Appendix C

Report to the NCC Interoperability Subcommittee
From the Rules/Policies Workgroup (#3)

Policy Recommendation for Trunking on Voice Interoperability Channels

Document #IO-0023D-20000218

Discussion:

Paragraph 76 of FCC 98-191 defines "Interoperability" as:

> "An essential communications link within public safety and public service wireless communications systems which permits units from two or more different entities to interact with one another and to exchange information according to a prescribed method in order to achieve predictable results."

In Paragraph 116 of FCC 98-191, the Commission recognized their "...tentative conclusion that trunking..." the interoperability channels "...may have been overstated." Therefore the Commission directed the National Coordination Committee (NCC) to "...consider the benefits of employing trunking on (at least) a portion of the nationwide interoperability channels" and to make a recommendation "...as to whether Commission action to require trunking on nationwide interoperability spectrum as needed."

September 24, 1999, the Trunking Evaluation Workgroup (IOWG5) of the NCC Interoperability Subcommittee reached consensus to forward its report "Recommendation for Trunking of Interoperability Voice Channels" (Document #IO-00013F-19990923) to the NCC Steering Committee. Recommendation #2 in that report states the following:

> Use of a limited number of interoperability channels on large multi-agency trunked systems should be permitted on a secondary basis, the recommended number to be determined by Interoperability Subcommittee Workgroup #3. These systems must be prepared to revert to conventional mode or a combination of trunked and conventional to allow communications with out-of-system resources.

<u>The Trunking Evaluation Workgroup did not recommend a trunking standard in its report, nor did it mandate trunked operation.</u>

While "base" channels are referenced in this document, corresponding "mobile" channels are also included by default.

In order to permit secondary trunked use and not preclude availability of non-trunked (conventional) use of the limited number of voice interoperability channels, a minimum of conventional-only channels must be established. Additionally, to afford the option to operate 6.25, 12.5, or 25[1] kHz bandwidth channel sets should be such that spectrum is fully realized and system design is possible with the least adverse impact upon antennas, filters, transmitter combiners, and receiver multi-couplers. Conversely, to afford accessibility to channels for secondary trunked use, the conventional-only channels should be utilized for conventional, interoperability operation prior to utilizing channels established for secondary trunked use. This would afford the highest degree of availability of channels for secondary trunked use

[1] 25 kHz channel bandwidth is contingent upon future action of the Federal Communications Commission. Any proposal should consider the Reserve spectrum immediately before each respective 12.5 kHz block of interoperability channels (i.e., channels 55 & 56 would combine with channels 57 & 58 to create a 25 kHz channel bandwidth).

The 700 MHz band plan per the First Report and Order in 96-86 (FCC 98-191) shows Interoperability channels set up in four groups of five, 12.5 kHz channel sets (6.25 kHz pairs) each and two groups of six, 12.5 kHz channel sets each. That makes a total of sixty - 6.25 kHz channels available for tactical interoperability use and two - 12.5 kHz channels available for Calling channels.

Each 12.5 kHz channel set has at least one adjacent 12.5 kHz channel set shown as Reserve spectrum. The 12.5 kHz channel set of Reserve spectrum prior to the initial groups shown in the attached band plan for both 764-767 MHz and 773-776 MHz subsets should remain in reserve as "guard channels" – particularly, between General Use and Interoperability spectrum unless it is released to expand Interoperability to 25 kHz channel sets. Thus, any expansion of the trunked Interoperability channels to 25 kHz would include the associated 12.5 kHz channel sets immediately before each 12.5 kHz channel set of Interoperability channels. In making a decision to allow 25 kHz trunking on these interoperability channels, Regional Planning Committees must consider the impact on the resulting adjacent 12.5 kHz General Use block channels below these 25 kHz channels.

To afford compatibility with the General Use spectrum, Interoperability channels trunked on a secondary basis may need to be available up to 25 kHz bandwidth. This would require Commission action. Careful attention to secondary trunked operation (up to 25 kHz bandwidth) must be given so to not create incompatible conventional interoperability if Interoperability channels remain at 12.5 kHz or less. The referenced bandwidth for this document is 12.5 kHz unless otherwise indicated.

821 MHz in 700 MHz equipment would reduce the need for two radios in vehicles or on the person; however, it will likely increase the cost, size, and weight of the equipment (i.e., a "tri-mode" radio). The cost of this equipment may be far outweighed by the cost, size and weight of two individual radios - including twice the maintenance costs. Realize that this argument may only be supported by agencies operating in both 821 MHz and 700 MHz bands. Whether agencies add 700 MHz operation to current 821 MHz systems or actually migrate from 821 MHz to 700 MHz, both bands in one radio could introduce backward compatibility to agencies remaining in 821 MHz systems only. Establishing the 821 MHz Calling channel as the Calling channel for the 700 MHz Interoperability channels (discussed later) would certainly add support to one radio for both bands. Ultimately, it may rest with the vendors and market forces. Hence, a policy is not proposed at this time.

Recommendation:

1. **Trunking the Interoperability channels on a secondary basis shall be limited to ten specific 12.5 kHz channel sets, divided into two subsets of five 12.5 kHz channels. One subset is defined by GTAC 5 through GTAC 13 and the other by GTAC 35 through GTAC 43. Fixed or mobile trunked operation shall be afforded access to the same pool of channels. In the event of conflict between multiple activities, prioritized use shall occur. All other Interoperability channels shall be used for conventional-only operation.**

2. **Any licensee implementing base station operation in a trunking mode on Interoperability Channels shall provide and maintain on a continuus (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.**

While it may be desirable for Regional Planning Committees 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 "Priority Level 4" 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 impossible to extract them from the trunked system in the event of an emergent event having higher priority. For this reason, Working Group #3 recommends that Regional Planning Committees limit the number of Interoperability channels that may be integrated into any single trunked system to the following amounts:

Recommendations:

3. **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.**

   Regional Planning Committees 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).

4. **It is recommended that channel sets (two 6.25 kHz pairs) in Reserve Spectrum immediately below the GTAC channels where trunking is permitted [(53, 54), (133, 134), etc in the lower block and (533, 534), (613, 614), etc in the upper block] be reserved as guard channels between the General Use and Interoperability channels. If a Regional Planning Committee elects to permit 25 kHz trunking on interoperability channels, these Reserve Spectrum guard channels would become the lower 12.5 kHz half of these channels. In making a decision to allow 25 kHz trunking on these interoperability channels, Regional Planning Committees must consider the impact on the resulting adjacent 12.5 kHz General Use block channels below these 25 kHz channels.**

Table of Interoperability Channels where secondary Trunking is permitted:

SPECTRUM BLOCKS	DESCRIPTION	LABEL
Channel 55 & 56	General Public Safety Services	GTAC 5
Channel 135 & 136	General Public Safety Services	GTAC 7
Channel 215 & 216	General Public Safety Services	GTAC 9
Channel 295 & 296	General Public Safety Services	GTAC 11
Channel 375 & 376	General Public Safety Services	GTAC 13
Channel 535 & 536	General Public Safety Services	GTAC 35
Channel 615 & 616	General Public Safety Services	GTAC 37
Channel 695 & 696	General Public Safety Services	GTAC 39
Channel 775 & 776	General Public Safety Services	GTAC 41