

This November 30, 2007 version of the NCTCOG "NPSPAC Mutual Aid Interoperable Architectural Plan," replaces all previous versions of the plan, which were originally titled "NPSPAC Mutual Aid Usage Plan"

1.0 General Overview

The 800 MHz band National Public Safety Planning Advisory Committee (NPSPAC) mutual aid radio channels, consisting of five frequency pairs, are generally under utilized in the urban area of the sixteen county region of NCTCOG, which, for this report, includes Dallas, Denton, Collin, Rockwall and Tarrant Counties. This situation is due to a number of factors and includes:

1. A surplus of repeater stations operating on common channels in a relatively small geographic area, which has resulted in the generation of self induced interference
2. A lack of unified operational procedures, which is generally attributed to a lack of frequent usage of the channels

The end result is that a valuable radio communications resource is not readily available, nor functional, when needed for interoperable communications. In the remaining eleven counties of the COG, the NPSPAC mutual aid channels are generally not in operation, since these areas do not utilize the 800 MHz band to any great extent.

The goal of this plan is to return functionality and allow improved interoperable communications through the managed use of the NPSPAC mutual aid radio channels for a greater part of the NCTCOG region. Success of the plan requires a very high level of regional cooperation and strict adherence to the adopted NPSPAC Mutual Aid Plan. The framework of such a plan is outlined in this document.

The approach recommended here minimizes costs and avoids a major system redesign and/or relocation of existing equipment. Some re-tuning and re-programming of existing equipment may be required and dispatch centers may require equipment upgrades or additional equipment, and generally, these items have been addressed in Phase II of the NCTCOG Interoperability project. In the case of some of the non-urban area counties, where 800 MHz systems are not in use, radio equipment will have to be implemented so that the 800 MHz radio units responding to an incident in the area can maintain communications with each other and the local agencies. Additionally, new equipment will have to be procured for some of the urban area agencies that currently do not operate these mutual aid channels, but have been selected to be primary operators. Again, the procurement of new equipment, has for the most part, been addressed via the NCTCOG Phase II Interoperability Project.

2.0 A Brief History

In the late 1980's, when the FCC allocated additional radio frequencies in the 821-824/866-869 MHz band to Public Safety, Regional Planning Committees

were formed. These RPCs were charged with developing a Plan that established the means by which eligible agencies would request 800 MHz radio frequencies. Region 40 represents the NCTCOG area, as well as the Texoma Regional Planning Commission, East Texas Council of Governments and Ark-Tex Council of Governments. The Region 40 plan was adopted in late 1988 and remains as the primary Public Safety Radio Communications Plan for the NPSPAC radio band. The information included in this document is meant to supplement the existing Region 40 Plan.

As part of the overall NPSPAC frequency allocations, the FCC released five channels that could be used for mutual aid communications. The assignment and use of these channels, which are comprised of a "Calling Channel" and four "Tactical Channels," is clearly stated in the Region 40 Plan.

Over the years, as the NCTCOG located Public Safety agencies implemented 800 MHz radio systems, many of which utilized trunking technology, the conventional mutual aid channels were generally put into service in concert with the Region 40 Plan. The mutual aid channel assignments are noted in Table 2.1a below.

Table 2.1a - Mutual Aid Radio Channels

Nomenclature	Channel #	Repeater Transmit Frequency	Repeater Receive Frequency
Calling Channel	1	866.0125 MHz	821.0125 MHz
Tactical Channels	2	866.5125 MHz	821.5125 MHz
	3	867.0125 MHz	822.0125 MHz
	4	867.5125 MHz	822.5125 MHz
	5	868.0125 MHz	823.0125 MHz
CTCSS Code		156.7 Hz	156.7 Hz

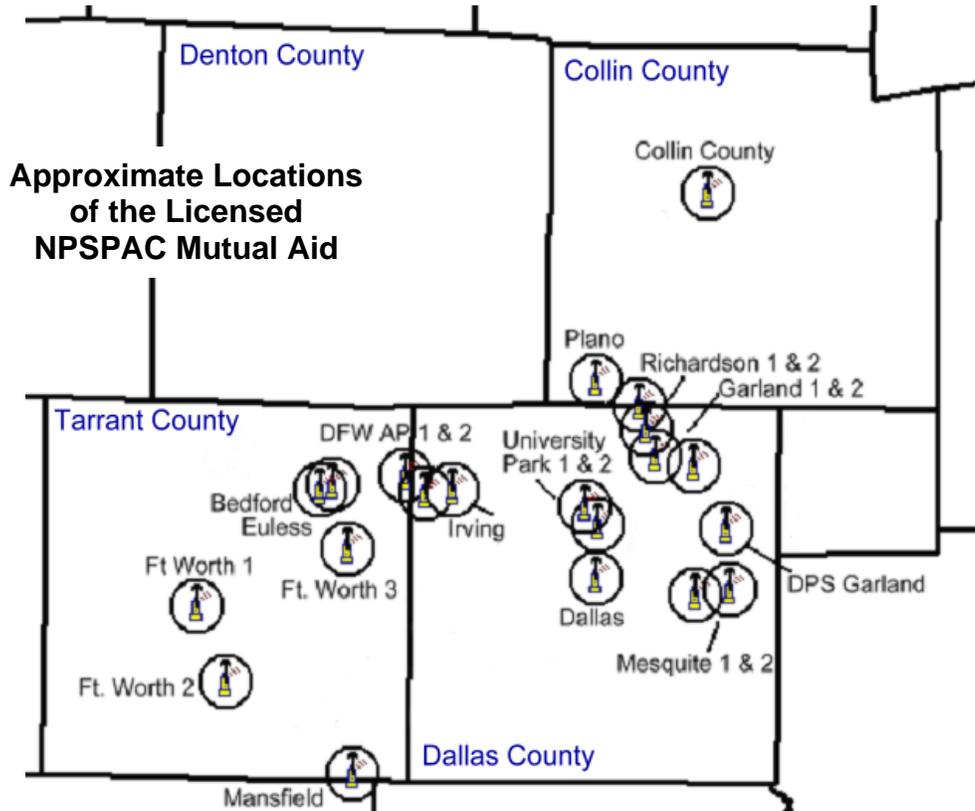
It should be noted that these radio channels will be affected by the 800 MHz Band Reconfiguration, which is also known as 800 MHz Rebanding. The NPSPAC mutual aid channels will be "relocated" or moved down in the radio band by 15 MHz. It is expected that this reconfiguration will take place during a period between mid 2006 and late 2008. After this occurs, the frequencies will change. The rebanded frequencies are shown in the Table 2.1b below. They also reflect the 2007 Texas Statewide Interoperability Channel Plan released November 20th, 2007.

Table 2.1b - Mutual Aid Radio Channels Post Rebanding

Nomenclature	Frequency	Channel Name and Number	Repeater Transmit Frequency	Repeater Receive Frequency
Calling Channel	1	8CALL90	851.0125 MHz	806.0125 MHz
Tactical Channels	2	8TAC91	851.5125 MHz	806.5125 MHz
	3	8TAC92	852.0125 MHz	807.0125 MHz
	4	8TAC93	852.5125 MHz	807.5125 MHz
	5	8TAC94	853.0125 MHz	818.0125 MHz
CTCSS Code			156.7 Hz	156.7 Hz

The graphic on the following page illustrates the general location of licensed NPSPAC mutual aid radio sites, which, for the general case, includes a calling channel repeater and at least one other station that contains the tactical channels, although an agency is free to implement multiple tactical channel stations. However, some sites may only contain a calling channel station, or a station that may be equipped with a single, or multiple tactical channels. Generally, in all cases, these stations are interconnected to an associated dispatch center via wireline or some other means.

It should be noted that in some cases, NPSPAC mutual aid stations were not implemented, or in some cases were licensed, but not constructed. Additionally, over the life of a system, some NPSPAC mutual aid stations became inactive, and although the equipment was present, the stations were not functional. Likewise, associated communication console systems interconnected to these stations may not be fully functionally for NPSPAC mutual aid communications.



3.0 Basic Elements of the NPSPAC Mutual Aid Plan

The NPSPAC Mutual Aid Plan is comprised of two major elements. The first addresses the existing situation in the five county urban area of Collin, Dallas, Denton, Rockwall, and Tarrant Counties. The second element speaks to the solution recommended for the remaining counties of NCTCOG.

3.1 NCTCOG Urban Area

In order to reduce the chance of self induced interference, a specific frequency plan must be instituted. Certain radio sites will be identified as Primary Calling Channel Sites with the associated dispatch center always monitoring and responding to the calls. A Tactical Channel will also be assigned. Designated Primary Tactical Sites will be assigned at least one working or tactical channel, and will use this channel as the means for general communications when interoperable communications are required. The number of **active** Calling and

Tactical Sites and associated stations will be limited in order to minimize interference. Dispatch centers associated with these sites are responsible for their operation.

Stations not assigned as Primary Sites, will be held in Reserve, and can be activated in the event a nearby Primary Site is disabled. Additionally a Reserve site may be utilized, with the permission of the nearest co-channel Primary site operator, if the Reserve site will provide better radio coverage for a particular incident than the designated Primary station. For those agencies that have "back-up" sites, these stations will not be used unless their Primary Site is off the air. Stations that are assigned specific operating tactical channels must adhere to the plan in order to reduce self induced interference.

Dispatch centers not designated as Primary may continue to monitor if desired. The picture below illustrates the general concept.

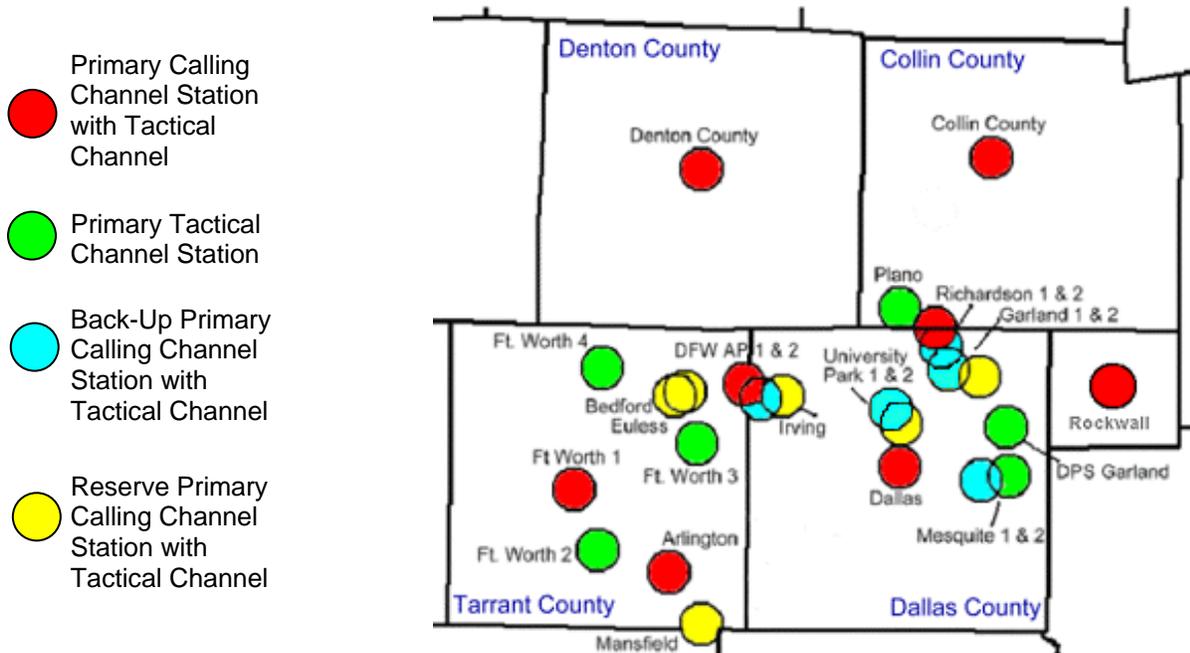


Table 3.1.1 below further illustrates the concept and includes the assigned mutual aid channels. In addition, it shows the new naming conventions adopted by the State of Texas as of November 20, 2007 in the Texas Statewide Interoperability Channel Plan. The nomenclature of the table is as follows:

- P = Primary as assigned as part of the Plan
- R = Reserve Site - not to be activated unless neighboring co-channel station is off the air, or permission is granted by the Primary Site operator
- BU = Back-Up Site - to be used if Primary Site is off the air

Table 3.1.1

	8CALL (90)	8TAC 1(91)	8TAC 2(92)	8TAC 3(93)	8TAC 4(94)	CHANNEL (New Number)
AGENCY	1	2	3	4	5	FREQUENCY PAIR
						NOTES
Arlington	Primary				P	New mutual aid radio site
Bedford	Reserve			R		
Eules	Reserve			R		
Collin County	Primary		P			
Dallas	Primary	P				New TAC CH station
Denton County	Primary	P				New mutual aid radio site
DFW Airport 1	Primary		P			
DFW Airport 2	Back-up		BU			
Eules	Reserve			R		
Fort Worth 1	Primary		P			
Fort Worth 2		P				
Fort Worth 3				P		
Fort Worth 4					P	New TAC CH Station
Garland 1	Reserve		R			
Garland 2	Back-Up		BU			
Irving	Reserve		R			
Mansfield	Reserve				R	
Mesquite 1	Reserve				P	
Mesquite 2	Back-Up				BU	
Plano	Reserve				P	
Richardson 1	Primary			P		
Richardson 2	Back-up			BU		

	8CALL (90)	8TAC 1(91)	8TAC 2(92)	8TAC 3(93)	8TAC 4(94)	CHANNEL (New Number)
AGENCY	1	2	3	4	5	FREQUENCY PAIR
Rockwall	Primary	P				New mutual aid radio site
Texas DPS			P			
University Park 1	Reserve	R				
University Park 2	Back-up	BU				

As noted in **Table 3.1.1**, Arlington and Rockwall County will be implementing new calling channel and tactical channel stations at designated radio sites. The City of Fort Worth is planning the addition of a NPSPAC tactical station at the # 4 site, or North Beach site.

For each entity that is assigned as a Calling Channel primary, the associated dispatch center will act as the full time operator of the calling channel and associated tactical channels. Those agencies assigned a tactical channel are responsible for operation of that station, but may also monitor the calling channel.

Dispatch centers associated with a Reserve site, may monitor the calling channel, but should always coordinate any activities with the nearest Primary site dispatch center.

Table 3.1.1 is illustrated in graphic form below with only the primary calling / tactical channels sites as well as the primary tactical channel sites highlighted.

Table 3.1.1 - Radio Frequency Pair Assignments for Primary Sites - Dallas, Denton, Collin, Rockwall & Tarrant Counties

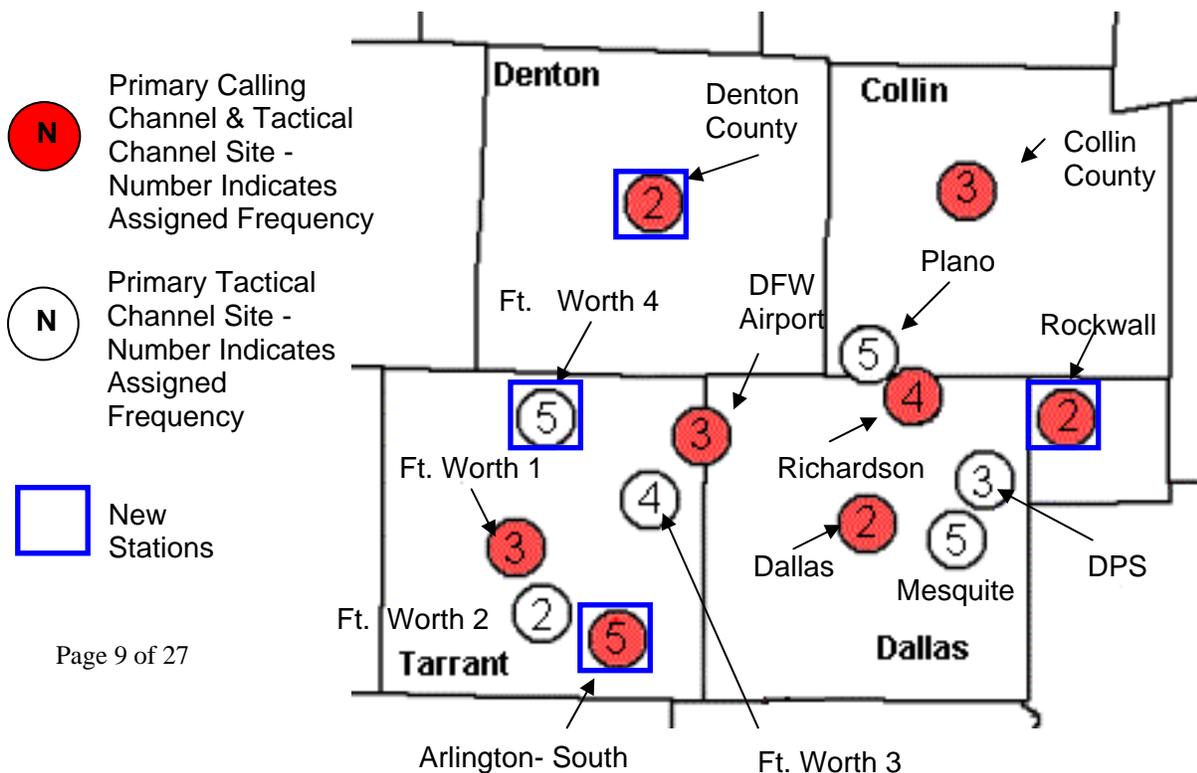


Table 3.1.2 below summarizes the channel assignments for the Primary Calling Channel and Tactical Channel Sites.

	8CALL (90)	8TAC 1(91)	8TAC 2(92)	8TAC 3(93)	8TAC 4(94)	CHANNEL (New Number)
	1	2	3	4	5	FREQUENCY PAIR
AGENCY						NOTES
Arlington South	Primary				P	New mutual aid radio site
Collin County	Primary		P			Wilmeth Road Site
Dallas	Primary	P				New TAC CH station
Denton County	Primary	P				To be implemented
DFW Airport 1	Primary		P			
Fort Worth 1	Primary		P			
Fort Worth 2		P				
Fort Worth 3				P		
Fort Worth 4					P	New TAC CH Station
Mesquite 1	Reserve				P	
Plano					P	Plano Parkway Site
Richardson 1	Primary			P		
Rockwall	Primary	P				New mutual aid radio site
Texas DPS			P			

There are eight (8) sites designated as Primary Sites for the calling channel. The associated dispatch center must maintain a 24/7 monitoring of the calling channel. These eight Primary Sites also have an assigned Tactical Channel, which is to be used for mutual aid communications for incidents that occur in the coverage area of the particular site.

Six other sites are designated as Primary Tactical Channel Sites. The primary duty of the associated dispatch center is to operate and monitor its assigned Tactical Channel. The dispatch center may also monitor the Calling Channel if desired, but must operate secondarily to the nearest Primary Site Calling Channel dispatch center.

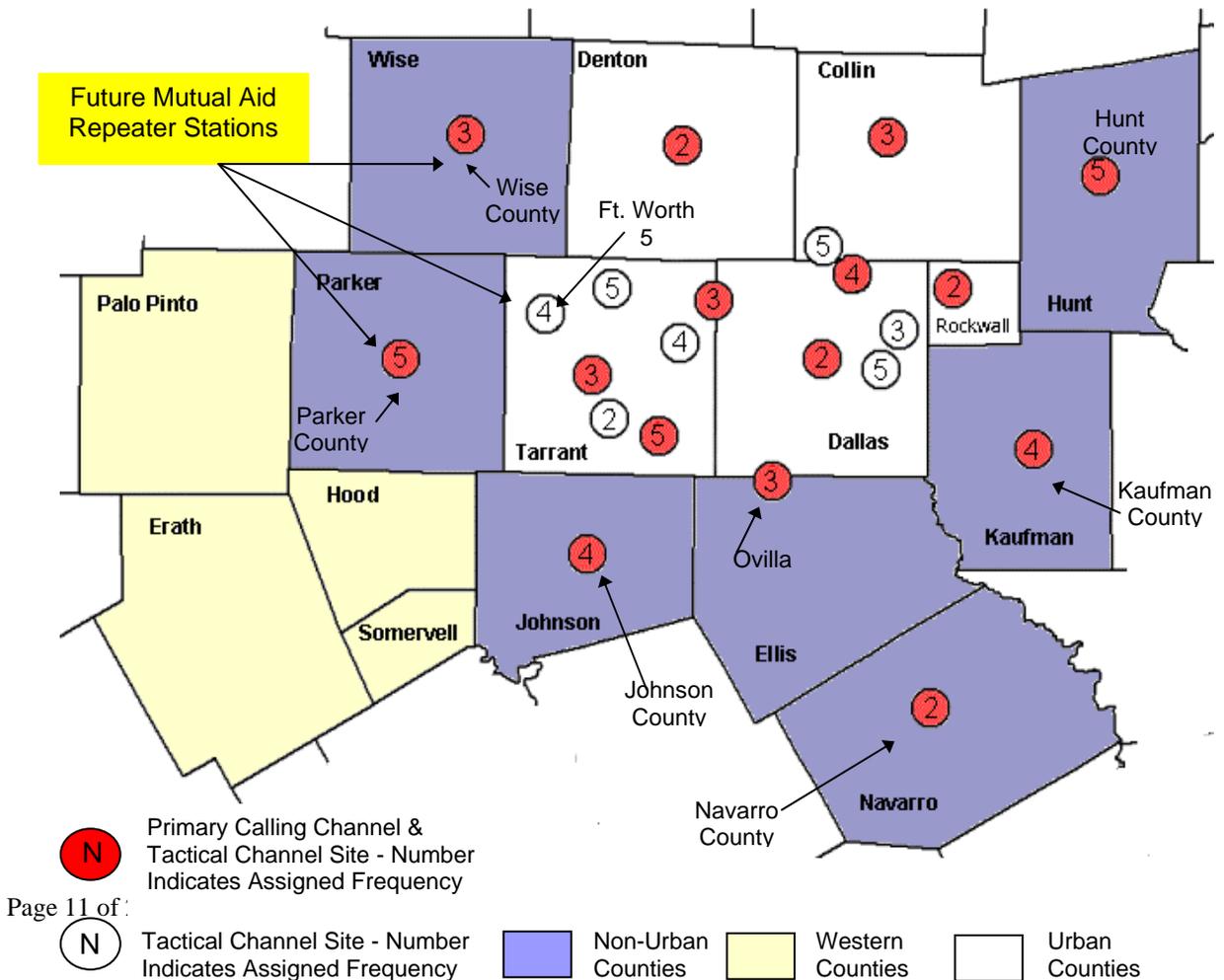
3.2 NCTCOG Non-Urban Areas

In addition to improving 800 mutual aid communications in the five county urban core of NCTCOG, recommendations have been made to provision a number of counties on the periphery with equipment that will provide 800 MHz communications capability. This action will allow 800 MHz radio units from the five county urban area to travel outside their normal areas of operation and still maintain communications with other 800 MHz radio units as well as the local agencies in the non-urban area.

Designated agencies will be equipped with calling channel and tactical channel repeater stations and the associated dispatch center will be responsible for the proper operation of these channels.

The picture below illustrates the concept and includes the urban area stations. The non-urban areas include Hunt, Kaufman, Ellis, Johnson, Navarro, Wise, and Parker Counties. Although Wise and Parker Counties are slated for a future implementation of the NPSPAC mutual aid channels, their assignments are included as part of this Plan.

Frequency Pair Assignments for Primary Sites - NCTCOG Agencies



The Table below summarizes the concept.

Table 3.2.1

	8CALL (90)	8TAC 1(91)	8TAC 2(92)	8TAC 3(93)	8TAC 4(94)	CHANNEL (new Number)
	1	2	3	4	5	FREQUENCY PAIRS
AGENCY						NOTES
Hunt County	Primary				P	New mutual aid radio site
Kaufman County	Primary			P		New mutual aid radio site
Navarro County	Primary	P				New mutual aid radio site
Ovilla-Ellis County	Primary		P			New mutual aid radio site
Johnson County	Primary			P		New mutual aid radio site
Parker County	Primary				P	Future implementation
Wise County	Primary		P			Future implementation
Ft. Worth 5				P		Future TAC channel

Three stations are included as future implementations, including Parker and Wise Counties. As part of the urban area, a fifth site of the Fort Worth radio system is slated for future implementation with an assigned tactical channel.

Palo Pinto, Erath, Hood, and Somervell Counties have not elected to implement the 800 MHz NPSPAC mutual aid radio channels. Instead, along with Parker and Wise Counties, a six county VHF interoperability radio system is being considered.

4.0 Supplementary Dispatch Centers

For those dispatch centers that do not have direct control of NPSPAC repeater stations, equipment has been recommended via the NCTCOG Phase II Interoperability Project that will allow communications via the mutual aid channels. This equipment generally consists of the following:

1. RF Control Station(s) interfaced to an existing communications console which has been upgraded to accommodate the new stations

2. RF Control Station(s) interfaced to a hardware patch, or "intelligent interconnect device"

The Table below illustrates the dispatch centers that have been identified as recipients of this equipment.

Table 4.1

Entity	RF Control Station(s)	Console Upgrade	Hardware Patch	Primary NPSPAC Station Sites(s) ^{N5}
Lewisville - Notes 1 & 7	NA	NA		Denton County
City of Denton - Note 1	✓	✓		Denton County
Flower Mound - Note 1	✓	✓		Denton County
The Colony - Note 1	✓	✓		Denton County
Highland Village - Note 1	✓	✓		Denton County
McKinney - Note 2	✓	✓		Collin County
Allen - Note 2	✓	✓		Collin County, Plano
Frisco - Note 2	✓	✓		Collin County, Plano
Wylie	✓	✓		Collin County, Plano
Greenville	✓		✓	Hunt County
Kaufman	✓	✓		Kaufman County
Terrell	✓	✓		Kaufman County
Forney	✓	✓		Kaufman County
Corsicana	✓	✓		Navarro County
Ennis	✓	✓		Ovilla
Waxahachie	✓	✓		Ovilla
Ellis County	✓	✓	✓	Ovilla
Red Oak	✓	✓		Ovilla
Cleburne	✓	✓		Johnson County
Alvarado	✓	✓		Johnson County
Burleson	✓		✓	Johnson County
Rockwall County	✓	✓		City of Rockwall
Carrollton - Note 3	✓	✓		Richardson, Plano
Addison - Note 3	✓	✓		Richardson, Plano
Farmers Branch - Note 3	✓	✓		Richardson, Plano
Grand Prairie	✓	✓		Arlington South
Dallas County	✓		✓	Dallas

Entity	RF Control Station(s)	Console Upgrade	Hardware Patch	Primary NPSPAC Station Sites(s) ^{N5}
DeSoto - Note 4	✓	✓		Ovilla
Duncanville - Note 4	✓	✓		Ovilla
Cedar Hill - Note 4	✓	✓		Ovilla
Coppell	✓	✓		DFW Airport
Highland Park	✓	✓		Dallas
Seagoville	✓	✓		Mesquite-Kaufman County
Lancaster	✓	✓		Ovilla, Dallas
Hutchins	✓	✓		Dallas, Mesquite
Rowlett	✓	✓		Texas DPS
Sachse	✓	✓		Richardson
Azle	✓	✓		Ft. Worth 4
White Settlement	✓	✓		Ft. Worth 1
Roanoke	✓	✓		Ft. Worth 4
Crowley	✓	✓		Ft. Worth 2
Richland Hills	✓	✓		Ft. Worth 3, Ft. Worth 1
Saganaw	✓	✓		Ft. Worth 1, Ft. Worth 4
Watauga	✓	✓		Ft. Worth 4, Ft. Worth 1
Haltom City	✓	✓		Ft. Worth 1
Pantego	✓	✓		Arlington South
Forest Hill	✓	✓		Ft. Worth 2, Ft. Worth 1
Benbrook	✓	✓		Ft. Worth 1, Ft. Worth 2

Notes:

1. Agency is to be part of a planned Denton County Motorola Embassy Network, which will allow use of centralized NPSPAC mutual aid resources. Control stations may be used as a back-up in case of network failure
2. Agency is to be part of a planned Collin County Motorola Embassy Network, which will allow use of centralized NPSPAC mutual aid resources. Control stations may be used as a back-up in case of network failure
3. Agency is part of the Metrocrest Motorola Embassy Network, which allows use of centralized NPSPAC mutual aid resources.
4. Agencies are part of the combined Southwest Regional Dispatch Center and share resources.
5. Primary Sites listed are based upon adoption of the NPSPAC Mutual Aid Plan. Other stations may be used, depending upon the location of the incident requiring mutual aid communications in relation to the Primary and Reserve Sites and the ability of the control station to access these stations.
6. Control stations are multi-mode and are equipped with all five NPSPAC mutual aid channels. Some RF control stations may also be equipped to operate via nearby trunked radio systems.
7. Currently equipped with control stations

In reference to item 5, above, the listing of the Primary NPSPAC Station Sites is for general reference only. Since each NPSPAC mutual aid station produces a specific radio coverage footprint, a field test must be conducted to verify which site produces the most usable coverage

for the particular area and associated RF control station. The table below summarizes the expected relationship between the dispatch center and associated repeater site.

Entity	Primary NPSPAC Site	Entity	Primary NPSPAC Site
Lewisville	Denton County	McKinney	Collin County
City of Denton	Denton County	Allen	Collin County, Plano
Flower Mound	Denton County	Frisco	Collin County, Plano
The Colony	Denton County	Wylie	Collin County, Plano
Highland Village	Denton County	Wylie	Collin County, Plano
Greenville	Hunt County	Corsicana	Navarro County
Kaufman	Kaufman County	Cleburne	Johnson County
Terrell	Kaufman County	Alvarado	Johnson County
Forney	Kaufman County	Burleson	Johnson County
Ennis	Ovilla	Carrollton	Richardson, Plano
Waxahachie	Ovilla	Addison	Richardson, Plano
Ellis County	Ovilla	Farmers Branch	Richardson, Plano
Red Oak	Ovilla	Grand Prairie	Arlington South
Rockwall County	City of Rockwall	Dallas County	Dallas
Azle	Ft. Worth 4	DeSoto	Ovilla
White Settlement	Ft. Worth 1	Duncanville	Ovilla
Roanoke	Ft. Worth 4	Cedar Hill	Ovilla
Crowley	Ft. Worth 2	Coppell	DFW Airport
Richland Hills	Ft. Worth 3, Ft. Worth 1	Highland Park	Dallas
Saganaw	Ft. Worth 1, Ft. Worth 4	Seagoville	Mesquite, Kaufman County
Watauga	Ft. Worth 4, Ft. Worth 1	Lancaster	Ovilla, Dallas
Haltom City	Ft. Worth 1	Hutchins	Dallas, Mesquite
Pantego	Arlington South	Rowlett	Texas DPS
Forest Hill	Ft. Worth 2, Ft. Worth 1	Sachse	Richardson
Benbrook	Ft. Worth 1, Ft. Worth 2		

5.0 Technical Requirements -

The success of this Plan is based upon a number of requirements. One of which is the operating condition of the existing and licensed NPSPAC mutual aid repeater stations. These items also apply for the newly implemented mutual aid stations. For the Plan to be successful, the following items must be addressed:

1. Existing repeater stations must be fully functional and interconnected via wireline or other means to a communication console system.
2. All repeater stations must be equipped with a repeater "set-up" and "knock-down" feature.
3. The assigned Calling and Tactical Channel must be programmed in the respective repeater station at each designated site.
4. All mutual aid repeater stations must be programmed so that upon a "power-up" cycle they will revert to the "repeater disable mode."
5. All repeater stations should be programmed, or otherwise configured, for AND squelch operation, that is, the station does not repeat a received signal, nor the repeater's receiver route audio to the wireline interface, unless there is at least 20 dB quieting of the RF signal and the proper

- CTCSS signal present. This action is recommended to somewhat mitigate the retransmitting or receiving of noisy radio signals.
6. As an optional step, some consideration should be given to reducing the transmitter RF power output of the urban area located repeater stations in order to reduce the chance of interference. This step should be given some thought since a reduction in power will also affect the "Talk-Out" radio coverage.
 7. The dispatch operator console position(s) associated with a Calling Channel repeater and/or a Tactical Channel repeater must be equipped with a repeater "set-up" and "knock-down" feature and console operator priority.
 8. RF control stations equipped with the mutual aid channels may require that their RF power output be adjusted to minimize the potential of activation of distant co-channel repeater stations.
 9. The primary operator of a Calling Channel and Tactical Channel station is responsible for the FCC licensing of the repeater station as well as the associated RF control stations

It should be noted again, that as part of this Plan an number of new mutual aid repeater stations will be activated for both the urban and non-urban areas of NCTCOG. For the urban area these are:

1. Arlington South - new Calling Channel and new Tactical Channel repeater stations as specified in the NCTCOG Phase II Interoperability Project
2. Denton County - new Calling and Tactical Channel repeaters at the County's main site in Denton. This implementation is being address by Denton County
3. City of Fort Worth, North Beach radio Site (Ft. Worth 4) - a new Tactical channel repeater is being implemented at this site as part of the NCTCOG Phase II Interoperability Project.
4. City of Fort Worth, Eagle Mountain radio site (Ft. Worth 5) - a new Tactical channel repeater will be implemented as part of the NCTCOG Phase II Interoperability Project in concert with the activation of this new trunked radio site.

For the non-urban area these are:

1. New Calling Channel and Tactical Channel repeater stations for Hunt, Kaufman, Navarro, and Johnson County. For Ellis County, a site near Ovilla will be used and the repeater stations will be controlled by the Midlothian dispatch center.
2. For future implementation, new Calling Channel and Tactical Channel repeaters stations for Wise and Parker Counties.

3. It should be noted that the radio sites for these sites have not been finalized as of the writing of this report. The actual location of these sites will impact the extent of radio coverage provided.

6.0 Operational Considerations and Scenarios -

6.1 General Information

As noted in this Plan, certain radio sites have been designated Primary Calling Channel Sites. Mobile radio units operating in the area of these sites requiring mutual aid communications would initiate a call on the Calling Channel. Because there are multiple Primary Calling Channel dispatch centers, it is very possible that more than one dispatch center may receive the call. Therefore, the calling unit must identify its location when placing its request for service so that the proper dispatch center can reply. Once contact is made, the calling unit would be directed to the proper tactical channel where mutual aid communications would take place.

Generally, the existing and planned NPSPAC mutual aid repeater systems are designed for reciprocal mobile to dispatch center radio coverage, that is, system "talk-out" is essentially equal to system "talk-in." Although portable radios may be used, their ability to "talk-in" to the system can be much less than a mobile radio unit, especially if the portable is located within a structure or building. Thus, portable radio usage can be less effective.

Use of the NPSPAC mutual aid radio systems should be closely controlled. It is strongly recommended that the many trunked system operators that have systems of the same manufacturer, i.e., M/A-Com or Motorola, continue, or better yet, expand the practice of sharing system and radio unit IDs, so that trunked radio units from one agency can simply switch their radio units to the system that they happen to be operating in instead of depending upon the conventional NPSPAC mutual aid channels. This action will allow more controlled use of the NPSPAC mutual aid channels for those radio units that are incompatible from a trunking protocol standpoint. This process is especially important for the urban area of the COG. For the non-urban areas, which are outside of the trunked system coverage of the urban area, the mutual aid channels will be used to allow the urban area 800 MHz radio units to converse to the local dispatch centers, and be patched, as necessary to the local VHF, or other band, or technology systems in the area.

6.2 Supplementary Dispatch Centers

Section 4 of this Plan notes a number of supplementary dispatch centers that will be equipped to allow access to the mutual aid channels. These dispatch centers will generally operate utilizing the nearest NPSPAC mutual aid repeater stations, as designated in the Table in Section 4. Generally, the calling channel should be

monitored for activity as a secondary process and the RF control station switched to the designated tactical channel when notified by the primary dispatch center, or other designated authority.

6.3 Operating Policies and Procedures

The actual operating policies and procedures related to use of the mutual aid channels are to be addressed by the NCTCOG Operational & Technical Committees that are involved in the Interoperability Project.

7.0 Radio Channel Naming (Nomenclature as of November 20, 2007)

The State of Texas has released a number of documents related to interoperable communications. In the "Texas Statewide Interoperability Channel Plan" dated November 20th, 2007, the naming convention for the 800 MHz NPSPAC mutual aid channels is as follows (Note: These channels are different than earlier channels which were listed 8CALL, 8TAC1, 8TAC2, 8TAC3 and 8TAC4. The 90 series numbers represent the new national channel naming format adopted by the State of Texas.

Mobile Receive MHz	Mobile Transmit MHz	Repeater Label	Direct Label	Use - For Mutual Aid Communications
866.0125	821.0125	8CALL90		Calling Channel (repeater)
866.0125	866.0125		8CALL90D	Calling Channel (direct)
866.5125	821.5125	8TAC91		Tactical Channel 1 (repeater)
866.5125	866.5125		8TAC191D	Tactical Channel 1 (direct)
867.0125	822.0125	8TAC92		Tactical Channel 2 (repeater)
867.0125	867.0125		8TAC92D	Tactical Channel 2 (direct)
867.5125	822.5125	8TAC93		Tactical Channel 3 (repeater)
867.5125	867.5125		8TAC93D	Tactical Channel 3 (direct)
868.0125	823.0125	8TAC94		Tactical Channel 4 (repeater)
868.0125	868.0125		8TAC94D	Tactical Channel 4 (direct)

The State of Texas has also made available via Texas DPS three "Incident Control Channels" that are meant for short range, unit to unit communications. The recommended naming of these channels is as follows:

Mobile Receive MHz	Mobile Transmit MHz	Direct Label	Use - Short Range Unit to Unit Communications
866.5500	866.5500	8TAC95D	Incident Control Channel
868.0500	868.0500	8TAC96D	Incident Control Channel
868.3500	868.3500	8TAC97D	Incident Control Channel

8.0 Representative Mobile Radio Coverage

Radio coverage maps are included here as a general guide. The expected mobile radio coverage is illustrated for each radio site that will employ the mutual aid channels. Although all sites have been identified, some, especially in the non-urban areas, have not yet been finalized. Therefore, the actual radio coverage may vary depending upon the selection of the actual radio site.

Additionally, the exact parameters for each site are not known, accordingly the coverage analyses were completed using common values, and are accurate only to this extent. For all maps, a Public Safety grade of coverage resulting in a Delivered Audio Quality of 3.0 and 95% reliability.

Individual coverage maps are provided for the sites designated as Primary Calling & Tactical Channel Sites, followed by sites designated as Primary Tactical Sites.

Primary Calling/Tactical Channel Sites

- Collin County
- Rockwall
- Ovilla (Ellis County)
- Arlington
- Denton County
- Hunt County
- Dallas
- Navarro County
- Fort Worth 1
- Richardson
- Kaufman County
- Johnson County
- DFW Airport

Primary Tactical Channel Sites

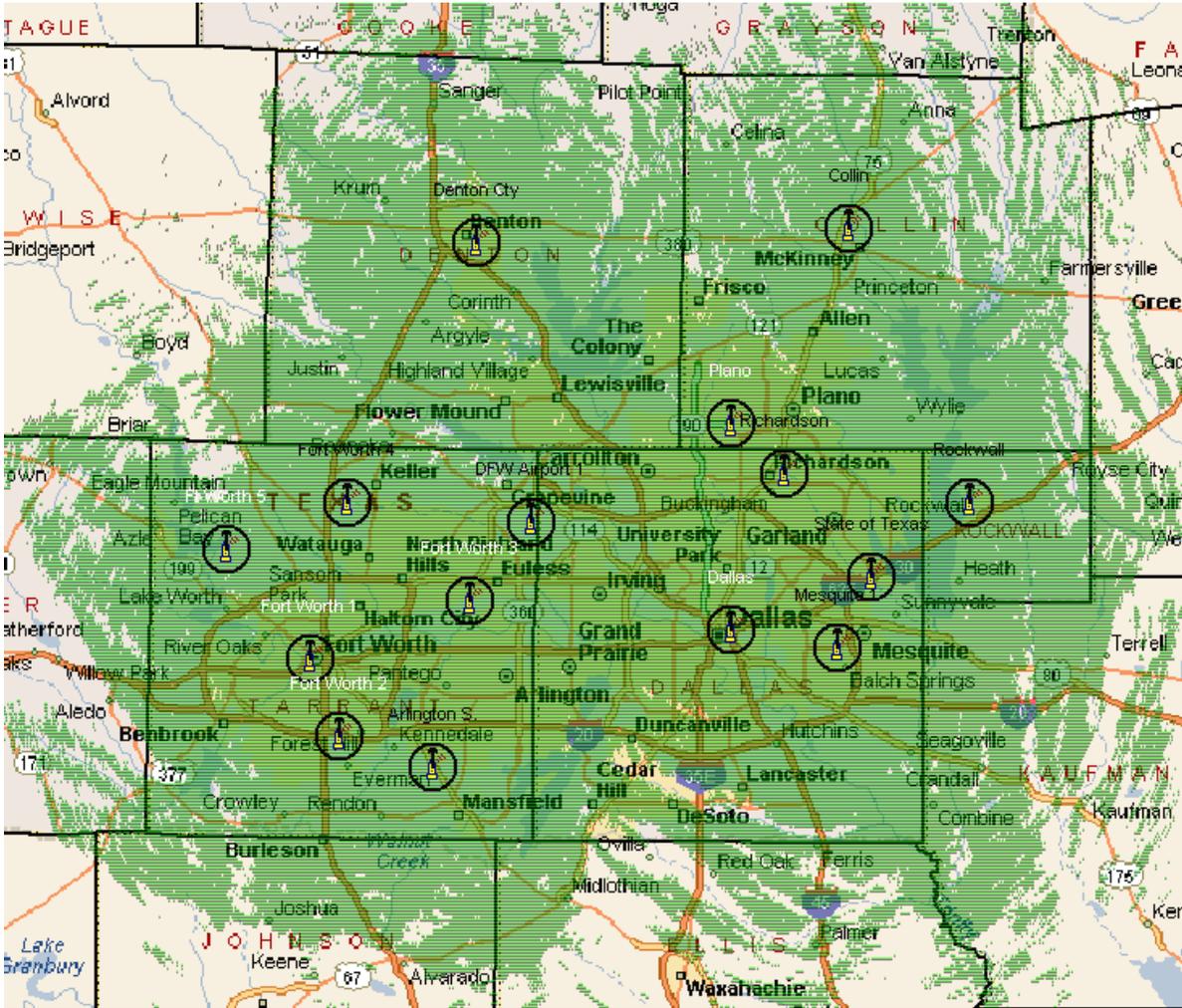
- Plano
- Fort Worth 2
- TX DPS - Garland
- Fort Worth 3
- Mesquite
- Fort Worth 4

Two other maps are included that illustrate the "composite" radio coverage derived from all Primary Calling/Tactical Channel sites, as well as Primary Tactical Channel sites. The first map illustrates the urban area, while the second illustrates the combined urban and non-urban areas. The future Fort Worth #5

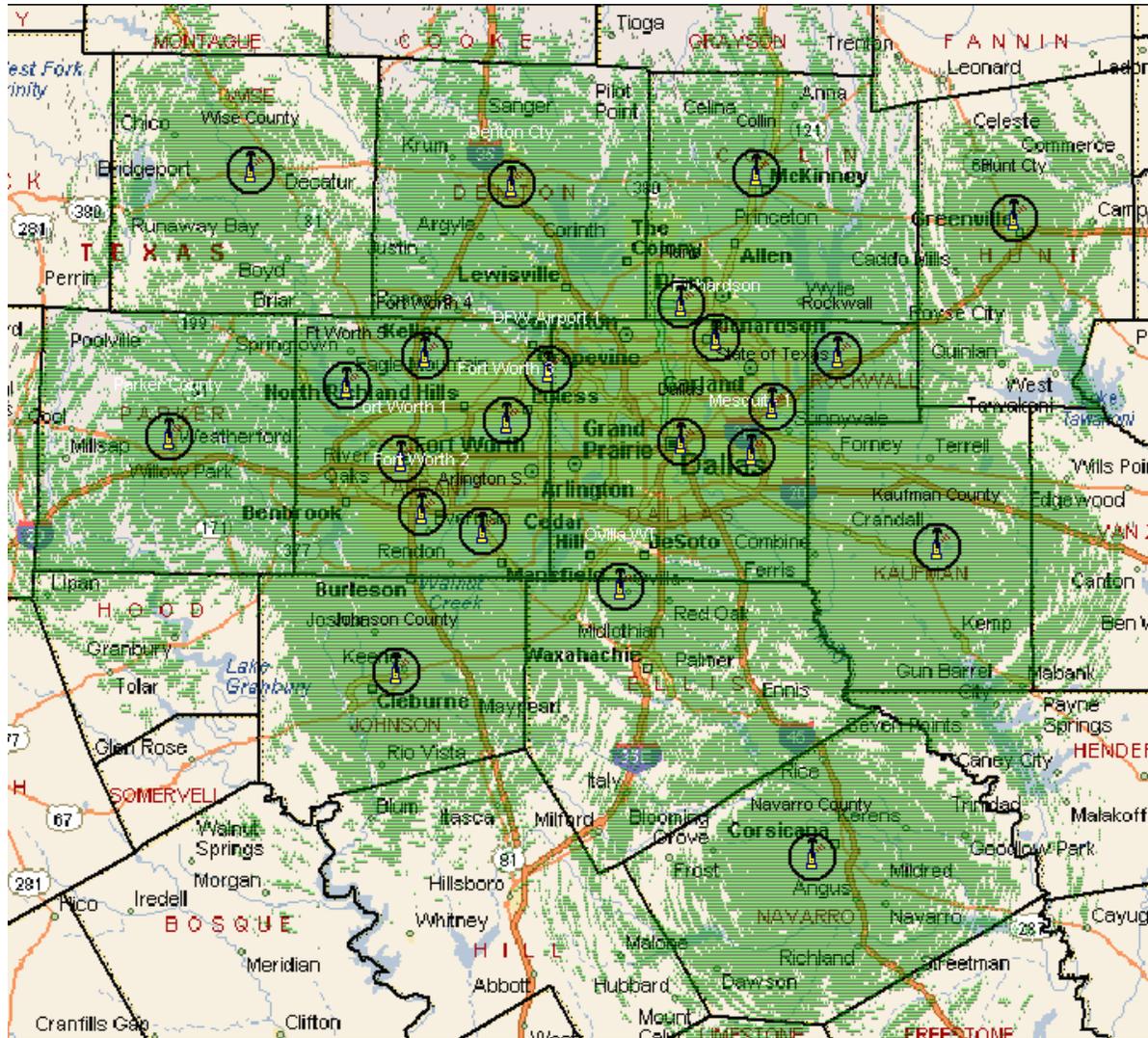
site is included in Picture 8.1, while the future Wise and Parker County sites are included in picture 8.2

The composite maps are provided first, followed by the individual coverage maps.

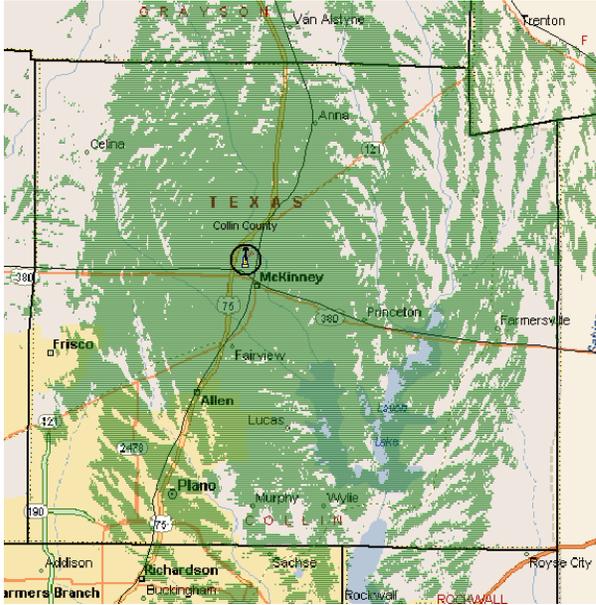
8.1 NCTCOG Five County Urban Area Expected NPSPAC Mutual Aid Mobile Coverage



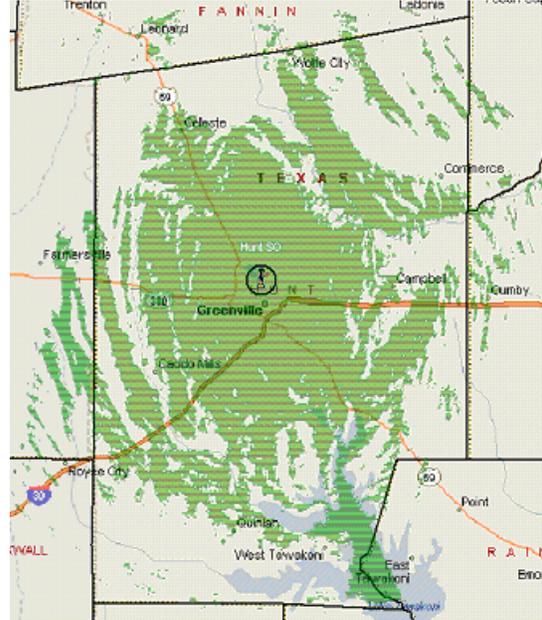
8.2 NCTCOG 12 County Area Expected NPSPAC Mutual Aid Mobile Coverage



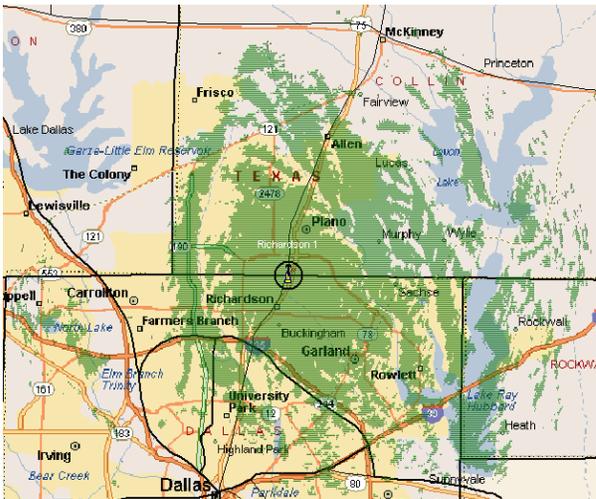
8.3 Collin County - Expected NPSPAC Mutual Aid Mobile Coverage



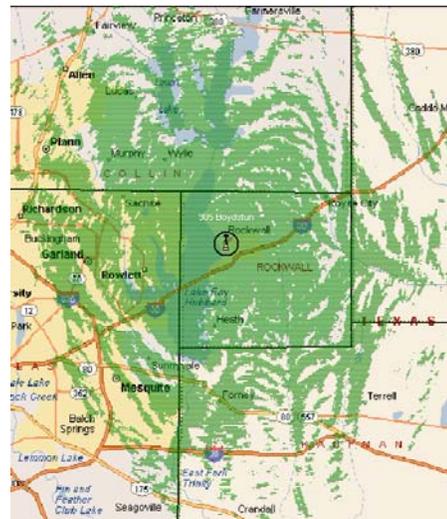
8.4 Hunt County - Expected NPSPAC Mutual Aid Mobile Coverage



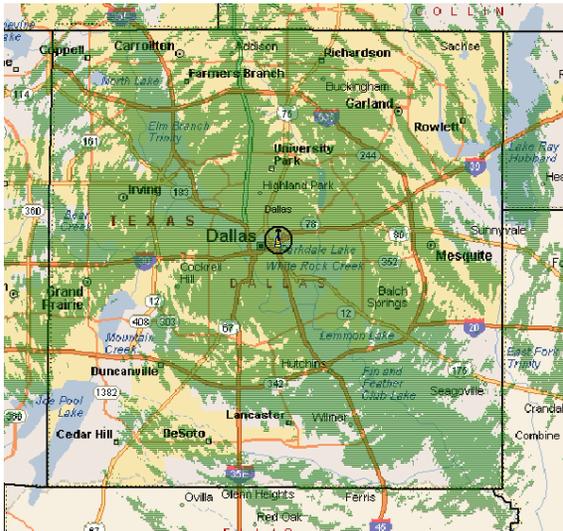
8.5 Richardson - Expected NPSPAC Mutual Aid Mobile Coverage



8.6 Rockwall - Expected NPSPAC Mutual Aid Mobile Coverage



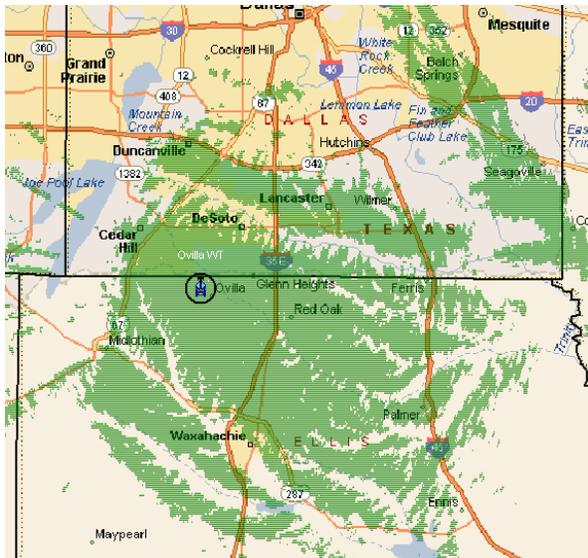
8.7 Dallas - Expected NPSPAC Mutual Aid Mobile Coverage



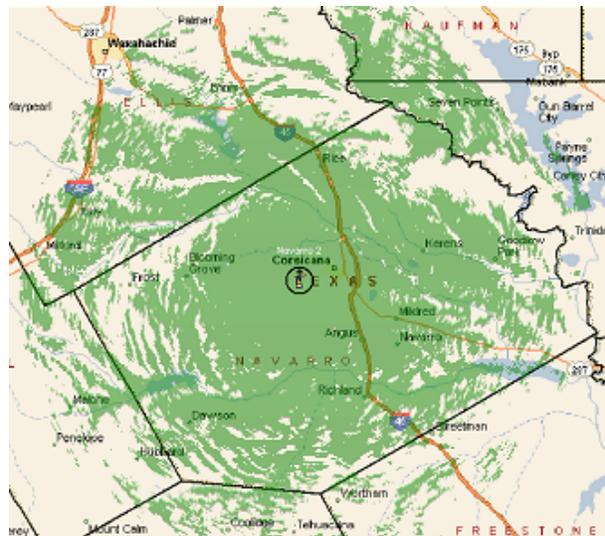
8.8 Kaufman County - Expected Mobile Coverage



8.9 Ovilla (Ellis County) - Expected NPSPAC Mutual Aid Mobile Coverage



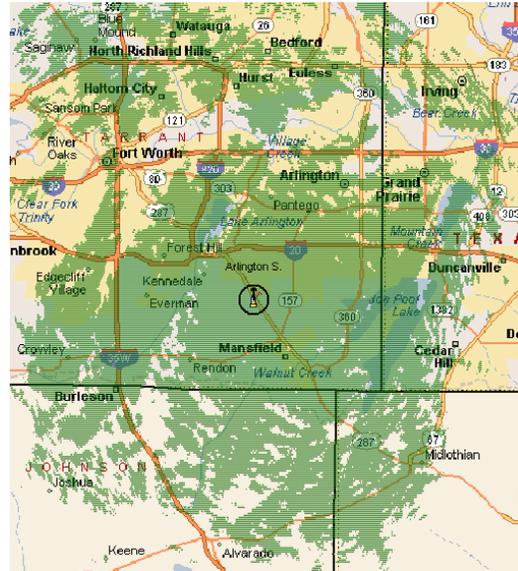
8.10 Navarro County - Expected NPSPAC Mutual Aid Mobile Coverage



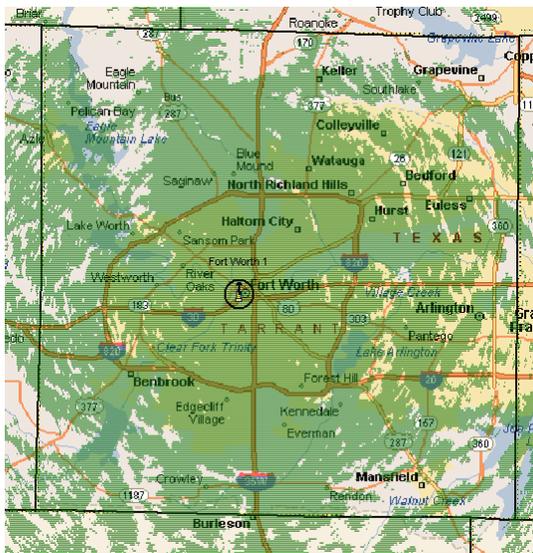
8.11 Johnson County - Expected NPSPAC Mutual Aid Mobile Coverage



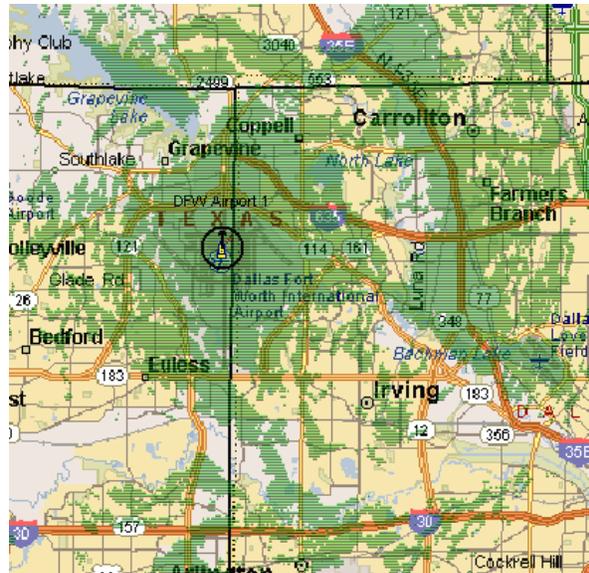
8.12 Arlington - Expected NPSPAC Mutual Aid Mobile Coverage



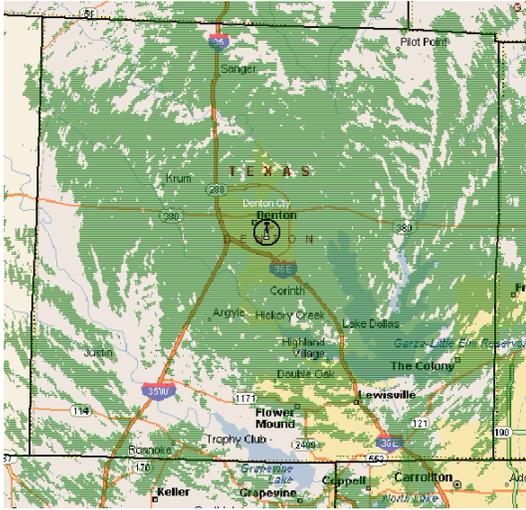
8.13 Fort Worth 1 - Expected NPSPAC Mutual Aid Mobile Coverage



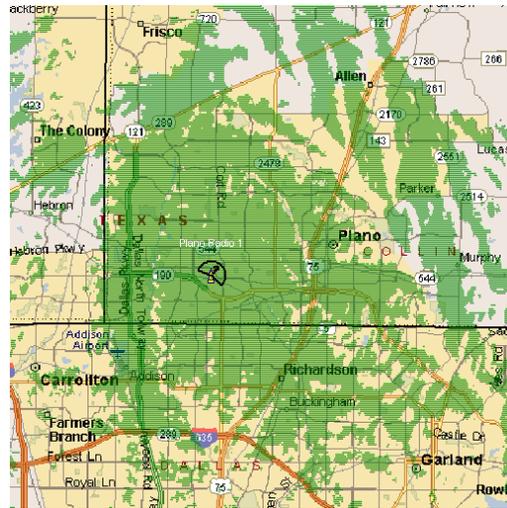
8.14 DFW Airport 1 - Expected NPSPAC Mutual Aid Mobile Coverage



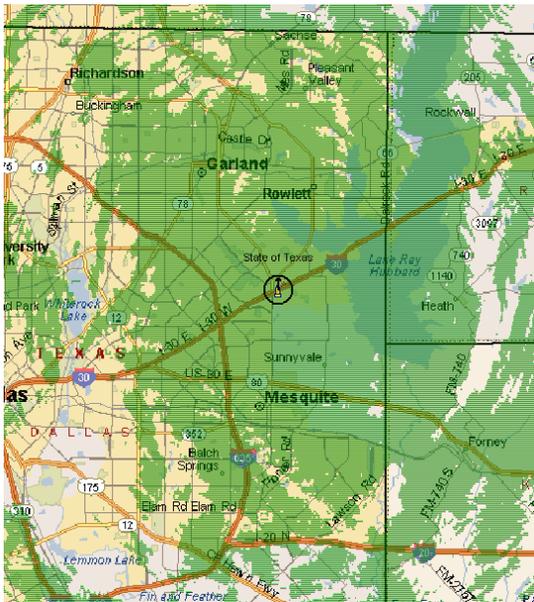
8.15 Denton County - Expected NPSPAC Mutual Aid Mobile Coverage



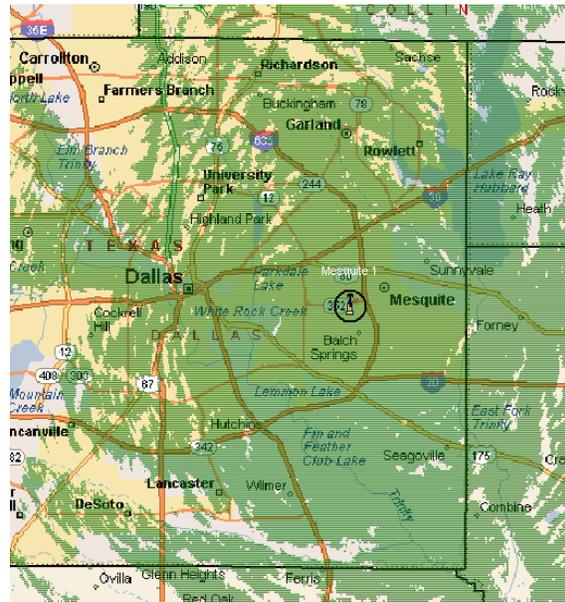
8.16 Plano - Expected NPSPAC Mutual Aid Mobile Coverage



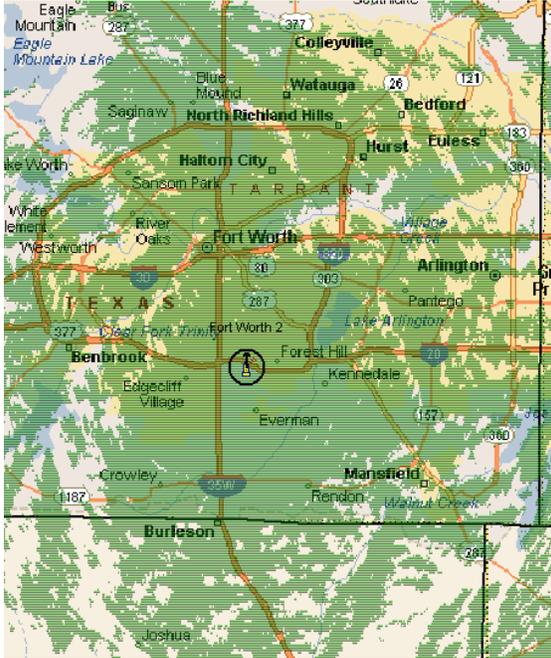
8.17 TX DPS Garland - Expected NPSPAC Mutual Aid Mobile Coverage



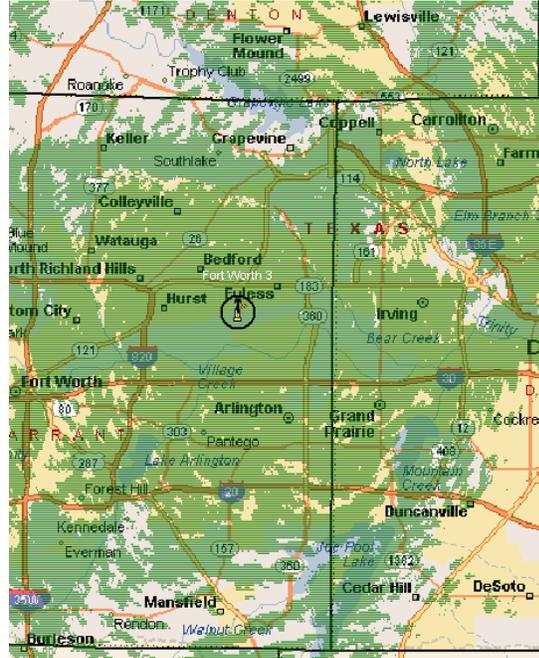
8.18 Mesquite - Expected NPSPAC Mutual Aid Mobile Coverage



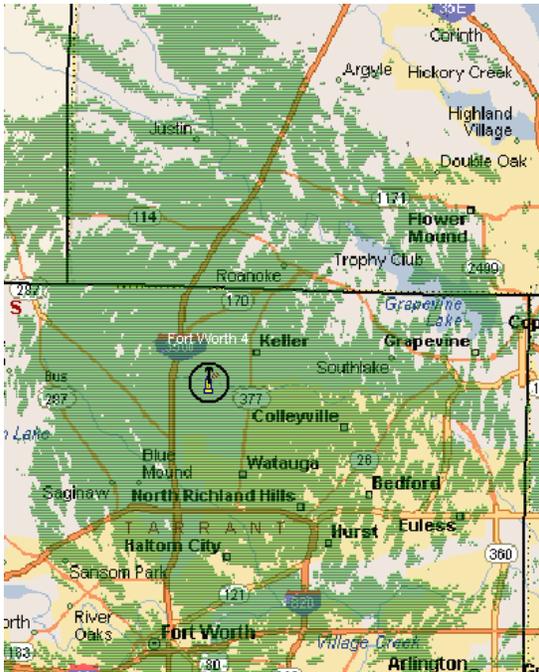
8.19 Fort Worth 2 - Expected NPSPAC Mutual Aid Mobile Coverage



8.20 Fort Worth 3 - Expected NPSPAC Mutual Aid Mobile Coverage



8.21 Fort Worth 4 - Expected NPSPAC Mutual Aid Mobile Coverage



Blank – No Map