

Summary of Major Elements of Region 21 700MHz Plan

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 National Coordinating Committee definitions. 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. A detailed discussion of the application process is given. This includes guidelines for spectrum use, a list and discussion of submittals that must accompany the application, the application review process and dispute resolution.

We specify a propagation model as modified R-6602, or "... any other methodology as provided for in TSB-88". Coverage and service areas have been expanded to include "county-like areas" consisting of a county's geographic boundary plus 10 miles. We incorporate language addressing "orphaned channels" and provide for reuse of unused portions of 25 kHz channel blocks. In addition, we give guidelines for relocating 25 kHz channels blocks throughout the region to accommodate applicants who find that their original channel allotments have proven unworkable. In addition the reader will find language addressing channel usage in light of international treaty obligations has also been added. We have added language to accommodate applicants wishing to avail themselves of the new deployable trunked channels, reserve channels and/or air to ground channels that have been added to our plan as a result of recent FCC actions.

All applicants must adhere to the interoperability guidelines and usage requirements in this plan or those guidelines promulgated by the Michigan State Interoperability Governance Board (SIGB) or other entity charged with managing the assignment and use of 700 MHz interoperability resources. Analog operation on the interoperability channels is not permitted. Should conflict arise between the I/O requirements in this plan and SIGB guidelines, the SIGB guidelines will prevail. A discussion of the future planning process is also included.

PREFACE TO THE FIRST REVISION

It has been said that the only things of which you may be certain are death and taxes. It now seems that we must add a third to this short list – change! The rapid change in both the technological and regulatory landscape in recent years puts the exclamation point to this simple truth.

The Region 21 regional planning process began in 2000 with Mr. Dick DeMello convening the first organizational meeting of the Regional Planning Committee. These efforts culminated in October 2008 with Federal Communications Commission approval of the first version of this plan. During this extended period of time, the committee found itself facing many changes; in personnel with the death of respected members; in technology with the digital television transition; in the regulatory arena with band realignment and two rounds of international treaty negotiations. Yet, a plan was produced and authorizations eventually issued by the Commission for allocations of the 700 MHz spectrum in Region 21.

But the technological and regulatory environment in which we labor did not stop evolving with the approval of our plan. In fact, the technological and regulatory landscapes have and will continue to change and this plan must change with them. Thus, the Michigan Public Safety Frequency Advisory Committee (MPSFAC) presents this, the first revision of the Region 21 700 MHz Regional Plan to the public safety community.

It is, of course, impossible for a volunteer committee such as the MPSFAC to function without representation from the public safety and public services community. By their willingness to serve, these remarkable individuals have made immeasurable contributions to the public's safety and welfare that while little understood or appreciated by that same public, are greatly appreciated by those in the public safety communications arena. Certain of these representatives deserve special recognition for their remarkable dedication to the regional planning process: Dale Berry (Vice Chairman), Patricia Coates (Secretary), Thomas Briggs, Kasey Mlujeak, Bill Nelson, Karl Beckman, Mike Whately, Jim Fyvie and Joseph Turner. Signatures on sign in sheets attest to these individuals presence at the very first planning meeting on May 3, 2000 and they remain actively involved to this day. So to them as well as all of the members of the MPSFAC throughout the years I offer sincerest thanks for a job well done.

I hereby certify that all meetings of the Region 21 700 MHz Regional Planning Committee and the Michigan Public Safety Frequency Advisory Committee are open to the public.

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

Date: _____

PREFACE TO THE SECOND REVISION

A public hearing was held at 10:00am on Thursday, May 21, 2015 at 4000 Collins Road, Lansing Michigan for the purpose of obtaining public input in regard to certain changes to the Region 21 700 MHz Regional Plan. The proposed changes add the former Reserve Channels as a pool of additional channels supplementing the original channel allotments and designate six of these pool channels for deployable trunked system operation. The six designated channels were identified by the National Regional Planning Council for adoption as deployable trunked channels nationwide. Regional Planning Committees are granted authority to modify regional plans in this manner under Federal Communications Commission docket FCC 14-172. No members of the public commented on the proposed plan amendments.

We applaud the FCC for taking this action which, upon approval of the amended plan, will make available more resources for use of the public safety community here in Region 21.

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

Date: _____

PREFACE TO THE THIRD REVISION

A public hearing was held at 10:00am on Thursday, May 19, 2016 at Marshall Regional Law Enforcement Center, 714 Old US 27 North, Marshall, MI for the purpose of obtaining public input in regard to certain changes to the Region 21 700 MHz Regional Plan. The proposed changes add the Air to Ground channels to the plan as well as correct and/or remove obsolete language. The state of Michigan SWIC has granted approval to the Region 21 RPC to administer the Air to Ground channels in Region 21 and this letter is included as an appendix. No members of the public commented on the proposed plan amendment. Regional Planning Committees are granted authority to modify regional plans in this manner under Federal Communications Commission docket FCC 14-172.

We applaud the FCC for taking this action which, upon approval of the amended plan, will make available more resources for use of the public safety community here in Region 21.

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

Date: _____

REVISION HISTORY

Revision Number	Purpose	FCC Approval
0	Original Plan Submission	October 10, 2008
1	Update appendices, flow charts,allottment table to conform to Arrangement Q	June 18, 2013
2	Addition of former "Reserve" and Deployable Trunked channels	March 11, 2016
3	Addition of Air to Ground channels	June 9, 2017

The Region 21 700 MHz Plan

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The Region 21 700 MHz Plan

INTRODUCTION

The Federal Communications Commission (FCC) requires that a Regional Plan outlining the use of the public safety radio frequencies in the 700 MHz band be complete and approved by the FCC before any agency within the region may utilize these frequencies. This plan was approved by the FCC on October 10, 2008. A diverse group of individuals and agencies, representing a cross-section of public safety and public services users, were invited to participate in the development of the regional plan. Notification was accomplished by LEIN, US mail, web page postings and e-mailings to organizations representing eligible agencies. Further federal, state, local and tribal government agencies concerned with national security and emergency preparedness were contacted. Appendix B contains the meeting notices, Appendix E contains the notification information and Appendix F contains the minutes of the meetings. All Region 21 RPC meetings are open to the general public. No other agencies within Region 21 have developed 700 MHz band plans that we are aware of.

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. This plan was developed to guide eligibles through the application process, provide an equitable means of settling disputes concerning frequency allocations should they arise, and ensure that frequencies once assigned will be used in the most efficient manner.

Region 21 Defined

Region 21 is defined as the entire state of Michigan¹.

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

Regional Planning Committee Authority

Authority for the Regional Planning Committee to carry out its assigned tasks is derived from the FCC Report and Order, Docket 96-86.

The Michigan Public Safety Frequency Advisory Committee

The Michigan Public Safety Frequency Advisory Committee (MPSFAC) processes all applications for spectrum in the 700 MHz band. The MPSFAC shall conduct its affairs in accordance with the region bylaws. All questions pertaining to committee operations or decisions shall be referred to the bylaws. The bylaws may be found in the Appendix D. Please note: each committee member who is a representative of an eligible agency is entitled to one vote in all committee matters. Except as may be provided elsewhere in this plan, the majority of those present at a scheduled meeting will prevail.

The MPSFAC shall make every effort to properly coordinate each application in accordance with applicable FCC rules and the requirements of this plan. Therefore, in addition to the technical data required on FCC Form 601, the committee may request and applicants are required to provide technical information such as but not limited to, antenna and interconnecting coaxial cable data by manufacturer model and type, transmitter emissions data and receiver noise and adjacent channel rejection data and/or any other information that the committee may deem necessary to make proper frequency assignments. However, final determination as to the efficacy of frequency assignments and/or technical parameters of the application rests with the FCC.

National Relationships

By officially sanctioning this Plan, the FCC agrees that it conforms to National Coordinating Committee (NCC) and FCC requirements. This plan does not conflict with the proper functions and duties of the frequency coordination entities in the Private Land Mobile Radio Service. The Plan provides procedures that are the

committee informed the FCC of its desire to modify region 21 boundaries to include the entire State of Michigan.

consensus of the group of individuals involved in its development. If there is a perceived conflict then the judgment of the FCC will prevail.

International Relationships

Assignment and use of 700 MHz frequencies in the Canadian border areas of Region 21 are subject to the conditions set forth in the “Exchange of Notes (October 24, 1962) Between the Government of Canada and the Government of the United States of America Concerning the Coordination and Use of Radio Frequencies Above 30 Mega Cycles per Second” as amended along with all pertinent arrangements. Copies of these agreements may be found on the International Bureau section of the FCC website at www.fcc.gov.

Spectrum Allotments

The Region 21 700 MHz Planning Committee accepts the National Law Enforcement and Corrections Technical Committee sort as the official allotment for Region 21. The sorted channel assignments by county are given in the appendix. Applicants may also review their allotments on the Computer Assisted Pre-coordination Resource And Database System (CAPRAD) website; <http://caprad.org>.

Eligibility

Eligible users are defined by the Public Safety Wireless Advisory Committee 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.

Coordination With Adjacent Regions

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 have their application coordinated with the effected adjoining Region. Applicants will be required to file identical applications with the Region 21 committee and the committee(s) of the region(s) adjoining the proposed allocation.

APPLICATION PROCESS

Applications will be reviewed at scheduled meetings of the MPSFAC. Applicants must contact the MPSFAC chairperson or secretary with a request to include their application as an agenda item and must supply all members of the MPSFAC with a copy of the application, either electronically or via US mail, at least two weeks before the review meeting. Late applications will be reviewed at the next scheduled meeting of the MPSFAC. Applications may be filed for committee review at scheduled meetings of the MPSFAC; however, applications so filed will be reviewed at the next scheduled meeting. The flow chart, entitled Application Submission and Approval Flow Chart, depicts the sequence of steps the committee will use in the allocation of 700 MHz spectrum. The flow chart may be found in Appendix I.

REQUIRED APPLICATION SUBMITTALS

Each applicant shall supply the following information:

- Statement of need for installing a new 700 MHz system.
- Explanation of budget commitment that has been made for the proposed system; include agency budgets and/or agency resolution(s).
- FCC Form(s) 601
- Details of engineering studies showing radio coverage will *not* exceed applicant's minimum requirements.
- An explanation of how an applicant's agency will comply with interoperability requirements of this plan.

- Proof of notification of surrounding entities of intent to seek 700 MHz channel resources and any plans or discussions to address cross-band and/or cross-agency interoperability
- An explanation of provision for future growth of agencies not involved in the initial system buildout, if any.

Statement of Need

Applicants are required to demonstrate need for frequencies requested. Frequency assignments will not be made so that applicants can warehouse such assignments for future use. Applicants are encouraged to join larger existing systems whenever possible or 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 will 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.

Budgetary Commitment

Applicants must demonstrate the financial resources to build the proposed system. Documentation in the form of resolutions for bonding or other fiscal mechanisms or agency budgets must be provided.

FCC Form 601

Applicants must submit Form 601 along with the appropriate coordination request form of the desired PW frequency coordination body. Form 601 consists of the following: Main Form (four pages), Schedule D (as appropriate), Schedule H (as appropriate), other schedules as necessary. If the applicant has identified potential frequencies, these will appear on Schedule H. If the applicant wishes the Committee to identify frequencies, Schedule H will be blank.

Engineering Studies

Contour studies showing coverage or service area, co-channel interference and adjacent channel interference must be supplied with the application. These shall include a 40dbu(50,50) coverage or service area contour, a 60dbu(50,10) adjacent

channel Interference contour and a 5dbu(50,50) co-channel interference contour. Contours are discussed in detail in the section titled Coverage and Interference Considerations elsewhere in this document.

Interoperability Requirements

Applicants must demonstrate that their system will provide interoperability with disparate agencies and disciplines as appropriate as specified elsewhere in this document. Applicants wishing to utilize 700 MHz channels with a proposed or existing system primarily operating in a different frequency band must comply with the interoperability requirements of the Region 21 700 MHz Plan, Region 21 800 MHz plan, and the State Interoperability Governance Board (SIGB) or other entity charged with managing the assignment and use of 700 MHz interoperability resources. Applicants must provide proof they communicated an announcement of their intent to seek new 700 MHz frequencies and have offered an invitation to relevant stakeholders to participate in discussions and formulate plans and procedures to facilitate interoperability. Interoperability plans and procedures must be furnished to the Committee as part of the application process.

Who to Contact with Questions

Any questions regarding the application process may be directed to the Michigan APCO local advisor or the Chairperson of the MPSFAC. Contact information for persons currently holding these positions is available in the Appendix or on the MPSFAC website www.MPSFAC.org.

FREQUENCY ASSIGNMENT CRITERIA

For the purposes of the following discussion, a “channel” shall be defined as four contiguous 6.25 khz spectrum allotments as described in the Channel Allotment appendix. A “partial channel” shall be defined as a channel utilizing less than four contiguous 6.25 khz channels. “Adjacent channels” shall be defined in the following manner: Two contiguous channel blocks of four 6.25khz partial channels each, or two contiguous channel blocks of two 6.25 khz partial channel blocks, or two contiguous 6.25 khz partial channels. A “talk-path” is defined as the quantity of channels

necessary for two-way voice communications. A talk-path may utilize one or more 6.25 khz channel allotments.

International Treaty Considerations

The treaty with Canada establishes a Sharing Zone within 100 kilometers of the border and a Protection Zone extending between 100 and 140 kilometers of the border. Within the Sharing Zone, use of certain channel allotments in Region 21 will be secondary to Canadian operations. These US secondary channels are highlighted in red in the list of allotments given in Appendix J. Within the Protection Zone, certain channel allotments are primary for Region 21 applicants; however, within the Sharing Zone these channels are secondary. These US primary channels are highlighted in blue in Appendix J. The Sharing Zone and Protection Zone channels may be used subject to the power and antenna height limits spelled out in the treaty. But, it must be remembered that Sharing Zone channels are secondary and therefore use of these channels may be restricted by present or future Canadian operations.

Channel Loading

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

Spectrum Efficient Technologies

Systems requiring four or fewer channel allotments may operate in the conventional, non-trunked mode. Systems requiring five or more channel allotments are expected to utilize spectrum efficient technologies meeting or exceeding FCC bandwidth rules.

COVERAGE AND INTERFERENCE CONSIDERATIONS

Propagation Model

The propagation model preferred for use in calculating the required contours is the corrected R-6602 model or any other methodology as provided for in TSB-88. Various software packages are commercially available to plot these contours.

Coverage

Service area for systems serving a single jurisdiction or systems serving multiple jurisdiction consortiums (multi-disciplinary) within the geographical boundaries of a single county will be defined as the boundaries of the contiguous geographic areas in which an applicant routinely offers public safety services plus three miles. An applicant for a county-wide multiple jurisdiction/multi-disciplinary system may request to use a county-like area to define their service area. A county-like area will be defined as the geographic boundary of the county plus ten miles. However, the applicant must show that emergency service is routinely rendered outside the applicant county's geographic boundary and within the county-like area. In such cases, the county-wide system applicant will be permitted to utilize channels allotted to their county within the county like area defined above.

Some applicants may require coverage that encompasses more than one contiguous county. A multiple county consortium may utilize county-like areas when determining their service area. In such cases, the service area would be considered the geographic boundaries of the contiguous counties plus ten miles. In that case, and with permission of the governing board of the affected county, allotments from each effected county may be used within the other county. However, "service area" applicants must show conformance with the "orphaned channel" provisions below. Should such a consortium be located in an area that lies beyond a distance of 113km from an adjacent planning region, no concurrence from that region will be necessary. If however, the consortium will operate within 113km of an adjacent planning region, concurrence from that region for the proposed frequency plan will be necessary.

Orphaned Channels

The General Use pool allotments within Region 21 are assigned on a per county basis with a bandwidth of 6.25 kHz per channel. These 6.25 kHz allotments may be used individually or in groups of two or four resulting in "channel" sizes of 12.5 or 25 kHz respectively. These allotments have been characterized as "technology neutral", that is, they are flexible enough to accommodate different technologies utilizing multiple bandwidths. If agencies choose a technology that requires less than 25 kHz channel bandwidth for their system, there is the potential for residual, "orphaned

channels” of 6.25 kHz or 12.5 kHz bandwidth immediately adjacent to the assigned channel within a given county. Depending on the technology chosen, it may not be possible to reuse these adjacent channels within the county to which they were originally allotted. When in the best interest of public safety communications and efficient spectrum use within the Region, the MPSFAC shall have the authority to move these orphan channel allotments to another county or county-like area as defined above.

An applicant may request to move a full 25 kHz channel allotment to a location outside of the county in which it was originally allotted; however, the applicant must provide a detailed explanation as to why the original county allotment will not work for them. The applicant must also show distance separation greater than 75 miles to the geographical border of reserved co-channel entities and 35 miles from the geographical border of reserved adjacent channel entities. At its new location, use of the “new” allotment must conform to the coverage and interference criteria of this plan.

For distances less than those stated previously, the applicant must use the coordination rules described in the Coverage and Interference section of this plan to show a "worst case" scenario. This “worst case” will assume a site within the reserved entity's geographical borders at the closest location to the applicants proposed site using the greatest antenna height and ERP allowed by FCC rules in the reserved entity's area.

These criteria must be met for all entities within Region 21 and the adjacent regions before an exception will be granted by the committee. In this manner, an applicant must show that moving an allotment will result in no future interference to the reserved entity or its surrounding entities or prevent the reserved entity from using it's allotted frequency in future systems. If any such move renders an allotment unusable in the donor county, a suitable substitute must be found by the applicant. This substitute allotment must be shown, using the coverage and interference criteria in this plan, to be functional within that county and will cause no co-channel or

adjacent channel interference issues with the surrounding counties in the same manner as the original allotment.

Movement of full or partial channel allotments can be approved on a majority vote of committee members in attendance at a special or regular meeting of the MPSFAC. If the movement of a full or partial channel allotment falls within the 'county-like area' of the original county (that is an adjacent county), no plan amendment will be required. However, if movement of a full or partial channel allotment is outside of its original county-like area boundary, the region will amend the regional plan and submit the amendment to the FCC along with the appropriate adjacent region concurrences if required. If movement of a full or partial channel allotment from one region to another is deemed in the interest of interregional sharing and cooperation, each region shall amend its plan and submit the amended plan to the FCC accompanied with concurrence from the participating region(s).

Coverage Contours

The maximum "designed mean signal strength" at a contour extending three (3) miles outside of the boundary of the coverage or service area shall not exceed +40dBu (+40dB above one microvolt per meter). This contour shall be included with the applicant's submittals and shall be calculated using the corrected R-6602 at a (location, time) confidence of (50,50) using a 1/4 wave whip antenna five (5) feet above the ground. In order to allow for practical system design, this three (3) mile limit may be altered on a case by case basis. In any case, the 40dbu contour minimum coverage radius in all cases shall not exceed five (5) miles beyond the boundary of the applicant's coverage or service area. Signal level may be verified using a 1/4 wave whip antenna five (5) feet above the ground.

Interference - Co-channel

Co-channel assignments (full or partial) will be made when it is determined that the two or more systems will create a signal of +5dbu or less anywhere within the coverage or service area boundary of the affected co-channel entity. This contour shall be included with the applicant's submittals and shall be calculated using the corrected R-6602 at a (location, time) confidence of (50,50).

Interference - Adjacent Channel

Adjacent channel assignments will be made when it is determined that the two or more systems will create a signal strength of +60dBu or less anywhere within the adjacent channel user's coverage or service area boundary. This contour shall be included with the applicant's submittals and shall be calculated using the corrected R-6602 at a (location, time) confidence of (50,50).

Coverage Limitations

Strict adherence to requirements limiting bounding contours to within the applicant's service area boundaries must be observed. Antenna heights are to be limited to provide only the necessary coverage for a system. When this is not possible, appropriate transmitter outputs and antenna patterns must be employed to realize the necessary coverage. All precautions must be taken to preserve maximum reuse of the limited 700 MHz spectrum.

INTEROPERABLE COMMUNICATIONS REQUIREMENTS

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 a S-160, Memorandum Of Understanding (MOU) or equivalent agreements, a licensee may permit federal use of non-federal communications spectrum.

Interoperability Plans

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 above, 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.)

System implementations must provide interoperability between area wide agencies as mandated by this plan. Should applicants wish to install base station equipment for the purpose of interoperability, such implementations must be reviewed and approved by the MPSFAC. However, the State Interoperability Governance Board will be the agency responsible for reviewing and approving the implementation of interoperability infrastructure within the region.

700 MHz Interoperability Channels

The narrowband voice & data interoperability channels (sixty-four at 6.25 KHz bandwidth) are defined on a nationwide basis. Since they are nationwide channels, each channel must have the same usage within each region and across regional borders. They are subdivided into different service categories. These channels utilize the ANSI/TIA 102 series standards (Project 25) for the digital conventional only mode of operation employed on the narrowband voice and data interoperability channels. Conventional only means that trunking is not allowed on these channels.

Analog modulation is prohibited on the interoperability channels. Mobile and portable transmitters that only operate on the low power channels designated in §90.531(b)(3) and (4) are exempt from this digital only requirement.²

There are two (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 categories:

² 47CFR90.535 (a)

Discipline or Use	Quantity
Emergency Medical Services	4
Fire Services	4
Law Enforcement Services	4
Mobile Repeater Operation	2
Other Public Services	2
General Services	4
Data Services	2
General Services (secondary trunking)	8

Calling Channels³

Two of the interoperability channel sets are designated as "Calling Channels". In addition to the usual calling channel functions, the calling channels may be used to notify users when a priority is declared on one or more of the tactical interoperability channels. They may not be used primarily for routine, day-to-day communications.

NAME	MOBILE TRANSMIT	MOBILE RECEIVE
7CALL50	799.24375	769.24375
7CALL50D	769.24375	769.24375
7CALL70	803.25625	773.25625
7CALL70D	773.25625	773.25625

Mode of Operation

All interoperability channels, except as described below, shall be used for conventional-only operation. If implemented locally, users will call a dispatch center on one of the calling channels and would be advised to switch to tactical channel.

Encryption

Use of encryption is prohibited on all interoperability channels, both calling and tactical.

Common Terminology

All communications on interoperability channels shall utilize "plain English" terminology to avoid confusion or misinterpretation of message traffic.

³ 47CFR90.531 (b) 1) ii)

Trunking Interoperability Channels ⁴

The following eight channel pairs may be combined with the appropriate adjacent secondary trunking channel pairs and used in trunked mode on a secondary basis to conventional Interoperability operations. For every ten general use channels trunked at a station, entities may obtain a license to operate in the trunked mode on two of the above contiguous Interoperability channel pairs. The maximum number of Interoperability channel pairs that can be trunked at any one location is eight (8). Below is the standard naming convention when using channels for interoperability purposes:

NAME	MOBILE TRANSMIT	MOBILE RECEIVE
7TAC51	799.14375	769.14375
7TAC52	799.64375	769.64375
7TAC53	800.14375	770.14375
7TAC54	800.64375	770.64375
7TAC71	803.10625	773.10625
7TAC72	803.60625	773.60625
7TAC73	804.10625	774.10625
7TAC74	804.60625	774.60625

Standardized Nomenclature

The channel names have been standardized in the NPSTC/ANSI 104 public safety channel naming document and adopted as recommended in the National Emergency Communications Plan. When operating in direct (simplex) mode, the letter “D” shall be appended to the end of the label.

Data-Only Use of the I/O Channels⁵

Narrowband data-only interoperability operation on the interoperability channels on a secondary basis shall be limited to the two following 12.5 KHz channel sets:

NAME	MOBILE TRANSMIT	MOBILE RECEIVE
7DATA69	800.74375	770.74375
7DATA89	804.75625	774.75625

Narrowband Interoperability Channels⁶

The following narrowband channels are designated for nationwide interoperability licensing and use:

⁴ 47CFR90.531 (b) (1) (iii)

⁵ 47CFR90.531 (b) (1) (i)

⁶ 47CFR90.531 (b) (1)

NAME	DISCIPLINE	MOBILE TRANSMIT	MOBILE RECEIVE
7TAC55	GENERAL GOV	799.74375	769.74375
7TAC55D	GENERAL GOV	769.74375	769.74375
7TAC56	GENERAL GOV	800.24375	770.24375
7TAC56D	GENERAL GOV	770.24375	770.24375
7MOB59	MOBILE RPTR	800.89375	770.89375
7MOB59D	MOBILE RPTR	770.89375	770.89375
7LAW61	LAW ENFORCEMENT	800.39375	770.39375
7LAW61D	LAW ENFORCEMENT	770.39375	770.39375
7LAW62	LAW ENFORCEMENT	800.49375	770.49375
7LAW62D	LAW ENFORCEMENT	770.49375	770.49375
7FIRE63	FIRE SERVICE	799.89375	769.89375
7FIRE63D	FIRE SERVICE	769.89375	769.89375
7FIRE64	FIRE SERVICE	799.99375	769.99375
7FIRE64D	FIRE SERVICE	769.99375	769.99375
7MED65	EMERG MED. SVC.	799.39375	769.39375
7MED65D	EMERG MED. SVC.	769.39375	769.39375
7MED66	EMERG MED. SVC.	799.49375	769.49375
7MED66D	EMERG MED. SVC.	769.49375	769.49375
7TAC75	GENERAL GOV	803.75625	773.75625
7TAC75D	GENERAL GOV	773.75625	773.75625
7TAC76	GENERAL GOV	804.25625	774.25625
7TAC76D	GENERAL GOV	774.25625	774.25625
7MOB79	MOBILE RPTR	804.50625	774.50625
7MOB79D	MOBILE RPTR	774.50625	774.50625
7LAW81	LAW ENFORCEMENT	804.00625	774.00625
7LAW82	LAW ENFORCEMENT	804.35625	774.35625
7LAW82D	LAW ENFORCEMENT	774.35625	774.35625
7FIRE83	FIRE SERVICE	803.50625	773.50625
7FIRE83D	FIRE SERVICE	773.50625	773.50625
7FIRE84	FIRE SERVICE	803.85625	773.80625
7FIRE84D	FIRE SERVICE	773.80625	773.80625
7MED86	EMERG MED. SVC.	803.00625	773.00625
7MED86D	EMERG MED. SVC.	773.00625	773.00625
7MED87	EMERG MED. SVC.	803.35625	773.35625
7MED87D	EMERG MED. SVC.	773.35625	773.35625

Minimum Channel Capacity

The minimum channel capacity for calling and tactical channel sets is left up to the applicant. Each applicant is required to show interoperability on the 700 MHz channels. For all system implementations and all applicants Region 21 recommends a minimum template of interoperability and tactical channels as indicated below.

ZONE/PROFILES FOR MINIMUM INTEROPERABILITY CHANNELS

Zone i	Zone ii	Zone iii	Zone iv
7TAC1	7TAC2	8TAC	DTAC
7CALL50D	7CALL70D	8CALL90	7FTAC1D
7TAC55D	7TAC75D	8CALL90D	7FTAC2D
7TAC56D	7TAC76D	8TAC91	7FTAC3D
7MOB59D	7MOB79D	8TAC91D	7GTAC4D
7LAW61D	7LAW81D	8TAC92	7GTAC5D
7LAW62D	7LAW82D	8TAC92D	7LTAC6D
7FIRE63D	7FIRE83D	8TAC93	7LTAC7D
7FIRE64D	7FIRE84D	8TAC93D	7LTAC8D
7MED65D	7MED86D	8TAC94	7MTAC9D
7MED66D	7MED87D	8TAC94D	7NTAC10D
7CALL50	7CALL70		7NTAC11D
7TAC55	7TAC75		7NTAC12D
7MOB59	7MOB79		
7LAW61	7LAW81		
7FIRE63	7FIRE83		
7MED65	7MED86		

Project 25 Common Air Interface

Interoperability Channel Technical Parameters

Certain common P25 parameters need to be defined to ensure digital radios operating on the 700 MHz interoperability channels can communicate. This is analogous to defining the common Continuous Tone Coded Squelch System (CTCSS) tone used on NPSPAC analog Interoperability channels.

Network Access Code

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

tables and other Project 25 CAI reserve values. The use of NAC code \$293 is required for the 700 MHz interoperability channel NAC code.

Talk Group ID

In the Project 25 CAI definition, the Talk Group ID on conventional channels is analogous to the use of talk groups in trunking. In order to ensure that all users can communicate, all units should use a common Talk Group ID. The Region 21 RPC recommends use of the P25 default value for Talk Group ID = \$0001.

Manufacturer's ID

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

Message ID

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

Encryption Algorithm ID and Key ID

In order to ensure that all users can communicate, encryption should not be used on the interoperability channels.

Incident Command System Standard

Region 21 supports NCC recommendations regarding the National Incident Management System and Incident Command System. Use of these incident response tools is encouraged for all Region 21 agencies.

LOW POWER CHANNELS

The Low Power channels are specifically reserved for incident response purposes using mobiles and portables. FCC rules currently limit operation on these frequencies to two (2) watts ERP and antenna height is limited to 20 feet AGL.

Based on initiatives in border regions, Region 21 adopts the common channel naming convention and common operating convention shown below.

In the following matrix, the first eight (8) entries are low power channels administered by the MPSFAC⁷. The last four (4) entries are nationwide low power itinerant channels and are not administered by the MPSFAC.⁸ They are listed here for convenience. Each channel has been given a discipline indicator to allow users some channels to focus on; however, all eight channels would be available for assignment as needed. Within each discipline group, frequency separation has been provided in order to reduce interference.

NAME	DISCIPLINE	MOBILE TX	MOBILE RX
7FTAC1D	FIRE TACTICAL	769.006250	769.006250
7FTAC2D	FIRE TACTICAL	774.931250	774.931250
7FTAC3D	FIRE TACTICAL	769.043750	769.043750
7GTAC4D	GENERAL TAC	769.031250	769.031250
7GTAC5D	GENERAL TAC	774.956250	774.956250
7LTAC6D	LAW ENF. TACTICAL	769.018750	769.018750
7LTAC7D	LAW ENF. TACTICAL	774.943750	774.943750
7LTAC8D	LAW ENF. TACTICAL	774.981250	774.981250
7MTAC9D	MED TACTICAL	774.968750	774.968750
7NTAC10D	NATIONAL TAC	769.056250	769.056250
7NTAC11D	NATIONAL TAC	769.068750	769.068750
7NTAC12D	NATIONAL TAC	774.993750	774.993750

RESERVE CHANNELS

The FCC has designated the former “Reserve” channels for use of the RPCs under FCC 14-172. These channels may be considered a “pool” of frequencies to be used on a first come, first served basis in those areas where the entire allotment of 700 channels has already been used or in areas where certain channels are precluded from use either by International treaty or adjacent region or adjacent channel dispute. The channels are set forth in 47CFR90.531(b)(2) as:

77, 78, 157, 158, 197, 198, 221, 222, 237, 238, 277, 278, 301, 302, 317, 318, 643, 644, 683, 684, 699, 700, 723, 724, 763, 764, 779, 780, 803, 804, 843, 844, 859, 860, 923, 924, 997, 998, 1021, 1022, 1037, 1038, 1077, 1078, 1101, 1102, 1117, 1118,

⁷ 47CFR90.531 (b) (3)

⁸ 47CFR90.531 (b) (4)

1157, 1158, 1181, 1182, 1197, 1198, 1237, 1238, 1261, 1262, 1277, 1278, 1603, 1604, 1643, 1644, 1659, 1660, 1683, 1684, 1723, 1724, 1739, 1740, 1763, 1764, 1803, 1804, 1819, 1820, 1843, 1844, 1883, 1884, 1899, 1900.

The channel pairs listed below are reserved for deployable trunked system use as discussed below:

37, 38, 61, 62, 117, 118, 141, 142, 883, 884, 939, 940.

DEPLOYABLE TRUNKED CHANNELS

On February 13, 2015, NPSTC and the NRPC recommended a set of six former reserve channels (12.5 kHz bandwidth) to be allocated nationwide for 700 MHz deployable systems. In Public Notice DA 15-483 of April 23, 2015, the FCC approved the NPSTC/NRPC recommendation. Channels available for deployable use in Region 21 are listed below:

Deployable Trunked Channel	Channel Number	12.5 kHz Center Frequency
A	37-38	769.23125
B	61-62	769.38125
C	117-118	769.73125
D	141-142	769.88125
E	883-884	774.51875
F	939-940	774.86875

AIR TO GROUND CHANNELS

The FCC has designated the former “secondary trunked channels” for air to ground use under FCC 14-172. The State of Michigan has authorized the Region 21 700 MHz Regional Planning Committee to administer the air to ground channels in Region 21. This authorization is included as an appendix.

Four (4) of the air to ground pairs are reserved for 12.5 kHz conventional repeater or trunked system use while the remaining four (4) pairs are reserved for simplex use for a total of eight (8) 12.5 kHz simplex channels as follows:

Channel Name	Channel Number	12.5 kHz MO RX	12.5 kHz MO TX
AGRPT1	21/22 - 981/982	769.13125	799.13125
AGRPT2	101/102 - 1061/1062	769.63125	799.63125
AGRPT3	181/182 - 1141/1142	770.13125	800.13125
AGRPT4	261/262 - 1221/1222	770.63125	800.63125
AGDIR1	659/660	773.11875	773.11875
AGDIR2	739/740	773.61875	773.61875
AGDIR3	819/820	774.11875	774.11875
AGDIR4	899/900	774.61875	774.61875
AGDIR5	1619/1620	803.11875	803.11875
AGDIR6	1699/1700	803.61875	803.61875
AGDIR7	1779/1780	804.11875	804.11875
AGDIR8	1859/1860	804.61875	804.61875

Air to Ground channels will be available to agencies with geographic areas up to and including the entire State of Michigan for two-way communications with aircraft.

Operation on the Air to Ground channels in Region 21 will conform to 47CFR90.537(b)(7) and International agreements. The current restriction on aircraft ERP (2 watts) and maximum operating altitude (1500 feet AGL) are not superceded by this change to our 700 MHz plan.

APPLICATION SUBMISSION AND APPROVAL, COMPETING APPLICATIONS AND SYSTEM IMPLEMENTATION

This plan has been written to facilitate consistent evaluation of applications, resolve conflicts due to competing spectrum requests and monitor system implementation after the license has been issued.. Variation outside of the parameters of this plan may require evaluation beyond the norm. Therefore, it is necessary for the MPSFAC to evaluate each application or situation on its own merit. The Application Submission and Approval Flow Chart presents the sequence of events that will be followed in the allocation and utilization of the 700 MHz spectrum. The Competing Application Flow Chart is to be used when two or more applicants request frequencies in an area where insufficient resources exist to satisfy all requests. For the following discussion, please refer to the flow charts found in the Appendix.

APPLICATION SUBMISSION AND APPROVAL FLOW CHART (Blocks I thru IX)

Applications are received by the MPSFAC (Block I). A complete application package must be delivered to each member of the committee two (2) weeks before the meeting at which the applicant desires their application be reviewed. A needs assessment review is conducted (Block II). This statement of need submitted with the application serves as an over-view of the proposed system. If the application is not in compliance with State Interoperability Governance Board requirements and regional plan requirements, the application will be rejected at this point (Block III) and returned to the applicant with an explanation of the reason(s) for rejection. Applicants who chose to do so may appeal the committee's decision at this point. If there are no competing applications (Block IV) to be considered, the application will be populated with channels (Block V) and be forwarded to the frequency coordinating body of choice (Block VI and beyond).

POST LICENSING SYSTEM IMPLEMENTATION (Blocks X thru XVI)

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. An 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 X). Monitoring of systems implementation by the MPSFAC will take place at a minimum of one-year intervals. If progress is made the system is implemented (Block XI). If progress is not made, the licensee is advised that the FCC and the appropriate public safety pool frequency coordinator will be informed of the situation (Block XII). The MPSFAC continues to monitor progress on the implementation of the system (Block X). If progress is still not being made, the licensee is notified of the pending action of the MPSFAC to advise FCC of lack of progress and request the license be withdrawn (Block XIII). The notified licensee can appeal this action (Block XIV) or can allow the license to be withdrawn (Block XV). If

the authorized frequencies are withdrawn they are added back to the frequency allotment pool (Block XVI) and the process starts a second iteration at Block I.

APPEAL PROCESS

Applicants so disposed shall initiate an appeal to MPSFAC within ten (10) business days of the rejection of their application. Appeals will then be decided based on the Region 21 Appeal Procedure as given in Appendix H. In the event that an appeal reaches the FCC, the decision of the FCC will be final and binding upon all parties.

COMPETING APPLICATION FLOW CHART (Blocks 1. thru 8.)

The Competing Application Flow Chart (see Appendix H) will be used when competition for spectrum arises. Implementation of the Competing Application Flow Chart will result in the award of a score for each application. The application score is the total number of points awarded in seven 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 seven categories are as follows:

1. Service and Use (Block #1) – maximum score 375 points. Who will make routine use of the proposed system? Score points for each individual discipline. Total points for this block will be the sum of the point assignments for each discipline and use the system is to support. A multiplier of 1.5 will be applied to applications that support multiple discipline/ multiple jurisdiction system designs.

Service and Use Points:

Local Gov	25
Police	50
Fire	50
EMS	50
Schools	50
Road Commission	<u>25</u>
	250

Multiple Jurisdiction/Discipline Multiplier (1.5 X 250 = 375 Maximum)

2. Interoperability Diversity (Block #2) – maximum score 200 points, minimum score 0 points.

The application is scored on the degree of interoperability that is demonstrated, with range of points from 0 to 200. 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.

Interoperability Points:

Each applicant is encouraged to have direct communications among the following applicable agencies:

Federal	20
State	20
Tribal Nations	20
Local Police	20
Local EMS	20
Local Fire	20
Local DPW	20
Highway Maintenance/ Road Commission	20
Non Governmental Organizations	20
Public Utilities.	<u>20</u>
	200 (Max)

3. Cooperative Use (Block #3) – maximum score 300 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.

Cooperative Use Points:

Multi jurisdiction trunked system	150, or
Single jurisdiction trunked system	100, or
Multi jurisdiction Conventional system	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 new system. Therefore, the point award from the aforementioned category will be doubled as;

$$\text{Cooperative Use Points} \times 2 = \text{Score.}$$

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

This category scores the application on the degree of efficiency of spectrum use 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 voice only	50, or
Trunked voice and data	100, or
Conventional	50
Increased system throughput	add 25

5. Urban Sprawl (Block #5) – maximum score 150 points.

If the applicant has recently established or plans to establish (applicant must show approved funding) a public safety agency, the applicant has no legacy frequency resources and the proposed system will support this new agency, the application will be credited 150 points.

Urban Sprawl Points: 150

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

This category scores the application on two factors, budgetary commitment and planning completeness. The degree of budgetary commitment is scored on a range of 0 to 100 points. An applicant who demonstrates a high degree of commitment in funding the proposed system will receive the higher score. Each application will be scored on the degree of planning completeness with a range of scoring from 0 to 100 points. Applicants will be required to submit a timetable for the implementation of the communications system or systems.

System Implementation Points:

Funding commitment	(% funding X 100)
Planning Completeness	+ <u>(% complete X 100)</u>

200 points Max

Resolutions or letters of intent verifying financial commitment shall be included with each application.

7. System Density (Block #7)

Each application will be scored on the ratio of subscriber units to the coverage area of the individual sites. For wide area or consortium systems, only count subscriber units permanently assigned within the boundary of the political subdivision where each site is located. Do not count itinerant units.

System Density Points:

$(\text{Number of units assigned to jurisdiction}) / (\text{Area of jurisdiction in square miles}) = \text{score.}$

Finally, points are totaled for each application (Block #SUM).

The MPSFAC shall be responsible for the frequency coordination of the application. This shall include making a determination about the engineering of the system, effective radiated power (ERP), coverage, and compliance with FCC requirements.

INTER-REGIONAL DISPUTE RESOLUTION

Disputes between adjoining regions arising due to competing applications or interference situations will be resolved through the use of the appropriate inter-regional coordination procedures. These procedures may be found in the Appendix.

REGIONAL PLAN UPDATE COMMITTEE

The Michigan Public Safety Frequency Advisory Committee shall be the Regional Plan Update Committee. This committee will remain in place to process applications, recommend changes to the regional plan to the FCC and provide a mechanism for interregional problem resolution.

APPENDIX

A - Regional Plan Officers and Membership

- B - Membership Application
- C - Listing of Michigan Cities
- D - Region Bylaws and MPSFAC Committee Structure
- E - Notification Information
- F - Minutes of the Meetings
- G - Loading Requirements
- H - Regional Plan Appeal Process
- I - Application Submission and Approval and Competing Application Evaluation Flow Charts
- J - Spectrum Allotment
- K - MOU Document
- L - Existing Interoperability Agreements
- M - Inter-Regional Coordination Agreements
- N – Michigan SWIC Air to Ground Letter