

Long-Term Interoperability Plan



**Capital Area
Council of Governments**

Developed By

Capital Area Council of Governments (CAPCOG)

Long-Term Interoperability Work Group

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Approved by David Abernathy 1/6/06

RECORD OF CHANGES
CAPCOG Long-Term Interoperability Plan

CHANGE #	DATE OF CHANGE	CHANGE ENTERED BY	DATE ENTERED
1	8/18-19/2005	Chuck Brotherton	8/19/2005
2	8/30/2005	Chuck Brotherton	8/30/2005
3	8/30/2005	Mike Simpson	8/30/2005
4	8/31/2005	Chuck Brotherton	8/31/2005
5	9/01/2005	Chuck Brotherton	9/01/2005
6	9/30/2005	Patrick Cobb	9/30/2005
7	10/18/05	Jerry Fackler	10/18/05
8	11/10/05	Jerry Fackler	11/10/05
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**CAPCOG Long-Term Interoperability Plan
For FCC Designated Public Safety Interoperability Channels**

150 MHz – 800 MHz

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CAPCOG Long-Term Interoperability Plan (LTIP)

Executive Summary

The Capital Area Council of Governments (CAPCOG) created the Long-Term Interoperability Work Group (LTIWG) in late 2004. The work group was formed with members appointed by their respective county judges to give true region-wide representation. Its mandate was to develop workable solutions for achieving communication interoperability within the framework provided by the Governor's Office of Homeland Security; determine immediate, intermediate, and long term regional interoperability needs; create guidelines for implementation of new hardware and best practices; and provide assistance to CAPCOG agencies to implement the final plan and document compliance.

The Texas State Executive Interoperability Committee (TSIEC) has published the Texas Interoperability Channel Plan (TICP). CAPCOG has reviewed and adopted this document as the fundamental guideline for achieving and maintaining regional Level 4 Interoperability. The TICP, in conjunction with guidelines from the federal SAFECOM program, supersedes all previous interoperability documents from local, regional, state, and federal levels.

CAPCOG Long-Term Interoperability Plan Version 2.0 incorporates the TICP and SAFECOM guidelines. The Plan is compliant with SAFECOM and NIMS (the Department of Homeland Security's National Incident Management System) directives for regional shared systems' optimal interoperability. In addition, the plan provides detailed information and instruction to member agencies for planning, implementation, operations, and training.

Questions or comments related to the **CAPCOG Long-Term Interoperability Plan Version 2.0** should be directed to:

Patrick Cobb

I. History

In 2002, the Governor's Office directed all state Councils of Government (COGs) to assess regional Weapons of Mass Destruction (WMD) response and communications interoperability. In response to this directive, CAPCOG distributed surveys to all public and private emergency service providers within the region. The surveys provided a "real-time" (2002) evaluation of regional communications and readiness information pertaining to field personnel and existing equipment for WMD response. Shortly thereafter, the state redirected responders to view WMD as an "All Hazards" response. This greatly broadened the scope of concern for radio interoperability across the state.

In 2004, CAPCOG contracted with RCC Consultants to evaluate current interoperability levels and provide recommendations for improvement. RCC examined previous surveys and reports, distributed new surveys, and hosted several public meetings throughout the region. During this same time frame, state agencies and various groups published multiple guidelines on achieving interoperability. Unfortunately, some of these documents caused confusion across the state directly related to interoperability. In addition to the TSIEC, the federal Department of Homeland Security released the first-ever Statement of Requirements (SoR) for public safety communications interoperability in April 2004. This document establishes basic communications and interoperability standards for all public safety agencies nationwide and is represented in this plan.

In conjunction with the RCC evaluation, the LTIWG was formed. The first tasks were to evaluate the enormous amount of data generated by these various reports, determine base level regional interoperability, and identify critical infrastructure needs (consoles, towers, repeaters, upgrades, generators, UPS, etc).

The LTIWG evaluated these reports and guidelines, then developed a prioritized list of solutions for improving regional interoperability. The original plan has been evaluated several times by various groups and has received varying levels of endorsement from Level 2 to Limited Level 3. CAPCOG hereby rescinds the original plan as previously published and adopts this current plan, titled: CAPCOG Long-Term Interoperability Plan version 2.0 (including the TICP & MOU).

II. Current Status

Interoperability within the region has been assessed at Limited Level 3. Some agencies fall short of this mark while a handful exceeds it. It is apparent that some agencies have poor interoperability within their own areas of operation.

Due to the complexity and cost of achieving Level 4 interoperability, CAPCOG proposes a multi-year, multi-phase plan.

III. Phased Approach

A. Phase 1: Officially Achieve Level 3 Interoperability

All public safety and publicly funded emergency response agencies within the COG must reach Level 3 interoperability before proceeding to Level 4. Level 3 is defined as having access to and consistently monitoring band-specific mutual aid channels, and executing the attached Texas Department of Public Safety (TxDPS) "Memorandum of Understanding" (MOU). This MOU governs the statewide use of interoperability/mutual aid radio frequencies on all radios *other than fixed-site base stations*. Fixed-site base stations on towers or at dispatch centers must be separately licensed by the owning public agency or private emergency response organization.

Privately funded emergency response companies must be made aware of the TICP and the LTIP, and must be strongly encouraged to abide by the terms of both plans.

By executing the TxDPS MOU, a publicly funded agency agrees to Adopt and abide by the terms of the TICP.

1. Special Considerations

The TICP states, "Interoperability channels shall be used for voice traffic. Paging, DTMF signaling and SCADA operations are not permitted on interoperability Calling or Tactical channels. The transmitters and/or receivers in temporary base stations and repeaters/mobile relays shall not be enabled, disabled or muted by any over-the-air signaling device (selective or DTMF signaling, etc)." CAPCOG recognizes that use of DTMF signaling on calling and tactical channels is prohibited. However, because many system owners¹ do not have funding to install direct-line control to remote repeater sites, CAPCOG will apply for an exemption to this ruling on behalf of those system owners.

2. In-Band Interoperability Frequencies

a. VHF Wideband²

- CAPCOG system owners using wideband VHF frequencies will have the wideband VHF interoperability frequencies programmed

¹ "System owner" is defined as a political subdivision of the State of Texas that owns and operates a publicly funded public safety radio system.

² If the agency's VHF radios have both wideband and narrowband capability, both wideband and narrowband interoperability channels must be programmed, as channel capacity allows, per the minimum programming requirements as defined in the TICP.

into each subscriber (defined as a portable, mobile, or base radio that relies on the system for primary, day-to-day operation) as channel capacity allows, per the minimum programming requirements as defined in the TICP. The wideband VHF interoperability channels will be identified and utilized consistent with the TICP, Section 3, except where noted in Section III, B, 1 of the LTIP.

b. VHF Narrowband³

- CAPCOG system owners using narrowband VHF frequencies will have the narrowband VHF interoperability frequencies programmed into each subscriber as channel capacity allows, per the minimum programming requirements as defined in the TICP. The narrowband VHF interoperability channels will be identified and utilized consistent with the TICP, Section 4, except where noted in Section III, B, 1 of the LTIP.

c. UHF Wideband

CAPCOG system owners using wideband UHF (450 MHz) frequencies as their primary form of communications will interoperate with other non-UHF agencies via deployable gateway devices and console patches as available.

d. UHF Narrowband

- CAPCOG system owners using narrowband UHF (450 MHz) frequencies will have the narrowband UHF interoperability direct and repeater frequencies programmed into each subscriber as channel capacity allows, per the minimum programming requirements as defined in the TICP. The UHF narrowband interoperability channels will be identified and utilized consistent with the TICP, Section 5, except where noted in Section III, B, 1 of the LTIP.

e. 800 MHz

- CAPCOG system owners using 800 MHz frequencies will have the 800 MHz NPSPAC mutual aid direct and repeater frequencies programmed into each subscriber as channel capacity allows, per the minimum programming requirements as defined in the TICP. The NPSPAC interoperability channels will be identified and utilized consistent with the TICP, Section 8, except where noted in Section III, B, 1 of the LTIP.

³ If the agency's VHF radios have both wideband and narrowband capability, both wideband and narrowband interoperability channels must be programmed, as channel capacity allows, per the minimum programming requirements as defined in the TICP.

3. Executing the MOU

CAPCOG will serve as the clearinghouse for all public safety and publicly funded emergency response agencies within the COG executing the TxDPS MOU. For those agencies that have not executed the MOU, CAPCOG will:

- Identify a single point of contact (SPOC) for each county and city operating its own public safety radio system within the COG.
- Provide the SPOC with the MOU and TICP.
- Inform the SPOC that his/her agency is required to coordinate with all political subdivisions relying on its system for primary, day-to-day communication, to ensure that each one is aware of and fully compliant with the TICP.
- Answer questions and concerns about implementation of the MOU and TICP.
- Assist the SPOC with getting the MOU executed by the agency's governing authority.
- Deliver the completed MOU to the State on the executing agency's behalf, monitor the approval process, and troubleshoot any problems.
- Monitor the agency's progress getting the appropriate interoperability frequencies programmed into all radios and consoles that access its owned public safety radio system.
- Modify CAPCOG 9-1-1 operator training to include instruction on the use of interoperability frequencies
- Modify CAPCOG regional law enforcement academy training to educate new peace officers in communications interoperability.

B. Phase 2: Level 4 Interoperability

Coinciding with the effort to achieve Level 3 interoperability, CAPCOG will achieve Level 4 interoperability across the ten-county region. As defined by the Technical Advisory Group of the Governor's Office of Homeland Security, Level 4 interoperability means that: "All first responders will have the capability, on incidents, to communicate on all interoperable frequencies, as outlined in the Texas Interoperability Channel Plan."

CAPCOG will accomplish Level 4 interoperability in several ways:

- Via console patching.
- By expanding narrowband VHF and 800 MHz NPSPAC mutual aid coverage region-wide, supplemented by expansion of the LCRA 900 MHz repeater system.
- Regional deployment of mobile incident command and communications interoperability vehicles.

1. Console Patching

For the most part, county-operated dispatch centers are the designated "patch owners" within the CAPCOG region. Therefore, console patching

will be controlled, and interoperability calling channels (Texas Law 2, 8CALL, VCALL, UCALL, and 700 MHz⁴) will be monitored, by each county-operated dispatch center. There are some exceptions, however: At the Austin/Travis County Combined Transportation, Emergency, & Communications Center (CTECC), depending on the incident, either the County or the City will set up a required patch; and in Hays County, the designated patch owner will be the City of San Marcos. Each patch owner that does not currently have console patching capability will receive RF control stations for those interoperability bands that are not used for day-to-day operations within their respective areas of operation.

2. VHF Narrowband Regional Coverage

At Level 3 interoperability, designated patch owners are required to monitor the VHF wideband interoperability calling channel, Texas Law 2. In anticipation of the coming migration to narrowband VHF, CAPCOG will coordinate the purchase and installation of VHF narrowband VCALL and VTAC 1 control stations in the dispatch center of each designated patch owner. As public agencies migrate their owned VHF public safety radio systems from wideband to narrowband, interoperability among wideband VHF, narrowband VHF, 800 MHz, and 900 MHz will be seamless.

3. 800 MHz NPSPAC Mutual Aid Regional Coverage

The most densely populated areas of the CAPCOG region are served primarily by 800 MHz users, except for City of San Marcos, which utilizes LCRA's 900 MHz system. To allow 800 MHz users to provide mutual aid outside their service areas, CAPCOG will coordinate the installation of one 8CALL and one 8TAC control station in the dispatch center of each non-800 MHz patch owner, and one 8CALL and one 8TAC repeater in each CAPCOG county not currently served by an 800 MHz system. When this is completed, the entire CAPCOG region will be covered by at least two conventional 800 MHz repeated mutual aid channels for use by all emergency service providers.

The 800 MHz NPSPAC mutual aid calling channel base stations will be continuously active in receive mode. In those systems where the patch owner does not have direct line control of the 800 MHz repeater, the mutual aid bases will be active in repeat mode so long as they do not cause interference with repeaters in neighboring systems. Patch owners are required to monitor the NPSPAC mutual aid calling channel, 8CALL. It is understood that due to proximity and terrain, radio traffic may be overheard by agencies not directly involved in an incident.

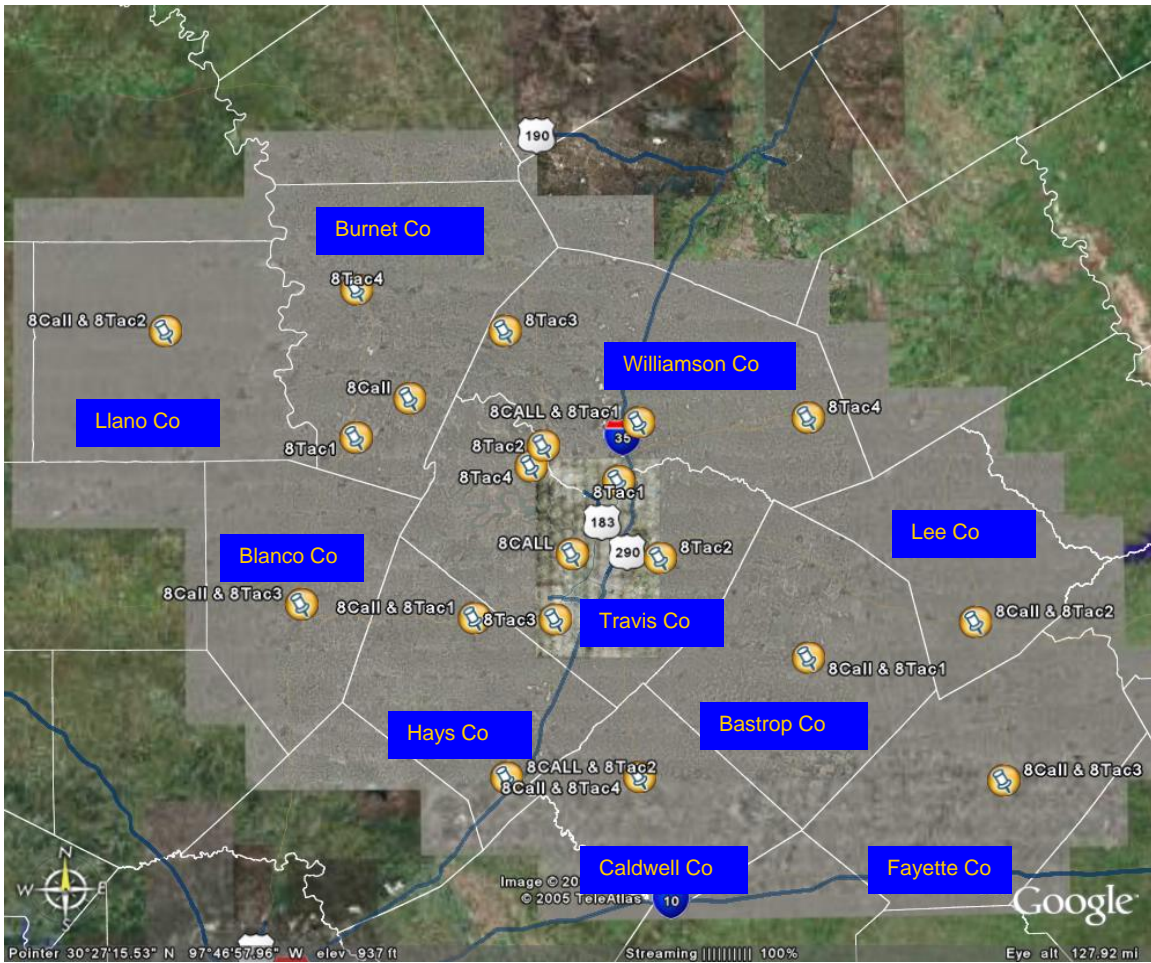
All 800 MHz NPSPAC 8TAC repeaters will be in passive mode until a dispatcher directs a field user to a specific repeated channel. CAPCOG proposes the following: Having given the direction, the controlling dispatch

⁴ 700 MHz interoperability channels, when available, will be identified consistent with the TICP.

center will use selective tone signaling to activate the specific repeater needed. After the incident is concluded, the controlling dispatch center will disable the repeater in the same fashion.

800 MHz NPSPAC non-repeated tactical channels, such as 8TAC1D, will be labeled accordingly and no repeater will be enabled for their use. Agencies and field users must understand that these channels are line-of-sight only and terrain dependent.

See the aerial photo below for placement and labeling of individual NPSPAC mutual aid repeater sites by county:



4. 900 MHz Regional Coverage

All county-operated dispatch centers will have 900 MHz interoperability channels installed or patched thru the Austin/Travis County Regional Radio System (RRS). This provides console patching capability to any 900 MHz users who travel outside of their service areas.

5. Mobile Command and Communications Interoperability Vehicles

Currently, the CAPCOG region has three (3) mobile command and communications vehicles that are deployable or under construction. The City of Austin has deployed a Command and Communications Interoperability Vehicle for use as a strategic resource throughout the region. This vehicle has substantial interoperable communications capability, including:

- 800 MHz (Motorola digital/ analog radio programmed with NPSPAC mutual aid channels).
- 900 MHz (M/ACOM EDACS radio that accesses the LCRA system).
- VHF (wideband/narrowband operation with VHF interoperability channels).
- UHF (narrowband with UCALL and UTAC 1).
- Gateway device (rack-mounted ACU-1000).
- Variety of satellite radio/phones and broadband Internet.

The LCRA operates a communications trailer with similar capabilities that is available for deployment.

Williamson County is constructing a vehicle with similar capabilities to include HF radio with packet data capability.

All of these vehicles are available upon request to any public safety agency within the CAPCOG region.

6. Local Efforts

In addition to efforts described above, CAPCOG counties are implementing interoperability among their local public safety agencies to allow first responders within each county to communicate on that county's primary system. Below are summary statements, by county, concerning the planned use of funds in FY05:

- **Bastrop County:** Issue 800 MHz portable and mobile units to first responder agencies not currently on the County 800 MHz trunked system. Purchase a generator to provide backup power for the system's prime site.
- **Blanco County:** Purchase a dispatch console for the County dispatch center to allow patching of disparate systems.
- **Burnet County:** Purchase a dispatch console for City of Marble Falls to allow patching of disparate systems.

- **Caldwell County:** Purchase a dispatch console for the County dispatch center to allow patching of disparate systems.
- **Fayette County:** Issue 900 MHz portable and mobile units to first responder agencies not currently on the LCRA system, which is the largest in use within the county.
- **Hays County:** Issue 900 MHz portable and mobile units to first responder agencies not currently on the LCRA system, which is the largest in use within the county.
- **Lee County:** Issue 800 MHz portable and mobile units to first responder agencies not currently on the County 800 MHz trunked system, the largest system within the county. Purchase a generator to provide backup power for the system's prime site.
- **Llano County:** Purchase a dispatch console for the County dispatch center to allow patching of disparate systems.
- **Travis County:** Issue 800 MHz portable and mobile units to Emergency Service Districts not currently on the Austin/Travis County Regional Radio System, the largest radio system in the county.
- **Williamson County:** Equip a mobile communications vehicle, bringing to three the number of mobile communications vehicles available for use within the CAPCOG region.

7. Special Considerations

Currently, 86% of the CAPCOG population is served by emergency service providers utilizing 800 MHz frequencies. Austin/Travis County comprises 58% and is operating on a Motorola digital system. FCC mandates on frequency bandwidth eventually will force 800 MHz analog users to upgrade their individual systems to digital. This migration presents an opportunity to all 800 MHz users to connect with each other and form a single regional system. This opportunity will be addressed in CAPCOG's long-range interoperability planning.

Williamson County is beginning the upgrade and may soon be operating as a zone on the Austin/Travis County RRS. These two counties combined contain 62% of the CAPCOG regional population and roughly 25% of the land area.

a. 700 MHz

- CAPCOG acknowledges the future use of 700 MHz frequencies for public safety communications. When the frequencies become available, CAPCOG system owners implementing them will have the 700 MHz interoperability direct and repeater frequencies programmed into each subscriber as channel capacity allows, per the minimum programming requirements as defined in the TICP.

C. Phase 3: Training

For this plan to succeed and for equipment be used to its fullest potential, all regional communications staff and field emergency service providers must receive training.

1. Communications Managers & Emergency Service Executives

- Modules provided by CAPCOG and LTIWG.
- Taught at CAPCOG regional office.
- Not agency-specific but provides regulations for interoperability channels, functioning within NIMS & ICS, Incident Based Communications.
- Provides tools managers can use to train agency staff.

2. Telecommunicators

- Extensive scenario-based training.
- Some agency specifics will be covered.
- Topics include:
 - Principles of interoperability
 - Regulations and governing usage
 - Console patching
 - Loss of Communications
 - Incident Based Communications
- Received during initial CAPCOG training.
- One refresher course per year.

3. Field Staff

- Computer Based Training (CBT) modules distributed to all regional emergency service providers.
- Principles of Interoperability.
- Regulations.
- Loss of Communications.
- Incident Based Communications.

4. Field Exercises

- Encourage testing of agency interoperability procedures within itself and other agencies during normally scheduled drills.
- Can be both agency-specific and mutual aid.
- Observed/ Controlled (OC) by outside personnel knowledgeable in field communications and NIMS.
- Develop “best practices” for continuous QA/QI covering agency specifics and regional mutual aid.

5. Compliance

- CAPCOG will remain the clearinghouse for research, information, and compliance with all governing regulations, MOU's, etc.

- LTIWG will periodically review problem reports, field surveys, and drill results.
- LTIWG is committed to utilizing “best practices” in resolving conflicts to continuously improve regional communications.
- Each public safety communication system owner is responsible for frequency licensing.
- LTIWG will serve as mediator (if necessary) between CAPCOG and its member organizations, the TSIEC, and the Region 49 Committee.

IV. Summary

CAPCOG, through its Homeland Security Task Force (HSTF) and Long-Term Interoperability Work Group (LTIWG), continues to strive for Level 4 interoperability. The solutions listed in this plan accommodate a wide variety of public safety radio communications equipment. The TICP and LITP address all known forms of public safety radio communications in use within the region and, in fact, the entire state of Texas. In late 2003, CAPCOG embarked on a long-term plan to achieve Level 4 interoperability and beyond, using a multi-phased approach. Each phase is built on the previous one, eventually leading to Level 4 interoperability.

Attaining Level 4 interoperability is CAPCOG’s number one priority for Homeland Security funding. CAPCOG is fully committed to reaching Level 4 interoperability by the mandated deadline of January 2007.

Through the LTIWG and the HSTF, CAPCOG staff will develop a method of verifying interoperability equipment ordered, installed, and implemented by each public safety communication system owner to ensure each has complied with the plan.

CAPCOG will remain the “hub” for educating executives, managers, and field users on interoperability equipment and procedures within the region.

Questions or comments concerning the **CAPCOG Long-Term Interoperability Plan Version 2.0** should be addressed to:

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