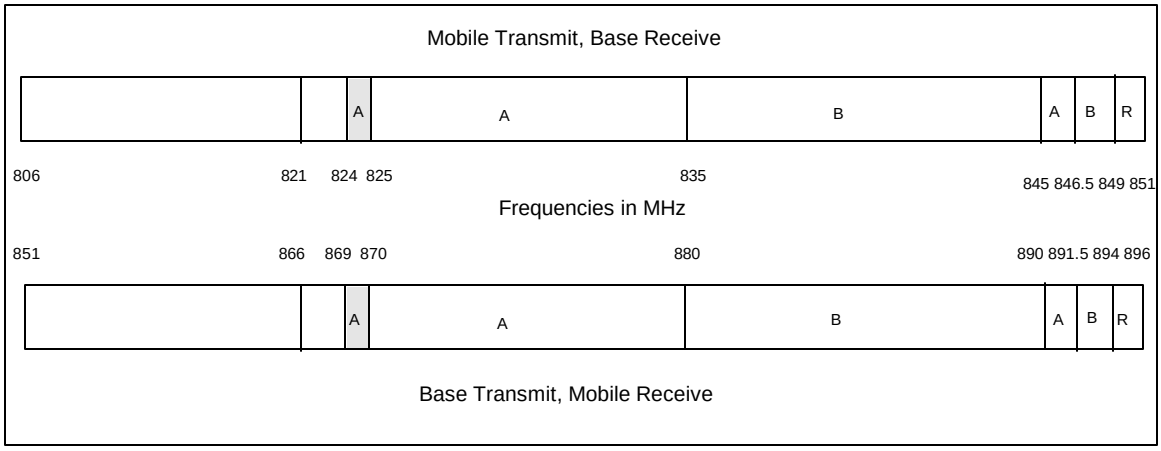


Figure 2 800 MHz Band

For trunked systems, channel assignments were made in blocks of up to five, with a constant 1 MHz separation between channels. This allowed for easy transmitter combining and minimizes some potential intermodulation. The cellular band was immediately adjacent to the land mobile band. Some reserve channels were held and later allocated to public safety and expansion of the cellular frequencies.

Later, around 1988, additional 800 MHz channels were made available exclusively for Public Safety. These new frequencies are often referred to as "821 MHz" rather than the more accurate but complex name 821-824/866-869 MHz bands. Five interoperable channels were assigned on a national basis. At that time, narrow banding to 12.5 kHz channels was difficult and operability with the existing 800 MHz channels was a requirement, so a compromise solution was developed. The channels would be 25 kHz wide, but channel assignments would be granted every 12.5 kHz. Interference would be administratively controlled by a group of Regional Frequency Coordinators. The assumption is that a receiver would provide 20 dB ACIPR and this would be considered a requirement by the frequency coordinators, but not by the FCC. Co channel frequency reuse was generally based on a 35 dB C/I, but local regional frequency planning committees policies may alter this requirement slightly. Local planning committee recommendations must be adhered to.

The last block of frequencies allocated to private land mobile is in the 900 MHz band. This was the first real narrowband allocation. Channels are 12.5 kHz wide. This creates the potential for "near-far" interference scenarios.

The "near-far" situation has two different scenarios, as shown in Figure 3.

- A unit close (near) to a site on a nearby or adjacent undesired channel interferes with a weak (far) unit talking inbound on the desired channel.

- A unit far from its desired site is interfered with when close (near) to a nearby or adjacent undesired channel base.

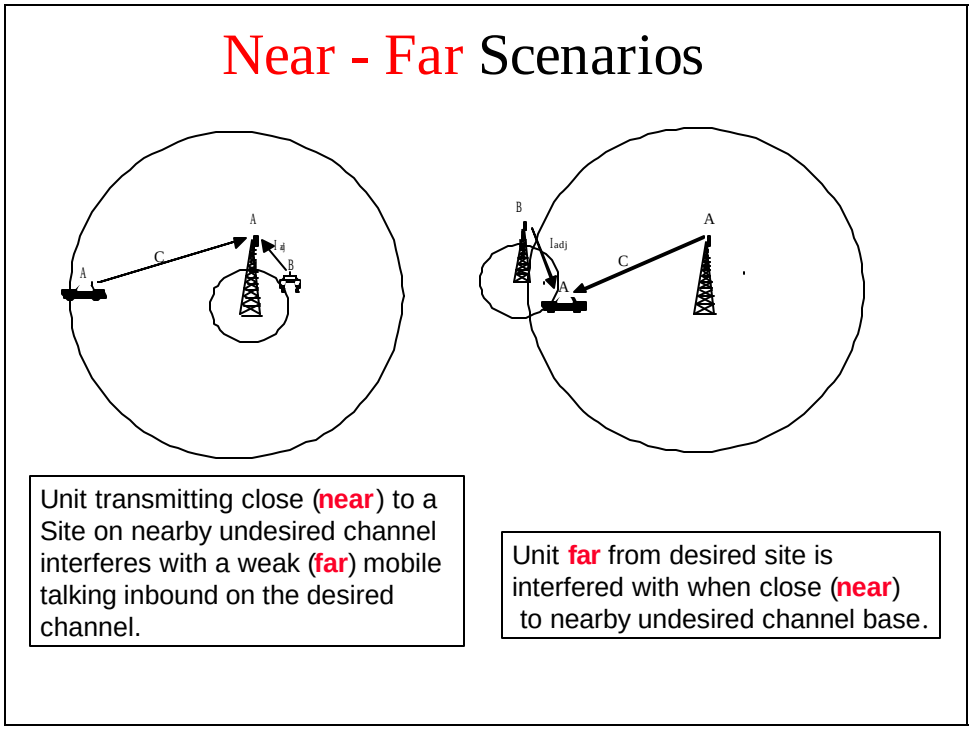


Figure 3 Near - Far Scenarios

To compensate for this possibility, the channels were allocated in blocks of 10 adjacent channels. The concept was that any money spent to be a "good neighbor" should result in improved system performance for the person that spent the money. Thus this assignment policy created the situation where a users adjacent channel assignment belonged to themselves, except for the two end channels of a block.

Channels were assigned with a transmit to receive separation of 39 MHz with the same configuration as 800 MHz, base stations transmit on the high split, and mobiles transmit on the lower split. This minimizes the cost of power transistors for the subscriber units as they operate on the lower frequencies.

2.2 HARDWARE HISTORY

Older radios used crystals or channel elements to derive its transmit and local oscillator frequencies. As a result, if a radio had four-frequency capability, it had to have a total of eight crystals or channel elements to generate the correct frequency sources. This resulted in considerable cost and space being devoted for just the frequency generation.

Crystals are a very high Q component, ~50,000, so they generate a very clean response. To stabilize their performance, heated ovens were used to keep the crystals at a constant temperature. This was a considerable current drain, even in mobiles. As greater frequency stability was required the channel element became the preferred solution. A channel element is a crystal with a temperature compensating circuit that has been calibrated for that specific crystal, thereby eliminating the requirement for heating and its current drain.

The channel element eliminated the current drain that was had been necessary to provide the temperature stability. However, they were still large and made radios quite large. The next step was to eliminate some of the channel elements by providing an offset oscillator for the receive frequency. In bands where a constant frequency difference from transmitter to receiver exists, one oscillator can be used for the specific transmit oscillator and offset it in frequency to become that pairs associated receiver local oscillator. When talk-around operation was needed, a second

offset oscillator was optionally available. Thus a normal 4-frequency radio would have 4 channel elements and one offset oscillator. When equipped with Wide Space Transmit, it would have 4 channel elements and two offset oscillators. Note that the frequency stability was decreased by the additional frequency error of the offset oscillator.

The channel element size limitation allowed receivers to be designed with relatively narrow bandwidths. As a result, helical resonators were commonly used in receiver preselectors. They provided good front-end selectivity, which provided excellent protection from undesired signals. However the next step in providing increased frequency capabilities required more flexibility, which resulted in the replacement of the highly selective front-end with one with a greater bandwidth.

The frequency synthesizer was introduced in the early 1980' s. The frequency synthesizer is a lower Q device, and only requires a single channel element at its fundamental frequency. The instructions for the synthesizer to be able to generate the appropriate frequencies are stored in a memory module that could be a PROM or code-plug.

A frequency synthesizer costs more than separate channel elements until a critical number of channels is reached. Radios were introduced with more memory to hold the additional instructions and user interfaces were developed to allow the users to keep track of what channels they are on.

To be able to use the increased frequency capability, radios had to have increased bandwidth. Transmitters were widened, as were receivers. Some representative values from that era are shown below in Figure 4.

Radio Type	Transmitter BW (MHz)	Receiver BW (MHz)
High Band Mocom 70	1, 2 w/ center tuned[1]	2
UHF Mocom 70	5	1
High Band Syntor	12	2
UHF Syntor	10	2
High Band Syntor X	24	24
800 MHz Syntor X	19	19
High Band MCX100	26/28[2]	4/12[3]
High Band MX300S	6	2
UHF MX300S	12	2

Figure 4 1980 Era Radio Frequency Limitations

[1] A special channel element was used to tune at the average frequency of the highest and lowest frequency.
[2] Low portion of band / high portion of the band
[3] Dual front ends. Two at 4 MHz each, with 12 MHz separation.

3 INTERFERENCE MECHANISMS

There are a large number of different interference mechanisms that can cause a radio to have degraded performance. To properly determine the root cause or predominant mechanism, field measurements are normally required. By the proper introduction of a step attenuator and/or cavity filter in the receiver's lineup or cavities into the suspect transmitter's lineup, the effect can be measured and from that the root cause determined.

There are several important reference standards that should be considered in making measurements of interference. They are all published by the TIA/EIA:

1. TIA/EIA-603 "Land Mobile FM or PM Measurement and Performance Standards."
2. TIA/EIA/IS-102.CAAA, "Digital C4FM/CQPSK Transceiver Measurement Methods"
3. TIA/EIA/IS-102.CAAB, "Digital C4FM/CQPSK Transceiver Performance Recommendations."
4. TIA/EIA/TSB-88A, "Wireless Communications Systems – Performance in Noise and Interference-Limited Situations – Recommended Methods for Technology-Independent Modeling, Simulation, and Verification."

The following mechanisms are the most common and will be discussed as well as recommended methods of measurement.

- Receiver Desensitization
  - ACRR - Adjacent Channel Rejection Ratio
  - ACCPR - Adjacent Channel Coupled Power Ratio
  - ACIPR - Adjacent Channel Interference Power Ratio
  - Overload
  - Local Oscillator
    - Sideband Noise
    - Radiation
  - Spurious Responses
- Intermodulation (IM)
  - Receiver
  - Transmitter
  - External
- Transmitter
  - Sideband Noise (adjacent/alternate channels)
  - OOB Emissions (>250% of channel bandwidth)
  - Spurious Emissions (Discrete frequencies)

4 EFFECTIVE RECEIVER SENSITIVITY

Receiver Desensitization occurs when a receiver requires higher signal levels to provide the same performance as when the interference source isn't present. The result is referred to as "Effective Receiver Sensitivity" as it determines what the sensitivity is in the presence of the interference mechanism and compares that to the sensitivity of a receiver when using only a signal generator, eliminating all external sources of interference. The difference between the Effective Sensitivity and the Normal Sensitivity is call Desensitization.

The Effective Receiver Sensitivity method of measurement is shown in Figure 5.

1. Measure and record the reference sensitivity of the receiver. The reference sensitivity is typically 12 dB SINAD for analog receivers or 5% static BER for digital receivers.

2. The receiver under test is connected to an "iso-tee" or directional coupler. Through the isolated leg, a signal generator is connected and the main input leg is terminated in the correct impedance (50Ω).
3. The receiver's reference sensitivity is again measured and recorded.
4. The termination is removed and the input port is connected to the normal external antenna system.
5. The signal generator is increased until the reference sensitivity is once again achieved and the value recorded.

The Effective Sensitivity is determined by determining the increase in required signal level to regain the performance provided at the reference sensitivity [Cs/N]. In this case the Cs/N is now Cs/(I+N).

$$\textit{Effective Sensitivity} = \textit{Direct Reference Sensitivity (Step 1)} \times \frac{\text{Sensitivity(Step5)}}{\text{Sensitivity(Step3)}}$$

For example, if the direct reference sensitivity is -119 dBm and the value in steps 3 and 5 are -99 dBm and -80 dBm then the effective sensitivity is -119 dBm + (-80 -(-99)) = -100 dBm, or 19 dB of desensitization.

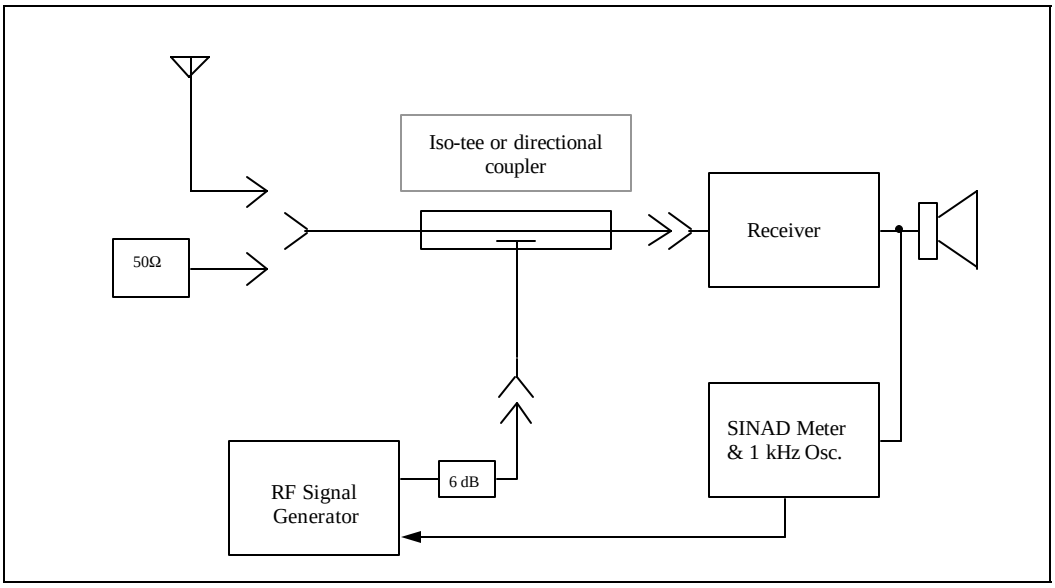


Figure 5 Receiver Desensitization Measurement

4.1 RECEIVER INTERFERENCE MEASUREMENT THEORY

Some receiver specifications are only valid when the desired signal is at reference sensitivity. When the desired is at this weak signal level, the noise floor becomes part of the consideration. As a result, it is commonly measured by injecting a desired signal into a receiver at its reference sensitivity and then boosting the desired signal by 3 dB. The potential interference is introduced and increased in level so that the original reference sensitivity is regained. This is essentially causing the interference to produce the same effect as the thermal noise floor of the receiver. The two noise floors add up to 3 dB greater than the original noise floor. Then the effect of the interference is equivalent to an on-frequency interferer reduced by the difference between the original reference sensitivity and the level of the interferer.

As will be shown later, when the desired signal is considerably above the reference sensitivity, the 3 dB boost is no longer required.

4.1.1 Receiver Overload

When a receiver is exposed to very strong signal levels, enough undesired energy could potentially force its way past the selectivity elements to cause limiters or AGC circuits to be activated. This reduces the available gain for the desired signal resulting in a loss of sensitivity. Figure 6 represents a "typical" receiver. It is general enough so it can be used for most of the receiver examples.

In this case, a strong signal passes easily through the preselector and is amplified and then down converted in frequency. The Intermediate Frequency Filters reduce the amplitude of the desired signal in addition to filtering the undesired signals. Typically its amplified again and then filtered again. Some receivers have two Local Oscillators. This is not always the case, but for the "typical" case it is included. When two Local Oscillators are being used, there is typically additional filtering at the second IF frequency. In most modern receivers, this filtering is done with Digital Signal Processors (DSP).

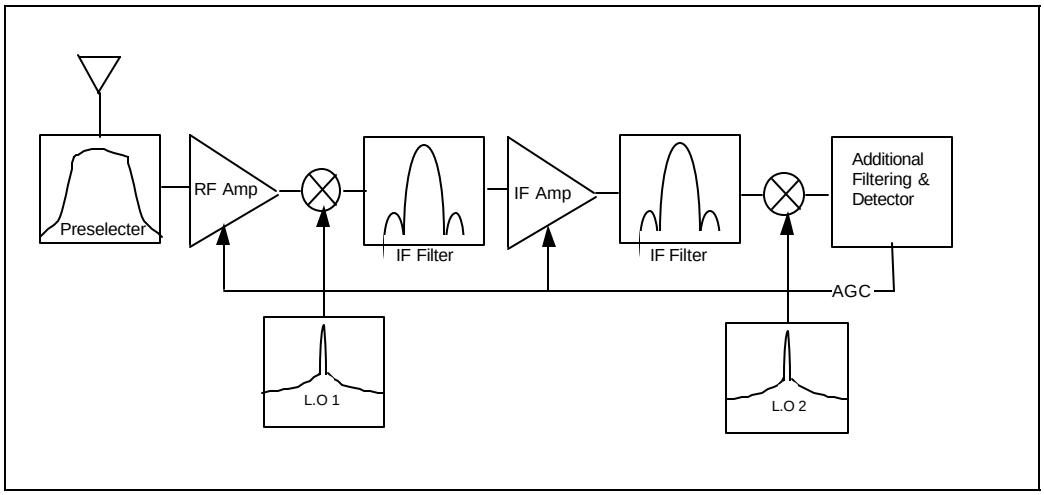


Figure 6 Typical Receiver

5 RECEIVER DESENSITIZATION

Desensitization is the measure of a receiver's ability to reject signals that are offset from the desired signal's frequency. Desensitization of a desired signal at the reference sensitivity level due to an adjacent channel signal is defined as Adjacent Channel Rejection (ACR) in the TIA-603 and IS-102CAAA documents. The measurement procedure detailed in the TIA documents for measuring ACR can be used to quantify receiver desensitization at any frequency offset and for higher desired signal levels. [Note that the TIA frequently uses a convention that produces a positive number for specified values. To accomplish this, they use ratios, always placing the largest value in the numerator and then adding an R to the end of the acronym. For example, ACR might be -75 dB, so ACRR would be 75 dB.]

There are several factors that may contribute to a receiver's desensitization characteristic. The receiver IF selectivity may be inadequate to reject strong signals, typically in excess of -50 dBm, on adjacent channels. Historically this has been a major factor determining the receiver's ability to reject strong signals on adjacent channels. With the

availability of small and inexpensive ceramic filters and digital signal processing, it is less of an issue with modern equipment.

Receiver local oscillator sideband noise can heterodyne an undesired signal into the IF pass-band by mixing with a single high level signal, typically in excess of -50 dBm, and usually within 500 kHz of the desired signal. This mechanism is often confused with adjacent channel interference, and it is a contributing factor to the receiver's ability to reject strong signals on adjacent channels.

An additional consideration is the spectrum of the interfering signal. If the interfering signal has a broad spectrum, or a high noise floor, the receiver desensitization measurement will indicate poor desensitization performance even for very well designed receivers. As receivers start utilizing very narrow IF bandwidths (12.5 kHz channel bandwidths or less) the effect due to the modulation components becomes more important. Previously receiver ACRR measurements only required a single 400 Hz tone at 60% of maximum system deviation. This no longer is considered applicable as it severely under estimates the amount of energy that the victim receiver can intercept from an adjacent channel. Currently the TIA recommendations are undergoing changes that will require that the interfering source be modulated so it simulates the energy distribution under actual operating conditions.

Figure 7 shows sensitivity level desensitization performance for a number of generic radios. Also compared in the figure are the desensitization levels due to the off-channel signal source. One of the sources is a high performance signal generator, modulating a 400 Hz tone at 3 kHz deviation. The other source is an iDEN base radio transmitting iDEN Quad-QAM modulation.

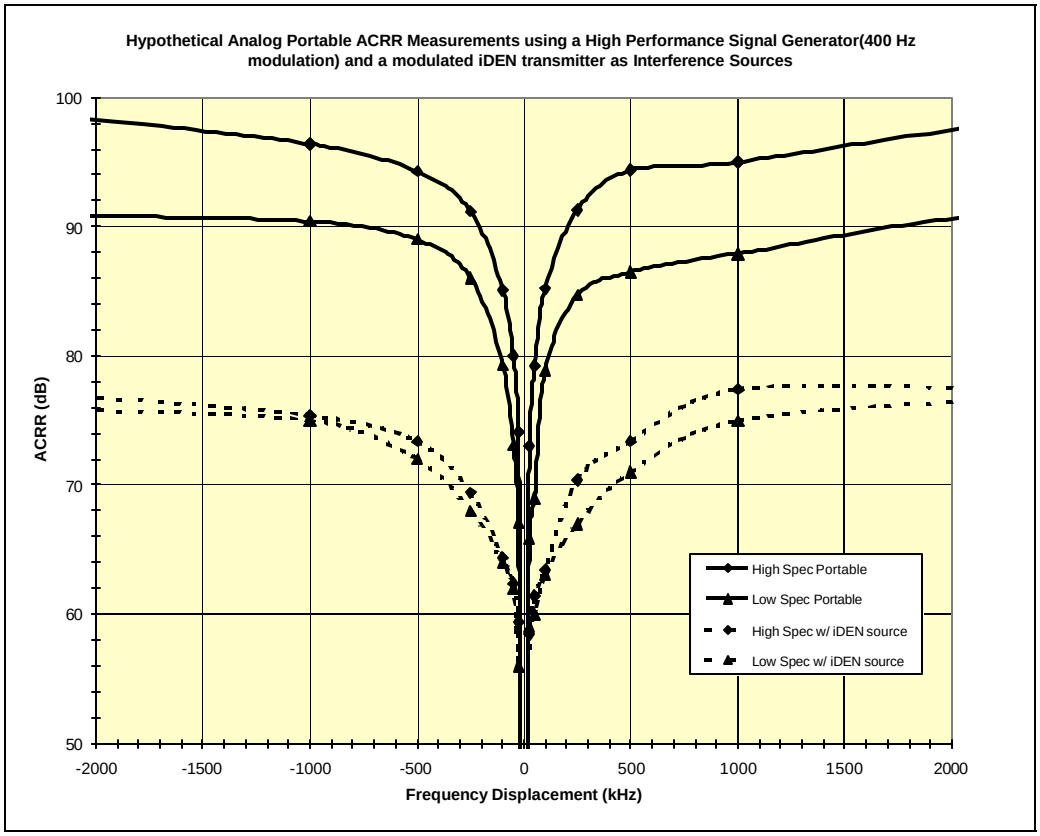


Figure 7 Receiver Desensitization

Figure 7 shows that when a high performance signal generator is used as the interference source, receivers will typically have ≥ 90 dB rejection of signals that are offset ≥ 500 kHz from the desired channel. Receivers usually will have better than ≥ 80 dB rejection for offsets exceeding approximately 50 kHz. When an iDEN base radio is used as the interfering signal source, the ACRR desensitization level is approximately 20 dB less than when the high performance signal generator is used. This occurs due to the noise floor characteristic of linear amplifiers. This indicates that high performance receiver designs may not realize improved desensitization performance because the performance is limited by an unfiltered base radio spectrum that contains high OOBE (noise). There is a penalty for noise limited systems in the same or nearby bands where interference limited systems are deployed.

6 RECEIVER BLOCKING

Excessive desired on-channel signal levels can overload the receiver, usually the result of Automatic Gain Control (AGC) design limitations. The receiver front end can be overloaded by a single high level unwanted signal, not on the desired channel, typically in excess of -25 dBm, or multiple high-level unwanted signals whose total peak instantaneous power exceeds -25 dBm. This is also known as receiver blocking.

Blocking is measured using a desensitization measurement procedure with progressively higher on-channel signal levels. Figure 8 shows the blocking of a hypothetical portable radio, as a function of frequency offset.

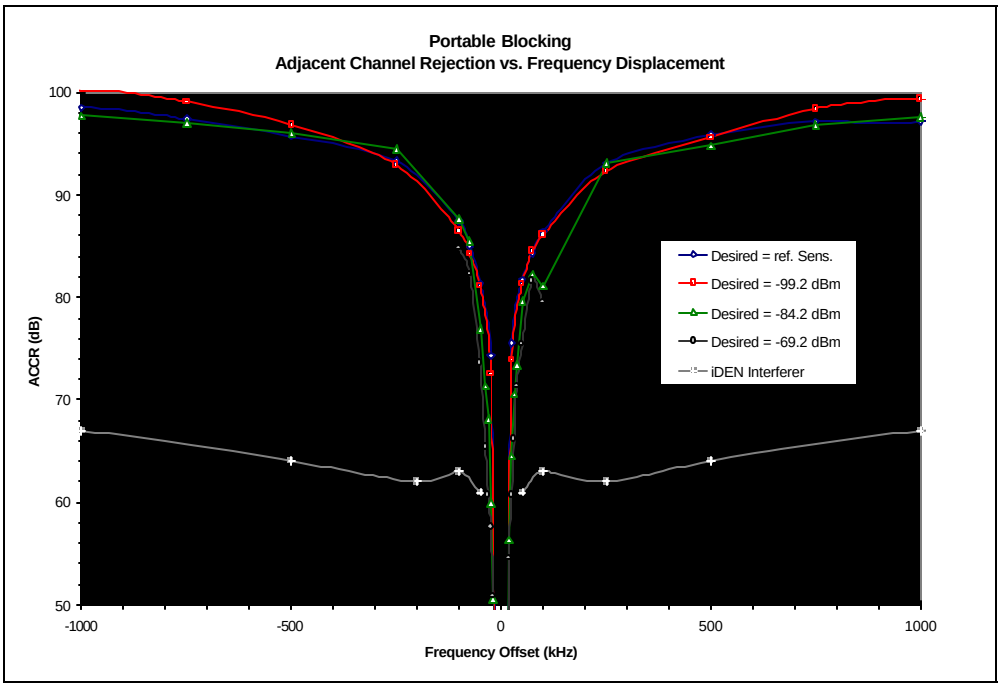


Figure 8 Receiver Blocking

Figure 8 shows that with desired signal levels as high as approximately -70 dBm signal levels, no blocking phenomena occurs. There is a small degradation of the desensitization performance at offsets ≥ 100 kHz for desired signal levels of ≥ -85 dBm.

Figure 8 also demonstrates the desensitization performance at sensitivity level due to an iDEN base radio used as the interfering signal. The desensitization limit imposed by the iDEN OOBE is nearly 20 dB worse than that of the hypothetical radio itself at any desired signal level. From this it can be concluded that ***receiver blocking due to high signal levels is not a significant source of interference, at least where the limiting interference source is from the noise contribution of a base radio generating strong OOB emissions.***

7 RECEIVER INTERMODULATION

Receiver front end (RF Amplifier) non-linearity can create intermodulation products on the desired frequency by mixing two or more high level signals, typically≥ -50 dBm. Figure 9 shows sensitivity level intermodulation rejection (IMR) for typical receivers, relative to the receiver' s reference sensitivity signal level. For practical purposes, IMR is not a function of frequency offset, as the preselector doesn' t provide additional rejection of potential Intermodulation combinations across the receiver' s desired bandpass. As a result, the IM performance is essentially flat in the desired band. The preselector does provide additional protection from signals outside the pass band. For each additional dB of insertion loss, the IMR products are reduced by the order of the IM product, e.g. 3 dB for 3rd order IM.

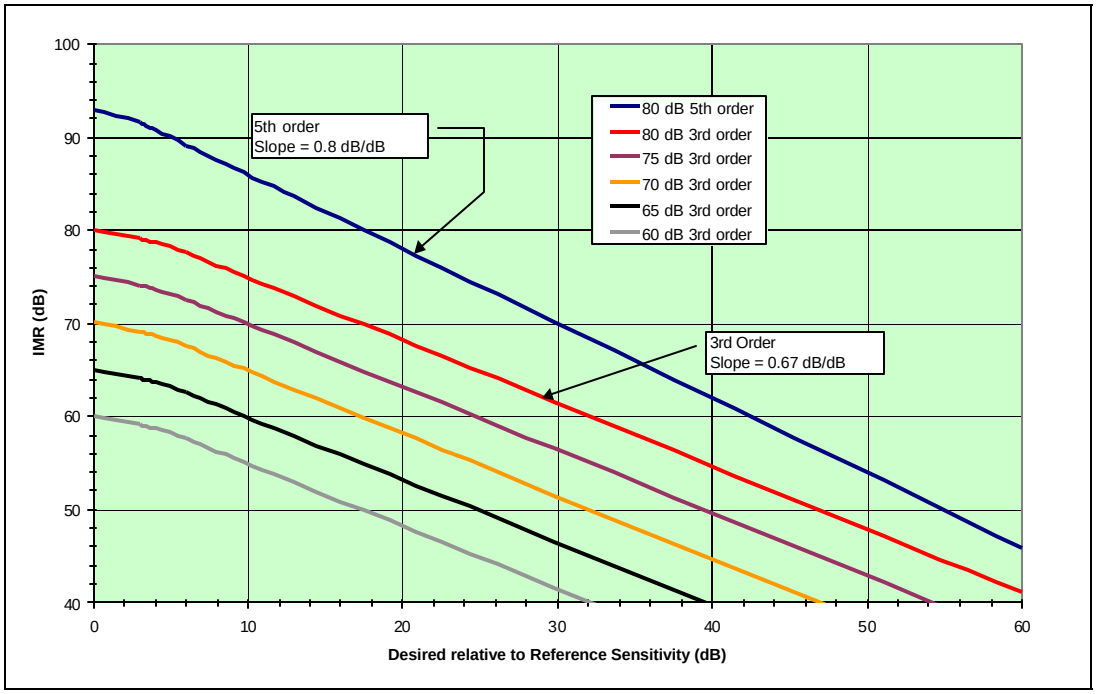


Figure 9 Receiver IM above Reference Sensitivity

While IMR is not a function of frequency offset, it is a function of the level of the desired signal. This is because the signal strength of intermodulation products grows at a rate proportional to the order of the intermodulation product. For example, third order intermodulation products grow 3 dB for every 1 dB increase in signal strengths of the carriers that produce them. Because of this, the IMR is reduced by 2/3 dB for each 1 dB increase in the desired signal level. This effect is shown in Figure 9.

Figure 9 shows that all the products normally follow the 2:3 slope expected for IMR with increasing strength of the desired signal. It is important to note at this point that IMR, as measured using TIA methods, is concerned only with two generator, third order IM processes. Higher order (5^{th}, 7^{th}, 9^{th}, etc., order) processes also exist but are usually of

little concern because they usually require much larger interference signal levels than the third order process. Three generator IM processes produce a slightly lower IMR due to the increased power due to the additional signal.

In situations where there is a high concentration of high-powered transmitters with high duty cycles, the higher order IM products can become significant for receivers in close proximity to the site. Figure 9 also shows a 5th order response for an 80 dB (3rd order IMR) receiver. The 5th order IM specification is typically 12 to 15 dB higher than the 3rd order IM specification. Although the 5th order IMR is much higher than the 3rd order IMR, its slope is greater so that 5th order IM can become a problem in situations where there are a large number of carriers. Although not shown, the 1-dB compression point is also very important. The 1-dB compression point exists roughly 10 dB below the IIP^3 and represents where the theoretical slope departs by 1 dB from the linear performance. Signal levels greatly in excess of the 1-dB compression point can cause the amplifier to saturate and eventually burn out.

The use of receiver multicouplers and tower top amplifiers can have a dramatic negative effect on a base station's receiver IMR performance. This is due to the fact that the IIP^3 is constant. The reserve gain of the amplifiers in the configuration raise both the desired signal and the potential IM signals, resulting in a reduction in the system IMR. Figure 10 demonstrates this.

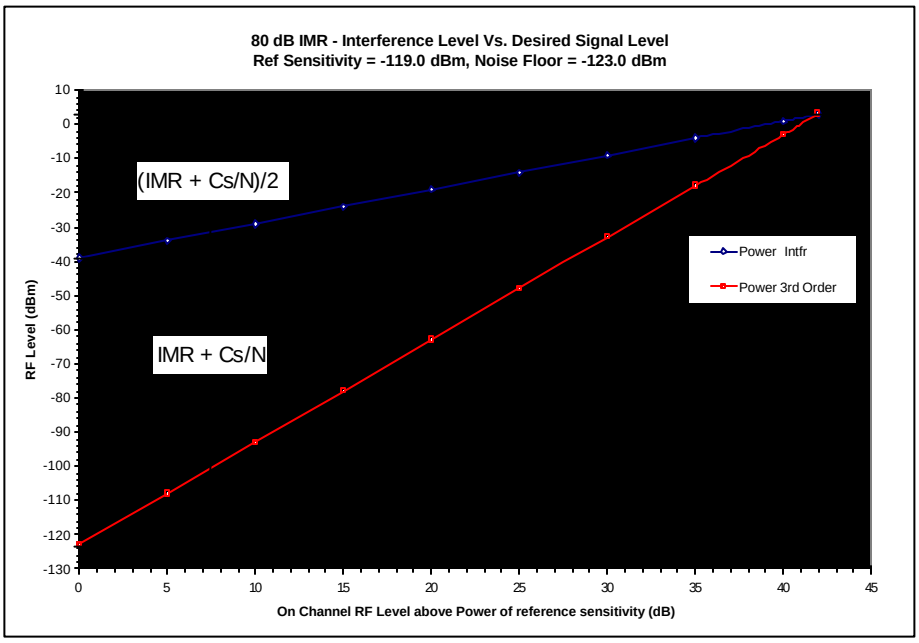


Figure 10 IMR Performance

In Figure 10, the reference sensitivity for 12 dB SINAD is -119 dBm, Cs/N is 4 dB and the IMR is 80 dB. The noise floor calculates to be -123 dBm. The IIP^3 is 1.5*x*(84) or 126 dB above the noise floor (+3 dBm). The individual power level from two equal interferers that produce an IM response on frequency is 42 dB below the IIP^3, -39 dBm.

To review, using the TIA IMR test methodology, consider the previous example. The -119 dBm produces a 4 dB Cs/N that creates the 12 dB SINAD reference sensitivity. The signal is boosted by 3 dB (-116 dBm) and the equal signal level interferers increased until 12 dB SINAD is again reached. This indicates that now a 4 dB Cs/(I+N) has been reached but the desired is now -116 dBm. Thus the composite noise floor is -120 dBm, consisting of -123 dBm from the receiver noise floor and -123 dBm, the equivalent noise from the intermodulating signals. The difference between the original signal (-119 dBm) and the level of the IMR signals (-39 dBm) is the IMR performance of the

receiver (80 dB). Note that at higher signal levels, the receiver's own noise floor becomes insignificant and the ratio is merely the difference between the desired and the IMR signals required producing 12 dB SINAD. This explains why the slope in Figure 9 tends to flatten out in the region where the receiver noise floor is significant.

If the desired signal for the example 80 dB IMR receiver is 20 dB above reference sensitivity, -99 dBm, then the difference between the IMR sources and IIP^3 is 102 dB. The level of 2 equal signal IM generating sources 102/3 = 34 dB below the IIP^3. (+3 dBm - 34 dB = -31 dBm). Thus for this example the IMR is now -31 dBm - (-99 dBm) = 68 dB, not 80 dB! In this case the two IMR signals produce an equivalent noise of -102 dBm. The receiver's own noise floor of -123 dBm is insignificant. What is important to note is that even at -99 dBm, the performance is only equivalent to the static reference sensitivity. This phenomenon supports the recommendation for deploying higher IMR receivers when the victim receiver can be close to the source that can produce IMR.

8 RECEIVER SPURIOUS RESPONSES

Receivers can have spurious responses to strong single signals, typically in excess of -50 dBm, which are on frequencies other than the desired receive frequency. Examples include the 1st IF image response, the 2nd IF image response, and any harmonics of the local oscillator mixing with any harmonics of the undesired signal.

Using the typical receiver in Figure 11, if the IF frequency is 11.7 MHz, and the desired signal is 460.0000 MHz, the Local Oscillator must be either 11.7 MHz above or below to cause an 11.7 MHz signal to be generated in the mixer. If the LO is below by 11.7 MHz (448.3 MHz) or above (471.7 MHz) proper operation can occur. With wider preselectors, the image frequency can easily fall within the passband of the preselector. To reduce the possibility of this occurring, the IF frequency should be greater than the preselector's bandwidth. Figure 11 shows how this can occur.

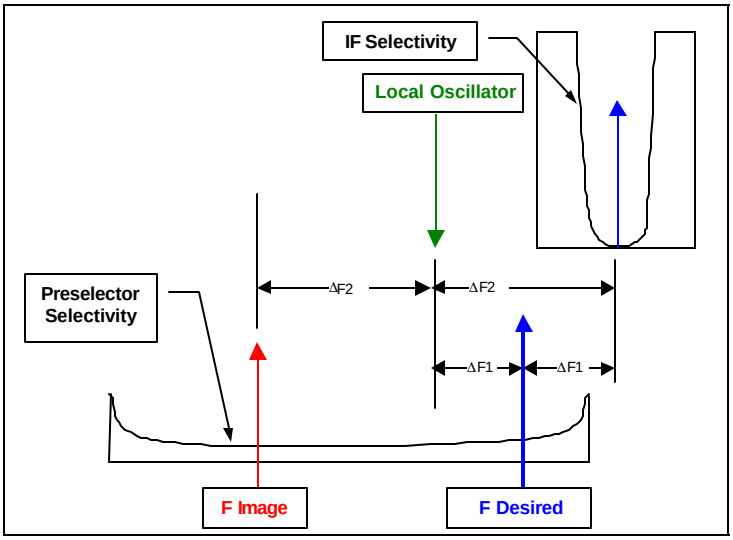


Figure 11 Typical Receiver with a Wide Preselector Passband

The spurious responses of a receiver can cause significant degradation to the desensitization properties of the receiver, on the order of 20 dB in some cases. In most cases, when the interfering signal is due to a base radio with high OOB Emission, the desensitization performance is dominated by that noise floor rather the spurious responses.

9 DETERMINING THE SOURCE OF INTERFERENCE

9.1 TEST EQUIPMENT REQUIRED

1. Spectrum analyzer.
2. Low noise RF amplifier.
3. Step attenuator (pad).
4. Cavity, bandpass filter that has a bandwidth (±3 dB) of at most 300 kHz, an insertion loss of at most 2 dB and that can be tuned to the desired channel.
5. Antenna for the frequency band in question.
6. Subscriber unit that can be connected to a coaxial cable.
7. Motorola Radio Service Software (RSS), or equivalent, loaded on a suitable PC laptop computer to read receive signal strength; if applicable. This capability may not exist for all radios in which case one must listen to the radio' s speaker and judge the quieting level.

9.2 EVALUATION PROCEDURE FOR INTERFERENCE TO SUBSCRIBER UNITS

The interference evaluation process begins by visiting the affected location, setting up the subscriber unit and connecting the test equipment as shown in Figure 12 below:

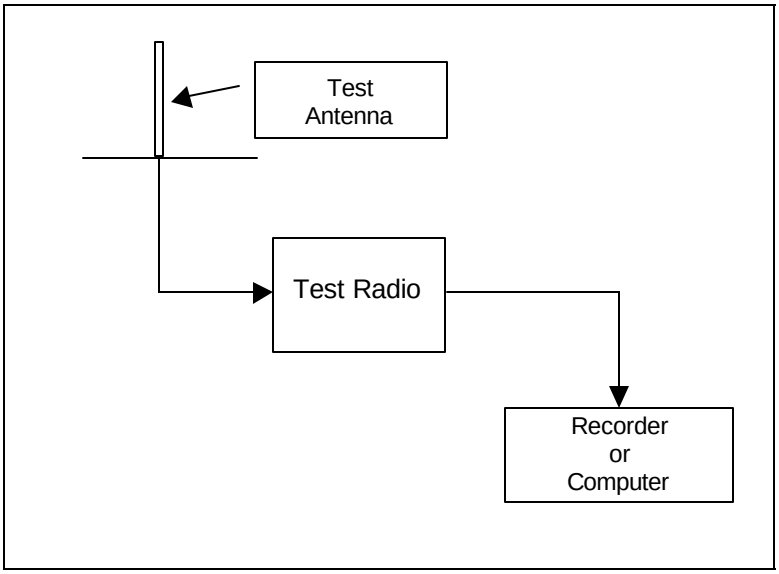


Figure 12 Initial Evaluation

Tune analog units to the appropriate RF channel, and observe the recovered audio quality by recording about two minutes of the audio while slowly driving the test vehicle around in at least a 100-foot circle. The audio should have noticeable degradation compared to the normal reception expected in the general area. After the recording has been made, replay it several times to become familiar with the type of audio degradation that is occurring.

If the subscriber unit uses digital modulation, and the Radio Service Software (RSS) package includes a signal quality metric, it may be more appropriate to record the data from that output on a computer for analysis.

Next, connect the spectrum analyzer to the antenna as shown in Figure 13:

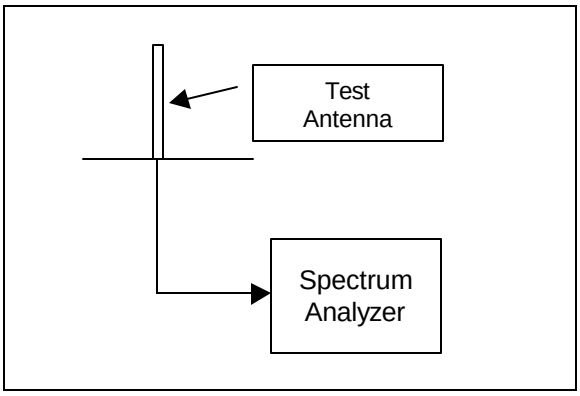


Figure 13 Evaluation with Spectrum Analyzer

Record all signals in the frequency bands that are above (stronger than) -50 dBm. Pay particular attention to those above -40 dBm, as they are the most likely to cause problems, particularly if there are several of them within a few MHz of the desired frequency. A rough guideline is to suspect receiver front-end overload if the total instantaneous peak RF power being delivered to the receiver is in excess of -20 dBm.

In order to correctly measure the power of any RF signal with a spectrum analyzer, it is necessary to use a resolution bandwidth in excess of the maximum spectral distribution of RF energy expected. For analog FM signals, this is typically 10 kHz. For narrowband digital modulation formats, this may be up to 30 kHz, and as much as 1.25 MHz for CDMA transmissions. The reason for this is so that the entire signal will be measured at the same time. The best procedure is to adjust the analyzer frequency span range until the desired signal is centered in the display screen and occupies about 20 percent of the width of the display. Then start at a 1 kHz resolution bandwidth and increase it until there is no further increase in the maximum amplitude shown on the display.

Be aware that multiple RF signals of any modulation format will occasionally add in phase, so that four signals each at a level of -25 dBm will have a total peak instantaneous power that is another 12 dB higher, or -13 dBm.

If there are no strong signals, then the cause is either man-made noise, or co-channel interference from another user on the desired frequency. The difference can be resolved by connecting the equipment as shown in Figure 14:

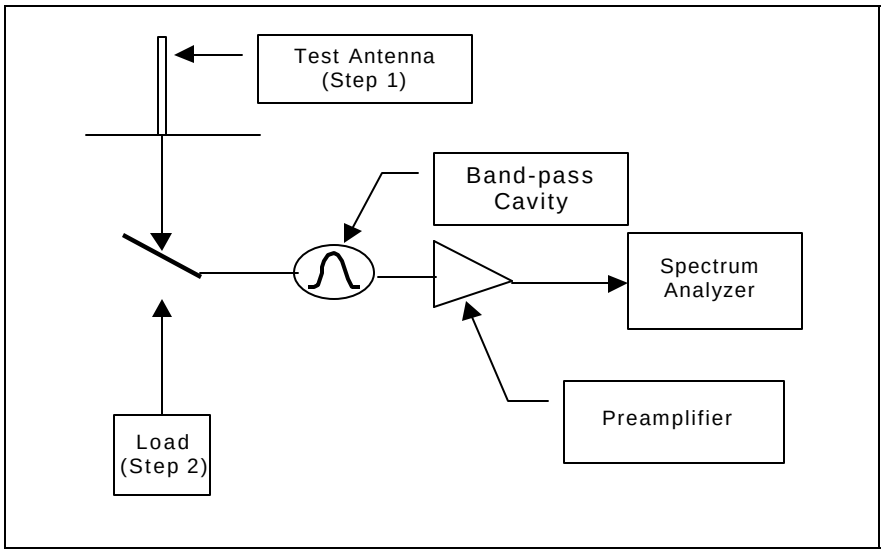


Figure 14 RF Noise Measurement Setup

Using a resolution bandwidth no wider than 3 kHz and a frequency span no greater than 3 times the desired RF channel bandwidth, measure the noise present on the channel, then connect a 50 ohm load in place of the antenna. The noise level should decrease less than 1 dB if there is no noise or interference present. If there is a noticeable reduction, note the amount, then reconnect the antenna, and note the spectral content of the noise. If it is not restricted to the desired channel (Figure 15), then it is most likely either from broadband digital services like CDMA systems or from non-RF sources such as power lines, neon signs, ignitions, and the like. If the noise is shaped to fit the channel (Figure 16), or a single frequency carrier appears in the channel, then co-channel interference is the cause.

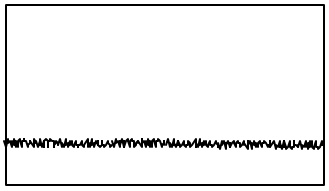


Figure 15 Broadband Noise

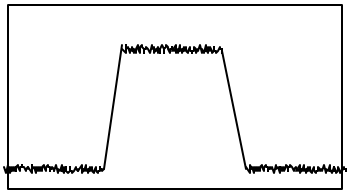


Figure 16 Digital Modulation

If there is only one strong signal present, and it is the desired one, then the cause is one of simple receiver overload. The symptoms are a very high desired signal strength, typically in excess of -30 dBm, with some degree of audio distortion. This is rare, but if it occurs, the only solutions are to move the subscriber unit farther away from the transmitter site, place an attenuator in the receiver' s antenna line or reduce the transmit effective radiated power.

If one or more strong signals are present record about two minutes of audio or data on the desired channel using the configuration shown in Figure 17. Listen carefully to the audio recording several times to get familiar with the recovered audio quality.

If the subscriber unit uses digital modulation, compute the average signal strength and signal quality for the entire recording of digital data. Next, add a 5 dB pad in the line between the antenna and the subscriber unit as shown in Figure 17 below:

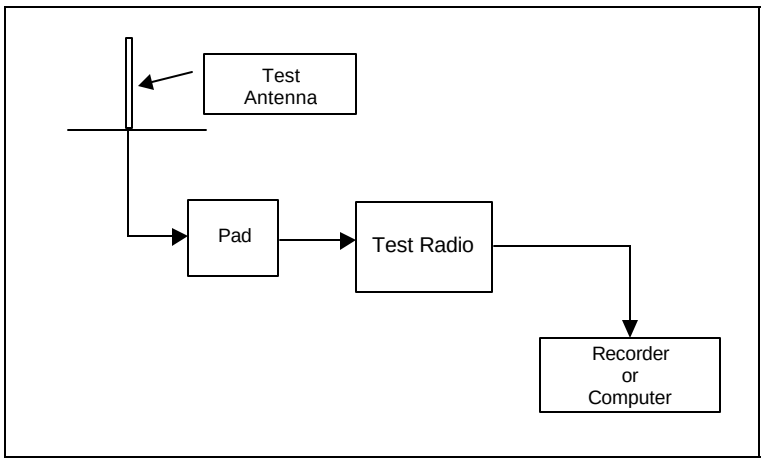


Figure 17 Intermodulation Test

Record another two minutes of audio or data while driving the exact same route as in step 1 and note the differences from the non-attenuated readings. The received signal strength should have been reduced by 5 dB, but if the audio or signal quality ***improved*** noticeably, then the root cause is a high order intermodulation product being generated in the receiver.

Subscriber units using digital modulation will clearly show the reduction in received signal strength while simultaneously indicating the improved signal quality. This type of response usually results from two or more strong signals at the receiver input.

If the received signal strength decreases by 4 dB or less when the 5 dB pad is switched in, the cause is receiver front end overload, resulting from one or more extremely strong signals anywhere in the frequency band. The reason for this is that one of the amplifier stages in the receiver is being driven into saturation by the extremely strong input signals. This effectively reduces the gain of that stage for all signals passing through it. When the strong signals are attenuated by 5 dB, the saturation is reduced, and the effective gain of the amplifier stage increases, so the measured signal strength decreases less than 5 dB. If the audio quality or signal quality remains unchanged when the 5 dB pad is switched in, then the problem is either due to receiver local oscillator noise, or received RF noise from nearby transmitters.

If there are no strong signals closer than 500 kHz away from the desired channel, the cavity filter can resolve whether the receiver is at fault, or the interference is being radiated on frequency from the nearby transmitters. First, connect the external antenna to the analog subscriber unit as shown in Figure 9. Record about two minutes of audio or data on the desired channel. Listen carefully to the audio recording several times to get familiar with the recovered audio quality.

If the subscriber unit uses digital modulation, compute the average signal strength and signal quality for the entire recording of digital data.

Next, connect the antenna through the cavity filter as shown in Figure 18 below:

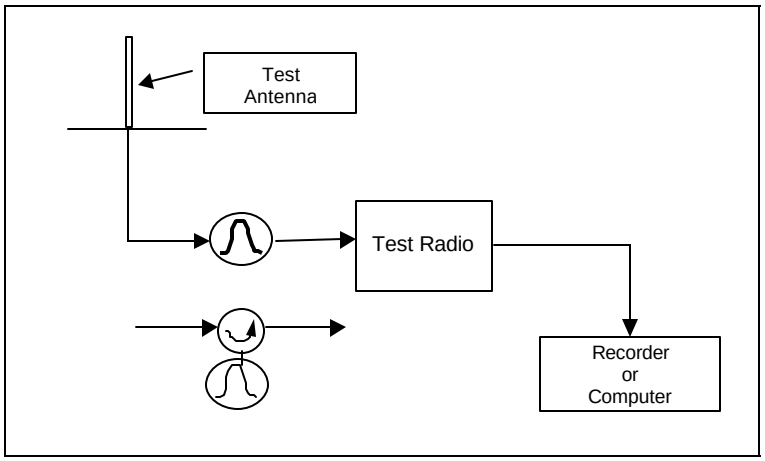


Figure 18 Sideband Noise Determination

Record another two minutes of audio or data on the desired channel. Again listen carefully to the audio recording several times to become familiar with the recovered audio quality. Average the data recorded from digital subscriber units. If the audio quality or average signal quality has improved, the problem is a result of receiver performance limitations.

If it remains about the same, the problem is a result of unwanted RF power being radiated on the desired channel.

It is a special case if any strong signals are less than 300 kHz away from the desired channel. If there are, they are under suspicion right away, especially if they are iDEN signals. A high Q notch filter is needed to perform the above procedure instead of a cavity bandpass filter. This can be achieved by using a bandpass cavity and circulator.

If the above procedures have determined that the problem lies with nearby transmitters, the usual procedures for identifying the exact one or ones apply: If the transmitters are on continuously, shutting them down one at a time can isolate the offender. As this is unpopular with the system operators, a less intrusive method that can be applied if the transmitters are not continuously keyed is to observe the timing of the interference compared to the activity of the nearby transmitters as observed on the spectrum analyzer display.

10 800 MHz BAND EXAMPLE INTERFERENCE SCENARIOS

In most band plans (except Low Band and High Band) there are transition points where the base transmit block of frequencies are adjacent to the base receive block of frequencies. High band and Low band do not follow this due to their earlier development before mobile relay became the dominant type of system deployment. Across this transition there is the potential for base station T to base station R interference in one direction and mobile T to mobile R in the other direction. Within the blocks there is potential for the classic near/far interference scenarios. This can occur as base – mobile interference or mobile – base interference. Recently the frequency of occurrences in the 800 MHz band has become more common, as illustrated in Figure 19.

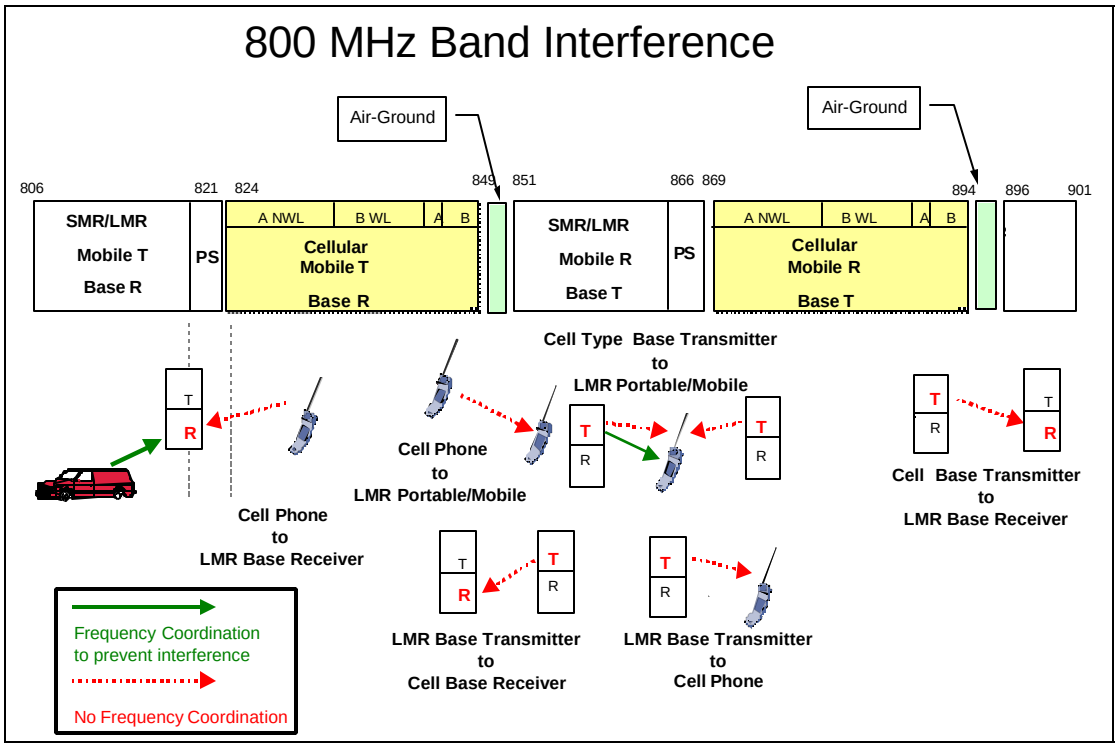


Figure 19 800 MHz Band Interference Scenarios

The following examples (Transmitter to Receiver Cases) will be individually diagrammed, with a table like Figure 20 to show the factors that can create interference, and methods to minimize or prevent that interference.

The logic of the example groupings is that a number describes the type of interference, e.g. Base to Subscriber, but there are different situations because of band breaks or how the systems are deployed.

1 A) LMR[4] Base to LMR Subscriber
B) SMR Base to LMR Subscriber
C) Cellular Carrier Base to Public Safety Subscriber
2 LMR Base to Cellular Phone
3 Cellular Base to 900 MHz Base
4 LMR Base to Cellular Base
5 Cellular Subscriber to LMR Subscriber
6 A) LMR Subscriber to LMR Base
B) Cellular Subscriber to LMR Base

Source of Interference Transmitter Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital
Transmit Interferor Charteristics					
Combining/ Filtering	High Q Cavity	Hybrid	Multi-CXR Amp	Band Only	
Multiple Transmitters	Yes	No			
Duty Cycle	Intermittent	Continuous			
Power Control	Yes	No			
Isolation From Source	High	Low			
Antenna Type	Omni	Directional			
Victim of Interference Receiver Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital
Receive Characteristics					
IMR > 75 dB	Yes	No			
Filtering Possible	Yes	No			
Frequency Coordination					
Frequency Coordination	Yes	No			
Type Of Coordination	Co-Channel	Adjacent Channel	Adjacent Band	Guard Band	Reuse Plan
Frequencies Are Closed Spaced	Yes	No			
Sources Are Physically Close (distance)	Yes	No			

Figure 20 Generic Interference Scenario Table

For each example, only the table sections appropriate for that interference scenario will remain legible. Those not appropriate will be darkened. For understanding the table, the rows contain the important information. The columns are not related to each other, other than representing the specific variables being considered in each raw by remaining unshaded.

[4] LMR is Land Mobile Radio

There are two considerations as far as the band is concerned. The cellular band is specifically identified and treated differently than the LMR/SMR band, which includes the exclusive public safety (NPSPAC) portion of the band. For cellular, there are currently three different types of modulations deployed. They include analog, which is referred to as AMPS or NAMPS. AMPS is the original 30 kHz channel bandwidth assignments while NAMPS is a Motorola narrowband version that limits the channel bandwidth to 10 kHz. The Time Division Multiple Access (TDMA) is the 3:1 - 30 kHz channel bandwidth version. Code Division Multiple Access (CDMA) is the 1.23 MegaChip version currently being deployed across markets in the United States. Typically combinations of these modulations can be deployed at any given site. Each cellular carrier selects what they wish to deploy.

In the LMR/SMR band there is currently only analog and some digital, with the digital being principally deployed in the Public Safety band as Project 25 (P-25) systems. However, Nextel has deployed iDEN systems throughout the LMR/SMR band.

Different systems use different transmitter combining techniques. Because LMR systems are narrow band, they typically use Hi-Q cavity combiners, while SMR's frequently uses broadband hybrid combiners to allow frequent frequency changes without requiring site visits.

The Multiple transmitter indication is there to identify where intermodulation products are the easiest to generate.

The duty cycle indicates whether the transmitter(s) are continuous as cellular type deployments require or intermittent as typical of LMR systems use. Note that when a trunking system is involved, the control channel may be continuous while the voice channels are intermittent.

Power Control applies primarily to subscriber units. When power control is available, the subscriber unit limits its output power based on information from the base site. This requires a full duplex path so that the feedback information is constantly updated. For the base station to use power control requires that only a single path be used per base station or that "smart antennas" allow ERP controlled full duplex paths to individual units. This is possible for "interconnect" type calls but isn't possible for dispatch as most of the units are only monitoring the "channel".

The isolation indicated as either High or Low refers to the typical losses involved. There are two different methods used to calculate site isolation. The simplest is to use the port-to-port isolation between the input to one antenna to the output of the other antenna (see the Site Isolation Section 11). The other is to use a propagation model and adjust for the specific antenna gains and propagation losses. The reason for differentiating them is that for the typical scenario being discussed, there is typically between 70 & 75 dB of port-to-port isolation to subscriber units operating in relatively close proximity of the site. Note that the port-to-port isolation eliminates the antenna gains. This makes estimating the effect of OOB emissions much easier. If the OOB emission is -50 dBm, then 70 dB of isolation would produce a -120 dBm interferer at the output of the victim's antenna. However when base-to-base interference is being analyzed, the paths are typically point to point and the antenna gains and minimal free space losses can dramatically reduce the amount of attenuation experienced by the OOB emission. The recent increased usage of "stealth" sites with very short towers has caused a reduction in the amount of site isolation available.

Antenna types are important due to potential directionality.

The victim receiver flag for IM performance is based on the recommendation that 75 dB IMR be a minimal specification. Portable antennas allow some reduction in this requirement as the loss of efficiency acts like an attenuator to potential IM.

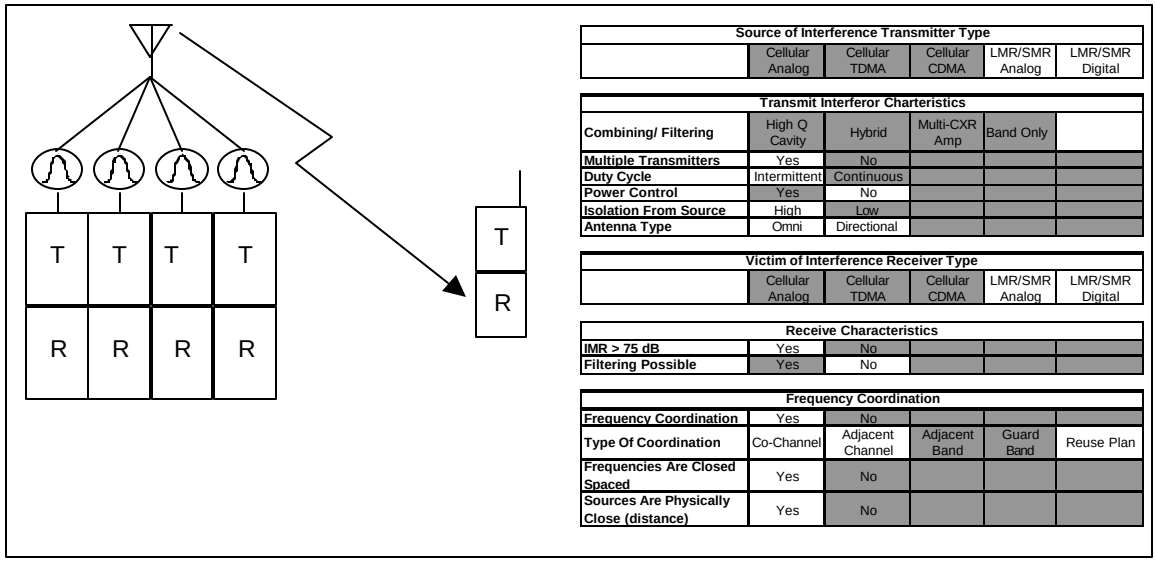
The filtering refers to what can be done at the receiver. Components that are already on frequency cannot be filtered at the victim receiver; they must be filtered at the source. However IM products can be filtered before reaching the active stages of a receiver.

Lastly, the issue of frequency coordination is highlighted. This is an extremely important but not well understood aspect of interference potential. Frequency coordination normally requires that someone (a frequency coordinator) evaluate the use of different candidate frequencies in various defined service areas and then recommends the candidate frequency that doesn't cause interference, or is the best choice from a poor selection. This normally involves evaluating only co-channel usage, but is being expanded to include adjacent channel interference potential. The frequencies are licensed based on the specific site and the ERP being used (referred to as site licensed). SMR's and cellular carriers have special circumstances where they can use any of their inventory of frequencies anywhere in their defined service area, subject to some co-channel reuse limitations where others may be licensed on the same frequencies. As a result, there is no available database of which and where their frequencies are deployed (referred to as area licensed). This allows them the capability of rapidly changing their frequency plan to allow new sites to be deployed thereby adding capacity. A frequency plan covers a wide are a and may be coordinated nationwide. A single change can ripple across the entire system, making exceptions more difficult.

The types of coordination are also listed. In some cases a guard band is provided to take the place of frequency coordination. It is implied that when a different band is used, the requirement for frequency coordination is eliminated. Unfortunately, with the wide band and high OOBE of some of the more complex modulations, this assumption is not longer true. The wide band OOBE is radiated into the adjacent or guard band and must be dealt with to minimize interference potential. Cellular type systems utilize frequency reuse plans. This allows a structured starting point for doing internal frequency coordination. The key point is that they are primarily concerned with their own intra-system interference. This type of frequency planning (interference limited) is based on the fact that when the interference gets strong enough, the system will be able to provide an alternative resource that isn't being interfered with.

The other two references under frequency coordination refer to whether or not the frequencies are close (a small frequency offset) or whether units can get into close physical proximity.

10.1 CASE 1A, LMR BASE TO LMR SUBSCRIBER



Source of Interference Transmitter Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital

Transmit Interferor Charteristics					
Combining/ Filtering	High Q Cavity	Hybrid	Multi-CXR Amp	Band Only	
Multiple Transmitters	Yes	No			
Duty Cycle	Intermittent	Continuous			
Power Control	Yes	No			
Isolation From Source	High	Low			
Antenna Type	Omni	Directional			

Victim of Interference Receiver Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital

Receive Characteristics					
IMR > 75 dB	Yes	No			
Filtering Possible	Yes	No			

Frequency Coordination					
Frequency Coordination	Yes	No			
Type Of Coordination	Co-Channel	Adjacent Channel	Adjacent Band	Guard Band	Reuse Plan
Frequencies Are Closed Spaced	Yes	No			
Sources Are Physically Close (distance)	Yes	No			

Figure 21 Case 1A LMR Base to LMR Subscriber

This is a very common scenario where a subscriber unit can be very close to a site that generates interference. In this case, the transmitters have Hi-Q cavities to limit the OOBE. The frequency coordination should have eliminated co-

channel and adjacent channel interference. If the receiver has an IMR specification of ≥75 dB this scenario would normally be interference free. However, it the undesired IM sources are considerably stronger than the desired signal, the IM "Noise" can prevent the required C/(I+N) from being realized.

However there are some situations where intra site interference can occur for users of that site when they are in close proximity. Figure 21 doesn't show the base receive site configuration. If there is low isolation between the base Transmit and base Receive combiners, then when two subscribers in close proximity to the site transmit a temporary lockup scenario can occur.

Consider the simple two-transmitter/receiver configuration shown in Figure 22. When the subscribers are close to the site, they produce strong signals that can enter the transmitter antenna system. Here the difference in frequencies cross modulate at a loose connector producing the necessary products which are re-radiated to keep the receivers satisfied that they are seeing the correct CTCSS tone or Trunking Connect Tone. When one subscriber de-keys, the cross modulation generates an on frequency interferer that continues to repeat the weak interferer with the other users audio. It is not until the second subscriber de-keys that the lockup will be released.

This can only be resolved by isolating the Transmit and Receive systems, e.g. by vertical antenna separation, and making sure that there are no extraneous locations for this IM to occur. This can also occur externally on the site, such as on rusted tower bolts, etc. For trunking, the use of transmission trunking forces the repeater to also immediately dekey thereby preventing this phenomenon.

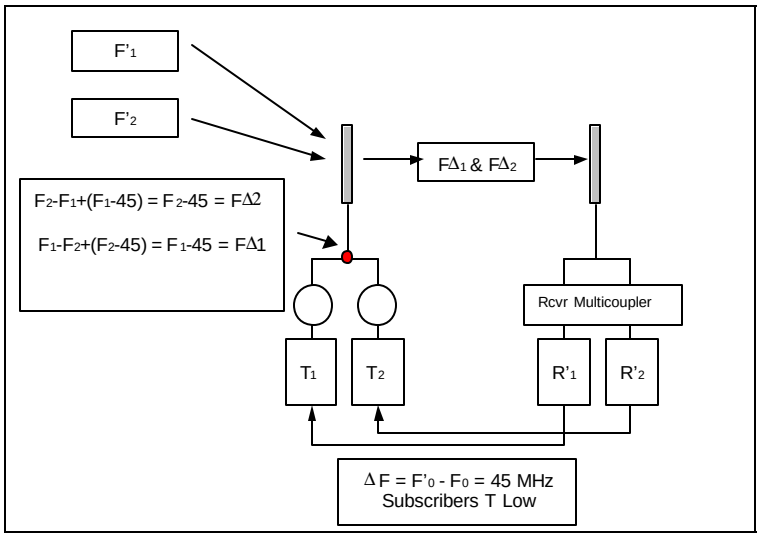
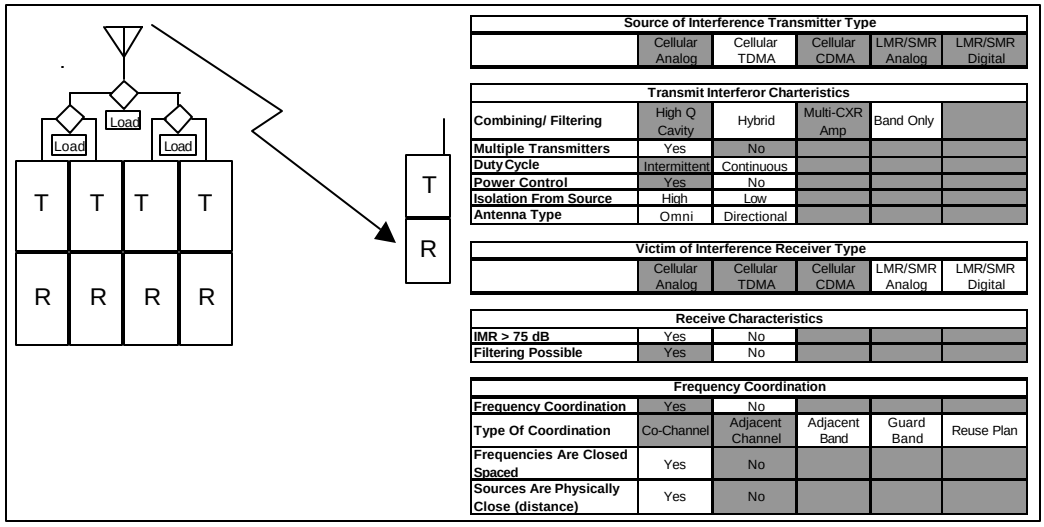


Figure 22 Intermodulation Example

10.2 CASE 1B, IDEN SITE TO LMR SUBSCRIBERS

In Case 1B, the interferer is an iDEN site deploying multiple transmitters as shown in Figure 23. This is a high potential interference scenario due to the fact that the transmitters are hybrid combined and therefore only have limited in-band filtering. The carriers are continuously keyed and subscribers can get in close proximity both in frequency and space with no frequency coordination.

The worst case involves combinations of frequencies that cause on-frequency receiver IM products. This is especially detrimental to receivers with low IMR specifications. If there is sufficient desired signal strength, inserting an attenuator in front of the receiver will reduce both the desired and undesired signals but the IM product of the multiple undesired signals will be suppressed more than the desired signal is attenuated. A building acts much as an attenuator. Building attenuation will reduce the desired by a given amount amount, but it also reduce the IM^3 product by three times the building attenuation, allowing the desired to achieve a usable C/(I+N).



Source of Interference Transmitter Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital

Transmit Interferor Charteristics					
Combining/ Filtering	High Q Cavity	Hybrid	Multi-CXR Amp	Band Only	
Multiple Transmitters	Yes	No			
Duty Cycle	Intermittent	Continuous			
Power Control	Yes	No			
Isolation From Source	High	Low			
Antenna Type	Omni	Directional			

Victim of Interference Receiver Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital

Receive Characteristics					
IMR > 75 dB	Yes	No			
Filtering Possible	Yes	No			

Frequency Coordination					
Frequency Coordination	Yes	No			
Type Of Coordination	Co-Channel	Adjacent Channel	Adjacent Band	Guard Band	Reuse Plan
Frequencies Are Closed Spaced	Yes	No			
Sources Are Physically Close (distance)	Yes	No			

Figure 23 Case 1B, SMR iDEN Site to LMR Subscriber

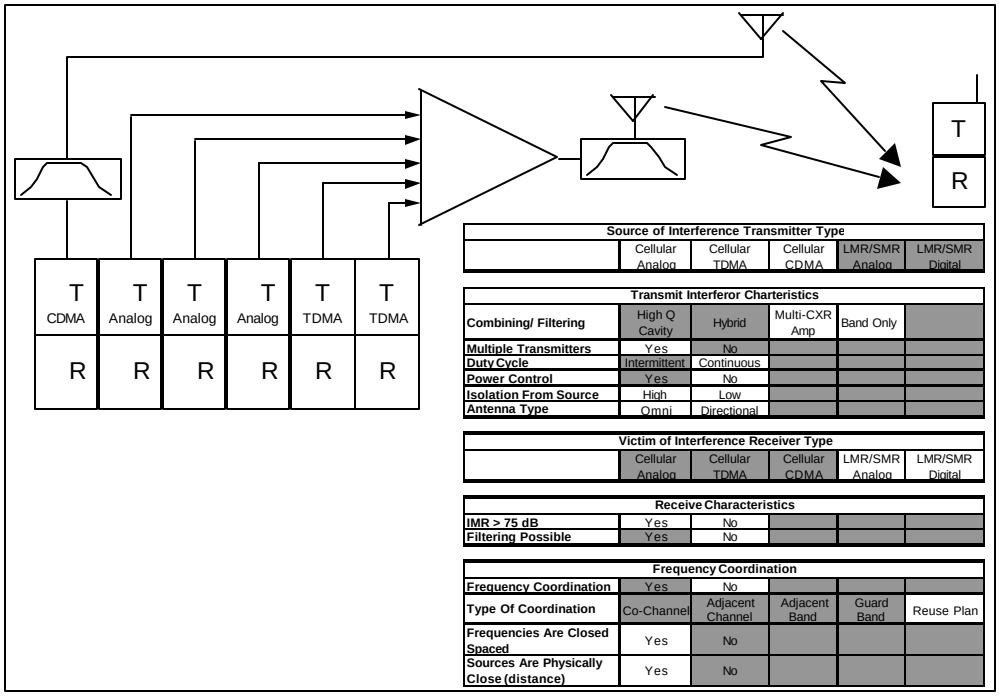
The coordination and reassignment of frequencies deployed at a particular site can eliminate the IMR, allowing the situation to be resolved.

10.3 CASE 1C, CELLULAR CARRIER TO PUBLIC SAFETY SUBSCRIBER

Case 1C is similar to the other Case 1 scenarios except that the interference emanates from transmitters in an adjacent band (Figure 24). The symptoms are similar to the other Case 1 scenarios as this produces coverage holes around the offending site. Due to pressures for minimizing antenna sites, many of the cellular carriers are co-locating. This greatly increases the potential for IMR due to the extremely high number of frequencies involved. The interference potential is increasing as cellular abandons analog for the digital transmitters with higher OOBE and eliminates Hi-Q cavities, deploying multi-carrier transmitters with only band filtering.

This scenario is especially destructive with older portables with 65 dB IMR specifications and preselectors that are designed for International in addition to Domestic distribution. That is because the International band for LMR extends 1 MHz into the Domestic cellular band. This situation is further aggravated if the portables utilize vehicular adapter consoles as this eliminates the portable antenna inefficiency and may even have mobile gain antennas.

Under these circumstances, 5^{th} order IM becomes commonplace. It is not unreasonable for a 20 channel trunked system that has units that operate within ¼ mile of a combined carrier site to have over 1000 IM products distributed randomly over the various frequencies in the 866 - 869 MHz band. For this case, the highest receiver IM performance is mandatory!



Source of Interference Transmitter Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital

Transmit Interferor Charteristics					
Combining/ Filtering	High Q Cavity	Hybrid	Multi-CXR Amp	Band Only	
Multiple Transmitters	Yes	No			
Duty Cycle	Intermittent	Continuous			
Power Control	Yes	No			
Isolation From Source	High	Low			
Antenna Type	Omni	Directional			

Victim of Interference Receiver Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital

Receive Characteristics					
IMR > 75 dB	Yes	No			
Filtering Possible	Yes	No			

Frequency Coordination					
Frequency Coordination	Yes	No			
Type Of Coordination	Co-Channel	Adjacent Channel	Adjacent Band	Guard Band	Reuse Plan
Frequencies Are Closed Spaced	Yes	No			
Sources Are Physically Close (distance)	Yes	No			

Figure 24 Case 1C, Cellular Carrier Base to Public Safety Subscriber

The Case 1 scenarios all have a similar pattern of interference, wherein the interference potential is maximized where the desired signal is weakest while the interferers are the strongest. This is the classic Near/Far problem (discussed earlier in this document). A typical system wide scenario might look something like Figure 25 with the LMR base in the center. In this case, both Base to Mobile and subscriber-to-subscriber interference is portrayed. Only consider the size of the red zones around interfering sites at this time. The green distribution will be discussed later.

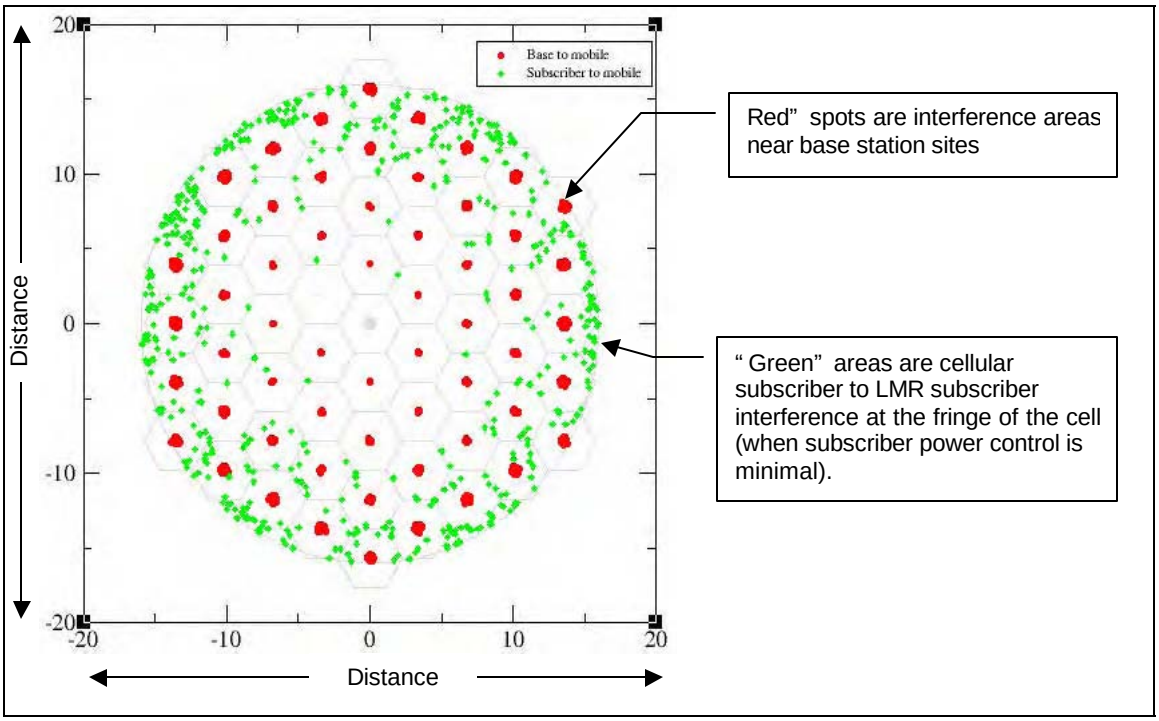
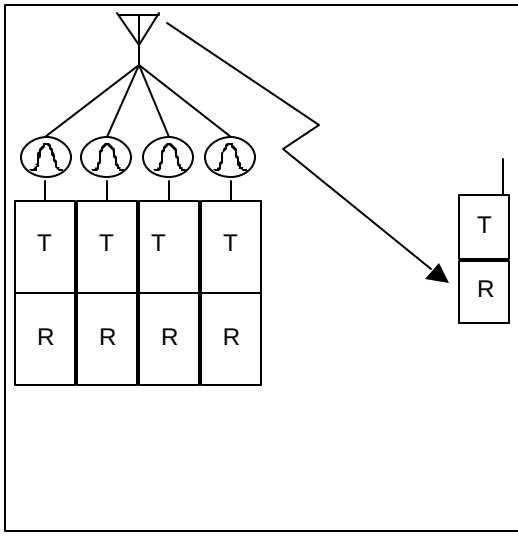


Figure 25 Base to Mobile and Mobile-to-Mobile Interference Pattern

10.4 CASE 2, LMR BASE TO CELLULAR PHONE

Case 2 essentially is the opposite direction from Case 1, where the LMR base station creates coverage holes around its sites for cellular subscribers (Figure 26). Although this case could cause limited interference, it is unlikely due to the fact that the stations are well filtered and the cellular subscribers have alternate sites to be handed over to in case of IMR type interference. Only Public Safety stations operate in the 866 -869 MHz band so their deployment density is quite low compared to the cellular deployment. Also, the LMR transmitters have an internal filter that provides protection above 869 MHz and the HI-Q cavities also limit any OOB emissions.



Source of Interference Transmitter Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital

Transmit Interferor Charteristics					
Combining/ Filtering	High Q Cavity	Hybrid	Multi-CXR Amp	Band Only	
Multiple Transmitters	Yes	No			
Duty Cycle	Intermittent	Continuous			
Power Control	Yes	No			
Isolation From Source	High	Low			
Antenna Type	Omni	Directional			

Victim of Interference Receiver Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital

Receive Characteristics					
IMR > 75 dB	Yes	No			
Filtering Possible	Yes	No			

Frequency Coordination					
Frequency Coordination	Yes	No			
Type Of Coordination	Co-Channel	Adjacent Channel	Adjacent Band	Guard Band	Reuse Plan
Frequencies Are Closed Spaced	Yes	No			
Sources Are Physically Close (distance)	Yes	No			

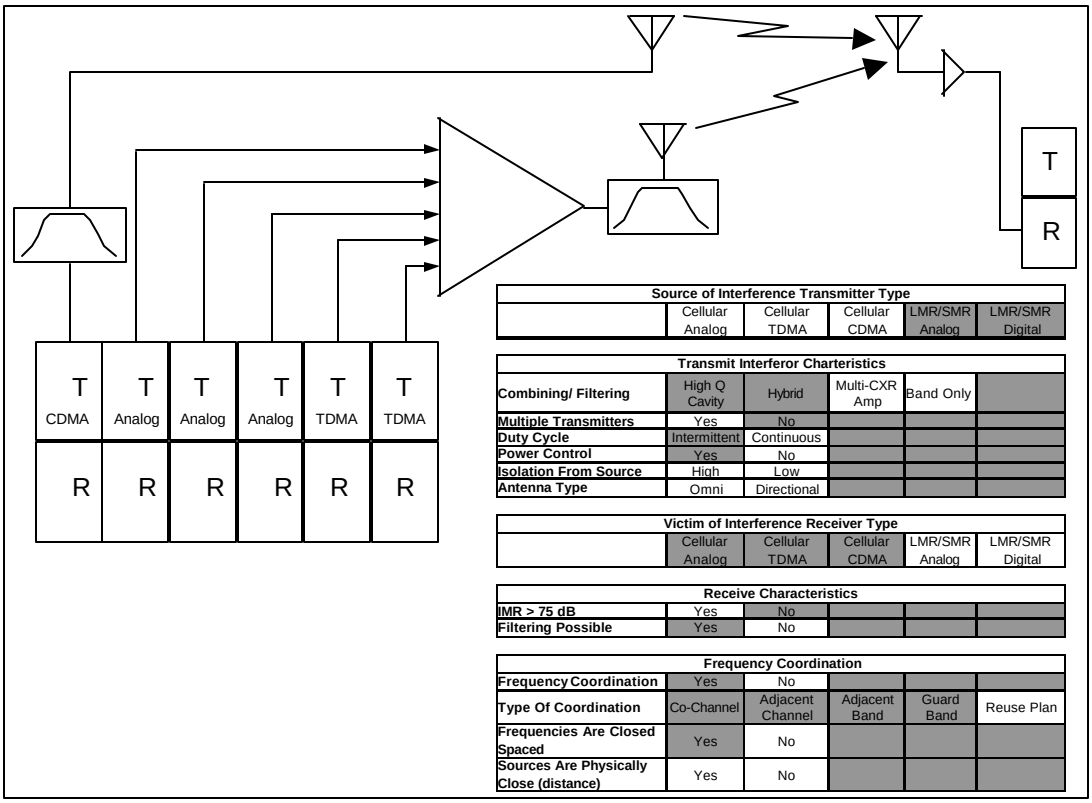
Figure 26 Case 2, LMR Base Station to Cellular Phone

10.5 CASE 3, CELLULAR BASE TO 900 MHZ BASE

Case 3 is the only 900 MHz scenario that will be evaluated (Figure 27). There are several documented cases of this type of interference, primarily caused by the Cellular B carrier. The high OOBE of the various modulations and combinations of modulations along with only band filtering can produce a fairly high noise floor. In this case the noise is amplified by the gain of the transmit antenna and also the receive antenna. Because it is base-to-base interference, the paths often have only free space losses associated with them. At 900 MHz the free space loss between dipoles at 1 mile is 91 dB, but this is reduced by as much as 23 dBd of antenna gains. Thus the isolation is less than 70 dB at one mile. However, sites can be closer than one mile and have even stronger interference potential. When CDMA and mixtures of analog or narrow band analog are present, the potential of IM increases. There is potential IM in the cellular antenna structure that would prevent any filtering at the 900 MHz LMR site from being effective. If CDMA is deployed, then there is also the potential of multiple sources of interference being received. When coupled with high performance TTA' s (Tower Top Amplifiers) to compensate for low power 900 MHz products, the probability of interference is increased.

The configuration shown in Figure 27 is very important. Note that the CDMA is on a separate antenna from the narrow band modulations. If they were combined, the resulting IM of the CDMA with the narrow band carriers can create a very strong and wide noise source. Therefore the combining of wide band and narrow band signals in a linear amplifier is not recommended and should be avoided!

Interference from nearby Paging transmitters operating without cavity filtering is also a frequent source of reduced coverage for 900 MHz base receivers. Excess reserve gain in the TTAs on sites with high ambient noise levels will also reduce coverage.



Source of Interference Transmitter Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital

Transmit Interferor Charteristics					
Combining/ Filtering	High Q Cavity	Hybrid	Multi-CXR Amp	Band Only	
Multiple Transmitters	Yes	No			
Duty Cycle	Intermittent	Continuous			
Power Control	Yes	No			
Isolation From Source	High	Low			
Antenna Type	Omni	Directional			

Victim of Interference Receiver Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital

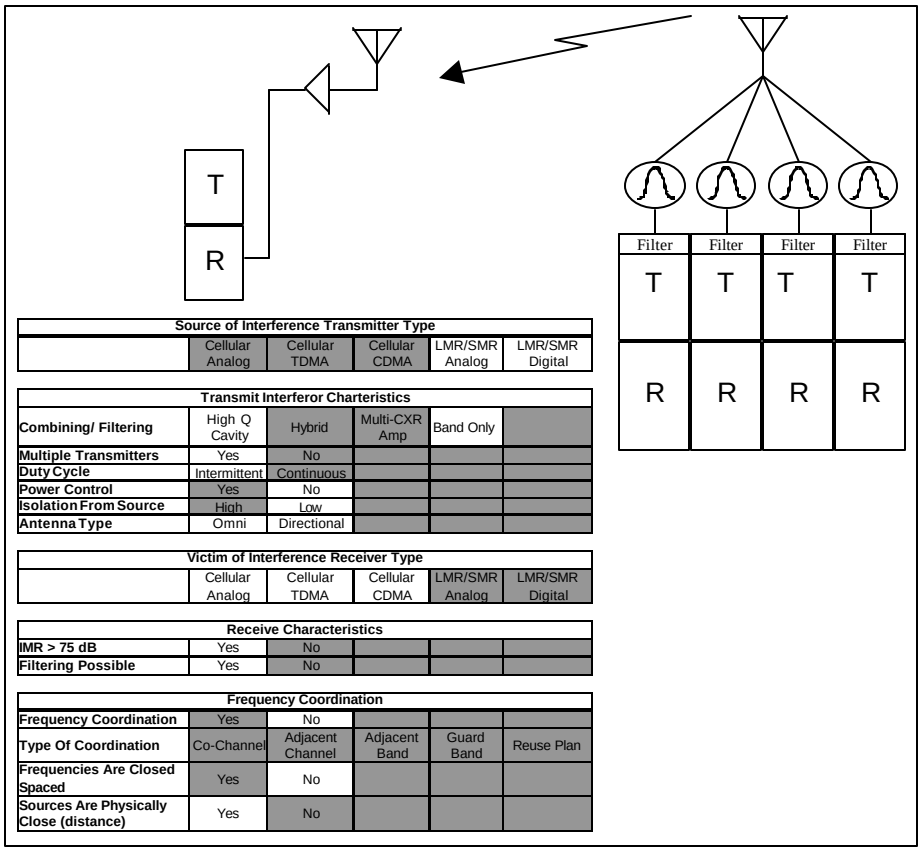
Receive Characteristics					
IMR > 75 dB	Yes	No			
Filtering Possible	Yes	No			

Frequency Coordination					
Frequency Coordination	Yes	No			
Type Of Coordination	Co-Channel	Adjacent Channel	Adjacent Band	Guard Band	Reuse Plan
Frequencies Are Closed Spaced	Yes	No			
Sources Are Physically Close (distance)	Yes	No			

Figure 27 Case 3, Cellular Transmitters to 900 MHz Base Receivers

10.6 CASE 4, LMR BASE TO CELLULAR BASE

Case 4 has LMR base stations causing potential interference to Cellular Base station receivers (Figure 28). There is little likelihood of this because there is a 2 MHz guard band between the LMR band and the cellular band. Motorola LMR base stations are heavily filtered and provide over 50 dB of suppression at the high end of the base receive band as shown in Figure 29. This coupled with Hi-Q cavity filters should suppress OOB emissions adequately to prevent cellular base stations from being interfered with. Even if they were interfered with, the density of LMR base stations is quite low compared to cellular base stations. The cellular system' s ability to hand over subscribers to other resources make this type of interference even less likely.



Source of Interference Transmitter Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital

Transmit Interferor Charteristics					
Combining/ Filtering	High Q Cavity	Hybrid	Multi-CXR Amp	Band Only	
Multiple Transmitters	Yes	No			
Duty Cycle	Intermittent	Continuous			
Power Control	Yes	No			
Isolation From Source	High	Low			
Antenna Type	Omni	Directional			

Victim of Interference Receiver Type					
	Cellular Analog	Cellular TDMA	Cellular CDMA	LMR/SMR Analog	LMR/SMR Digital

Receive Characteristics					
IMR > 75 dB	Yes	No			
Filtering Possible	Yes	No			

Frequency Coordination					
Frequency Coordination	Yes	No			
Type Of Coordination	Co-Channel	Adjacent Channel	Adjacent Band	Guard Band	Reuse Plan
Frequencies Are Closed Spaced	Yes	No			
Sources Are Physically Close (distance)	Yes	No			

Figure 28 Case 4, LMR Base to Cellular Base

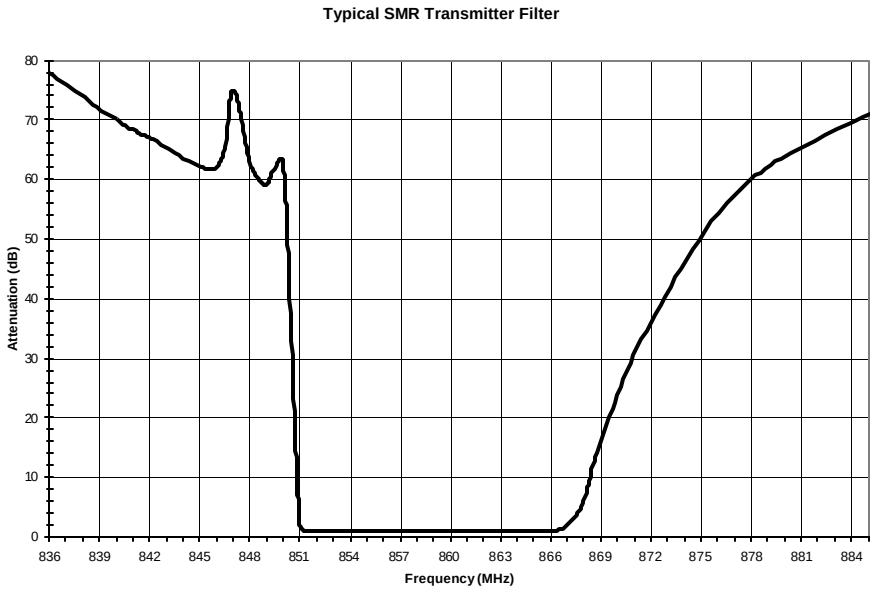
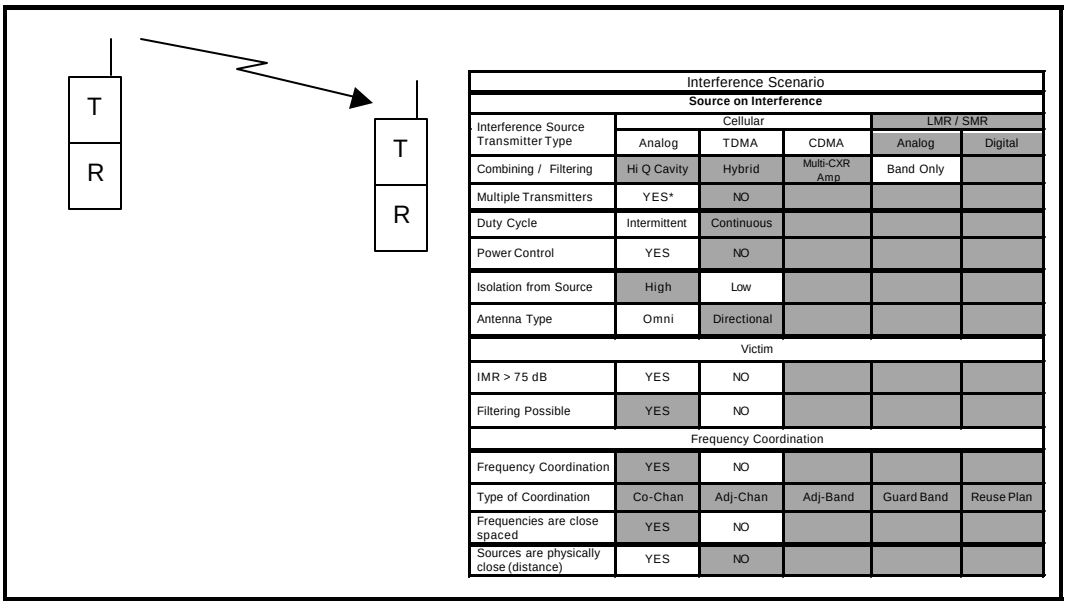


Figure 29 Typical Motorola iDEN Base Station Internal Bandpass Filter

10.7 CASE 5, CELLULAR SUBSCRIBER TO LMR SUBSCRIBER

Case 5 is where Cellular Subscriber units can interfere with LMR subscriber units (Figure 30). There are several mechanisms that need to be discussed. First there is the direct subscriber-to-subscriber interference. Here the high allowable OOBE of cellular subscriber units can cause localized interference around those units when the cellular units are far from their sites (power control doesn' t limit the power output) and the LMR unit is far from its desired signal. Figure 21 shows this as the light green blotches associated with the fringe of the cell sites.

The use of CDMA subscriber units is more worrisome as multiple units can be transmitting simultaneously on the same wideband frequency. Often a large population of cellular users coincident with a major public safety event can occur. Now the large population of subscribers in close proximity both in frequency and distance can increase the potential for interference. In addition, if the public safety event is close to a cellular site and a large population of cellular subscribers occurs, then there is also the opportunity for receiver IM to occur. In a well documented case in Canada, intermittent interference occurred to the direct mode of fire fighter portables.



Interference Scenario					
Source on Interference					
Interference Source Transmitter Type	Cellular			LMR / SMR	
	Analog	TDMA	CDMA	Analog	Digital
Combining / Filtering	Hi Q Cavity	Hybrid	Multi-CXR Amp	Band Only	
Multiple Transmitters	YES*	NO			
Duty Cycle	Intermittent	Continuous			
Power Control	YES	NO			
Isolation from Source	High	Low			
Antenna Type	Omni	Directional			
Victim					
IMR > 75 dB	YES	NO			
Filtering Possible	YES	NO			
Frequency Coordination					
Frequency Coordination	YES	NO			
Type of Coordination	Co-Chan	Adj-Chan	Adj-Band	Guard Band	Reuse Plan
Frequencies are close spaced	YES	NO			
Sources are physically close (distance)	YES	NO			

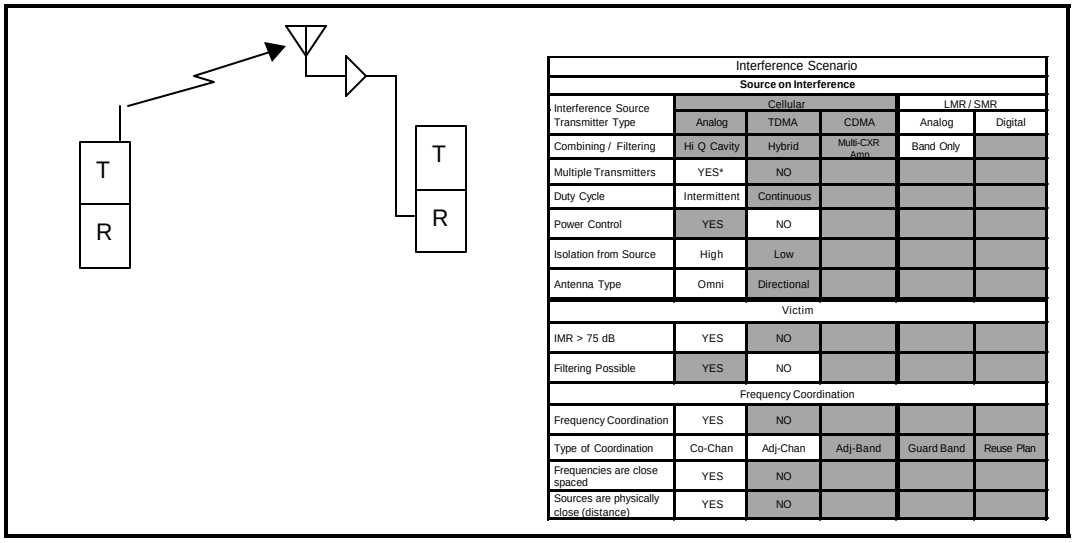
Figure 30 Case 5, Cellular Subscriber to LMR Subscriber

10.8 CASE 6, SUBSCRIBER TO LMR BASE

Case 6 involves interference from subscriber units to LMR base receivers (Figures 31 & 32). Again this is a classic Near/Far scenario. Receiver voting in the LMR system is the best defense for this type of interference, recognizing that for analog systems strong interference can be misinterpreted as a desired signal. Proper use of sub-audible codes can mitigate the undesired voting potential with the voting offering the decreased likelihood that multiple interfering scenarios occur simultaneously.

Case 6A involves the in-band LMR case. In many systems, TTA' s are used to increase sensitivity for fringe talk-in. However, this also increases the susceptibility to interference. A special case is where the LMR subscriber is a control station. This can produce the example of system cross talk and temporary lockup previously described. The area of maximum impact is a reduction in the base talk-in coverage.

Case 6B is the cellular case. Here subscriber units have power control so they would have minimal impact if the cellular site and LMR sites are co-located.



Interference Scenario					
Source on Interference					
Interference Source Transmitter Type	Cellular			LMR / SMR	
	Analog	TDMA	CDMA	Analog	Digital
Combining / Filtering	Hi Q Cavity	Hybrid	Multi-CXR Amp	Band Only	
Multiple Transmitters	YES*	NO			
Duty Cycle	Intermittent	Continuous			
Power Control	YES	NO			
Isolation from Source	High	Low			
Antenna Type	Omni	Directional			
Victim					
IMR > 75 dB	YES	NO			
Filtering Possible	YES	NO			
Frequency Coordination					
Frequency Coordination	YES	NO			
Type of Coordination	Co-Chan	Adj-Chan	Adj-Band	Guard Band	Reuse Plan
Frequencies are close spaced	YES	NO			
Sources are physically close (distance)	YES	NO			

Figure 31 Case 6A, LMR Subscriber to LMR Base

Interference Scenario					
Source on Interference					
Interference Source Transmitter Type	Cellular			LMR / SMR	
	Analog	TDMA	CDMA	Analog	Digital
Combining / Filtering	Hi Q Cavity	Hybrid	Multi-CXR Amp	Band Only	
Multiple Transmitters	YES*	NO			
Duty Cycle	Intermittent	Continuous			
Power Control	YES	NO			
Isolation from Source	High	Low			
Antenna Type	Omni	Directional			
Victim					
IMR > 75 dB	YES	NO			
Filtering Possible	YES	NO			
Frequency Coordination					
Frequency Coordination	YES	NO			
Type of Coordination	Co-Chan	Adj-Chan	Adj-Band	Guard Band	Reuse Plan
Frequencies are close spaced	YES	NO			
Sources are physically close (distance)	YES	NO			

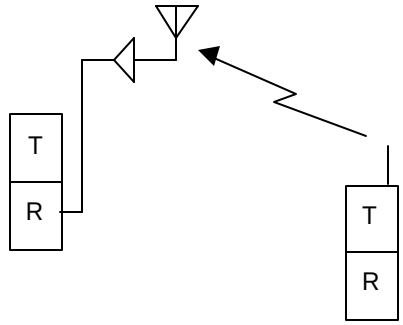


Figure 32 Case 6B, Cellular Subscriber to LMR Base

The use of macro diversity (voting) is the best tool for the prevention of this type of interference.

Figure 33 depicts a special case where the cellular system and LMR system are co-located. This essentially minimizes the size of the reduced coverage. If a LMR site were at the junction of three cells, then the potential for multiple interferers transmitting at maximum output power would produce a much worse case. Fixed cellular units, similar to LMR control stations are also a potential problem. In this case the small red diamonds represent the cellular type deployment of sites.

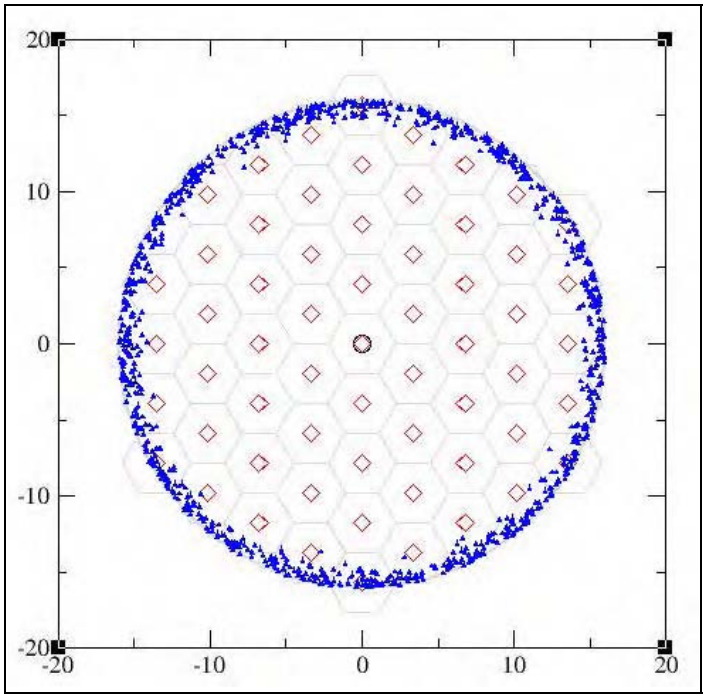


Figure 33 Co-Located Cellular System and LMR System

11 SITE ISOLATION

As described earlier, there are two ways of predicting the losses between a base station and a subscriber unit at close distances. The antenna patterns aren't completely formed and in many cases there are little to no obstructions to increase the losses.

Numerous investigations have been made. Dr. Garry Hess reported on this in his books, and numerous measurements have been made while investigating interference cases.

Figures 35, 36 and 37 show the results of measurements made in the Motorola Schaumburg parking lot many years ago. Note that except for the very low antenna case, all the port-to-port isolation measurements produced ≥65 dB of path loss [isolation] for omni directional antennas. The near/far field transition occurs at ~36 feet. This particular pattern is very important as lower antenna heights are being deployed and this lowers the anticipated site isolation by eliminating the additional isolation produced by the transmit antenna pattern.

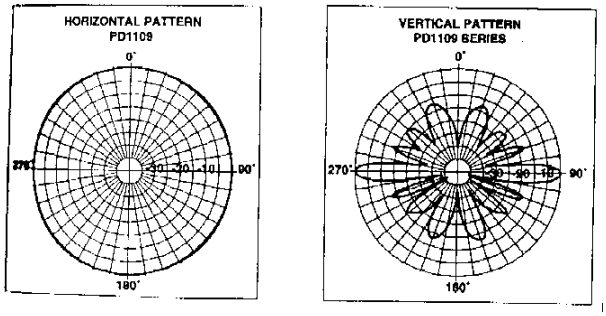


Figure 34 PD 1109 Antenna Pattern.

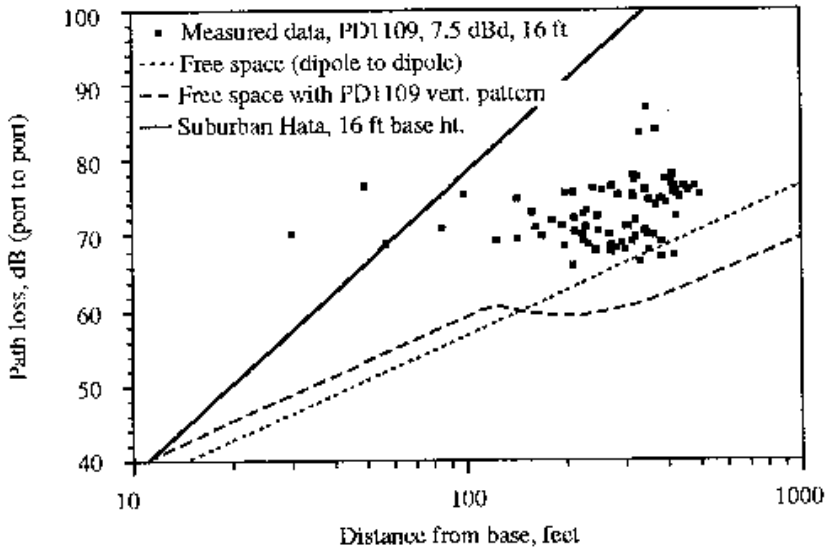


Figure 35 PD1109 @ 16 Ft Above Receive Antenna

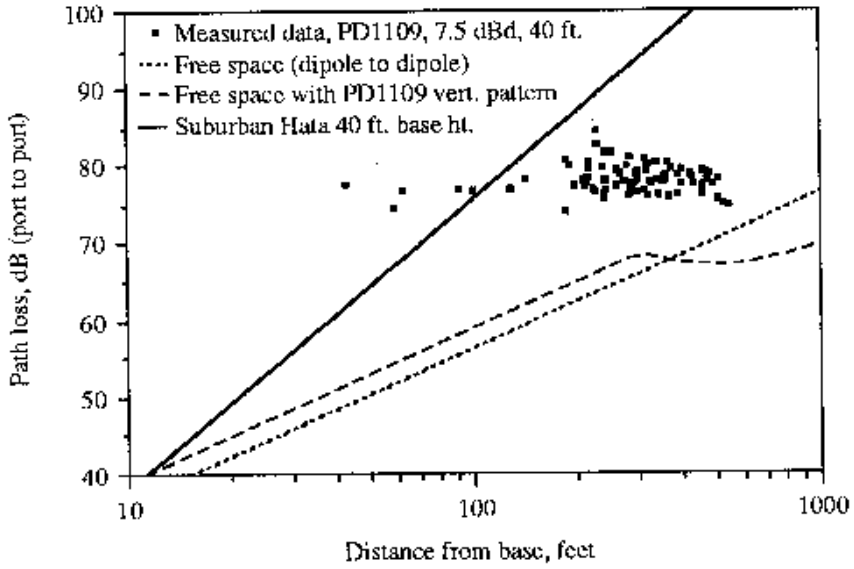


Figure 36 PD1109 @ 40 Ft Above Receive Antenna

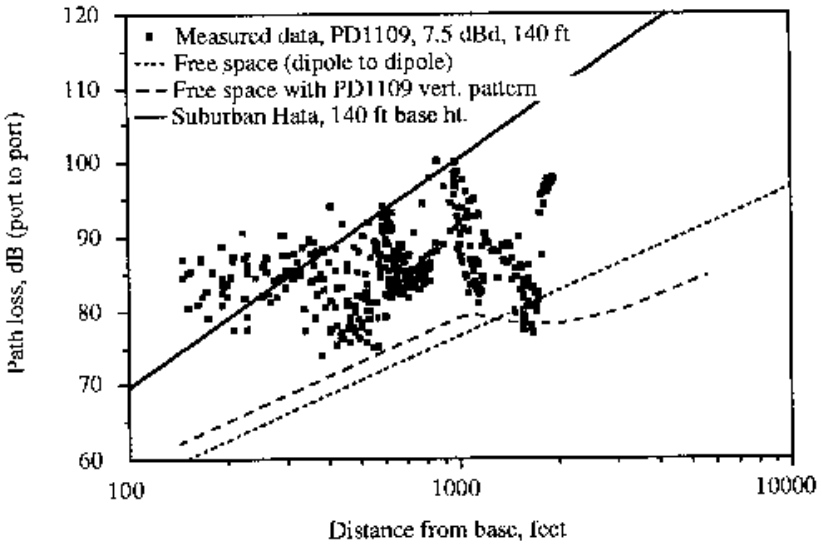


Figure 37 PD1109 @ 140 Ft Above Receive Antenna

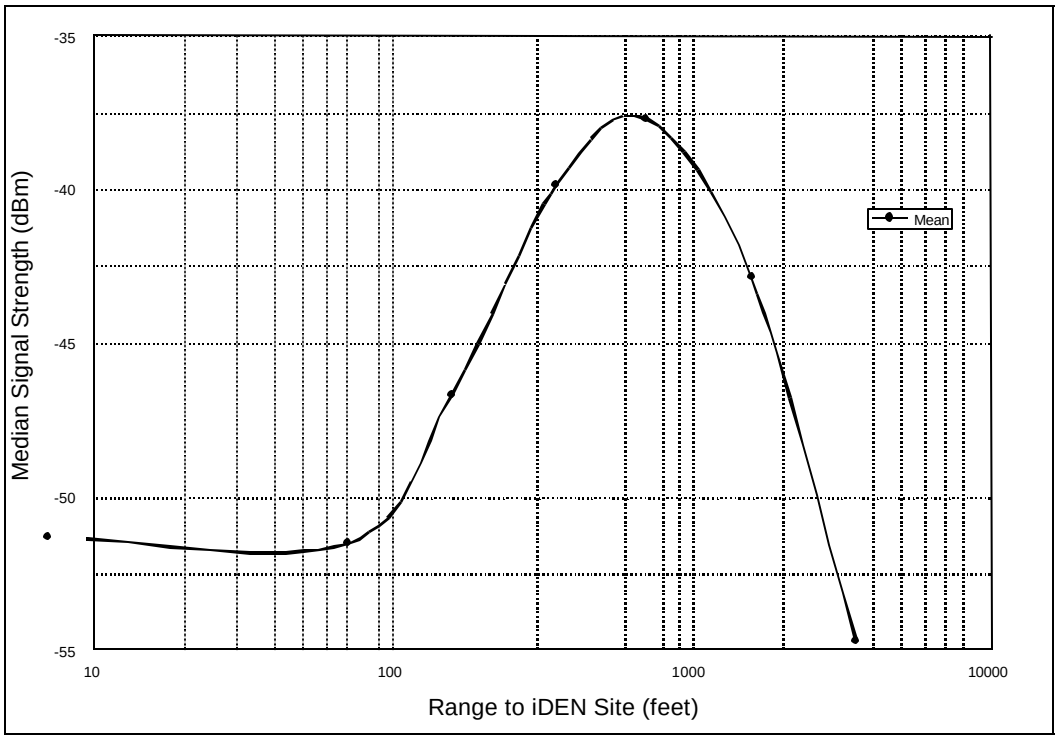


Figure 38 Median Signal Strength Model for Measured iDEN Sites

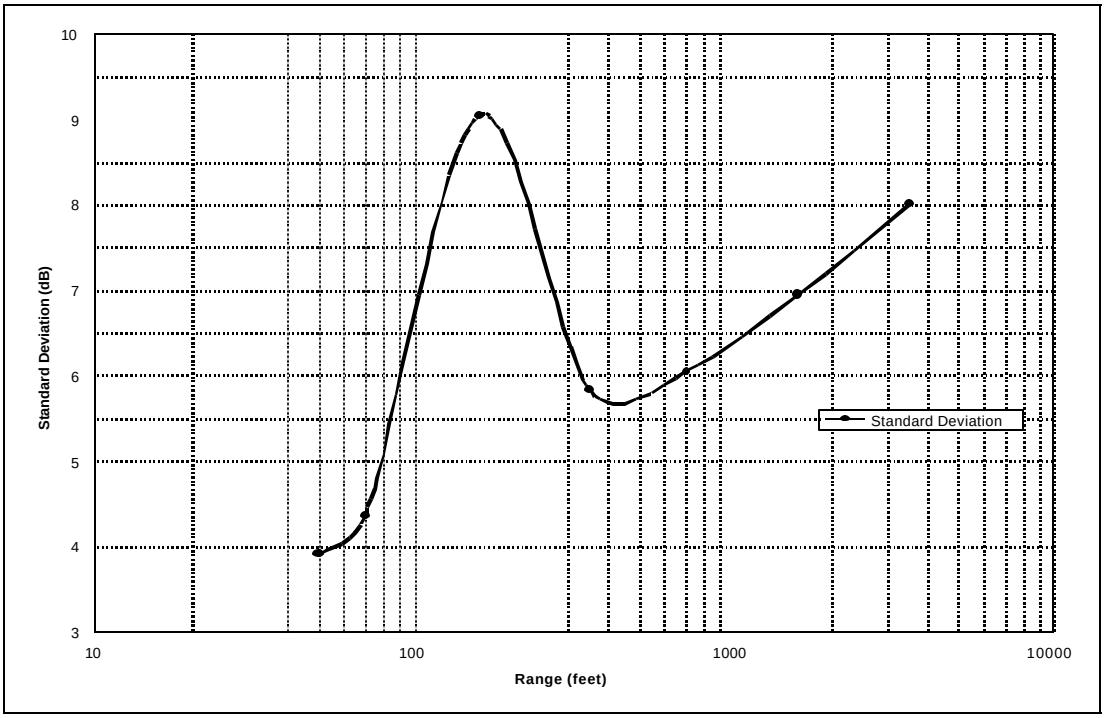


Figure 39 Standard Deviation of Received Power from iDEN Sites vs. Range (measured)

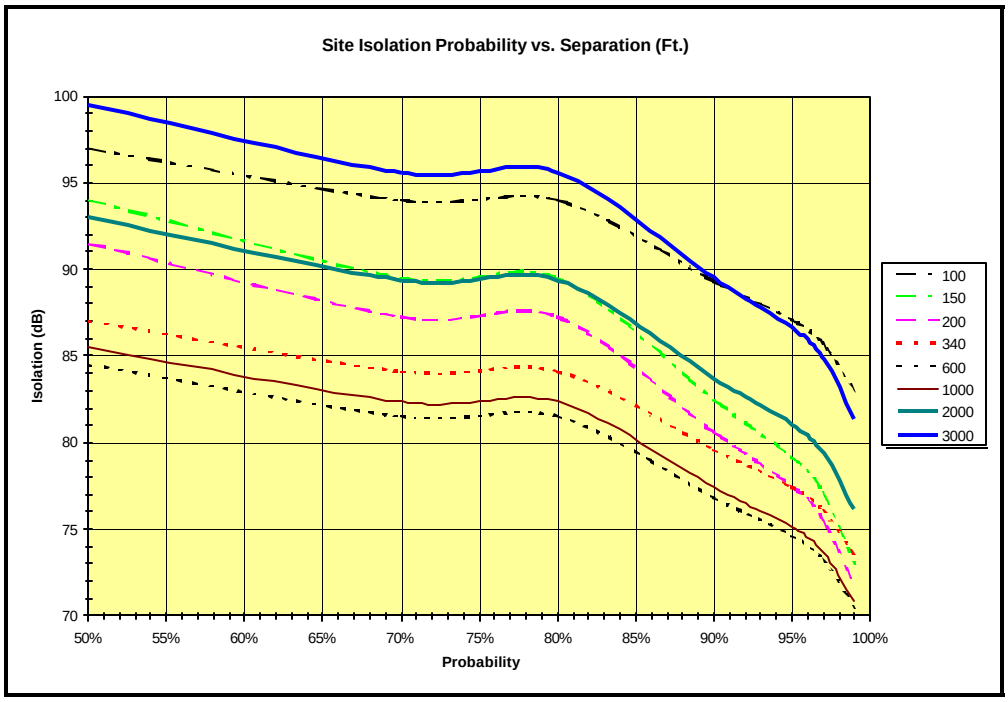


Figure 40 Calculated Probability of Site Isolation

Compare this to a simple spreadsheet model. This allows a coarse look at the port-to-port isolation (Figure 41). The scenario consists of a tower 100 feet tall, a 105° sectored antenna with 11.8 dBd gain, and an arbitrary 10 dB of clutter loss. The primary point to note is that the isolation is greater than 75 dB and that the general shape of the graph is quite similar to the standard deviation of field measurements (Figure 39). The standard deviation is highest in the region closest to the base of the tower, as this is where nulling of the antenna sidelobes occurs. Since there were many different types of antennas involved in the data, the largest variations occur in this region.

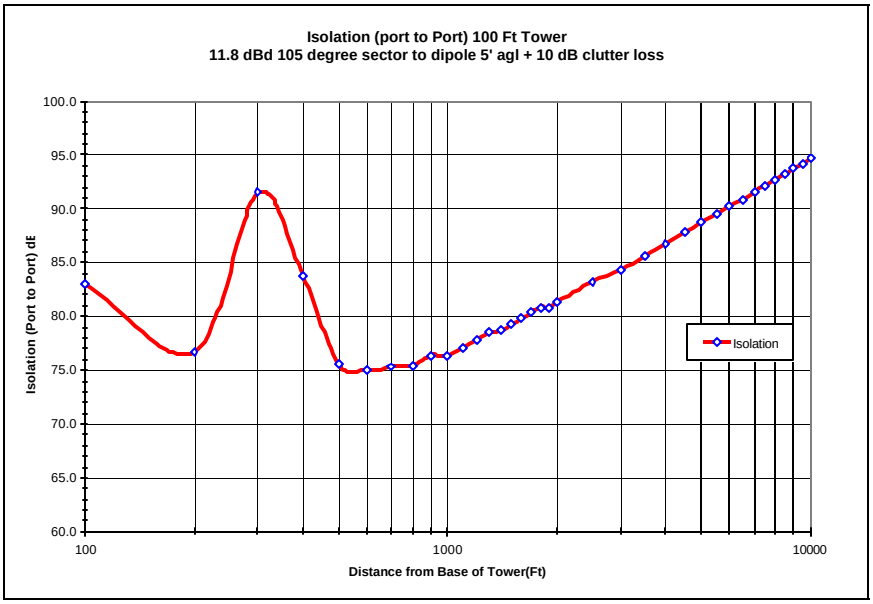


Figure 41 Port-to-Port Isolation

12 RESOLVING INTERFERENCE

The following sections describe actions that can be taken to minimize Radio Frequency Interference (RFI) between systems operating at 800 MHz within the same geographical location. These guidelines are general in nature and these same techniques and philosophies can be applied to most any systems experiencing RFI. Thorough testing will determine actual causes (in some cases, multiple causes) and sources of interference that the system is experiencing. Therefore, thorough testing should precede and follow the application of any solutions proposed below to determine the appropriate actions required and the effectiveness of the deployed solution.

12.1 RECOMMENDED RESOLUTION PROCESS:

1. Identify performance issue as RF Interference.
2. Identify potential source(s) of the interference.
3. Contact other system operators to cooperatively identify the interference issue. The correct and accurate assessment of the interference mechanism is critical to developing an action plan that will rectify the situation.
4. FCC rules stipulate that the two system licensees must work cooperatively to resolve any reports of interference.
5. Implement required changes.
6. Monitor performance.
7. Maintain communications with other operators as the site/system evolves.

12.2 METHODS TO REDUCE INTERFERENCE OF SPECIFIC TYPES

12.2.1 POSSIBLE ACTIONS TO REDUCE THE EFFECTS OF TRANSMITTER SIDEBAND NOISE:

- Change frequencies to increase frequency spacing between the channels.
- Lower transmitter power as much as possible. This can reduce coverage and move traffic to surrounding sites if there is sufficient coverage overlap. The resulting reduction in carried load may allow a reduction in the number of transmitters that will also reduce the noise floor rise due to transmitter sideband noise.
- Increasing the center of radiation on the undesiredtransmit antennas > 80' AGL will increase the local path loss to the affected units and reduce the noise floor rise due to antenna discrimination.
- Increase desired signal level. This may be accomplished by increasing desired ERP (more power or higher gain antennas) or adding desired sites.
- Co-locating sites will maximize the desired signal strength where the undesired energy is strongest.
- Change antennas in an attempt to reduce the undesired signal level in the immediate area of a site. This may be a change of pattern, the removal of down-tilt, less energy in lower lobes or higher gain (narrower vertical beamwidth).
- Use cavity combiners instead of hybrid combiners. Use only when the recommended tests have demonstrated that cavities will help. Note that some auto-tune cavity combiners may not work properly with iDEN' s Quad-QAM modulation.
- Escalate the construction of new sites in surrounding areas to allow further reduction in ERP.
- Swap frequencies or segregate spectrum. These alternatives would require FCC approval.

12.2.2 POSSIBLE ACTIONS TO REDUCE THE EFFECTS OF PORTABLE RECEIVER IM

- Increase desired signal strength by adding sites or changing antennas.
- Avoid using portables with an IM specification < 75 dB. Portables with higher IM specifications are much more immune to IM interference.
- Design systems for in-building coverage. This will present higher desired signal levels "on-the-street", overriding IM interference where it is more likely to occur - on the street near low sites. (The undesired signal strengths are typically attenuated inside buildings and the strength of the IM mix is typically insufficient to interfere with the desired signal.) This may allow portables with lower IM specifications (i.e. IM ≤ 70 dB) to be utilized.
- Determine the frequencies being used by each operator. Attempt to coordinate to prevent creating third and fifth order Intermodulation (IM) products. Change the receive and transmit frequency plan so that IM products do not fall on receive channels.
- Reduce the ERP of the undesired transmit channels as much as possible. A 1 dB reduction in ERP will reduce 3rd order products by 3 dB and 5th order products by 5dB. This reduction in ERP is likely to reduce the number of transmitters that can contribute to mixes as the traffic is offloaded to surrounding sites.
- Change portable antennas. Reduce portable antenna gain if there is sufficient desired signal. Each 1 dB reduction in gain will reduce 3rd order products in the receiver front-end by 3 dB and 5th order products by 5 dB.
- Use voting receivers to minimize the impact of portable interference to base receivers.
- Sweep the transmit antenna system or check the tuning on the combiners to reduce transmitter generated IM.
- Swap frequencies or segregate spectrum. These alternatives would require FCC approval. Consolidated spectrum would tend to create tightly clumped IM products. Existing interlaced frequency allocations spread out the IM products across much of the band.

12.2.3 POSSIBLE ACTIONS TO REDUCE THE POSSIBILITY OF INTERFERENCE IN THE FUTURE

- Maintain constant communication between license holders to coordinate frequency deployments and system expansion plans and actions.
- Co-locate sites whenever possible.
- Swap frequencies to remove interlaced frequency assignments - requires FCC approval.
- Segregate frequencies into sub-bands and either minimize use of frequencies at sub-band edge or establish guard bands between sub-bands.

12.3 INTERFERENCE REDUCTION METHODS

The following section describes various methods for minimizing or eliminating interference. Most often, the interference is not totally eliminated, it is just reduced to levels that where acceptable communications can be maintained.

Multiple methods must often be employed. One method may reduce a certain kind of interference and then a different type of interference may then be revealed. Only thorough testing will completely characterize the interference types that are occurring in any given situation. The "best" solution for any given case will depend on many factors including the individual circumstances of the location. What worked in one case may not work as well in another case. For example, a change of frequencies in one case may not be possible in another case.

These solutions are offered as a menu of possible choices. The optimal applications of the various solutions will be determined by the details of each and every situation.

12.3.1 CHANGE FREQUENCY PAIRS

Changing frequencies is a relatively easy way to avoid both Side Band Noise (SBN) and Intermodulation (IM) interference if this flexibility exists in any given case. Changing frequencies in a frequency reuse system has multiple effects that ripple across many sites if not the entire service area.

Increase the frequency spacing between channels to address sideband noise issues. Moving one or more close spaced frequencies can reduce the amount of sideband noise that can fall on nearby channels. Frequency spacings of 150 KHz or greater permits the use of filtering on the transmitter. Greater frequency spacings generally offer increased protection.

Changing transmit frequencies involved in an IM product can be used to move the mix to a channel that is not used in the area or to a frequency that is more immune to the IM product. Receiver frequencies can be moved from channels where IM mixes occur.

In some cases an exchange of frequencies is another possibility where and when this is permitted. Ideally, a segregation of frequency utilization into sub-bands offers much more protection as compared to situations where frequencies assignments are interlaced. IM may be generated, but it is more likely to be within ones own sub-band where the system design can mitigate it. IM products generated at the source and outside the sub-band can be filtered.

12.3.2 REDUCE ERP OR SIGNAL STRENGTH OF THE UNDESIRED SIGNAL

One way to reduce interference is to reduce the signal strength of undesired signals. This may be difficult at times as the amount of reduction required may be sufficient as to negatively impact communications on those channels. But when possible, this can be effective solution.

In some cases the reduction may be aimed solely at the sideband energy on a given channel or set of channels. In other cases, a reduction in the radiated power of the main carrier is required.

Adding filters (typically RF cavity filters) between a transmitter and the antenna may by used to reduce the energy radiated in channels separated from the transmit frequency. Cavity filters typically offer little reduction within 150 kHz on either side of the carrier frequency. Cavity filter will typically offer more protection at greater frequency separations. Ceramic autotune cavity filers and combiners provide higher Q filters while offering more flexibility to change frequencies when needed. Note that some autotune cavities may not function with iDEN modulation.

Lowering transmitter ERP can help control both sideband noise levels as well as the power in an IM mix. Due to the nature of IM interference, a 1 dB reduction in ERP on frequencies involved in a 3rd order mix can reduce the IM product level inside a portable receiver front-end by 3 dB. For 5th order mixes, a 1 dB reduction can reduce the IM level by 5 dB. A 1-2 dB reduction in transmitter ERP may be enough to reduce the IM levels to acceptable levels. A reduction in transmit ERP may reduce the size of a cell and the traffic carrying capacity of that cell. A drop in offered load may also allow one or two transmitters to be turned off, thereby decreasing the interference potential of the cell.

ERP can be simply reduced by reducing the transmitter power. This change affects the entire cell. A more selective way to change the ERP to specific location is to change the antenna gain pattern. The area where a reduction is desired may be a specific spot or it may be the area within a certain distance of the site. Reducing antenna gain , reducing down-tilt, or using an antenna with greater lobe reduction or using a different gain antenna can all be used to reduce the signal strength near a site where there is an abundance of signal strength.

There are several more creative ways to reduce IM interference by reducing the levels of the signals involved in the process. A portable with increased immunity against the IM products is one of the best methods of protecting oneself from IM interference no matter what the sources are. Such a portable generally has better all around performance and the added expense is well worth the investment, especially given the growth in wireless and the increased chances of operating near other wireless devices. A portable with an IM spec of 75 dB or greater is sufficient protection against almost all IM in studied and expected scenarios. Receiver specification improvements typically require an increase in battery drain to provide enhanced IM performance. That is why mobile installations tend to have better IM performance than portables.

Oddly enough, using a lower gain antenna on a portable that is experiencing IM interference is one way to lower the amount of undesired signal reaching a portable receiver's front-end. This lowers the desired signal a few dB but reduces the IM products by the order of the product. This can be an effective solution when there is sufficient desired signal strength and the interference is due to front-end overload. Note that a lower gain antenna may reduce the portables' effective range in other situations.

Another method of decreasing the impact of an undesired signal to increase the distance between the source and target. Path loss increases logarithmically with distance. Distance also changes the amount of gain in the antenna pattern. The potential for interference is noticeably reduced when sites are above 80' above ground level (AGL). Raising the center of radiation of transmit antennas can eliminate interference. Zoning rules and atheisticare forcing antennas to lower levels and there may be "stealth" sites behind store-front facades and many more sites below 80' AGL. A more conventional tower or building installation provides increased protection from RFI. Note that increasing demands for wireless services is a factor in more sites that are heavily loaded and frequency reuse is enhanced when theses sites are deployed below tree top or building top levels.

Lowering the ERP's and reducing the number of transmitters on any one site may shrink the coverage area of a given cell and off load traffic to surround cells. Adding additional cells (otherwise known as cell splitting) adjacent to the cell is one way to accommodate these reductions while maintaining offered service levels.

Sweeping sites to find transmitted IM (IM) is required regularly to insure legal operation. Reducing transmitted IM levels and maintaining low radiated IM levels is an effective method to reduce the possibility of interference of this type.

12.3.3 INCREASE ERP OR SIGNAL STRENGTH OF DESIRED SIGNAL

A number of methods exist for reducing or eliminating interference by increasing the desired signal level. This method can override many forms of interference including both Sideband noise and receiver IM.

It is fairly common now for users of wireless communications systems to desire or demand coverage inside buildings. Many two-way radio users conduct business indoors and therefore need inside coverage. The mobility of portables requires in-building coverage. Public Safety users often have to enter buildings to perform their critical life-preserving activities. Providing in-building coverage will require more sites or equipment but it will also provide protection against many forms of interference. Many of the interference problem areas can be found near other sites while on the street. The little extra building loss usually reduces the interference down below troublesome levels. This is especially true for the case where IM is occurring in the portable's receiver. Every dB of attenuation to the undesired produces a 3 times or 5 times reduction in the level of any IM product.

Increasing the transmitter power on desired frequencies can improve the downlink performance by overriding the interference. The ERP can also be raised into a particular area by changing the antenna pattern or by increasing antenna gain. Increasing the antenna height above ground level on the desired transmitters can also increase the level of the desired signal.

Adding additional sites on the desired channels is another available option. This has the added benefit of increasing coverage inside buildings.

Deploying Bi-Directional Amplifiers (BDA) or channelized repeaters are also possible ways to improve coverage into specific areas that would benefit from enhanced coverage. However, BDA's can be a source of interference so their deployment needs to be well engineered.

The co-location of transmitter sites ensures that the desired signal is stronger on-channel than any interfering signal. This may not always be possible when mixing systems of different types such as high density cellular on many low sites and a lower density two-way radio system on a few high sites. This option reduces talk-out interference but it can increase talk-in interference, requiring "voting" receivers to minimize this effect.

Mentioned above, the use of a portable with higher performance specifications is another way to reduce the probability of interference. The specifications of interest are the selectivity and IM performance of the radio. Radios with specifications in this areas > 70 dB are needed to offer reasonable protection for use in typical environments where there high levels of desired RF. Increased protection is offered by improved specifications.

Increasing the signal strength of the desired signal is a highly effective method for minimizing interference and these choices should be considered as alternatives in most cases.

12.3.4 LONG TERM AVOIDANCE

Longer term strategies for minimizing or eliminating inference may involve an exchange of frequencies or a segregation of frequencies to move the operations of any given system to its own spectrum allocation. This will usually require some approval by the FCC and possibly some coordination with one or more designated coordinating bodies.

Swapping one or more frequency pairs may provide an opportunity to address an individual case or set of cases throughout a small area.

Segregating frequencies would separate distinct service types into different sub-bands and offer higher each service a higher level of protection against interference. There may be some interference if the sub-bands are located next to each other but the interference in such cases would easier to predict, identify and create an engineered solution when it does occur.

Return to list of Appendices

APPENDIX T - REGION 21 700 MHz PLAN

This Appendix Contains

1. The Plan's reference for technical information on spectrum realignment as related to the transition from analog television broadcasting to digitalized television broadcasts.

NOTE: The Region 21 700 MHz Plan's Appendix "T" may also be identified as "National Coordination Committee — Implementation Subcommittee Appendix P - DTV Transition (IM00040-A 20010510"

DTV TRANSITION

DTV TRANSITION

Frequency Availability through the DTV Transition

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."[1] By Congressional direction in the Balanced Budget Act of 1997, the FCC reallocated 24 MHz of spectrum to Public Safety services in the 764-776 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" [2].

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 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,

[1] 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*).

[2] 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.

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 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 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 coordinations. 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.[3] 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.[4]

[3] *See Reallocation Report and Order*, 12 FCC Rcd 22,969-22,970. Stations with existing channel 60-69 TV construction permits must complete their stations and file for a license by January 2, 2001.

[4] *See DTV Sixth Report and Order*, 12 FCC Rcd 14,739-14,754; *See also* In the Matter of Advanced Television Systems and Their Impact upon the Existing Television Broadcast Service, *Memorandum Opinion and Order on Reconsideration of the Sixth Report and Order* in MM Docket No. 87-268, 13 FCC Rcd 7418 (1998). The 11 DTV allotments are:

STATE	CITY	NTSC TV Ch.	DTV Ch.	ERP (kW)	HAAT (m)
California	Stockton	64	62	63.5	874
California	Los Angeles	11	65	688.7	896
California	Riverside	62	68	180.1	723
California	Concord	42	63	61.0	856
Pennsylvania	Allentown	39	62	50.0	302
Pennsylvania	Philadelphia	6	64	1000.0	332
Pennsylvania	Philadelphia	10	67	791.8	354
Puerto Rico	Aguada	50	62	50.0	343
Puerto Rico	Mayaguez	16	63	50.0	347
Puerto Rico	Naranjito	64	65	50.0	142
Puerto Rico	Aguadilla	12	69	691.8	665

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 - 24 megahertz of spectrum

TV 61	TV 62	TV 63 Public Safety 6 MHz	TV 64 Public Safety 6 MHz	TV 65	TV 66	TV 67	TV 68 Public Safety 6 MHz	TV 69 Public Safety 6 MHz	806-824 LMR Band

TV Channel 63 TV Channel 64 TV Channel 68 TV Channel 69

764 MHz 770 776 794 MHz 800 806

NB **3 MHz**	**WB** **6 MHz**	**NB** **3 MHz**

NB **3 MHz**	**WB** **6 MHz**	**NB** **3 MHz**

NB = narrowband channels **WB** = wideband channels

The FCC designated 764-776 MHz (TV Channels 63 and 64) for base-to-mobile transmissions and 794-806 MHz (TV Channels 68 and 69) for mobile-to-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 separation 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 full-service 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.

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.

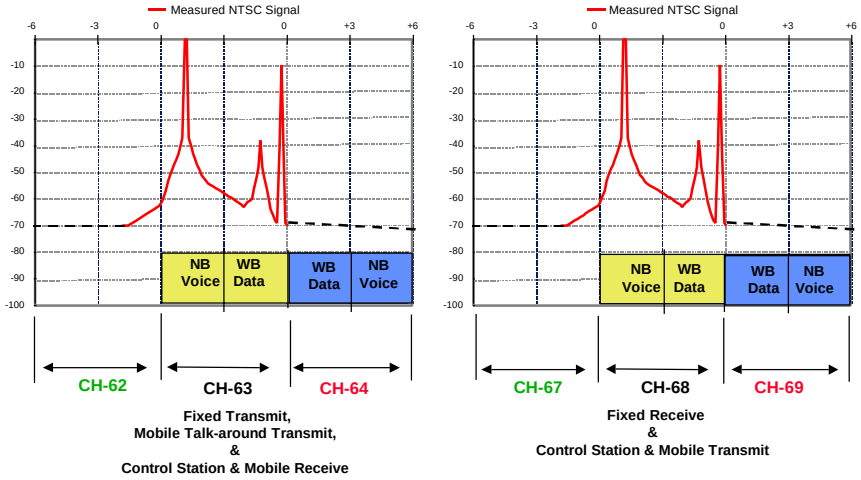
TV/DTV Protection

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 - co-channels 63 and 68, as well as, adjacent channels 62, 64, 67, and 69.

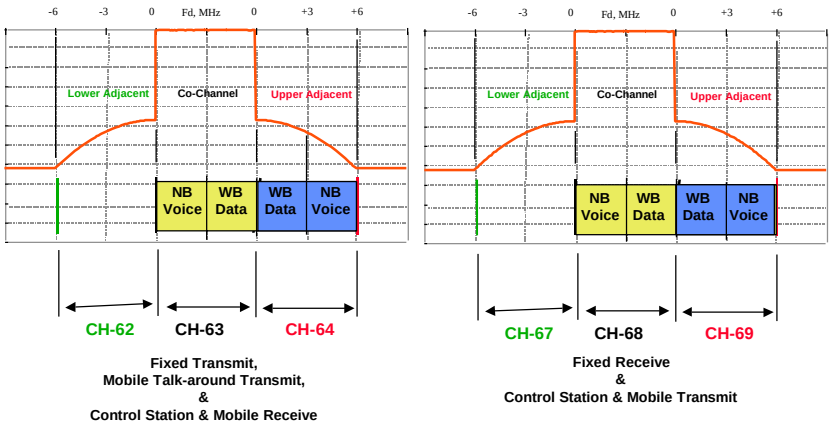
[5] *See Reallocation, Notice of Proposed Rule Making*, 12 FCC Rcd at 14,141, 14,177-78 and 14,182-83.

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

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

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 takes 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.[6] 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[7] between the desired TV signal and undesired co-channel 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 requirements for co-channel operations be based on a D/U signal ratio of

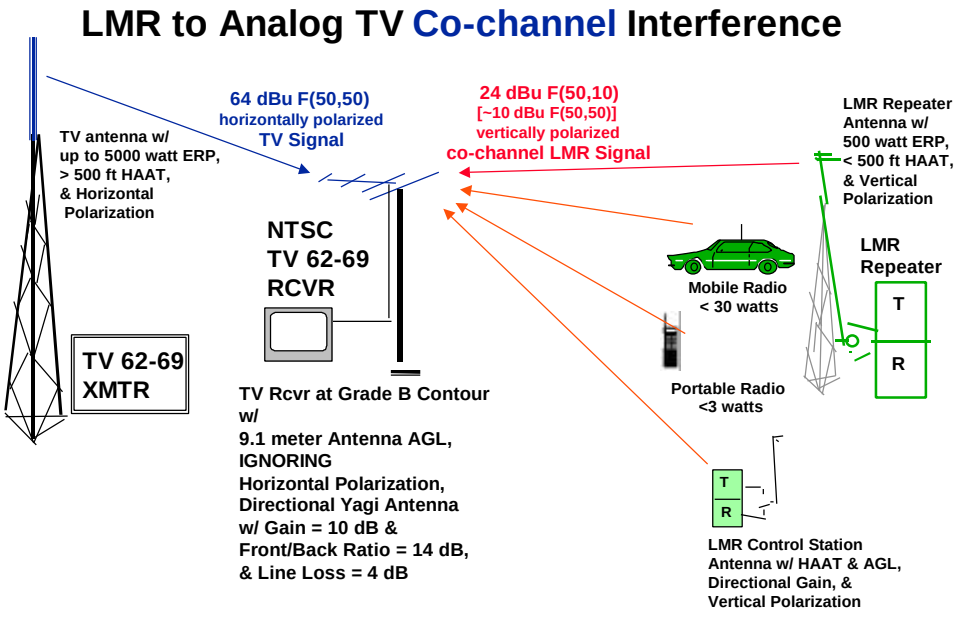
[6] *See Second Notice*, 12 FCC Rcd 17,803.

[7] For TV Channel 15 in New York City, a 40 dB D/U signal ratio is used. *See* 47 C.F.R. §§ 90.307(b) and 90.309 (Table B). A 50 dB protection ratio means that the amplitude of the desired TV signal is more than 300 times greater than the amplitude of the undesired signal at the Grade B service contour. A 40 dB protection ratio means the desired TV signal is 100 times greater.

40 dB rather than 50 dB.[8] 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.

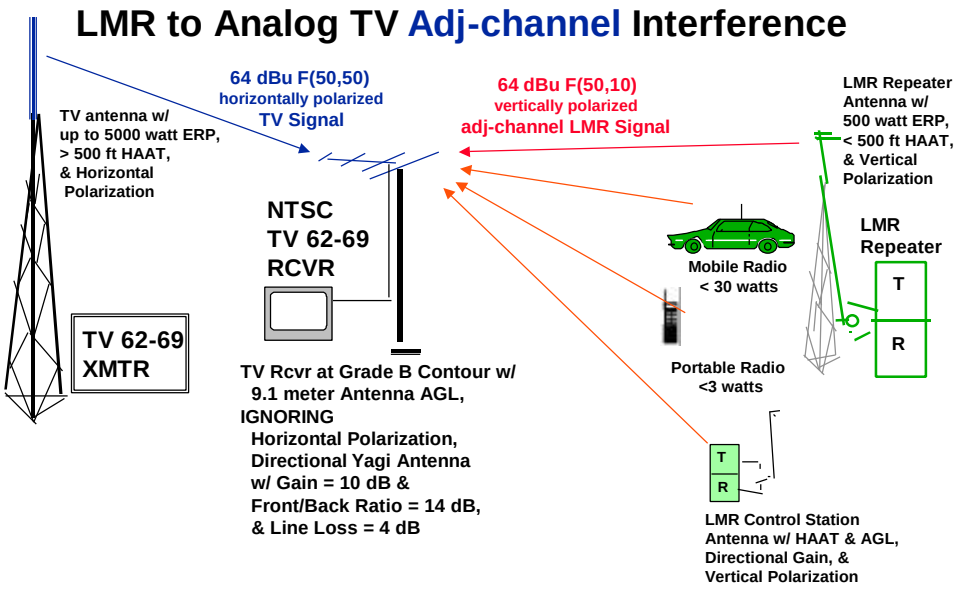
Since this simple, yet conservative, method was successful, the FCC decided to use this same method, the 90.309 HAAT/ERP Separation Tables, to administer LMR to TV/DTV receiver protection criteria for the services in the 700 MHz band.

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).[9] 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.



[8] *See* Amendment of the Rules Concerning Further Sharing of the UHF Television Band by Private Land Mobile Radio Services, GEN Docket No. 85-172, *Notice of Proposed Rulemaking*, 101 FCC 2d 852, 861 (1985) (*UHF-TV Sharing NPRM*).

[9] In terms of miles, if everything else is the same, a 40 dB D/U ratio rather than a 50 dB D/U ratio allows base stations to be located approximately 48.3 km (30 mi) closer to a co-channel TV station. *See* 47 C.F.R. § 90.309, Tables A & B.



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.

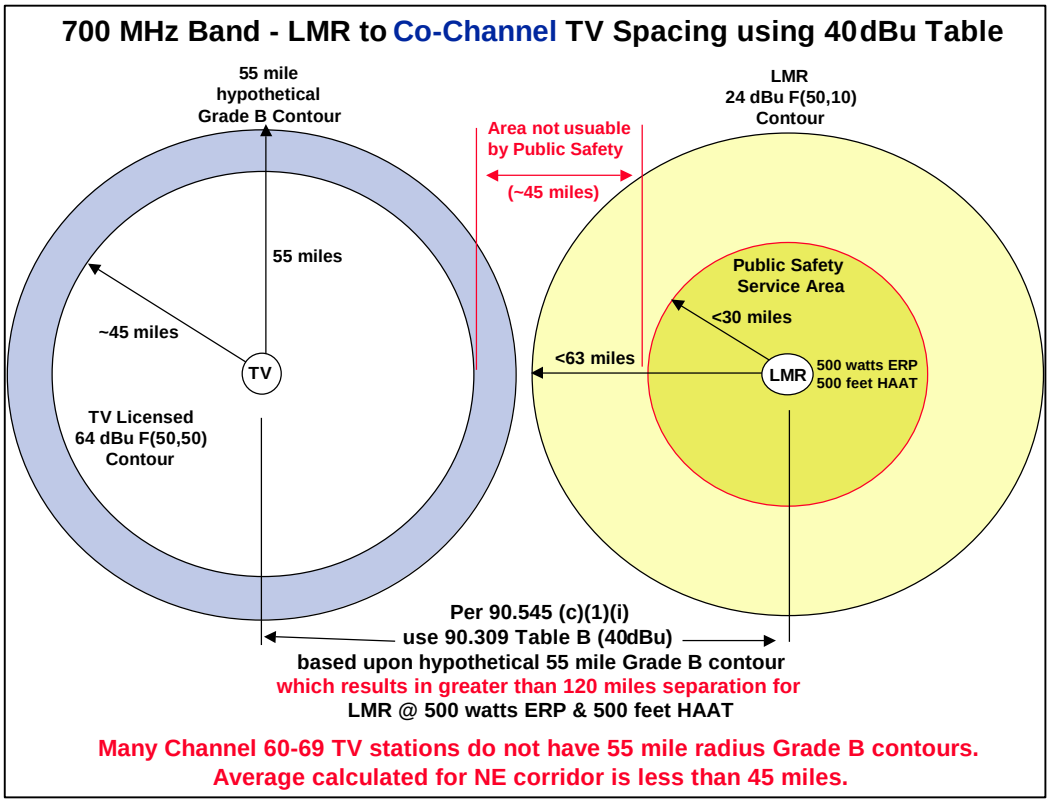
Control stations and mobiles/portables shall keep a minimum distance of 8 kilometers (5 miles) from all adjacent channel TV/DTV station hypothetical or equivalent Grade B contours (adjacent channel frequencies based on 0 dB protection for TV and -23 dB for DTV). This means that control and mobile stations 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

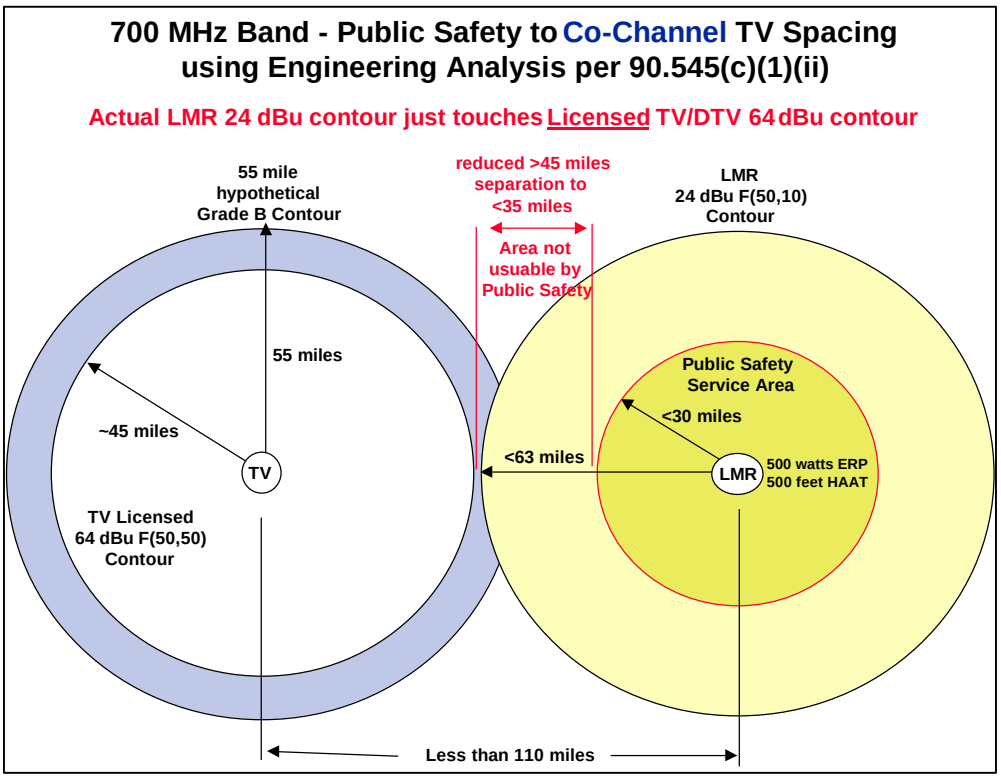
in order to protect the TV/DTV stations, and advise the mobile operators of these areas and their restrictions.

Engineering Analysis

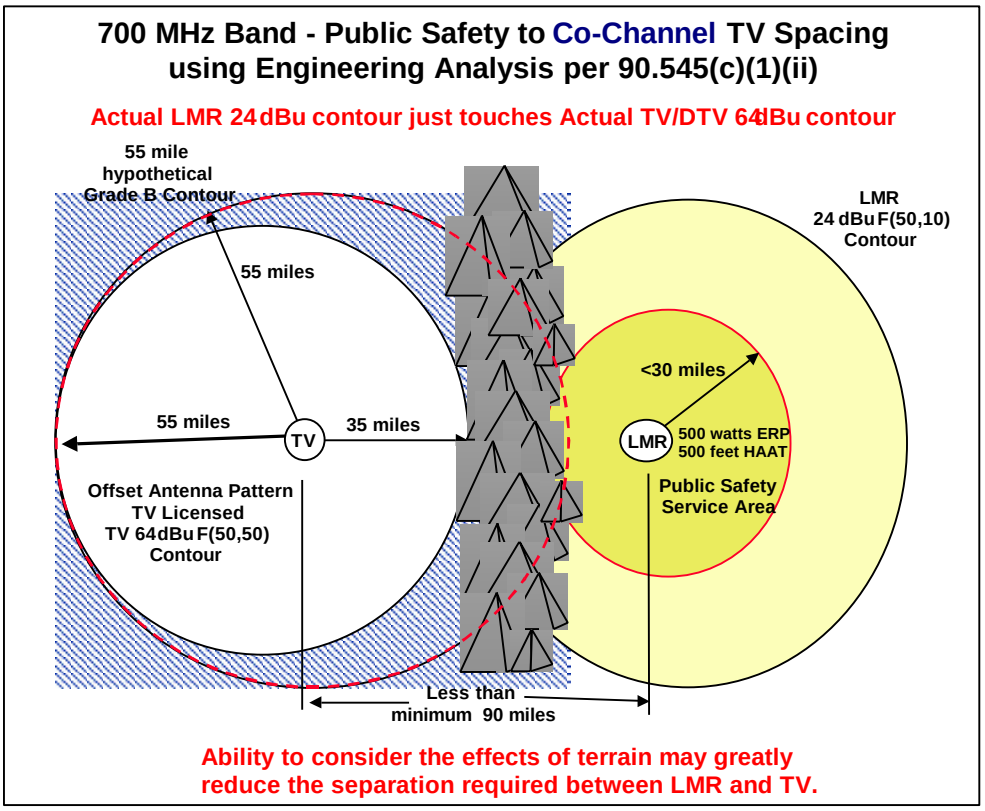
Limiting TV/land mobile separation to distances specified in the 40 dB HAAT/ERP Separation Tables found in 90.309 may prevent public safety entities from fully utilizing this spectrum in a number of major metropolitan areas until after the DTV transition period ends. Public safety applicants will be 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.



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.

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

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 short-spaced against another TV/DTV station, limiting their area of operation, but does not affect LMR operations.

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.

TV/DTV Height Adjustment Factor

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.

Return to list of Appendices

APPENDIX U - REGION 21 700 MHz PLAN

This Appendix Contains

1. The Plan’s illustration of the committee structure of the Michigan Public Safety Frequency Advisory Committee (MPSFAC)

NOTE: The Region 21 700 MHz Plan will be administered by MPSFAC upon formal approval of the Plan by the Federal Communication Commission.

NOTE 2: The MPSFAC committee has before it a working draft of new By-Laws Because the document is undergoing language changes, it is not included within this Appendix, but the reader should be aware of pending modifications with regard to membership, meeting dates and other potential changes in MPSFAC's operations.

CONTACT INFORMATION FOR MPSFAC

January 2008 Michigan Public Safety Advisory Committee MEMBERSHIP

AGENCY	Name	Address	Phone	Email
State of Michigan – Department of State Police	Al Nowakowski	MPSCS Communications 4000 Collins Road Lansing, MI 48909-8131	517-333-5010	Nowakowskia@michigan.gov
State of Michigan – Department of Natural Resources	Dave Held Alternate F.C.	3833 New Salem Okemos, MI 48864	517-349-0269	heldd@sbcglobal.net
State of Michigan – Emergency Management	Al Eichenberg	MPSCS Communications 4000 Collins Road Lansing, MI 48909-8131	517-333-5020	Eichenba@michigan.gov
Michigan Chiefs of Police	Chief Lloyd Collins	South Lyon Police Department 219 Whipple South Lyon, MI 48178	248-473-1773	chief@southlyonpolice.com
Michigan Sheriff's Association	Sheriff William Barnwell	Montcalm County Sheriff Dept 659 N. State Stanton, MI 48888	989-831-7590	Bbarnwell@co.montcalm.mi.us
American Public Works Association/MDOT	Thomas Briggs		(517 373-0453)	(BriggsT@michigan.gov)
Michigan Municipal League	Joe Turner (Chairman)	Michigan Property Consultants 2719 State Street Saginaw, MI 48602	989-793-7373	jturner@michiganpropertytax.com
Michigan Association of Counties	Kathy Vosburg	MAC 935 N Washington Ave Lansing, MI 48906	586-949-3810	Kathy.vosburg@macomncountymi.gov
Michigan Association of Fire Chiefs	Chief Bill Nelson	Troy Fire Department 500 W. Big Beaver	248-524-3419	nelsonws@troymi.gov

		Troy, MI 48084		
Michigan Ambulance Association	**Dale Berry** (Vice-Chairman)	**Huron Valley Ambulance 2215 Hogback Road Ann Arbor, MI 48105**	**734-477-6262**	**dberry@hva.org**
Michigan Chapter of APCO	**Patricia Coates** (Secretary)	**Oakland County CLEMIS 1200 N. Telegraph, 49W Pontiac, MI 48361**	**248-452-9947**	**coatesp@oakgov.com**
Michigan Chapter of APCO	**Mark Jongekrijg**	**Ottawa County Central Dispatch 15 N. Sixth Street Grand Haven, MI 49417**	**616-842-2299 ext. 209**	**Mjongekrijg@occda.org**
Michigan Chapter of APCO	**Karen Chadwick**	**Ingham County Central Dispatch 120 W Michigan Lansing, MI 48933**	**517-483-7612**	**Kchadwick@ci.lansing.mi.us**
Michigan Chapter of APCO	**Jim Fyvie**	**Clinton County Central Dispatch 100 E State Street, Suite 1400 St. Johns, MI 48879**	**989-224-3580**	Fyviej@clinton-county.org
APCO Appointed Frequency Coordinator	**Keith Bradshaw** F.C.	**Macomb County Radio 21930 Dunham Road Mt. Clemens, MI 48043**	**586-469-6433**	**Keith.Bradshaw@macombcountymi.gov**
FCCA	**Not filled**			

Note: This document is included for historical perspective; MPSFAC is currently revising its By-Laws and Committee Structure, but a formal vote hasn't been taken.

APPENDIX U MPSFAC Committee Structure

Agency	Number of Representatives
Michigan State Police	2
Michigan Department of Natural Resources	1
Michigan Department of Public Health	1
Michigan Municipal League	1
Michigan Chapter of the Sheriffs, Association	1
Michigan Charter MACP	1
Michigan Department of Transportation	1
EMS service providers	1
MI. APCO frequency advisor	1
FCCA	1
Fire Department	1

There are also 4 APCO appointed members of the committee representing city (one from Detroit) or county public safety agencies that have a background in either or both of the following:

1. radio frequency systems
2. public safety answering point

MPSFAC MEETINGS

The MPSFAC meetings function in accordance with Roberts Rules of Order.

MPSFAC Routine Duties

- A chairman is elected during the first meeting each year.
- Meetings are scheduled for the 3rd Tuesday each month except July and August; when application need committee action. Applications are to be sent to committee members by the applicant two weeks prior to the meeting. The applicant can obtain the addresses form the MPSFAC secretary. The MSP has acted as the host and provided the secretary for the MPSFAC since it inception about 50 years ago. Presently the secretary is, Harry Warner of the Michigan State Police (MSP). His phone number is 517-336-6623.

- Review application based upon the Region 21 matrix. Review the application(s) for interoperability technical requirements. Further the MPSFAC will review the application(s) for interoperability operational requirements if there is no SIEC

- Deal with appeals/application clarification, consider applicant presentations.

- Interact with applications to determine if the implementation of their systems is in accordance with their applications.

- Maintain coordination with neighboring regional committees and other FCC certified frequency coordinators and their advisors.

- Promulgate other rules and procedures as need to operate efficiently and effectively.
  Further the MPSFAC adjusts it's membership as needed to insure that it is representative of the agencies it serves.

APPENDIX V - REGION 21 700 MHz PLAN

This Appendix Contains

1. General statewide interoperability rules promulgated by a series of agreements between the state of Michigan (through the Michigan State Police) and various agencies, entities and units of government. The aggregated agreements have been codified in this Plan's Appendix V document titled: "MICHIGAN EMERGENCY PUBLIC SAFETY SYSTEM (MEPSS) REGULATIONS"

2. General statewide interoperability rules promulgated through a series of mutual agreements codified in this Plan's Appendix V document titled: MICHIGAN PLAN FOR OPERATION AND MANAGEMENT of A STATEWIDE COORDINATING FIRE COMMUNICATIONS SYSTEM Operated on THE COMMON FREQUENCY 154.295 MHz

Appendix V
Existing Interoperability Agreements

The Region 21 Planning Committee feels that it would be impractical to gather all of the interoperability agreements that may exist statewide. As soon as agencies begin requesting 700 MHZ frequencies, these documents will have become outdated. Therefore, we have included only existing plans that cover the whole of the State of Michigan. However, as per the Region 21 Plan, applicants are required to provide existing interoperability information and to plan for interoperability for both pre and post 700 MHZ system implementation

The MEPPS channel (155.865) is a statewide channel intended to provide inter-agency mobile communications for police agencies. Fire agency interoperability is provided for by Common Channel (154.295).

MPSFAC

155.865 MEPSS, ok for anybody to license mobile only, base station requests to go to committee

155. 370 Intracity ok for any Police Dept. base only.

39.82 Sheriffs mutual aid in top of mitten give to any police dept. that wants it in that area.

39.14 Sheriffs marine and prisoner transfer.

154.295 Fire mutual aide channel set up by DNR and Michigan Fire Chief Assoc., we don't have to do anything but answer questions occasionally.

425.375 simplex, mutual aide channel for 420 mhz in Detroit area

155.475 National Mutual Aide Channel

FREQUENCIES USED STATE WIDE BY MICHIGAN STATE POLICE. Mobile license is at East Lansing so they often show up as useable frequencies when they really are not.

154.695 MSP Vehicle repeater state wide
154.695 State Wide Criminal Investigation
154.920 ditto
155.460 Organized Crime Invest
155.505 Auto theft
154.905 NARC

Other State Police only freqs are listed in FCC rules we are licensed also for 155.445 in Flint and 154.680 in Lansing.

MSP low band freqs are 42.74, 42.58, 42.94, 42.58, 42.94, 42.30, 42.68, 42.24.02, 42.80, 42.64, 42.18, 42.86, 42.28.

Frequency band limits for searches

Low band Police 39.10 to 46.58
Low band LG 45.08 to 46.56
High band VHF Police 154.650 to 159.210
High band VHF LG 153.740 to 158.955
UHF LG 453.150 to 453.975
UHF Police 460.0125 to 460.550
420 mhz all svc 50 mile radius of kntn Detroit 420.000 to 425.450
800 mhz all svc outside Canada zone 851.0125 to 860.9875

REGION 21 TACTICAL FREQUENCIES

COUNTY	FREQUENCY	COUNTY	FREQUENCY
Alcona	822/867.5125	Keweenaw	821/866.5125
Alger	822/867.5125	Lake	822/867.5125
Allegan	822/867.0125	Lapeer	822/867.0125
Alpena	822/867.0125	Leelanau	821/866.5125
Antrim	823/868.0125	Lenawee	822/867.0125
Arenac	822/867.5125	Livingston	823/868.0125
Baraga	822/867.5125	Luce	822/867.0125

MPSFAC

33.100 THRU 33.400

Original Source: R. DeMello 1996 List
File Source: J. Turner FreqList1996Mpsfac

FIRE SERVICE	33.780	Hillsdale Co. Sheriff; Jackson Co.
FIRE SERVICE	33.940	Eaton Co.
SPECIAL EMERGENCE	35.640 (B)	Clinton Co. Sheriff-St. Johns; Flint Osteopathic Hosp.-Flint; General Hosp.-Lapeer Co.; Heritage Hosp.-Taylor; Hurley Medical Center-Flint; Lapeer Co.; Riverside Osteopathic Hosp.-Trenton; Sisters of BoSecours-Grosse Pte; St. Joseph Hosp.-Mt. Clemens
	35.680 (B)	Annapolis Hosp.-Wayne Co.; Sinai Hosp.-Detroit
POLICE	37.020 (MO)	Monroe Co.
POLICE	37.040 (BM)	Milford, Wixom, South Lyon, Wolverine Lake, Novi, Kensington Metro Park-Milford, Wolverine White Lake Twp.
POLICE	37.060 (BM)	Detroit PD;
POLICE	37.080 (BM)	
POLICE LOCAL GOVT	37.100 (BM)	Chelsea, Washtenaw CO., Ypsilanti State Hosp. Durand, Dexter, Milan, Petersburg, Livingston CO. SO., Carleton, Pinckney, Howell, Estral Beach-Newport, Handy Twp, Gladwin CO., Pittsfield Twp. PD, Ann Arbor, Saline, Onway
POLICE	37.120 (BM)	Frenchtown Twp.-Monroe Co.; Ida-Monroe Co.; Monroe-Monroe Co.;
POLICE	37.140 (BM)	Brighton; Hamburg Twp.-Livingston Co.; Livingston Co. Sheriff-Howell;
POLICE	37.160 (BM)	Pittsfield Twp. PD; Ann Arbor Washtenaw Co., Saline PD, Chelsea, Livingston CO. SO. -Howell ,
POLICE	37.180 (BM)	Dundee; Gife Lake Area Utilities; Oscodo Co. Rd. Comm.; Plymouth Twp.-Wayne Co.;
POLICE	37.200 (BM)	Washtenaw Co.-Ann Arbor;
POLICE	37.220 (BM)	Carleton PD; Howell; Ida; Livingston Co.; Monroe Co. SO-Monroe;
POLICE	37.240	Kensington Metro Park-Milford; Novi PD; South Lyon PD; Walled Lake; White Lake Twp.; Wixom PD; Wolverine Lake PD;

MPSFAC

Barry	822/867.5125	Mackinaw	822/867.5125
Bay	821/866.5125	Macomb	821/866.5125
Benzie	822/867.0125	Manistee	821/866.5125
Berrien	821/866.5125	Marquette	823/868.0125
Branch	822/867.5125	Mason	822/867.0125
Calhoun	821/866.5125	Mescosta	822/867.5125
Cass	822/867.0125	Menominee	821/866.5125
Charlevoix	822/867.5125	Midland	822/867.0125
Cheboygan	822/867.0125	Missauke	822/867.0125
Chippewa	821/866.5125	Monroe	822/867.5125
Clare	822/867.5125	Montcalm	822/867.0125
Clinton	822/867.5125	Montmorency	823/868.0125
Crawford	822/867.5125	Muskegon	822/867.5125
Delta	822/867.0125	Newaygo	823/868.0125
Dickinson	822/867.0125	Oakland	822/867.5125
Eaton	822/867.0125	Oceana	821/866.5125
Emmet	821/866.5125	Ogemaw	822/867.0125
Genesee	821/866.5125	Ontonagon	822/867.5125
Gladwin	823/868.0125	Osceola	821/866.5125
Gogebic	823/868.0125	Oscoda	821/866.5125
Grand Traverse	822/867.5125	Otsego	821/866.5125
Gratiot	821/866.5125	Ottowa	823/868.0125
Hillsdale	821/866.5125	Presque Isle	822/867.5125
Houghton	822/867.0125	Roscommon	821/866.5125
Huron	822/867.0125	Saginaw	823/868.0125
Ingham	821/866.5125	Sanilac	821/866.5125
Ionia	823/868.0125	Schoolcraft	821/866.5125
Iosco	823/868.0125	Shiawassee	822/867.0125
Iron	821/866.5125	St.Clair	822/867.5125
Isabella	821/866.5125	St. Joseph	821/866.5125
Jackson	822/867.5125	Tuscola	822/867.5125
Kalamazoo	823/868.0125	Van Buren	822/867.5125
Kalkaska	821/866.5125	Washentaw	821/866.5125
Kent	821/866.5125	Wayne	822/867.0125
		Wexford	823/868.0125

EXISTING Michigan Rules INTER-OPERABILITY FREQUENCIES

MPSFAC

POLICE39.180 (LM) LOCAL GOVT	Crawford Co. Shrf. Grayling, Toalanau Co. Shrf. Leland. Osceola Co. Shrf. Reed City, Antrim Oo. Shrf. Bellaire. Emmet Co. Petoskey, Village of Ellsworth, Antrim Co. Bellaire. Norman Twp. FD aNell-ctonx Clement Twp, Gladwin, South Branch Twp. FD, Rnscommon. Pellston FD, Gros-ce Ile Twp. Grosse Ile, Leelanau Co. Leland, Wyandstte PW, Caro. Melrouce Twp., Clearwater Twp. RDgers City. Horton Springs, Elmwood Twp. Grand Traverce Oo.; Caro, Tuscola Co. 11/91;
POLICE39.200	Charlevoix Oo. Charlevoix, Lapeer Oo. Shrf. Lapeer, Bayne City, Imlay City PD, East Jordan
POLICE39.220	Kalkaska city 9/93
POLICE39.240	Grand Traverse Oo. Shrf.
POLICE39.260 (MD)	Presque Isle Oo. Shrf. Rogers City, Onaway PD, Harbor Beach, Huron Oo. Shrf. Bad Axe. Sebewaing PD, Grand Rapids PD, Ogemaw
POLICE39.280 (BM)	Detroit PD, Wexford Sheriff; East Tawas PD. Iosco Co., 11/91;
POLICE39.300 (MO)	Tuscola Co. Shrf., Novi PD, Millington Twp. PD, Rochester PD, Oxford PD, Avon Twp. PD. Leonard PD, Pontiac Twp. PD, Lake Orion PD.
POLICE39.320 (BM)	Crawford Co. Shrf.
POLICE39.340 (MO)	Huron Co. Shrf.
POLICE39.360 (BM)	Oxford PD. Holly PD, Pontiac Twp. PD, Rochester PD, Leonard PD, Lake Orion PD.
POLICE39.380 (MO)	Cheboygan Co. PD, Alpena PD, Roscommon Co. Shrf, Lapeer Co. Shrf.

MICHIGAN EMERGENCY PUBLIC SAFETY SYSTEM (MEPSS) REGULATIONS

The radio frequency of 155.865 MHz will be used as a mobile emergency channel for mutual aid purposes. Base stations are strategically located throughout the State of Michigan for emergency contact for any mobile unit equipped with the MEPSS frequency. Base stations shall be installed and operated only as approved and recommended by the Michigan Public-Safety Frequency Advisory Committee.

The purpose of the MEPSS System is to implement a uniform, statewide frequency that will insure direct communications with all elements working together in an emergency situation. The system is intended to transform area police departments from a loose collection of independent units into a cohesive, coordinated team.

The MEPSS frequency will not be used within the licensee's normal service area for day-to-day operation. Inclusion of other local government mobile users, such as fire departments, civil defense units, federal agencies and public works departments shall be as recommended by the Michigan Public-Safety Frequency Advisory Committee

REGULATION OF MEPSS

Section I — Requirements of Prime Station Locations

1. 24-hour, 7 day-a-week, established dispatching service.
2. Personnel dedicated to radio dispatching on every shift.
3. Point-to-point communications facilities, either LEIN, radio or both.

Section II - Operating Requirements

1. All established base stations in the MEPSS System shall continuously monitor the MEPSS channel at all times.
2. The MEPSS System shall not be used within a licensee's normal service area for day-to-day operations.
3. Mobile originated traffic shall be confined to interagency coordination.

MICHIGAN EMERGENCY PUBLIC SAFETY SYSTEM
(MEPSS)
REGULATIONS

4. Base station originated traffic shall be confined to coordination of mobile units, except for weekly tests.

5. The MEPSS System shall not be used as an alternate for facilities presently available.

6. Plain language rather than-ten codes shall be used when operating on the MEPSS System.

7. If the entity selected for base operation fails to properly carry out the prescribed responsibilities for maintaining the system operation, the MPSFAC at its discretion may select another base station location to serve the area.

8. A weekly test will be conducted to assure that receivers and transmitters are in good working order. These weekly tests will be conducted on a talk around basis.

9. All operations on the MEPSS channel must be in compliance with Part 90 of the Federal Communications Commission's Rules & Regulations.

Section III - Technical Requirements

1. Prime system stations shall be equipped with a discreet receiver on the MEPSS channel. A scanner-type or dual, front-end receiver will not be accepted. Base station receivers shall not be equipped with a tone filter.

2. Tone squelch will not be used in the system.

3. The base station locations have been selected on the assumption of 90-100 watt transmitters with 3.db gain antennas located 100 feet AGL.

4. System calculations are based on mobile units with standard, 1/4 wave antennas and receivers with .5uv sensitivity.

5. If the entity selected for base operation fails to properly carry out the prescribed responsibilities for proper equipment maintenance, the MPSFAC may at its discretion select another base station location to serve the area.

KEY TO MEPSS SYSTEM MAP

1. Detroit Police Department
(313) 224-4425

2. Wayne County Sheriff (Detroit)
(313)561-5680

3. Monroe County Sheriff (Monroe)
(313) 241~2727

4. Oakland County Sheriff (Pontiac)
(313) 658-4911

5. Macomb County Sheriff (Mt. Clemens)
(313) 469-5151

6. St. Clair County Sheriff/Port Huron Police Department (Port Huron)
(313) 985—8115

7. Sandusky MSP #34
(313) 648-2233

8. Huron County Sheriff (Bad Axe)
(517) 269-6421

9. Genesee County Communications Center (Flint)
(313) 732-9911

10. Bay City MSP #31
(517) 684-2234

11. Livingston County Sheriff (Howell)
(517) 546-2440

12. East Lansing MSP (Operations Office)
(517) 336-6100

13. Ann Arbor Police Department
(313) 994-2911

14. Jackson County Sheriff (Jackson)
(517) 788-4200

15. Branch County Sheriff (Coldwater)
(517) 278-2325

16. Paw Paw MSP #51
(616) 657-5551

17. Berrien County Sheriff (St. Joseph)
(616) 983-7141

18. Battle Creek Police Department
(616) 966-3363

19. Kent County Sheriff (Grand Rapids)
(616) 774-3113

20. Muskegon County Central Dispatch (Muskegon)
(616) 726-6650

21. Ithaca MSP #14
(517) 875—4111

22. Houghton Lake MSP #75
(517) 422-5101

23. Gaylord MSP #73
(517) 732-5141

211. Petoskey MSP #78
(616) 347-8101

25. Cheboygan MSP #72
(616) 627-9973

26. Mecosta County Sheriff (Big Rapids)
(616) 796-4811

27. Mason County Sheriff (Ludington)
(616) 843-3475

28. Benzie County Sheriff (Beulah)
(616) 882-4484

29. Traverse City MSP #71
(616) 946-4646

30. Lake County Sheriff (Baldwin)
(616) 745-4614

31. Alpena MSP #74
(517) 354-4101

32. East Tawas MSP #32
(517) 362-3434

33. St. Ignace MSP #83

KEY TO MEPSS SYSTEM MAP

(906) 643-8383

32. Sault Ste. Marie MSP #93
(906) 632-2216

35. Newbetry MSP #82
(906) 293-5151

36. Manistique MSP #84
(906) 341-2101

37. Munising MSP #91
(906) 387-4550

38. Negaunee MSP #81
(906) 475-9922

39. Gladstone MSP #65
(906) 428-1212

40. Dickinson County Sheriff (Iron Mountain)
(906) 774-6262

41. Stephenson MSP #89
(906) 753-2275

42. Iron River MSP #92
(906) 265-9916

43. Wakefield MSP #87
(906) 224-9691

44. L'Anse MSP #88
(906) 524-6161

45. Calumet MSP #90
(906) 337-2211

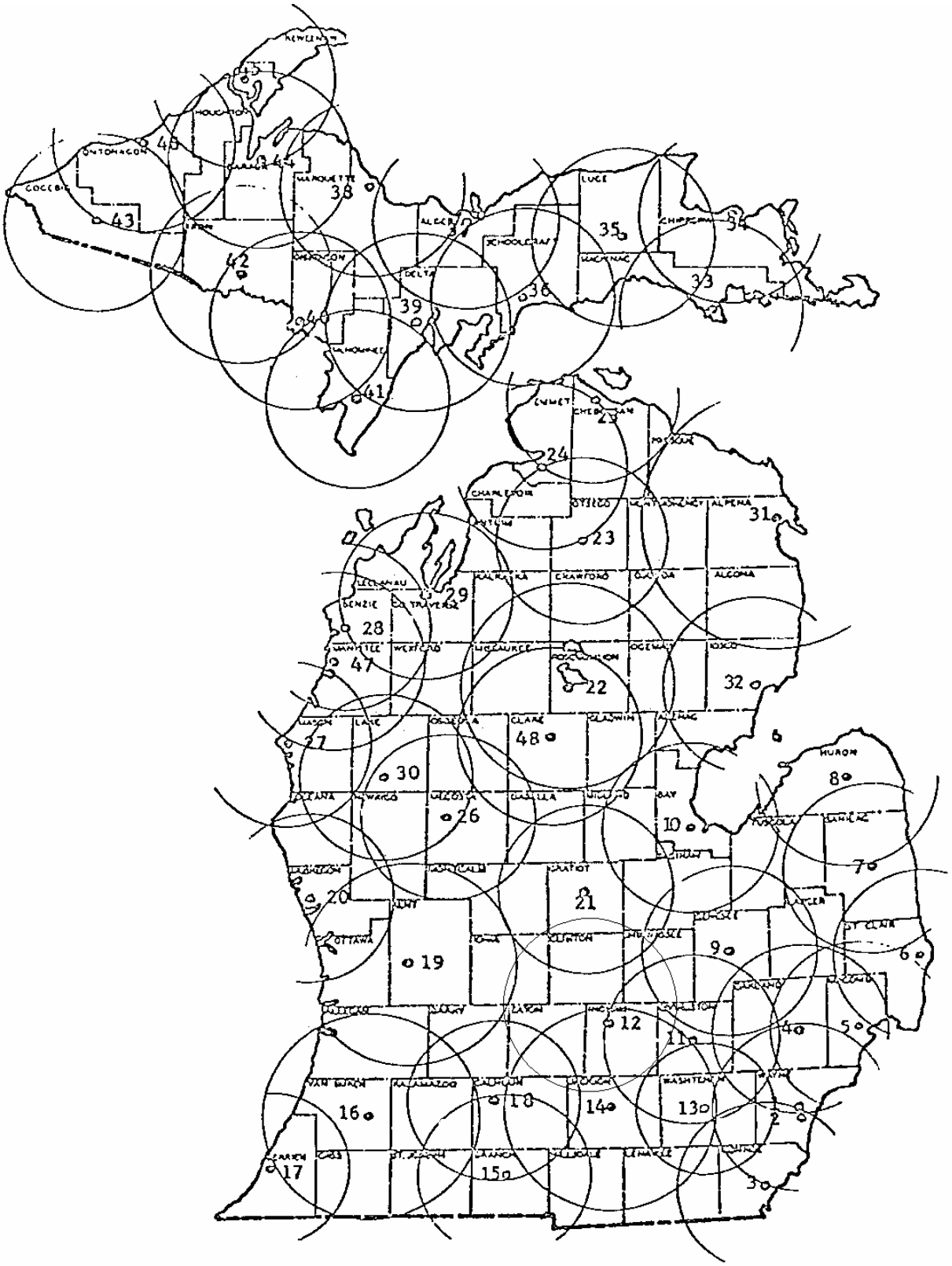
46. Ontonagon County Sheriff (Ontonagon)
(906) 884-4901

47. Manistee MSP #77
(616) 723-3535

48. Clare County Sheriff (Harrison
(517) 539-7166

MICHIGAN EMERGENCY PUBLIC-SAFETY RADIO SYSTEM

PROPOSED BASE STATION LOCATIONS



MICHIGAN PLAN

FOR

OPERATION and MANAGEMENT

of

A STATEWIDE COORDINATING

FIRE COMMUNICATIONS SYSTEM

Operated

on

THE COMMON FREQUENCY

154.295 MHz

FIRE COMMUNICATIONS SYSTEM

The frequency 154.295 MHz has been designated for use exclusively in an interagency fire coordinating system in the State of Michigan.

The system will be a valuable tool, which will help to assure the safety of firemen and fire equipment, and aid in the coordination of multi-jurisdictional responses to emergency situations.

The statewide use of this emergency channel will be used, under sound technical and operational standards, to provide the following major improvements in fire communications:

(1) Provide improved command and control communications to supervisory personnel in situations where fire agencies from multiple jurisdictions are responding to a mutual aid request or other emergency.

(2) Permit direct mobile or portable to mobile or portable emergency communications between fire units from various jurisdictions.

Considerable time and money will be expended in developing and implementing a statewide fire coordinating communications system on 154.29S MHz. The communications system can only achieve its full potential if its day to day use is prudently managed.

The principal objective of the state's management plan is to assure disciplined, controlled use of the radio network so that it will be available in times of emergency to provide the benefits it is intended to provide.

STATE NETWORK GOVERNING BOARD

The entire fire community of the State of Michigan will be served by the emergency fire coordinating communications system on 154.295 MHz. Each agency will have a significant investment in portable or mobile equipment to operate on the channel. Accordingly, over-all responsibility for, and control of, the system is vested in a broadly representative board. Members of the board represent the full -range of types of fire entities, which will be using the system, including a representative appointed from each of the following:

Michigan State Police, Fire Marshal Division Michigan
Natural Resources, Forest Fire Division
Michigan State Firemen's Association
Michigan Fire Chiefs Association
Michigan Fire Frequency Coordinator

OPERATION OF THE SYSTEM

Responsibility for operation and management of the system will be vested in the using fire agencies under detailed-operating procedures established by the governing board.

COORDINATION OF REGULATORY AFFAIRS

Like any other fire service communications system a fire communications system operating on 154.295 MHz must be licensed by the Federal Communications Commission and operated in accord with its rules. The entity responsible for day to day operation of the network will be responsible for all licensing and regulatory matters.

Each application for use of the frequency should be submitted first to the frequency advisory committee for Michigan. Detailed technical and operating plans for the network should be submitted to the fire frequency coordinator and the fire coordinating communications governing board.

If the request conforms with the planned use of the frequency, a recommendation will be made to grant the request. The frequency coordinator's recommendation must then accompany the application when it is filed with the Commission.

ESTABLISHMENT OF TECHNICAL STANDARDS

The existing radio networks offer the most optimum emergency channel resource. If an agency's current operation is in the high-band VHF spectrum and existing communications units have compatible configuration, it should be feasible to add the emergency channel to its mobile or portable radios. Participating agencies presently operating on low band VHF or UHF frequencies will have to add to their intercommunications capability on 154.295 MHz.

The desired level of interagency communications on an existing fire or other emergency can be served by either mobile or hand-held radio equipment; however, individual system requirements will dictate the most optimum method for a given system.

Regular testing to assure the technical effectiveness of the emergency network is essential. The nature of such tests and the manner in which they are conducted to be established by the governing board.

ESTABLISHMENT OF OPERATING STANDARDS

The dedication of the frequency 154.295 MHz for use in an interagency fire coordination radio network has set aside a valuable spectrum resource. Rigid control of radio traffic and enforced discipline will be necessary to achieve the goals of the fire service and thus justify the allocation of the frequency. Unnecessary and uncontrolled traffic on the channel would ultimately defeat its intended purpose. Accordingly, a principal objective of the network operating procedure must be to establish means of assuring disciplined and professional use of the system.

In general, the fire coordinating channel can be used in any fire service action requiring communication between units under circumstances where regular radio services are not available.

The fire coordinating radio network is primarily for portable and mobile service. It is principally intended to provide a communications capability among fire units of differing jurisdictions when an emergency arises which renders the regular channels of communication inadequate to provide the comminations capability needed to successfully complete the operation.

In order to preserve the emergency nature of the network, mobile installation must be limited to fire vehicles, in accordance with Federal Communications Commission Rules & Regulations for use of the frequency.

Operating procedures on the channel will follow those procedures outlined in the Associated Public-Safety Communications Officers manual of system operating procedures. Codes are not recommended and are not to be used in radio transmissions of multi-jurisdictional nature.

Where many units are involved in a particular emergency response, individual mobile and portable operators must exercise discretion to avoid overloading the fire coordination channel. Intradepartment transmission must be on that department's regular frequency with transmission on 154.295 MHz limited to only the transmissions required to properly coordinate the department's participation in the emergency response with units of other departments on the scene.

APPENDIX W - REGION 21 700 MHz PLAN

This Appendix Contains

1. Open meetings certification by the 700 MHz RPC Chairman

Michigan Public Safety

FREQUENCY ADVISORY COMMITTEE

(MPSFAC) REGION 21 700 MHz Planning Committee

DIRECT ALL CORRESPONDENCE TO:

Joseph M. Turner, Chairman
2719 State St
Saginaw, MI 48602
(989) 793-7373

REPRESENTING:

Associated Public-Safety Communications Officers, Inc.
Michigan Association of Chiefs of Police
Michigan Sheriff's Association
Michigan Municipal League
State of Michigan

CERTIFICATION OF PUBLIC MEETINGS

ON BEHALF of the members of the Region 21 700 MHz Planning Committee, I hereby certify that all meetings of the Planning Committee were open to the public; that solicitations were made at said meetings to secure comments from members of the public; and that any comments received were duly noted and properly considered during the development of the Region 21 700 MHz Plan to which this certification is affixed.

I ATTEST that proper notification was given to the public. Public notices included, but were not limited to: postings on web sites maintained by the FCC, by the Michigan Chapter of APCO and by the Michigan Public Safety Frequency Advisory Committee; notices sent via the LEIN system, and notices distributed via representatives of the various government units, not for profit agencies, for profit entities and private parties who attended 700 MHz RPC meetings and those persons who attended meetings of the Michigan Public Safety Frequency Advisory Committee. An initial solicitation of individual and parties of interest was distributed on March 28, 2000 (See Exhibit E of the 700 MHz Region 21 700 MHz Plan). The planning process was terminated on March 31, 2006 upon an electronic filing of the plan with the Federal Communications Commission.

I FURTHER ATTEST that the 700 MHz RPC will terminate upon final approval of the 700 MHz Region 21 Plan, but that the 700 MHz RPC members have voted to remain active and make available opportunities for further public comment should there be a need to revise or modify the Plan submitted to the FCC on March 31, 2006. Following approval of the Plan by the FCC, public comment will be accepted for 700 MHz frequency allocations pursuant to guidelines of the Plan as finally approved.

On this 10th day of April 2006, the above comments are certified as true and accurate to the best of my belief and knowledge.

Joseph M. Turner

Joseph M. Turner, Chairman
Region 21 700 MHz RPC
989 793-7373

Return to list of Appendices

APPENDIX X - REGION 21 700 MHz PLAN

This Appendix Contains

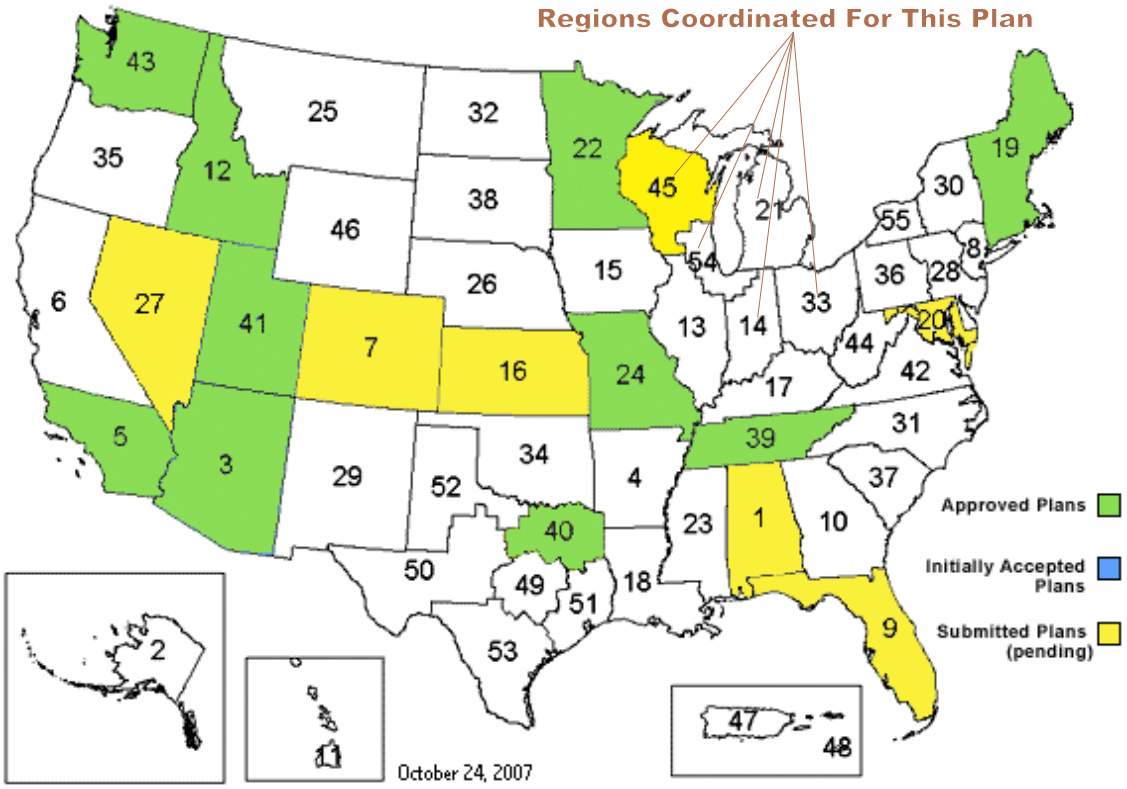
1. Documentation of approval of the inter-region coordination agreements between Region 21 and Regions: 14, 33, 45 and 54

2. Signed Dispute Resolution Agreements between Region 21 and Regions: 14, 33, 45 and 54

APPENDIX X - INTER-REGIONAL COORDINATION AGREEMENTS

MAP OF REGIONS

Regions 45, 54, 14 and 33 Coordinated with Region 21



This section contains (A) copies of concurrence agreements from each of the required adjacent Regions for the entire plan; and (B) copies of signed dispute resolution agreements from each of the required Regions.

INDIANA 700 MHZ REGION PLANNING COMMITTEE

FCC REGION 14

H. Anthony Stantz, Chairman
Alex R. Whitaker, Vice Chairman
c/o Indiana State Police, Communications Division
8500 East 21st Street, Indianapolis, Indiana 46219
TX: 317-899-8524 ; FAX: 317-899-8282
E-mail: astantz@isp.in.gov
E-mail: awhitaker@isp.in.gov

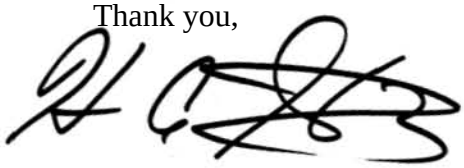
May 18, 2007

Joseph M. Turner, Chairman
Region 21 700 MHz RPC
2719 State St.
Saginaw, MI 48602

Dear Mr. Turner,

Region 14 has reviewed the proposed 700 MHz Region Plan for FCC Region 21. After review from the Committee, Vice-Chairman Whitaker, and myself, Region 14 hereby gives its approval to and concurrence with Region 21's 700 MHz Region Plan. Please send an interference resolution document to Region 14 for the appropriate signatures so that final approval for your plan may be obtained.

Thank you,



H. Anthony Stantz,
Chairman
Region 14 700 MHz Regional Planning Committee
8500 East 21st Street
Indianapolis, IN 46219

Rec'd 1/2/07

Region 33 (Ohio) 700 MHz. Planning Committee
Paul M. Mayer, Chairman
Ohio Office of Information Technology
2323 W. 5th Ave., Columbus, Ohio 43204
614-995-0063 (voice) 995-0067 (fax)
E-mail paul.mayer@ohio.gov or mayerp@apco911.org

December 27, 2006

Joseph M. Turner, Chairman
Region 21 700 MHz. Planning Committee
2719 State Street
Saginaw, Michigan 48602

Dear Mr. Turner:

After reviewing the Michigan 700 MHz. Plan, we find it very similar to Ohio's in that coordination, for the most part, will be processed using the CAPRAD pre-assignment data base and that applications within 70 miles of an adjacent state will also be coordinated with that (those) state(s).

This being the case, the Region 33 (Ohio) 700 MHz. Planning Committee concurs with the Region 21 (Michigan) Plan as published and in effect on April 10, 2006.

We look forward to continuec good relations, working together for the overall improvement of public safety and interoperable communications within and between our respective states.

Sincerely,

Paul M. Mayer

Paul M. Mayer, Chairman

City of Sheboygan
spirit on the lake

June 30, 2006

Mr. Joseph M. Turner
Chairman
Region 21 700 MHz Planning Committee
2719 State Street
Saginaw, MI 48602

RE: Letter of Concurrence for Regional Plan

Dear Mr. Turner:

Region 45 is in receipt of your proposed 700 MHz Regional Plan submitted to this Committee on April 20, 2006. The members of the Region 45 700 MHz Planning Committee have reviewed and formally approved Region 21's Plan.

This letter serves as the official written concurrence of Region 45 to your proposed 700 MHz Regional Plan.

Sincerely,

DAVID E. KIRK
CHIEF OF POLICE

RUSSELL R. SCHREINER
COMMUNICATION/ELECTRONICS
TECHNICIAN
CHAIRPERSON REGION 45

RRS:pmk

DEPARTMENT
OF POLICE

CITY HALL
828 CENTER AVE.
SHEBOYGAN, WI
53081-4499

920/459-3333
FAX 920/459-0205

Region 54 700 MHz RPC

111 East Illinois Ave
Morris, IL 60450
815-405-0998 / 815-941-5718 fax
ckspire@grundy911.org

January 19, 2007

Joseph M. Turner, Chairman
2719 State Street
Saginaw, MI 48602

Dear Mr. Turner

Region 54 is in receipt of your proposed 700 MHz Regional Plan, submitted to this Committee on 10/11/06. Region 54 met on 1/10/2006, reviewed and formally approved Region 21's Plan.

This letter serves as the official, written concurrence of Region 54 to your proposed 700 MHz Regional Plan.

Sincerely,

Mr. William J Carter
Chairperson Region 54
111 East Illinois Ave
Morris, IL 60450

Inter-Regional Coordination Procedures and Procedures for Resolution of Disputes That May Arise Under FCC Approved Plans

I. INTRODUCTION

This is a mutually agreed upon Inter-Regional Coordination Procedures Agreement by, between, and among all of the following 700 MHz Regional Planning Committees: Region 14 Indiana, Region 21 Michigan, Region 22 Minnesota, Region 33 Ohio, Region 45 Wisconsin, and Region 54 Southern Lake Michigan. In order to encourage the use of a single standard process for inter-Region coordination, additional public safety Regions bordering any of the Regions named above may be added to this agreement without requiring the approval of those above not bordering the newly joining Region.

II. INTER-REGIONAL COORDINATION AGREEMENT

The following is the specific procedure for inter-regional coordination which has been agreed upon by the signers, initially Regions 14, 21, 22, 33, 45, 54. It will be used to coordinate with adjacent Regional Planning Committees when a license application is filed with the RPC.

A. Definitions

The Protected Service Area shall be defined as the area within the applicant's geographical boundaries plus three (3) miles. The interference contours shall be defined as a 5 dBu co-channel contour, a 60 dBu adjacent channel contour between two 12.5 kHz analog systems with channel centers spaced at 12.5 kHz, or as defined in the current version of TSB-88 for other specific channel bandwidths, spacings, and emission types. The applicant is responsible for determining the correct interference criteria to be utilized when submitting their application package. Other proposed definitions of service area or interference between

applicants shall be justified with an accompanying *Memorandum of Understanding (MOU)* or other documentation submitted as part of the license application, i.e. mutual aid agreements.

If the frequency assignment recommended by the home Region does NOT comply with the current CAPRAD frequency sort AND either of the two conditions below apply, then the application must be submitted for approval by the affected adjacent Region(s) before forwarding to an authorized frequency coordinator.

1) An applicant's proposed protected service area (PSA) contour lies within three miles of the border with an adjacent Public Safety Region(s), OR
2) Any of the applicant's predicted interference contours extend into an adjacent Public Safety Region(s).

In these cases the application for non-conforming channel use must be submitted for approval by the affected adjoining Region(s) using the evaluation and consent process outlined below.

B. Coordination Procedures

1. Intra-regional review and coordination takes place, including a technical review resulting in recommendation of channels to be assigned.

2. After intra-regional review, a copy of those proposed frequency-specific applications requiring adjacent Region approval, including a definition statement of proposed protected service area, PSA and interference contour maps, and other supporting documentation 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.

3. The adjacent Region reviews the application according to its approved Plan and established policies. 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. 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.

C. Dispute Resolution

4. If the applicant and its home 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 chairperson's 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 or adjacent channel interference free protection to existing licensees within the adjacent Region.

5. 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. The Regional Plan Oversight Committee (RPOC) is a committee within the National Public Safety Telecommunications Council (NPSTC) established to arbitrate disputes between 700 MHz Regions that cannot be resolved by the impacted Regions. 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.

D. Notification of Approval to Coordinate

6. 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 an authorized frequency coordinator for processing and filing with the Commission.

7. Where adjacent Region concurrence has been secured, and the channel assignments would result in a change to the Region's current 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). Upon Commission issuance of an *Order* adopting the amended channel assignment matrix, the initiating Regional chairperson will send a copy of the *Order* to all adjacent Regional chairperson(s) and may then advise the applicant(s) that they may forward their applications to an authorized frequency coordinator for processing and filing with the Commission.

8. In the event that multiple Region plans require modifications, each Region is responsible for taking the actions indicated and notifying all adjacent Regions via the CAPRAD database when their *Order* is issued by the FCC.

APPENDIX X Signature Page

III. CONCLUSION

IN AGREEMENT HERETO, Regions 14, 21, 22, 33, 45, and 54 do hereunto set their authorized signatures the day and year first above written.

Respectfully,

Region 14 - IN _____ Date: 11/28/2007

Region 21 - MI _____ Date: Dec. 15, 2007

Region 22 - MN _____ Date: _____

Region 33 - OH _____ Date: _____

Region 45 - WI _____ Date: _____

Region 54 - SLM _____ Date: _____

APPENDIX X Signature Page

III. CONCLUSION

IN AGREEMENT HERETO, Regions 14, 21, 22, 33, 45, and 54 do hereunto set their authorized signatures the day and year first above written.

Respectfully,

Region 14 - IN _____ Date: _____

Region 21 - MI Joseph M Turner Date: Dec. 15, 2007

Region 22 - MN _____ Date: _____

Region 33 - OH Paul M. Mayer Date: 12-10-2007

Region 45 - WI _____ Date: _____

Region 54 - SLM _____ Date: _____

APPENDIX X Signature Page

III. CONCLUSION

IN AGREEMENT HERETO, Regions 14, 21, 22, 33, 45, and 54 do hereunto set their authorized signatures the day and year first above written.

Respectfully,

Region 14 - IN _____ Date: _____

Region 21 - MI Joseph M. Zuiss Date: Dec. 15, 2007

Region 22 - MN _____ Date: _____

Region 33 - OH _____ Date: _____

Region 45 - WI _____ Date: 5-10-07

Region 54 - SLM _____ Date: _____

APPENDIX X Signature Page

III. CONCLUSION

IN AGREEMENT HERETO, Regions 14, 21, 22, 33, 45, and 54 do hereunto set their authorized signatures the day and year first above written.

Respectfully,

Region 14 - IN _____ Date: _____

Region 21 - MI Joseph M. Zuman Date: Dec. 15, 2007

Region 22 - MN _____ Date: _____

Region 33 - OH _____ Date: _____

Region 45 - WI _____ Date: _____

Region 54 - SLM _____ Date: 5-1-07

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APPENDIX Y - REGION 21 700 MHz PLAN

This Appendix Contains

1. Acronyms used in this Plan

Acronyms Used in the Region 21 Plan

DTV -	Digital Television
ICS -	Incident Command System
MDT -	Mobile Data Terminal
MOU -	Memorandum of Understanding
MPSFAC -	Michigan Public Safety Frequency Advisory Committee
NCC -	National Coordinating Committee
NIJ -	National Institute of Justice
NPSTC -	National Public Safety Telecommunication Council
PSWAC -	Public Safety Wireless Advisory Committee
PW -	FCC designator for Public Safety “Pool” Frequencies
SIEC -	State Interoperability Executive Committee