TEXAS DEPARTMENT OF PUBLIC SAFETY

5805 N LAMAR BLVD • BOX 4087 • AUSTIN, TEXAS 78773-0001
512/424-2000
www.dps.texas.gov

STEVEN C. McCRAW
DIRECTOR
DAVID G. BAKER
ROBERT J. BODISCH, SR.
DEPUTY DIRECTORS

COMMISSION
A. CYNTHIA LEON, CHAIR
MANNY FLORES
FAITH JOHNSON
STEVEN P. MACH
RANDY WATSON

September 25, 2014

Dear Member of the Texas Legislature:

The Texas Department of Public Safety in cooperation with the Texas Interoperable Communications Coalition, and other key local and state stakeholders, is pleased to report Texas' progress toward interoperable public safety radio communications deployment. In accordance with Texas Government Code Section 421.098, on behalf of the Office of the Governor, the Annual Report on Interoperable Communications is provided for your review and information at: http://www.dps.texas.gov/LawEnforcementSupport/communications/interop/index.htm .

Highlights of the report include:

- Identified Funding Gap for Maintenance & Operation Costs (p18)
- An overview of the Long-Term Evolution (LTE) Public Safety Broadband Network and related Texas accomplishments in 2013 (p 25)
- A breakdown by recipient of the $253 million in federal grant funds for interoperable communications administered by DPS as the State Administrative Agent for fiscal years 2007 through 2013 (p 36)
- Interoperability status levels achieved in each Texas county (p 21 and p 45)

In 2011, the 24 Texas Regional Councils of Governments (COGs) each completed Regional Interoperable Communications Plans (RICPs) which provided greater clarity and detail regarding public safety communications needs and the plans for meeting those needs. (p 15). Analysis of the plans in the RICPs reflected that an estimated $1.03 billion over 10 years would be required to achieve the maximum level of interoperability. Annual Maintenance & Operation funding requirements for this statewide system of systems going forward are estimated to total $30.9 million each year.

With continued cuts in federal grant funding for these purposes, there will be a significant impact on public safety communications interoperability for state and local responders across Texas.

Should you have questions or require additional information, please contact us.

Respectfully submitted,

Steven C. McCraw

Steven C. McCraw
Director

Texas Department of Public Safety Report on Interoperable Communications to the Texas Legislature

August 2014

EXECUTIVE SUMMARY

The citizens of Texas rely on and expect emergency responders to arrive quickly to a scene and be ready to help them during a day-to-day incident or emergency. Texans are fortunate to have an impressive force of 5,300 emergency response agencies that respond daily to emergencies and life- threatening incidents throughout Texas. However, not all responders across the State have the resources and communications tools and they need to be fully prepared and capable of doing the best job they can to protect citizens.

While some agencies have state-of-the-art communications equipment, other agencies do not have a single radio to communicate with other responders in their own agency or neighboring jurisdictions during an emergency. Some agencies do not have the resources to train responders on how to properly use the radio equipment they have. In some areas across our vast State, radio coverage is non-existent, meaning responders are unable to communicate with anyone if an incident occurs in these areas.

Many emergency response agencies have depended on Federal communications funding for more than 10 years to sustain their emergency communications systems. Since 2009, Federal funding for emergency response communications has decreased by more than 70%. Due to this lost funding, emergency response agencies in every jurisdiction will suffer significantly, and in many locations, communications will become handicapped and unreliable. Some existing systems may become completely non-operational.

In addition to $1.03 billion needed to complete construction of the public safety communications "System of Systems", the public safety community in Texas needs $30,900,000 annually to provide for consistent funding for:

- The sustainment (during daily operations and emergencies) of emergency responder radio communication capabilities
- Ongoing development, maintenance, and capital replacement of interoperable communications systems for emergency responders statewide, allowing them to talk within and across disciplines and jurisdictions on demand, in real time, and when authorized

Without annually-allocated funding:

- Citizens' lives and property are at risk because emergency responders cannot communicate to coordinate the most efficient and effective delivery of emergency services,
- Emergency responders' lives are at risk, and
- There will be a loss of remaining Federal funding due to inability to meet the cash-match requirements.

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Report Prepared By:
Texas Department of Public Safety
Public Safety Communications Service

Contact: Todd Early – Statewide Interoperability Coordinator (SWIC)
(512) 424-2121 – todd.early@dps.texas.gov

1 Defining the Problem

For decades, inadequate and unreliable public safety communications systems have compromised the ability of emergency responders[1] across Texas and the Nation to perform their mission critical duties.

Communications is the fundamental capability within disciplines and jurisdictions that practitioners need to perform the most routine and basic elements of their job functions.
Source: Target Capabilities, www.DHS.gov

Communications Challenges

"Texas faces a full spectrum of threats, and our state's vast size, geography, and large population present unique challenges to public safety and homeland security," said DPS Director Steven McCraw. "Accordingly, our emergency responders must be on guard every day – ready to quickly and seamlessly work together to protect our communities. [2013 Texas Emergency Management Conference]

In the last few years, Texas has increased emergency communications capabilities significantly at the State and local levels. However, criminal organizations are also racing ahead with technology and efficiency. In addition, Texas still experiences record numbers of natural disasters requiring rapid, coordinated response from the emergency response community.

The following issues, identified by the Regional Focus Groups[2], are key emergency response communication problems in Texas that prevent or hamper basic communications between responding agencies during incidents and emergencies:

- Inadequate and drastically reduced funding to sustain communications systems
- A lack of radio communication equipment e.g., some agencies do not even have radios
- Limited radio signal coverage for some agencies (particularly in more rural regions), meaning communication is unreliable
- Obsolete and ineffective radio systems, radio towers, and antenna systems
- Disparate frequency bands: Radios in one frequency band cannot directly communicate with radios in other bands. For example, VHF radios cannot directly communicate with UHF or 700/800 MHz radios
- Proprietary radio systems that do not meet the current P25 suite of standards

[1] The term 'emergency responders' refers to persons from the broad public safety and first responder community including but not limited to: law enforcement, fire, emergency medical services, emergency management, transportation, public works, and hospitals.
[2] COGs hold a Regional Focus Group annually to bring together public safety first responders to discuss and document progress on their regional plans (RICPs), their accomplishments, initiatives, and gaps/needs.

- A lack of standardized, basic communications training for all radio-carrying responders
- Standard operating procedures that are documented but may not be practiced

"When multiple agencies/jurisdictions are unable to communicate at emergency response sites the lives of Texas citizens and emergency responders are at risk … every disaster is a local disaster. It is at the local level that the greatest challenges are faced and the toughest decisions are made." (W. Nim Kidd, CEM, Texas Division of Emergency Management)

Common Natural Threats

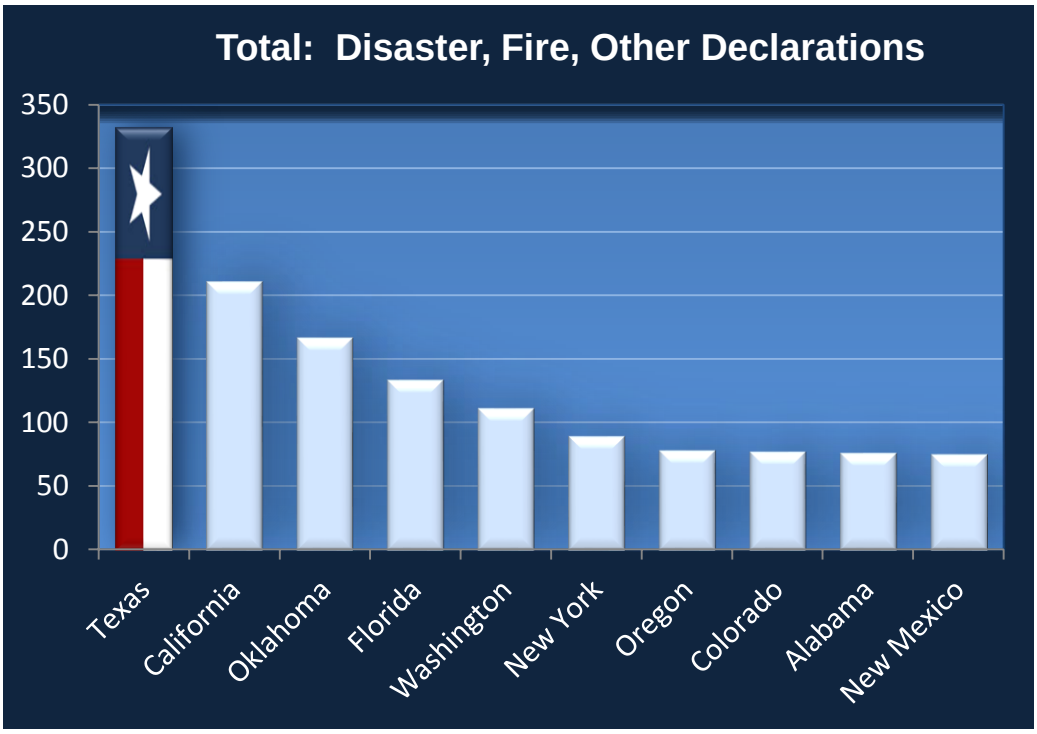
"Natural disasters such as floods, hurricanes, tropical storms, tornadoes, drought, and wildfires represent a continued and highly unpredictable public safety threat. These disasters result in deaths, loss of infrastructure, and billions of dollars in personal property damage and economic losses."

Source: 2013 Threat Overview, Director Steve McCraw

Below is a summary of natural disasters that occurred in 2013 and along with their impact on the lives and property of Texans. The expanse of natural disasters experienced in Texas highlights the importance and need of coordinated response during these emergencies. Communication capabilities are at the core of effective coordinated response as numerous agencies come together and need to communicate as they respond to these emergencies.

Summary of 2013 Texas Natural Events	Drought	Flash Flood	Flood	Excessive Heat	Heat	Hail	Heavy Rain	High Wind	Ice Storm	Lightning	Sleet	Strong Wind	Thunderstorm Wind	Tornado	Wildfire	Winter Storm	Winter Weather	TOTALS
Number of County/ Zone areas affected	198	104	26	1	1	196	52	72	41	26	8	8	158	45	13	86	106	
Number of Days with Event:	102	44	21	1	1	182	43	49	5	31	3	7	50	29	11	7	31	
Number of Deaths	0	11	1	1	1	0	0	0	0	2	0	2	2	7	0	0	4	31
Number of Injuries	0	0	0	0	1	0	0	1	0	6	0	0	4	67	2	0	5	86
Property Damage ($ millions)	15.7	115	1	0	0	496	7	0.7	21	3	0.2	1.3	443	270	628	30	1	$2,032
Crop Damage ($ millions)	2,232	0.3	0.1	0	0	15	0	0	0	0.1	0	0	0.19	0.2	0.3	0	0	$2,248

www.ncdc.noaa.gov/stormevents



Texas leads the nation in disaster declarations and has faced far more catastrophic incidents than any other State in the nation.

Significant Disasters in 2013

- Fires & Wildfires: (http://txforestservice.tamu.edu)

	2013 Fire Season Statistics	2011 Fire Season Statistics (Worst Case Scenario)
Total number of fires	13,313	30,457
Total acres burned	139,307.43 acres	3,993,716 acres
Total homes saved	3,813 homes	39,413 homes
Total homes lost	58 homes	3,017 homes
Total lives lost	0	2 lives

Explosion: Fertilizer plant explosion in West, Texas was one of the most devastating disasters in recent Texas history. 15 people lost their lives, including 11 responders, injured more than 300, and caused approximately $100M in damage. (http://www.usatoday.com/story/news/nation/2013/04/18/west-texas-explosion/2093663/)

Tornadoes: On May 15, 2013, 18 tornadoes across north central Texas resulted in six deaths, approximately 100 people were injured, and 277 homes were destroyed or severely damaged. (http://www.huffingtonpost.com/2013/05/15/texas-tornadoes_n_3283172.html)

Damage in Granbury, Texas.
Image Credit: NWS

Image credit: Austin Statesman, Jay Janner

Flood: A flash flood in Austin on Halloween (10/31/14) morning killed five people and damaged more than 1,200 homes. (http://www.usatoday.com/story/news/nation/2013/11/07/flash-flood-austin-residents-killed-displaced/3459181/)

Ice Storms: The ice storms on December 6 in North Texas on left 2 dead and 250,000 people without power. (http://www.foxnews.com/weather/2013/12/06/ice-friday-blast-bears-down-on-south-midwest/)

Image credit: Dallas News, Holly Hacker/Staff writer

Hurricanes: Although no hurricanes had major impacts in Texas in 2013; vigilant planning and preparation efforts are constantly being developed and under review.

- In 2008, despite the planning and mandatory evacuation of Galveston and the surrounding areas, authorities could not prepare for the number of individuals displaced by Hurricane Ike. 3,459 families became homeless due to Hurricane Ike and 74 people lost their lives.

Border Communications

The Department of Homeland Security (DHS) reports "*the U.S. border with Mexico is vulnerable to cross-border illegal activity. Coordinated communications between Federal, State, local, and Tribal organizations with a border security mission is critical in combating this activity. ...the varying terrain and pockets of sparsely populated areas continue to result in limited operable and interoperable communications. In addition, the large number of Federal, State, local and Tribal agencies and governments performing operations on the border necessitate ongoing coordination and communications.*"[3]

The 1,240-mile Texas-Mexico border presents numerous homeland security concerns, many of which center on the lack of basic radio operability in parts of the region, as well as poor interoperable communications among local, Tribal, State, and Federal law enforcement agencies. In addition, daily incidents occur along the border when law enforcement officers, fire departments, EMS, and other emergency responders are unable to communicate with their counterparts in Mexico.

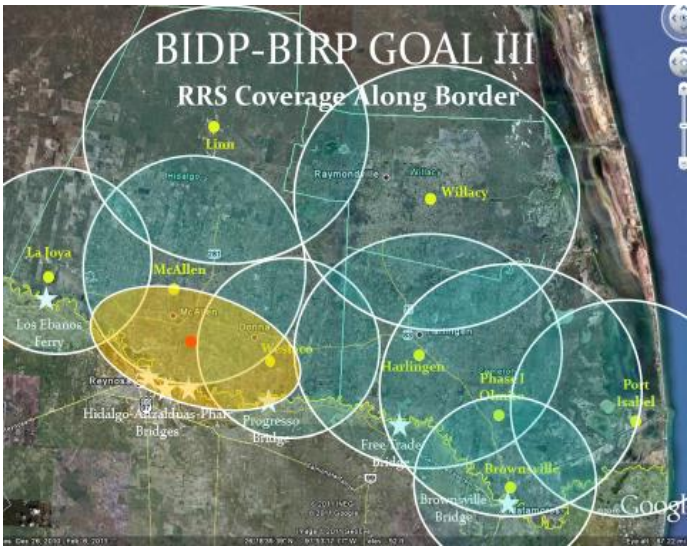
Texas is striving to improve communications for emergency responders along the border. As part of this effort, Texas is a strong participant on the DHS Southwest Border Communications Working Group (SWBCWG). This group identified the following challenges as their priorities to address:

- Limited infrastructure
- Infrastructure Sharing Barriers
- Equipment and Training Limitations
- Varying/incompatible Communications Systems, Equipment, and Operating Procedures
- Cross-border interference
- Ensuring interoperability while enabling secure communications

Successes achieved in 2013 along the Texas/Mexico Border include:

- Connected agencies from the DHS Customs and Border Patrol El Paso Sector, the City of El Paso, and El Paso County with common interoperability needs, resulting in a new technical solution for intergovernmental coordination.
- Rio Grande Valley Border Interoperability Demonstration Project (BIDP)
  The City of McAllen, through BIDP, is improving communications throughout the Lower Rio Grande Valley region, which shares 80 miles of border with Mexico and includes seven border crossings. This will create a shared standards based system with shared talk groups for mutual aid.

[3] Southwest Border Communications Working Group Executive Level Briefing Summary, April 2013



Goal I: Ability to communicate along and across 80 miles of the US/Mexico border within our region. ≈ 80% complete

Goal II: Ability to distribute text messages via radio using the existing RGV Regional Radio System. ≈ 80% complete

Goal III: Increase the coverage footprint of the RGV Regional Radio System and begin filling in the gaps along the border to assist with Goal I. ≈ 80% complete

Goal IV: Increase the capacity of the RGV Regional Radio System to compensate for increased border traffic to assist with Goal I.

The Mexican cartels are the most significant organized crime threat to Texas […] cartels exploit an unsecure Texas Mexico border to smuggle thousands of tons of drugs and hundreds of thousands of people into the U.S. and billions of dollars of bulk cash, stolen vehicles and weapons into Mexico […] Texas gangs and other criminals engage in child trafficking for the sexual enslavement of children [...] These same organizations recruit our children as criminal labor.
Source: 2013 Threat Overview, Director Steve McCraw

2 Public Safety Communications Background and Governance

Recognizing the need to improve public safety communications, the 77th Legislature called for the development of an interagency communications network, and a preliminary plan was accepted on March 27, 2001. It was determined that the network should be expanded to include all emergency response agencies in the State. The Immediate Radio Communications Interoperability Plan (IRCIP) was adopted January 2003. The IRCIP addressed radio communications interoperability between State and local jurisdictions for dispatch, en-route, and on-incident communications. Approximately 300 local government jurisdictions adopted and executed this plan.

Since 2003, significant changes have taken place in Texas that affect emergency response – some changes, such as a population increase, created more response challenges, where new technology helped improve response capabilities.

- The 2003 estimated population was 22,118,509 (U. S. Census Bureau).

- The 2013 estimated population is 26,448,193, an 20% increase of 4.3 million people in just ten years.

- In 2003 there were originally 300[4] Texas emergency response jurisdictions working toward improving emergency communications.
    - Currently, there are 5,300-plus Texas entities collaborating to improve mutual aid and emergency communications capabilities throughout our State.
- In 2003 emergency communications between responding agencies in much of Texas was executed over the County Sheriff's very high frequency (VHF) single radio channel. Technological upgrades were made to these wide area systems to meet the multiple-channel demands of rural communities.
    - Currently, most metro and urban communities have upgraded to use 700 & 800 MHz digital radio systems. These systems have been expanded with numerous talk groups and features to meet the emergency responder demands of major metropolitan areas. However, while some of these digital systems are interoperable, many are still proprietary and do not provide interoperability when responding to emergency mutual aid incidents.
- In 2003, there were only 8 VHF channels for LMR interoperability
    - Currently, there are approximately 84 interoperability channels across the State to enable emergency communication between agencies operating on different systems.
        - 16 - VHF calling/ tactical/ mobile/portable / repeater channels
        - 4 - UHF mobile/portable/repeater [mobile command post, incident temporary repeater] channels
        - 31 - 700 MHz mobile/portable/ tactical/repeater channels
        - 8 - NPSPAC 800 channels
        - 5 - NPSPAC Border area channels with associated Incident Temporary Repeater channels
        - 17 – Mobile Satellite Talkgroups

[4] Immediate Radio Communications Interoperability Plan (IRCIP) of January 2003

Governance

The TxICC, which represents the 5,300 emergency response agencies in Texas, was formed in 2006 to work toward improving the disjointed approaches to emergency response communications across the State. The TxICC is the State interoperability governance body and is responsible for planning and oversight of emergency communications interoperability throughout Texas. The SEC serves as the voting, oversight body of the TxICC. The SWIC is Chairman of the TxICC and provides coordination and guidance on emergency communications concerns and priorities.

To implement SCIP initiatives, SCIP Strategic Advisory Groups (SAGs) are formed on an ad hoc basis and comprised of TxICC members and other SMEs and are managed by the SWIC office. Some of these SAGs can be found in Figure 3. The TxICC and the SWIC have made great strides in maintaining and implementing the Texas SCIP[5] and forming partnerships between agencies that previously had little or no working relationships. All emergency response, public service, and support organizations are encouraged to join the TxICC. Figure 3 illustrates the SCIP Governance Structure adopted in January 2013.

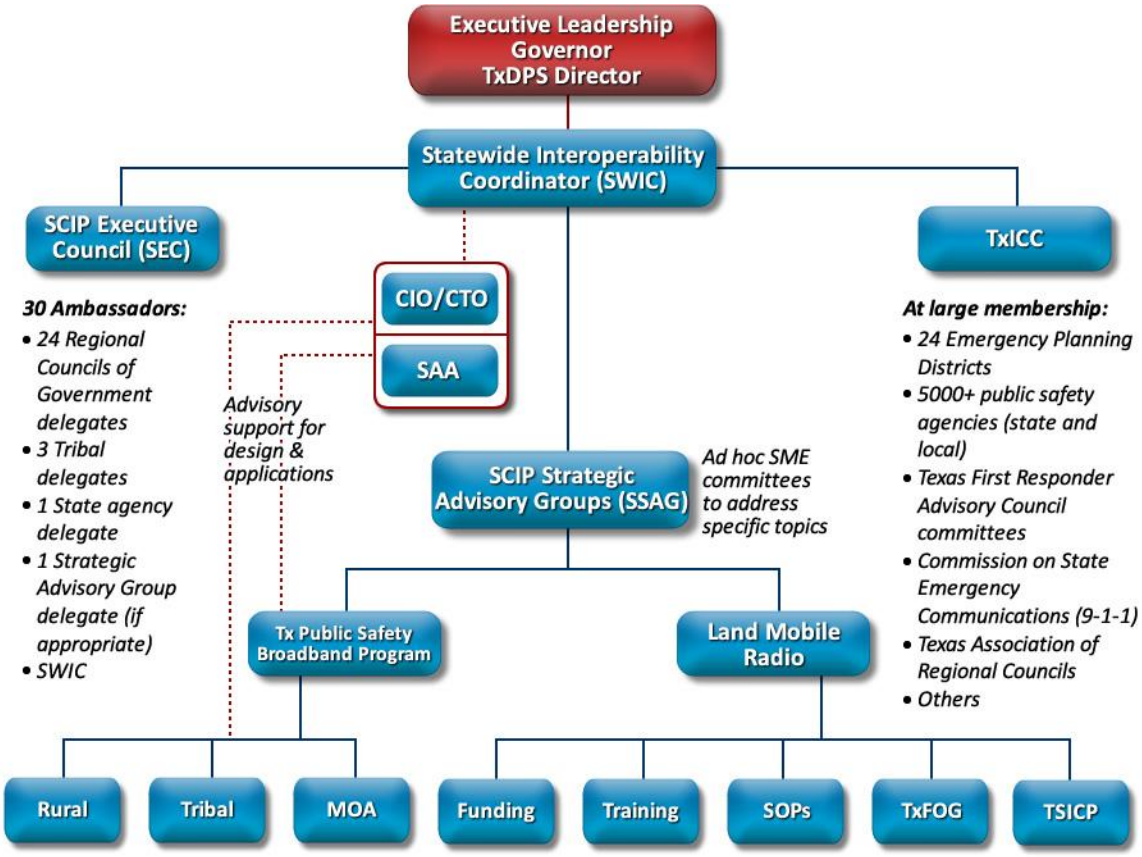


Figure 3 – Texas Interoperable Communications Coalition Governance Structure

[5] The Texas SCIP can be found at: http://www.txdps.state.tx.us/LawEnforcementSupport/communications/interop/documents/texasSCIP.pdf

Tribal Nations

There are three Federally-recognized Tribal Nations in Texas.

- The Alabama-Coushatta Tribe of Texas has a population of approximately 500 and is located on a 4,600-acre Tribal Nation near Livingston in Polk County.
- The Kickapoo Traditional Tribe of Texas is located near Eagle Pass in Maverick County on the international border with Mexico and has over 400 citizens.
- The Ysleta del Sur Pueblo Tribe is located near El Paso in El Paso County on the international border with Mexico and the State border with New Mexico. Tribal enrollment is over 1,600 citizens.

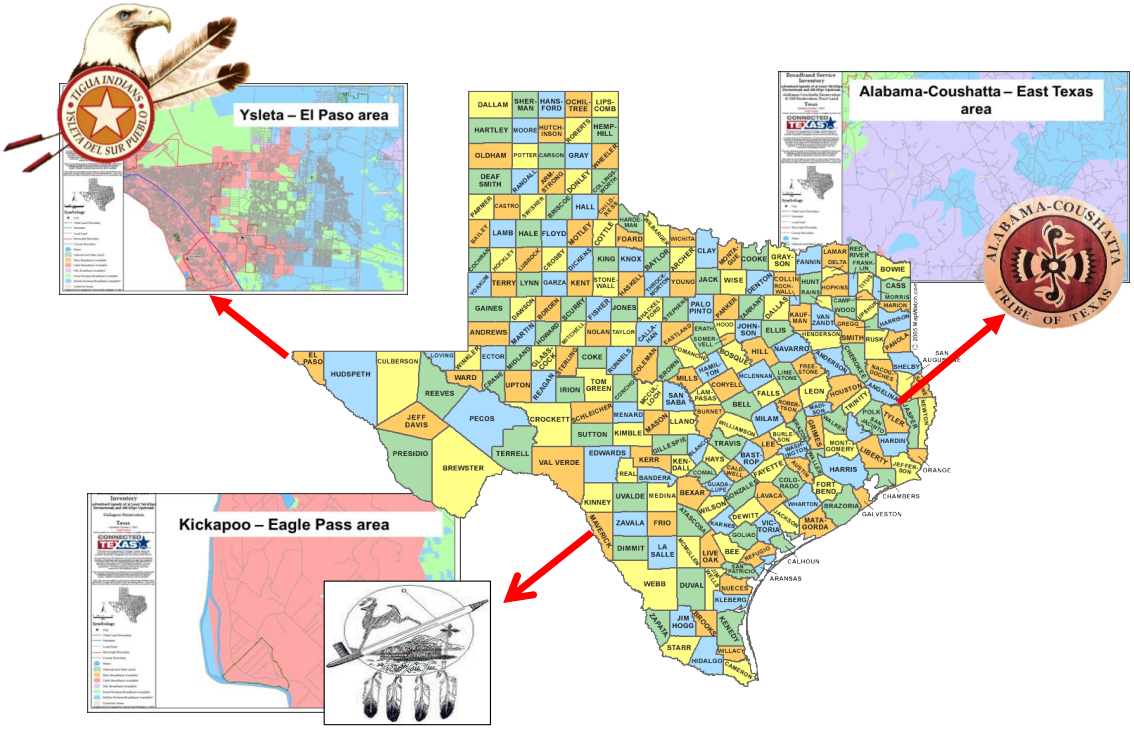


Figure 1 – Texas Federally Recognized Tribes

The Texas Statewide Interoperability Coordinator (SWIC) has met with Tribal representatives to discuss emergency communications capabilities, needs, concerns, and the future of public safety broadband in Texas. Each of the Tribes has attended annual Statewide Communications Interoperability Plan (SCIP) Conferences and Texas Emergency Management Conferences and are integrated into the Texas Interoperable Communications Coalition (TxICC) Governance process.

Most incidents on Tribal lands requiring an emergency response are facilitated by Tribal responders. When additional resources are required, mutual aid responders are called in. Tribal fire departments respond to mutual aid calls throughout Texas, and through the Texas Interagency Coordination Center they also respond to catastrophic events nationwide.

Statewide Communications Interoperability Plan (SCIP)

The TxICC, under the leadership of the SWIC, is specifically constituted to examine communication problems across Texas and identify cohesive solutions to address them through the SCIP. The SCIP Executive Council (SEC) meets in-person annually to review the SCIP and to discuss and vote on related issues.

In addition, representatives from the public safety community in each COG and the SEC delegate in the COG meet annually to complete their Regional Focus Group Report. This report documents the COG's emergency communications capabilities, initiatives, gaps/needs, and proposed solutions. State and regional gaps in communications must be listed in the SCIP to qualify for Federal funding. Information from the regional Focus Group Reports is compiled by the SWIC office and is used for DHS reporting requirements to document progress on the SCIP and also indicates potential new needs to be incorporated in the SCIP. These SCIP Implementation Reports to DHS from 2008 – 2012 can be found at www.txdps.state.tx.us/LawEnforcementSupport/communications/interop/txicc/scip.htm

The SWIC's office participated in a National effort to update the National Emergency Communication Plan with new goals and action items to be addressed in the State SCIP's. This includes public safety long term evolution (PS LTE) broadband planning and implementation, sustainment of land mobile radio (LMR), and funding requirements. Texas also participated in the upgrade of the National SCIP template and participated in an OEC workshop in September 2013 to help update the Texas SCIP. The SWIC office continued to refine the updated SCIP which the SEC will vote on at the annual SCIP conference in August 2014.

3 Interoperable Communications in Texas – the Vision

Vision Statement from Texas Statewide Communication Interoperability Plan

All public safety and first responder entities in Texas will have access to effective and sustainable wireless interoperable voice and data communications.

To achieve this vision and enable responders to better protect the lives and property of Texans, the Texas Department of Public Safety (TxDPS), the TxICC, and the 24 Texas Councils of Governments (COGs), along with State agencies that use public safety radios, adopted a "system-of-systems" approach. This design consists of multiple regional emergency communications systems networked for coverage and interoperability when needed.

Because of the stakeholders' decision to leverage existing infrastructure and radio systems, where possible, Texas is transitioning toward statewide interoperability and building shared regional communications systems. The regional system designs are driven by needs in their region, and aligned with the existing statewide "system-of-systems" strategy.

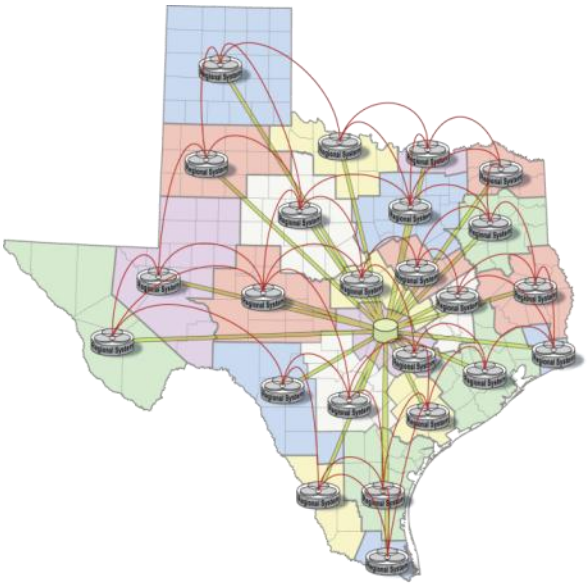


Figure 2 – Texas "system of systems"

Defined by the DHS SAFECOM program, a "system of systems" exists when a group of independently operating systems – comprised of people, technology, and organizations – are connected, enabling emergency responders to effectively support day-to-day operations, planned events, or major disasters. The Texas "system of systems" will enable agencies and regions to meet their specific needs while connecting to a broader network of resources. To continue working toward this system-of-systems goal, DPS has procured a Master Site which could potentially connect disparate radio systems and enable interoperability. Research is still being conducted to determine the most efficient and beneficial implementation plan and which systems may participate. Figure 2 provides a conceptual illustration of how regional systems will operate independently, but will also have the ability to communicate with other regions and agencies, as needed, through the use of "gateways" and other interoperable solutions.

The principles to create the system of systems include:

- **Operability for All** – While interoperability across the State is the public safety wireless communication goal for Texas, many areas still need assistance to achieve a basic ability to communicate within their own agency (operability) before they can communicate with other agencies (interoperability).
- **Standards-based Systems** – The nationally-recognized P25[6] suite of standards has been adopted by the emergency response community and the Federal Government. The Texas State Administrative Agency (SAA) also requires that radio equipment purchased with grant funds that flow through the SAA to be P25 compliant.[7]
- **Driven by End-user Needs** – The regional systems and designs are driven by user-identified requirements.
- **Leverage Existing Resources** – local, State, Federal, and private sector agencies continue to work with emergency response agencies across the State to leverage existing communication equipment, systems, and other resources to build the statewide system of systems. This approach saves time and money and can minimize recurring maintenance costs.

[6] http://www.project25.org/

[7] In special circumstances, the DPS-SAA permits "compelling reason exceptions" to the P25 requirement on a case-by-case basis, with the approval of the Texas Statewide Communications Interoperability Coordinator (SWIC).

- **Coordinated Approach** – By coordinating with one another, agencies from different disciplines and jurisdictions at the local, Tribal, regional, State, and Federal levels are able to leverage existing resources, coordinate purchases, and share infrastructure.

4 Accomplishments

"The TxICC and all the work and leadership that has been accomplished at the State are models in the Nation and I am so very proud and heartened to see the concrete results that have come about as a result of EVERYONE's hard work!" (Sue Landry, Director, Homeland Security and Emergency Management Planning Division, South East Texas Regional Planning Commission; March 6, 2013.)

2013 accomplishments include these efforts:

- Improved the Texas level of Interoperability from 3.8 in June 2013 to level 3.85 in July 2014, out of 5.0.
- Updated the Texas SCIP with near-term (3-5 year) goals per the new National SCIP Template.
- Influenced National public safety communications policies through participation and leadership in these National programs:
    - Texas SWIC is chairman of the National PS LTE Early Builders Advisory Council.
    - Texas SWIC is the vice chair of the Early Builders Working Group of the Public Safety Advisory Committee to FirstNet
    - Participated in the DHS/ Office of Emergency Communications working groups:
        - Development of the Land Mobile Radio Life-Cycle Requirements
        - Development of the Annual Progress Reports
        - Development of the Funding and Sustainment Guidance
- Continued build out of emergency communications and mutual-aid capabilities:
    - Disaster Communications: TxDPS and local jurisdictions continue to collaborate on development and enhancement of deployable emergency communications equipment and task forces. Texas is ensuring disaster communications capabilities with strategically-located equipment and teams that can be quickly deployed to emergency incident sites.
    - State and local mutual-aid assets: Capabilities are recorded in the Texas Regional Response Network (TRRN) and Communications Assets Survey and Mapping (CASM) databases for emergency pre-planning efforts.

- The DPS Communications Emergency Operations Team (CEOT) executed 27 deployments during 2013.
    - Thirteen deployments were in support of DPS Task Forces and/or Special Operations.
    - Specific deployments provided emergency communications with local agencies on mutual aid events. Other deployments consisted of public education venues and training or exercises preparing for natural disasters, acts of terrorism, and other man-made disasters with federal, local, regional and mutual aid agencies.
    - Due to the shortfalls in local funding and resources, the DPS involvement with multi-emergency communications teams and networks at significant events could be critical to emergency response efforts.

Based on information provided by the COGs through their Focus Group Reports, COG accomplishments across the State include, but are not limited to:

- Many COGs conducted some level of training (including Communication Leader training) and/or tested interoperability capabilities during an exercise
    - Most of these COGs reported concern about future training and exercises being eliminated due to funding problems.
- Many COGs either have P25 standard radio systems or they are able to communicate with P25 systems
    - Many volunteer fire departments[8] are NOT P25 compliant due to lack of funding.

Improved/Integrated Public Safety Communications Training

"Combining resources and people is a complex endeavor that cannot be first attempted during an actual emergency. Experience shows that success requires a foundation of common processes, policies, interoperable equipment, and cooperative training and exercises. The public is best served when officials at every level train to a common standard and exercise their emergency roles routinely. Interoperability, integration, and mutual support must be the daily norm not the exception."

Source: Texas Homeland Security Strategic Plan 2010 2015.

Currently, emergency responders in Texas do not have access to standardized emergency response communications training for basic radio operations nor for using their radios during emergencies involving multiple agencies.

[8] According to the U.S. Fire Administration, 72% of Texas' fire departments are comprised 100% of volunteers. http://apps.usfa.fema.gov/census/summary.cfm#c

The DPS SWIC Office developed a training strategic advisory group (SAG) comprised of training SMEs and emergency responders to develop a strategy and high-level curriculum to integrate specific emergency response communications training into existing emergency response training efforts.

This integrated training effort will leverage existing annual funding and resources without duplication of efforts. The SWIC office and the Training SAG will coordinate with DHS/OEC and Texas Division of Emergency Management (TDEM) and will work with local and State responders to identify their communications training needs and determine how to best integrate them into training curriculums.

Because of the significant downturns in budget revenues, the fear is that communications training and exercises may be deferred or eliminated.

Texas 700/800 MHz Regional Planning Committees (RPCs)

The Federal Communications Commission (FCC) established Regional Planning Committees (RPCs) to encourage innovative use of radio spectrum and accommodate new and unanticipated developments in technology and equipment.

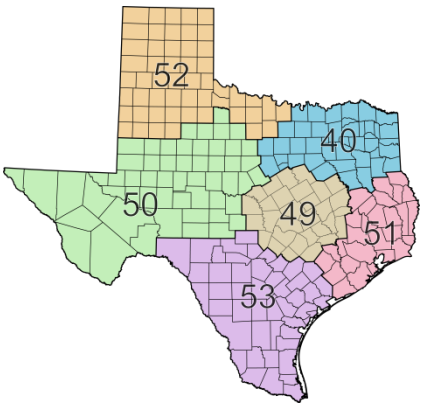


Figure 4 – Texas Regional Planning Committees

700 MHz Plans: Figure 4 illustrates the six Texas RPCs. Each committee is required to submit a plan for the 700 MHz Public Safety General Use spectrum.

The Federal Communications Commission (FCC) established a structure to allow RPCs optimal flexibility to meet State and local needs, encourage innovative use of the spectrum, and accommodate new and unanticipated developments in technology and equipment.

Each committee is required to submit its 700 MHz Regional Plan for the General Use spectrum[9]. The FCC approval of these plans will safeguard the 700 MHz narrowband channels for mission critical voice communications in the designated counties of the region.

- Five of the six Texas RPCs have FCC approved 700 and 800 MHz plans
    - One RPC plans to submit their 700 MHz Plan in 2014

[9] Source: 47 C.F.R. § 90.527; *see also* Development of Operational, Technical and Spectrum Requirements.

- Regions 50 and 53 are currently working through Wave 4, Texas-Mexico border, 800 MHz re-banding process; upon concluding re-banding, these Regions will be required to update their 800 MHz Plans[10]

- Regions are evaluating the possible FCC changes to their 4.9 GHz Band use and possible FCC changes to rules for Signal Boosters/ Bi-Directional Amplifiers[11]

5 Texas Goals and Next Steps

The DHS priorities for emergency response communications is sustainment of current capabilities and deployable communications for emergency incidents. These priorities are of utmost importance to Texas and are the current focus. COGs and "Whole Communities" have prioritized sustainment and implementation of emergency communications. Plans are refreshed annually with newly identified gaps, priorities, and necessary capability skills. Due to limited funding this will remain a priority.

Additional next steps include:

- Current infrastructure maintenance and connectivity
- Core capabilities training
- Education of the whole community on: risks of high-consequence events; State and local capabilities; and evaluation of existing capabilities

Emergency response entities will continue to enhance coordination of emergency responders and processes across the State by:

- Strengthening governance and partnership structures to ensure every resource, including funding, is strategically utilized to benefit emergency communications capabilities.
- Ensuring communications plans, procedures, and resource documents are current and preplans for large scale incidents have been developed and disbursed.

TxDPS will ensure any early PS LTE deployments permitted by FirstNet in the State are developed to be consistent with the intended overall nationwide plan for interoperability. TxDPS will continue to serve as the State's single interface with the FCC, NTIA, and FirstNet.

[10] The FCC adopted a plan to reconfigure ("re-band") the 800 MHz band (806-824/851-869 MHz) to prevent serious interference to public safety radio communications.
[11] WT Docket No. 10-4, Amendment of Parts 1, 2, 22, 24, 27, 90 and 95 of the Commission's Rules to Improve Wireless Coverage Through the Use of Signal Boosters.

6 Funding Gap

Citizens look to their elected and appointed officials to ensure that emergency response agencies can respond effectively in a crisis. An investment in infrastructure and communication equipment is necessary to sustain existing emergency response communications systems and to enable basic communications operability in some areas of Texas.

$1.03-billion in State funding, plus $449.5-million in Federal and local monies, will be required through 2015 to build a statewide "system of systems" – a network of state, local and regional public safety communication systems connected together to provide "interoperability".[12]

Total Interoperability Funding Need for Infrastructure Equipment 2015	$750 Million
Total Interoperability Funding Need for Subscriber Equipment 2015	$667.0 Million
Total Interoperability Funding Need for Maintenance & Operation 2014/15	$61.9 Million
Total Projected Interoperability Funding Need	$1.48 Billion
Estimated Funding from Federal Government through 2015	$449.5 Million[13]
Funding Needed from the State of Texas through 2015	$1.03Billion

Aging infrastructure must be replaced. Some towers are more than 35 years old and have deteriorated, yet are still in use. The $1.48 billion in funding would provide a base level of operability and interoperability that meets emergency response communications standards and system maintenance.

The financial needs for infrastructure and operations and maintenance to allow for a basic level of communications interoperability were determined by compiling data from each of the 24 COGs. Each region developed a Regional Interoperability Communications Plan (RICP) in 2011 to document their public safety communications needs and to create technical implementation and migration plans along with the associated costs to meet those needs. These plans are maintained by the COGs and reviewed on a regular basis. In addition, the SWIC office is working with the DHS OEC Technical Assistance team to provide system migration planning assistance to review, update existing plans, or create new plans.

Examples of equipment identified by the COGs that are needed to fill this gap include: gateways, repeaters, microwave technology, radio consoles, mobile and portable radios, and mobile communication command vehicles. Emergency responders also rely on subscriber radios for daily communications. Subscriber radio procurements have historically been the responsibility of state and local agencies, but do comprise a large portion of annual communications funding.

[12] Operation Texas Talks (http://www.txdps.state.tx.us/LawEnforcementSupport/communications/interop/documents/operTexasTalks.pdf)
[13] $253.1 million of the $449.5 million has been spent from FY 2007 through FY 2013 in Federal funding and local funding match, as administered and tracked by TxDPS.

The complex regional radio systems that comprise the "System of Systems" will require funding for ongoing maintenance and operations costs beyond 2015. In order for the emergency response community to be able to sustain their radio communication systems – during both daily operations and emergencies – State funding will be necessary in the amount of $30.9 million annually for ongoing development, maintenance, and capital replacement of interoperable communications systems for emergency responders statewide.

Yearly Maintenance & Operation Funding Need from the State of Texas 2016 & on	$30.9 Million/yr

On September 1, 2011, House Bill 442 was enacted to establish the emergency radio infrastructure account in the general revenue fund, consisting of criminal conviction fees and all interest attributable to money held in the account. The account is currently collecting funding, but funding has not yet been appropriated.

7 Funding spent toward the vision

Since FY 2007, Texas jurisdictions have spent $253,123,109.93 in TxDPS-SAA distributed Federal funds, plus local match, for interoperable communications technology purchases, including infrastructure and equipment. This amount does not include expenditures on the development of standard operating procedures, training and exercises conducted, or funding for strategy and governance development, which are also critical elements of emergency response communications. The importance of these elements is further highlighted in the DHS SAFECOM Continuum[14].

Additional funds directly flow to local jurisdictions from the Federal Government or other entities. Local jurisdictions also budget local funds derived from local taxes, fees, bond elections, and certificates of obligation to support operable/interoperable communications. The figures captured in this report only reflect Federal funds that have flowed through the TxDPS-SAA office to local jurisdictions. There is no known centralized repository itemizing the described local communications operability/interoperability funding sources, amount, and expenditures.

Appendix C-1 includes a table called Expenditures by COG on Interoperable Communications Equipment, is a summary of the TxDPS-SAA administered Federal grant funds expended by each COG on operable/interoperable communications equipment starting in FY 2007 through FY 2013.

This table includes expenditures by COG per fiscal year (using the State's FY period – September 1st through August 31st), including the Public Safety Interoperable Communications (PSIC) matching funds by COG, and total amounts. TxDPS-SAA administered Federal grant

[14] http://www.safecomprogram.gov/oec/interoperability_continuum_brochure_2.pdf

funds to Urban Area Security Initiative (UASI) jurisdictions are captured in the figures under the COG name where the UASI is located.

The TxDPS SWIC Office and TxDPS-SAA partnered to further improve a methodology for collecting valid expenditures for communications equipment. The full methodology can be obtained by contacting the TxDPS SWIC Office at TXSWIC@dps.texas.gov, but key aspects of the methodology include collecting and sorting the expenditure data by:

- Communications Equipment Code – scoping the collected information by specific communications equipment codes as they are tracked by TxDPS-SAA.
- State of Texas Fiscal Year – scoping the data collection by Texas FY (September 1 through August 31). This timeframe aligns with the TxDPS-SAA funding cycles.

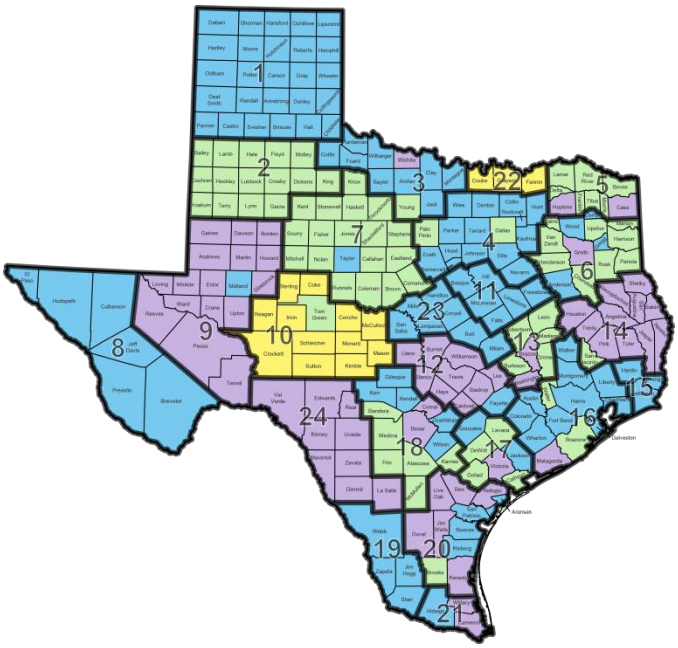
To view the raw data to extract and sort information by other aspects such as jurisdiction, grant name, etc., please email TXSWIC@dps.texas.gov.

8 The Current Status of Voice Communications Interoperability in Texas (as of COG County Survey 7/28/14)

The Texas Statewide Communications Interoperability Maturity Model (TSCIMM), summarized below and fully depicted in Appendix D, is based on the SAFECOM Interoperability Continuum.[15] The TSCIMM outlines the evolution from the lowest level to the highest level of communications interoperability (Level One – least interoperable to Level Five – most interoperable). The following map of Texas highlights the current status of each county regarding their level of interoperability in the "Voice Technology" lane of the TSCIMM. The status is indicated by the individual colors associated with the five levels of interoperability in the TSCIMM.

The color-coded map reflects a snapshot of each county's status of voice communications interoperability. This information was obtained directly from the 24 COGs through a survey submitted to DPS as of July 28, 2014. As the map indicates, for the most part, Texas has achieved slightly below level 4.0 wireless communications interoperability.

Texas Statewide Voice Communications Interoperability Color-Coded Map by COGs and Counties *(as of 7/28/14)*



Texas Statewide Communications Interoperability Maturity Model Color Codes:

Level One (least interoperable) .....0 Counties
Level Two .....15 Counties
Level Three .....72 Counties
Level Four .....104 Counties
Level Five (most interoperable) .....63 Counties
Total: .....254 Counties

Average Statewide Interoperability Level: 3.85

[15] For additional information about the U.S. Department of Homeland Security's SAFECOM Interoperability Continuum developed by the SAFECOM program, see http://www.safecomprogram.gov/oecguidancedocuments/continuum/Default.aspx

9 Conclusion: When will Texas reach Level Five – Full Interoperability (P25 Standards-Based, Shared Systems Capability)

Much has been accomplished; however, because of the extensive natural disasters and manmade events that occur across our vast State, we must continue our vigilance and ensure our public safety agencies have proper equipment and training to respond to our 9-1-1 emergency calls.

Texas has an average of more than eight natural disaster events per day. All of these events require emergency responder coordination via radio communication with local agencies, and many events also require radio communication with regional, mutual aid, State, and Federal agencies.

Achieving the vision of the Texas SCIP by the end of 2015 is dependent upon receipt of needed funding for infrastructure: $37.4 million from the Federal Government through grants (which has been cut more than 70% since 2009) and $1.03 billion from the Texas Legislature. It will mostly be up to local jurisdictions to provide funding for mobile and portable radios.

By approving $1.03 billion, the public safety community will be able to complete construction of the "System of Systems", and by appropriating $30.9 million annually thereafter, the public safety community will be able to sustain—during both daily operations and emergencies—their radio communication capabilities and fnd ongoing development, maintenance, and capital replacement of interoperable communications systems for emergency responders statewide. This funding is critical to enabling emergency responders to talk within and across disciplines and jurisdictions on demand, in real time, and when authorized.

The threat to the State of Texas from natural and man-made disasters can be mitigated by a long-term investment strategy for communications systems, equipment, and training.

Appendices:

A. Long-Term Evolution (LTE) Broadband for Public Safety

B. Acronyms and Glossary

C. Expenditures on Communications Interoperability Equipment by: COG/State Fiscal Years (2007-2013) and Purchased Equipment Type

D. Voice Radio Communications Interoperability Levels across Texas

E. Associated Documents and Information

Appendix A:
Long-Term Evolution (LTE) Broadband for Public Safety

Long-Term Evolution (LTE) Broadband for Public Safety

Currently, some agencies have commercial USB modems or "air cards" in their vehicles, and they are only able to share and obtain small amounts of data and video at very slow speed with no interoperability between agencies. While still useful, these are not effective solutions for dedicated, secure public safety information sharing needed to save more lives and property.

LTE700 MHz broadband interoperable communication capabilities will enable emergency responders to receive and transmit greater amounts of data and video at a much faster speed from a mobile environment.

700 MHz Public Safety LTE Broadband = High Volume of Information + Rapid Speed

With LTE, responders will be able to more effectively:

- Transmit and view high-quality, full-motion streaming video for the purposes of:
  - Tactical operations (e.g., fire scenes, police operations, critical incidents, etc.)
  - Surveillances (e.g., crime-ridden hot spots, SWAT incidents, etc.)
  - Planning and Strategy (e.g., aerial videos of an incident to help responders plan before entering a scene)
- Download and view large-sized building plan files on the way to incidents, and even display building plans on the face shields of firefighter helmets – pictures and drawings which can change as the firefighters move about
- Increase victim survival rates through remote telemedicine capabilities installed in EMS units
- Wirelessly monitor geographic locations of responders, their heart rate, blood pressure, and breathing rate during an incident (which is especially helpful during fire response)
- Read license plates and determine owners and "stolen" status by using a Smartphone or Tablet PC camera to take photos
- Collect and search fingerprint information
- Through facial recognition, obtain a person's identity by using a Smartphone or Tablet PC to take a photo, which can be used to search and match against existing databases
- Enhance situational awareness by providing real-time data and using interactive maps
- Transmit real-time patient vital signs and video from the scene of an incident to an incoming helicopter, back-up ambulance(s), and hospitals

- Integrate data bases and data sharing, such as the sharing of CAD data which is rarely shared between systems now

The air cards currently used by emergency response agencies operate on commercial carrier networks and are plugged into mobile computers (often mounted in vehicles), or in some instances make use of external modems mounted elsewhere in the vehicle. The public safety LTE modems will look much the same, but will primarily operate on the new nationwide PSBN, and "roam" to commercial carriers when needed. Handheld LTE devices are still in manufacturer development, but should look similar to a large Smartphone (or maybe even a tablet-style device) with a reasonable-sized display screen to enable viewing of live videos, documents, and drawings.

Why can't public safety use cell phones and smart phones for their mission critical voice communications?

"Just ask anyone who has tried to protect the public during Rita, Gustav, and Ike. During the most critical time—cell phone service always goes down." (Sue Landry, Director, Homeland Security and Emergency Management Planning Division, South East Texas Regional Planning Commission.)

Although emergency responders regularly use cell phones, smart phones, and other commercial wireless devices and services as a secondary form of communications, these devices and systems are currently not sufficiently suited for emergency response mission critical voice communications during critical incidents.

Emergency responders cannot depend upon commercial systems that can be overloaded and unavailable. Experience has shown such systems are often the most unreliable during critical incidents when public demand overwhelms the systems. Emergency responders have unique and demanding communications requirements. Optimal emergency response radio communications require:

- Dedicated channels and priority access that is available at all times to handle unexpected emergencies
- Mission critical one-to-many group capability, a feature not available in today's commercial cellular systems
- Highly reliable, secure, and redundant networks under local control that are engineered and maintained to withstand natural disasters and other emergencies
- The best possible coverage within a jurisdictional area, with minimum dead zones – even in areas where commercial cellular services are not economically viable
- Unique, ruggedized equipment designed for quick response in emergency situations. Emergency responders must not be forced to dial, wait for call connections, or get busy signals when seconds mean the difference between life and death

Will the LTE system replace my land mobile radio (LMR) system that I currently use for mission critical VOICE communications?

Although the nationwide public safety broadband network (NPSBN) will have voice capabilities that will be valuable to emergency responders, the network initially will not be able to provide (likely not for many years) the mission critical level of voice service and dependability needed by emergency responders. The NPSBN is intended to provide urgently-needed broadband data capabilities for emergency responders and is NOT initially being designed to replace current LMR mission critical emergency response voice systems.

Local, Tribal, State, and Federal public officials are urged to not abandon or stop funding their public safety voice LMR systems until such time as it can be demonstrated that broadband can safely and adequately provide public safety with the mission critical requirements currently provided by LMR.

Source: NPSTC Information for Local, Tribal, State, and Federal Officials, April 15, 2013.

What is Texas doing with LTE?

TxDPS has become a National leader in pursuing early deployment of public safety LTE broadband. The State of Texas has identified the following objectives for public safety LTE broadband:

- To create an effective 700 MHz interoperable mobile public safety broadband network, which, when fully deployed, will enable emergency responder users operating in Texas to be safer, more responsive, and more effective when saving lives and property.
- To enable the early deployments of 700 MHz interoperable mobile public safety broadband network layers in Harris County including a site in College Station and a mobile site.
- To support the planning and eventual deployment of a nationwide 700 MHz interoperable mobile public safety broadband network.

State and Local Implementation Grant Program (SLIGP) to Assist in Planning for the Nationwide Public Safety Broadband Network

In September 2013, the SWIC's office was awarded a grant by the Department of Commerce, National Telecommunications and Information Administration. This grant provides award funding to assist State, local, and Tribal governments with required outreach and programmatic planning for the nationwide interoperable emergency response broadband network in Texas. The initial timeline for the grant planning and strategy development is 2013 third quarter through 2015 first quarter.

With SLIGP funding, the SWIC office is rolling out an extensive outreach and education (O&E) effort to all identified emergency response and related agencies in Texas. In addition to

numerous speaking engagements across the State, this O&E effort includes holding a meeting in each COG with all public safety related individuals, elected officials, and other decision makers. The intent of the O&E effort is to provide high-level information on LTE and FirstNet, help the response community to understand their potential LTE-related needs, describe what information FirstNet will need from them, encourage participation in regional broadband teams, and discuss next steps.

The TxDPS will provide an interface to the FCC, NTIA, FirstNet, and all jurisdictions in the State to support the effective flow of information between these entities and support the best decisions for all jurisdictions.

Texas Participation in National, Regional and Local LTE Working Groups

The State, through the TxDPS's Law Enforcement Support Division, Public Safety Communications Service and SWIC Office, has been and will continue to be an active participant in National, regional and local working groups, education programs, and other venues that move PS LTE forward. The State has been active on Federal technical working groups, in the FEMA Region VI Public Safety LTE Interoperability Forum, and is actively reaching out to jurisdictions through seminars, COGs, and a newly created website, www.dps.texas.gov/LTE/index.htm. The SWIC participates in the following groups:

- Early Builders Advisory Group (Chair)
- Early Builders Working Group of the Public Safety Advisory Committee to FirstNet (Vice Chair)
- APCO Broadband Committee
- NPSTC Applications Committee

Appendix B:
Acronyms and Glossary

List of Acronyms

Acronym	Definition
COG	Council of Governments
D Block	Frequency range from 758 -763 MHz
DHS	Department of Homeland Security
EMS	Emergency Medical Services
EPC	Evolved Packet Core
FCC	Federal Communications Commission
FirstNet	Established by the Jobs Creation Act of 2012 to build and manage the Public Safety Broadband Network
LTE	Long Term Evolution
MHz	Megahertz
NECP	National Emergency Communications Plan
NTIA	National Telecommunications and Information Administration
P25	Project 25 (formerly Association of Public-Safety Communications Officials - International Project 25)
PSIC	Public Safety Interoperable Communications
QoS	Quality of Service
RICP	Regional Interoperable Communications Plan
RAN	Radio Access Network
SCIP	Statewide Communications Interoperability Plan
SOPs	Standard Operating Procedures
TSCIMM	Texas Statewide Communications Interoperability Maturity Model
TxDPS	Texas Department of Public Safety
TxDPS-SAA	Texas Department of Public Safety State Administrative Agency (under TxDPS Chief of Staff; SAA Office administers grant programs)
TxICC	Texas Interoperable Communications Coalition
UHF	Ultra High Frequency
VHF	Very High Frequency

Glossary

Term	Definitions
3GPP LTE	The **3rd Generation Partnership Project** (3GPP) is the LTE standards body and is a collaboration between groups of telecommunications associations and standards bodies, known as the Organizational Partners. 3GPP standardization encompasses Radio, Core Network and Service architecture.
Backhaul	**Backhaul** (or Transport Network) connects all the LTE base stations (usually Tower Sites) to one another and to other components in the LTE system. Backhaul is often microwave or fiber-optic technology. Backhaul is also present in 3G and land mobile radio (LMR) systems.
Consoles	Desktop **Consoles** are self-contained radio dispatching units that control single or multiple base stations. Consoles may be remotely located in another part of the building, a branch office, or even in another city. Multiple desktop consoles can work in parallel to access and control a radio system. IP dispatch applications can be used to dynamically connect disparate networks, or provide over-IP control for a single network. Dispatchers, network administrators or other authorized personnel can set up connections in seconds to communicate with radio users.
Evolved NodeB (eNodeB)	**Evolved NodeB** (eNodeB or eNB) The single network element, which provides the user and control plan terminations, supports transmission and reception over the air interface, it comprises the e-UTRAN and connects to the EPC. Most simply it is an LTE RF site or base station.
Evolved Packet Core	The **Evolved Packet Core** (EPC) unifies voice and data into one subdomain and comprises all of the core network infrastructure to which the radio access network (RAN) elements connect.
Gateway	A **Gateway** is a network functional element which translates traffic between multiple, disparate networks. Gateways can connect over the air and over a wireline network.
Inter Subsystem Interface	The Project 25 Inter RF Subsystem Interface (**P25 ISSI**) is a non-proprietary interface that enables RF subsystems (RFSSs) built by different manufacturers to be connected together over a network interface. The wide area network connections using the ISSI provides an extended coverage area for subscriber units (SUs) that are roaming. The extended coverage area is important for public safety first responders that provide assistance in other jurisdictions during an emergency.

Glossary

Term	Definitions
Internet Protocol (IP)	**Internet Protocol** (IP) is the method by which data travels from one computer to another over the Internet. Each computer has an IP address that uniquely identifies it. IP-based communication systems can transform voice signals into digital information that then can be sent over data networks.
Microwave	**Microwave** systems can be used for any terrestrial based radio transmission including data, voice, and video. Both point-to-point and point-to-multipoint operations are permitted. For government agencies and municipalities, microwave systems can provide a more cost-effective solution with increased communications reliability and extended coverage over typical T1 and Fiber connections.
Mobile Communications Units	A **Mobile Communications Unit** (MCU) refers to any vehicular asset that can be deployed to provide or supplement communications capabilities in an incident area. Examples of the communications devices an MCU can house include subscriber and base station radios of various frequency bands, gateway devices, satellite phones, wireless computer networks, and video broadcasting/receiving equipment. MCUs provide the ability to communicate with every agency called upon to support an incident. This would include any Federal agencies, State agencies, County Sheriffs' offices, municipal police departments, fire departments and protection districts/dispatch centers, highway departments, park departments, hospitals, ambulances, the American Red Cross, and amateur radio operators.
Mobile and Portable Radios	Mobile Radios installed in vehicles as well as Portable Radios that are hand-held units **can also be called subscriber units**. The cost associated with Subscriber Units includes the cost for the hardware, as well as all the software flash upgrades and programming costs.
Narrowbanding	FCC Docket 99-87: In December 2004, the FCC mandated that all Land Mobile Radio Systems operating below 512 MHz must upgrade to **Narrowband** equipment that more efficiently uses the frequency spectrum. Licensees are required to switch from equipment that uses 25 KHz of bandwidth (Wideband) for each channel, to equipment that uses 12.5 KHz (Narrowband) bandwidth per channel. The deadline for licensees to complete the transition is 12-31-2012.

Glossary

Term	Definitions
Project 25 Standards	Refers to the **Project 25** (P25) suite of standards for digital radio communications for use by Federal, State/province and local public safety agencies to enable them to communicate with other agencies and mutual aid response teams in emergencies. For additional information on P25 standards, please see http://www.project25.org
Radio Towers/Antennas	**Radio masts and towers** are structures designed to support antennas for telecommunications systems. **Antennas** provide system capability to transmit and receive radio waves.
Radio Access Network	The **Radio Access Network** (RAN) implements a radio access technology. Conceptually, it sits between the Mobile phone, and the core network. RAN equipment supports the administration and provisioning of the local users.
Repeaters	A **radio repeater** is a combination of a radio receiver and a radio transmitter that receives a weak or low-level signal and retransmits it at a higher level or higher power, so that the signal can cover longer distances without degradation. In dispatching, and emergency services communications, repeaters are used extensively to relay radio signals across a wider area. With most emergency dispatching systems, the repeater is synonymous with the base station, which performs both functions.

Appendix C:

Expenditures on Communications Interoperability Equipment by: COG / State Fiscal Year and Purchased Equipment Type

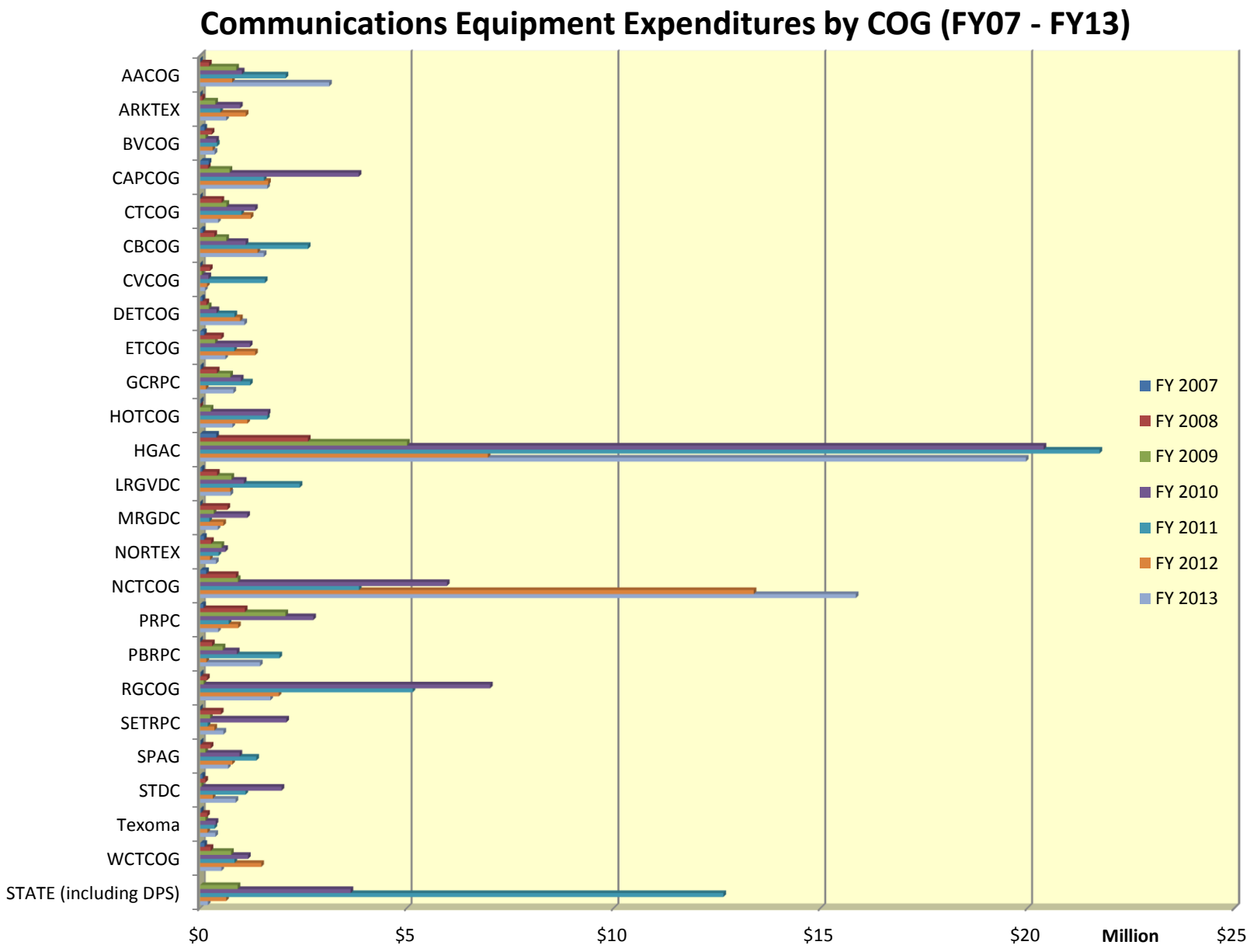
Appendix C-1:

Summary of Expenditures by COG on Interoperable Communications Equipment Using TxDPS-SAA Administered Federal Grant Funds for Texas State Fiscal Years 2007 through FY2013

Expenditures by COG on Interoperable Communications Equipment using DPS-Administered Federal Grant Funds for Texas State Fiscal Years FY 2007 through FY 2013

COG	FY07-08 9/1/06 -8/31/08	FY2009 9/1/08 - 8/31/09	FY2010 9/1/09 - 8/31/10	FY2011 9/1/10 - 8/31/11	FY2012 9/1/11 - 8/31/12	FY2013 9/1/12 - 8/31/13	Total
AACOG	$ 214,400.89	$ 871,216.44	$ 1,006,479.01	$ 2,066,133.54	$ 770,479.48	$ 3,116,716.76	**$ 8,045,426.12**
ARKTEX	$ 52,546.03	$ 364,434.83	$ 963,913.23	$ 485,850.07	$ 1,102,131.36	$ 630,078.29	**$ 3,598,953.81**
BVCOG	$ 381,295.37	$ 127,595.53	$ 388,223.91	$ 405,444.09	$ 299,238.30	$ 349,297.23	**$ 1,951,094.43**
CAPCOG	$ 394,440.03	$ 711,562.27	$ 3,832,317.86	$ 1,540,422.21	$ 1,642,613.48	$ 1,620,602.27	**$ 9,741,958.12**
CTCOG	$ 514,798.41	$ 635,946.20	$ 1,327,276.62	$ 994,766.33	$ 1,221,968.45	$ 434,222.20	**$ 5,128,978.21**
CBCOG	$ 402,385.74	$ 631,713.25	$ 1,099,314.36	$ 2,602,540.42	$ 1,387,328.90	$ 1,538,806.41	**$ 7,662,089.08**
CVCOG	$ 236,282.42	$ 36,392.51	$ 199,970.00	$ 1,564,047.10	$ 166,090.28	$ 118,296.05	**$ 2,321,078.36**
DETCOG	$ 205,204.22	$ 209,981.22	$ 395,408.10	$ 827,651.57	$ 963,851.36	$ 1,068,731.21	**$ 3,670,827.68**
ETCOG	$ 602,212.72	$ 359,945.73	$ 1,200,381.97	$ 822,054.56	$ 1,327,785.01	$ 607,536.12	**$ 4,919,916.11**
GCRPC	$ 426,636.13	$ 726,972.12	$ 983,381.71	$ 1,205,266.40	$ 138,562.03	$ 801,888.68	**$ 4,282,707.07**
HOTCOG	$ 23,038.41	$ 253,398.86	$ 1,633,781.82	$ 1,617,273.50	$ 1,140,216.96	$ 779,015.03	**$ 5,446,724.58**
HGAC	$ 2,992,316.66	$ 4,999,519.46	$ 20,387,233.19	$ 21,737,218.26	$ 6,953,228.33	$ 19,959,851.44	**$ 77,029,367.34**
LRGVDC	$ 448,106.87	$ 755,219.02	$ 1,056,994.92	$ 2,404,988.62	$ 724,085.45	$ 733,381.55	**$ 6,122,776.43**
MRGDC	$ 660,075.29	$ 326,673.50	$ 1,137,678.44	$ 220,686.53	$ 560,115.18	$ 425,990.09	**$ 3,331,219.03**
NORTEX	$ 358,281.98	$ 515,332.22	$ 606,685.86	$ 443,232.03	$ 238,334.50	$ 382,415.20	**$ 2,544,281.79**
NCTCOG	$ 1,007,763.54	$ 909,584.56	$ 5,964,191.37	$ 3,836,833.30	$ 13,379,406.26	$ 15,847,993.56	**$ 40,945,772.59**
PRPC	$ 1,154,494.14	$ 2,060,382.78	$ 2,733,388.35	$ 689,052.31	$ 916,138.81	$ 435,778.90	**$ 7,989,235.29**
PBRPC	$ 286,696.95	$ 543,697.54	$ 886,484.63	$ 1,915,967.20	$ 150,508.04	$ 1,445,085.18	**$ 5,228,439.54**
RGCOG	$ 184,889.09	$ 81,825.67	$ 7,007,310.19	$ 5,136,021.71	$ 1,899,315.70	$ 1,695,193.89	**$ 16,004,556.25**
SETRPC	$ 501,228.75	$ 238,411.38	$ 2,081,892.32	$ 182,069.90	$ 343,080.83	$ 562,664.11	**$ 3,909,347.29**
SPAG	$ 270,639.53	$ 125,539.66	$ 951,568.32	$ 1,356,779.48	$ 775,156.36	$ 674,574.68	**$ 4,154,258.03**
STDC	$ 180,515.23	$ 27,601.77	$ 1,968,170.85	$ 1,095,705.76	$ 305,397.13	$ 854,846.09	**$ 4,432,236.83**
Texoma	$ 192,265.10	$ 126,250.50	$ 374,103.85	$ 346,688.52	$ 174,184.00	$ 366,699.60	**$ 1,580,191.57**
WCTCOG	$ 353,586.30	$ 747,073.42	$ 1,156,826.55	$ 828,800.24	$ 1,477,153.07	$ 512,693.74	**$ 5,076,133.32**
STATE (including DPS)	$ -	$ 905,280.00	$ 3,636,061.73	$ 12,647,611.80	$ 629,651.29	$ 186,936.24	**$ 18,005,541.06**
Total	**$12,044,099.80**	**$17,291,550.44**	**$62,979,039.16**	**$66,973,105.45**	**$38,686,020.56**	**$55,149,294.52**	**$ 253,123,109.93**

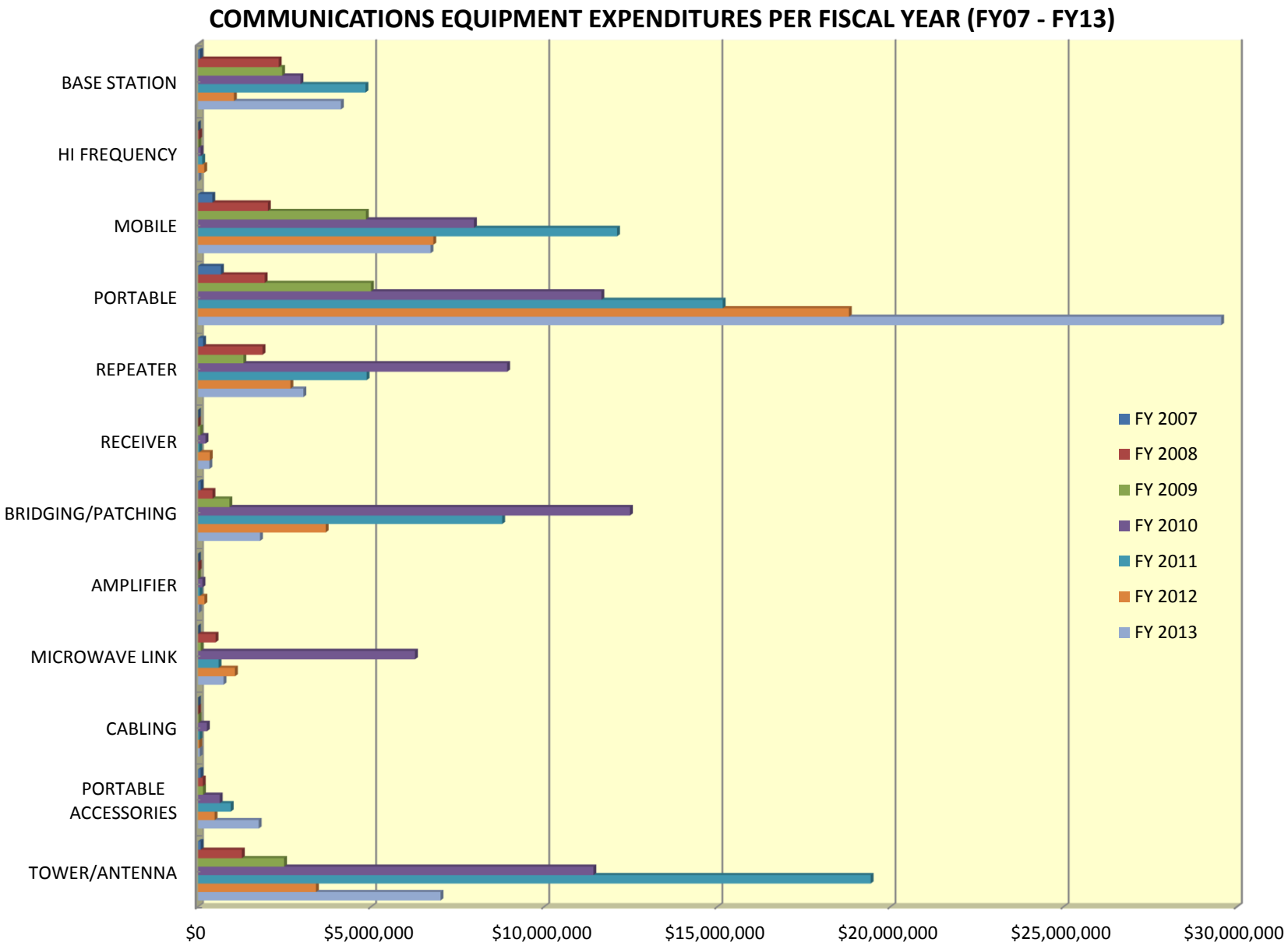
NOTE: TxDPS-SAA administered Federal grant funds to UASI jurisdictions for interoperable communications are captured in the figures under the COG name where the UASI jurisdiction is located.


Communications Equipment Expenditures by COG (FY07 - FY13)
AACOG
ARKTEX
BVCOG
CAPCOG
CTCOG
CBCOG
CVCOG
DETCOG
ETCOG
GCRPC
HOTCOG
HGAC
LRGVDC
MRGDC
NORTEX
NCTCOG
PRPC
PBRPC
RGCOG
SETRPC
SPAG
STDC
Texoma
WCTCOG
STATE (including DPS)
$0
$5
$10
$15
$20
Million
$25
FY 2007
FY 2008
FY 2009
FY 2010
FY 2011
FY 2012
FY 2013

Appendix C-2:
Expenditures on Communications Interoperability Equipment by Equipment Type and Texas State Fiscal Years FY2007 – FY2013

Communications Equipment Expenditures by Equipment Type and Fiscal Year

Equipment Type	FY 07-08	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	TOTALS
BASE STATION	$ 2,389,557.46	$ 2,429,381.55	$ 2,959,630.11	$ 4,836,863.98	$ 1,038,756.92	$ 4,128,093.96	$ 17,782,283.98
HI FREQUENCY	$ 33,688.54	$ 10,618.60	$ 73,442.64	$ 122,130.73	$ 180,030.68	$ 18,415.83	$ 438,327.02
MOBILE	$ 2,432,598.73	$ 4,848,877.14	$ 7,970,067.36	$ 12,101,883.11	$ 6,796,502.41	$ 6,715,926.09	$ 40,865,854.84
PORTABLE	$ 2,589,292.74	$ 4,995,503.83	$ 11,650,938.80	$ 15,154,288.02	$ 18,797,488.86	$ 29,549,362.92	$ 82,736,875.17
REPEATER	$ 2,012,385.43	$ 1,311,300.98	$ 8,929,133.10	$ 4,870,270.91	$ 2,669,500.09	$ 3,044,216.13	$ 22,836,806.64
RECEIVER	$ -	$ 62,174.50	$ 217,579.22	$ 38,757.78	$ 341,389.89	$ 328,776.46	$ 988,677.85
BRIDGING/PATCHING	$ 495,989.72	$ 906,803.67	$ 12,474,785.07	$ 8,785,369.27	$ 3,687,621.27	$ 1,791,340.35	$ 28,141,909.35
AMPLIFIER	$ 23,047.35	$ 1,390.75	$ 130,621.94	$ 50,720.03	$ 184,842.90	$ 28,328.96	$ 418,951.93
MICROWAVE LINK	$ 507,472.40	$ 77,111.64	$ 6,266,688.15	$ 594,695.83	$ 1,067,648.79	$ 737,732.81	$ 9,251,349.62
CABLING	$ 3,670.56	$ 17,328.84	$ 257,166.24	$ 46,192.51	$ 36,527.68	$ 49,632.65	$ 410,518.48
PORTABLE ACCESSORIES	$ 211,754.55	$ 144,271.14	$ 629,709.63	$ 946,076.69	$ 479,466.42	$ 1,753,117.82	$ 4,164,396.25
TOWER/ANTENNA	$ 1,344,642.32	$ 2,486,787.80	$ 11,419,276.90	$ 19,425,856.59	$ 3,406,244.65	$ 7,004,350.54	$ 45,087,158.80
TOTAL	**$ 12,044,099.80**	**$ 17,291,550.44**	**$ 62,979,039.16**	**$ 66,973,105.45**	**$ 38,686,020.56**	**$ 55,149,294.52**	**$ 253,123,109.93**


COMMUNICATIONS EQUIPMENT EXPENDITURES PER FISCAL YEAR (FY07 - FY13)
BASE STATION
HI FREQUENCY
MOBILE
PORTABLE
REPEATER
RECEIVER
BRIDGING/PATCHING
AMPLIFIER
MICROWAVE LINK
CABLING
PORTABLE ACCESSORIES
TOWER/ANTENNA
$0
$5,000,000
$10,000,000
$15,000,000
$20,000,000
$25,000,000
$30,000,000
FY 2007
FY 2008
FY 2009
FY 2010
FY 2011
FY 2012
FY 2013

Appendix D:
Voice Radio Communications Interoperability Levels across Texas

7 The Current Status of Voice Communications Interoperability in Texas (as of COG County Survey 7/28/14)

The Texas Statewide Communications Interoperability Maturity Model (TSCIMM), which appears below, is based on the SAFECOM Interoperability Continuum.[16] The TSCIMM outlines the evolution from the lowest level to the highest level of communications interoperability (Level One – least interoperable to Level Five – most interoperable). The following map of Texas highlights the current status of each county regarding their level of interoperability in the "Voice Technology" lane of the TSCIMM. The status is indicated by the individual colors associated with the five levels of interoperability in the TSCIMM.

Level One = The lowest level of interoperability, which is accomplished by physically exchanging radios to communicate with other agencies (swap radios)

Level Two = Minimal interoperability, which is accomplished with the use of gateway devices (electronically interconnecting two or more disparate radio systems through gateways)

Level Three = Mid-range interoperability through the use of shared channels

Level Four = Improved interoperability through the use of shared proprietary system(s)

Level Five = The optimal level of full interoperability through the use of P25 standards-based shared system(s) to communicate with other agencies

The color-coded map reflects a snapshot of each county's status of voice communications interoperability. This information was obtained directly from the 24 COGs through a survey submitted to DPS as of July 15, 2014. As the map indicates, for the most part, Texas has achieved slightly above Level Three (mid-range) wireless communications interoperability. In Appendix C, the three tables following the same map list the:

a) interoperability level of each county, sorted at the COG level;

b) interoperability level of each county, sorted by level; and

c) interoperability level of each county, sorted by county name alphabetically. The average level of interoperability statewide was determined to be 3.85 on the five-level scale, an increase from 3.8 in 2013.

[16] For additional information about the U.S. Department of Homeland Security's SAFECOM Interoperability Continuum developed by the SAFECOM program, see http://www.safecomprogram.gov/oecguidancedocuments/continuum/Default.aspx

Texas Statewide Communications Interoperability Maturity Model

Level 1
Minimal Interoperability
(Swap Radios)

Governance
Individual Agencies Working Independently

SOP
Individual Agency SOPs

DATA Technology
Swap Files

VOICE Technology
Swap Radios

Training and Exercises
General Orientation on Equipment and Applications

Usage
Planned Events

Level 2
Limited Interoperability
(Use of Gateways)

Governance
Informal Coordination Between Agencies

SOP
Joint SOPs for Planned Events

DATA Technology
Common Applications

VOICE Technology
Gateway

Training and Exercises
Single Agency Tabletop Exercises for Key field and Support Staff

Usage
Localized Emergency Incidents

Level 3
Mid-Range Interoperability
(Use of Shared Channels)

Governance
Key Multi-Discipline Staff Collaboration on a Regular Basis

SOP
Joint SOPs for Emergencies

DATA Technology
Custom Interfaced Applications

VOICE Technology
Shared Channels

Training and Exercises
Multi-agency Tabletop Exercises for Key Field and Support Staff

Usage
Localized Emergency Incidents

Level 4
Improved Interoperability
(Use of Proprietary Shared Systems)

Governance
Key Multi-Discipline Staff Collaboration on a Regular Basis

SOP
Regional Set of Communications SOPs

DATA Technology
One-Way Standards-Based Sharing

VOICE Technology
Proprietary Shared System

Training and Exercises
Multi-agency Full Functional Exercises Involving All Staff

Usage
Regional Incident Management

Level 5 - Full Interoperability
(P25 Standards-Based, Shared Systems)

Governance
Regional Committee Working within a Statewide Communications Interoperability Plan Framework

SOP
National Incident Management System Integrated SOPs

DATA Technology
Two-Way Standards-Based Sharing

VOICE Technology
Standards-Based Shared Systems

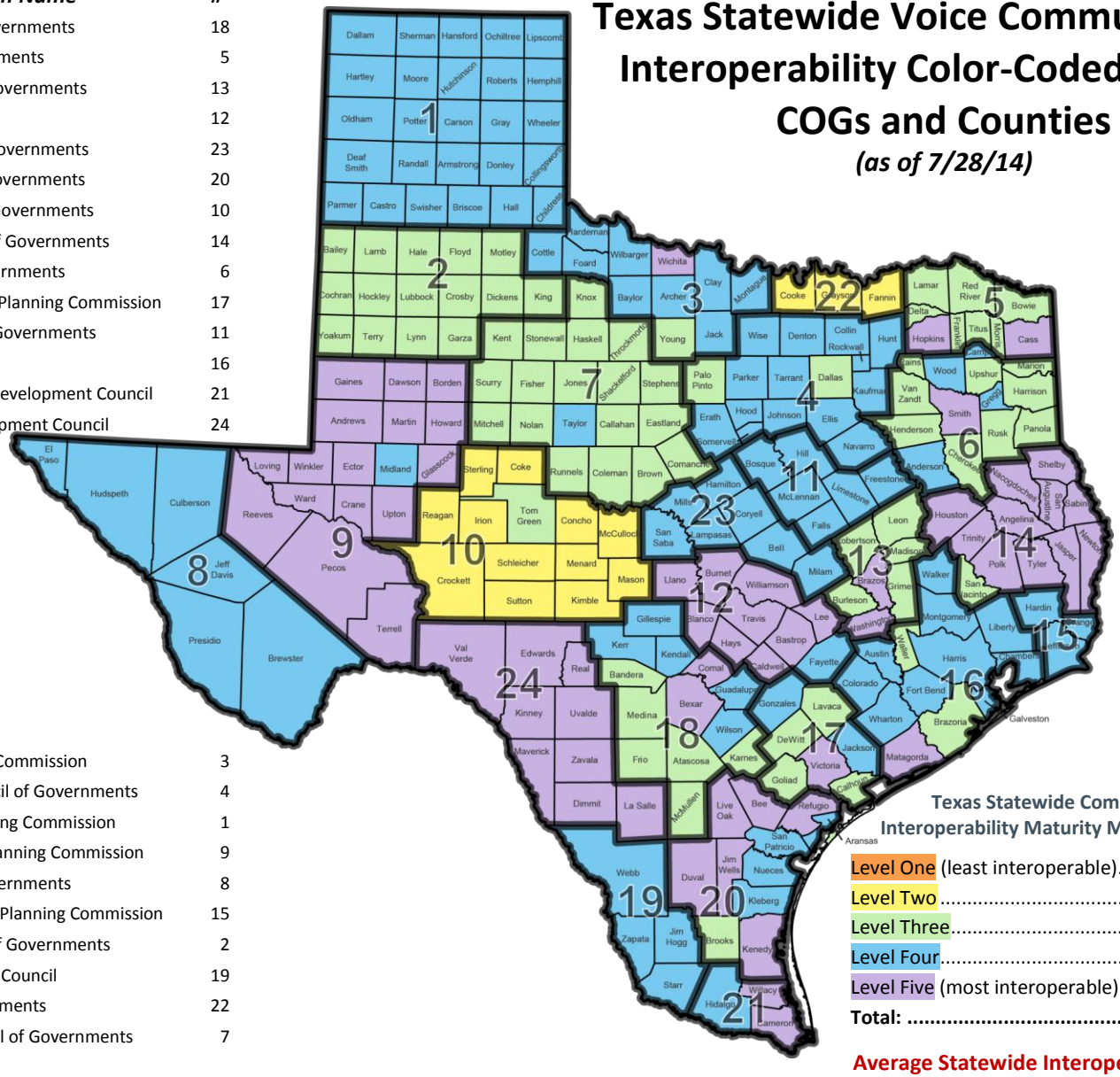
Training and Exercises
Regular Comprehensive Region wide Training and Exercises

Usage
Daily Use Throughout Region

Texas Statewide Voice Communications Interoperability Color-Coded Map by COGs and Counties

(as of 7/28/14)

COG Region Name	*#*
Alamo Area Council of Governments	18
Ark-Tex Council of Governments	5
Brazos Valley Council of Governments	13
Capital Area Council of	12
Central Texas Council of Governments	23
Coastal Bend Council of Governments	20
Concho Valley Council of Governments	10
Deep East Texas Council of Governments	14
East Texas Council of Governments	6
Golden Crescent Regional Planning Commission	17
Heart of Texas Council of Governments	11
Houston-Galveston Area	16
Lower Rio Grande Valley Development Council	21
Middle Rio Grande Development Council	24
Nortex Regional Planning Commission	3
North Central Texas Council of Governments	4
Panhandle Regional Planning Commission	1
Permian Basin Regional Planning Commission	9
Rio Grande Council of Governments	8
South East Texas Regional Planning Commission	15
South Plains Association of Governments	2
South Texas Development Council	19
Texoma Council of Governments	22
West Central Texas Council of Governments	7



Texas Statewide Communications Interoperability Maturity Model Color Codes:

Level One (least interoperable)..... 0 Counties
Level Two ..... 15 Counties
Level Three..... 72 Counties
Level Four..... 104 Counties
Level Five (most interoperable) ..... 63 Counties
Total: ..... 254 Counties

Average Statewide Interoperability Level: 3.85

Communications Interoperability Status by COG and County (As of 7/28/14)

Alamo Area COG		***Coastal Bend COG***		Panola	3
Bexar	5	Bee	5	Rains	3
Comal	5	Duval	5	Rusk	3
Gillespie	4	Jim Wells	5	Upshur	3
Guadalupe	4	Kenedy	5	Van Zandt	3
Kendall	4	Live Oak	5	***Golden Crescent Regional Planning Commission***	
Kerr	4	Refugio	5	Victoria	5
Wilson	4	Aransas	4	Gonzales	4
Atascosa	3	Nueces	4	Jackson	4
Bandera	3	Kleberg	4	Calhoun	3
Frio	3	San Patricio	4	DeWitt	3
Karnes	3	Brooks	3	Goliad	3
McMullen	3	***Concho Valley COG***		Lavaca	3
Medina	3	Tom Green	3	***Heart of Texas COG***	
Ark-Tex COG		Coke	2	Bosque	4
Cass	5	Concho	2	Falls	4
Hopkins	5	Crockett	2	Freestone	4
Bowie	3	Irion	2	Hill	4
Delta	3	Kimble	2	Limestone	4
Franklin	3	Mason	2	McLennan	4
Lamar	3	McCulloch	2	***Houston - Galveston Area COG***	
Morris	3	Menard	2	Matagorda	5
Red River	3	Reagan	2	Austin	4
Titus	3	Schleicher	2	Chambers	4
Brazos Valley COG		Sterling	2	Colorado	4
Brazos	5	Sutton	2	Fort Bend	4
Washington	5	***Deep East Texas COG***		Galveston	4
Burleson	3	Angelina	5	Harris	4
Grimes	3	Houston	5	Liberty	4
Leon	3	Jasper	5	Montgomery	4
Madison	3	Nacogdoches	5	Walker	4
Robertson	3	Newton	5	Wharton	4
Capital Area COG		Polk	5	Brazoria	3
Bastrop	5	Sabine	5	Waller	3
Blanco	5	San Augustine	5	***Lower Rio Grande Valley Development Council***	
Burnet	5	Shelby	5	Cameron	5
Caldwell	5	Trinity	5	Willacy	5
Hays	5	Tyler	5	Hidalgo	4
Lee	5	San Jacinto	3	***Middle Rio Grande Development Council***	
Llano	5	***East Texas COG***		Dimmit	5
Travis	5	Smith	5	Edwards	5
Williamson	5	Anderson	4	Kinney	5
Fayette	4	Camp	4	LaSalle	5
Central Texas COG		Gregg	4	Maverick	5
Bell	4	Wood	4	Real	5
Coryell	4	Cherokee	3	Uvalde	5
Hamilton	4	Harrison	3	Val Verde	5
Lampasas	4	Henderson	3	Zavala	5
Milam	4	Marion	3		
Mills	4				
San Saba	4				

Communications Interoperability Status by COG and County (As of 7/28/14)

Nortex Regional Planning Commission		Hutchinson	4	Crosby	3
Wichita	5	Lipscomb	4	Dickens	3
Archer	4	Moore	4	Floyd	3
Baylor	4	Ochiltree	4	Garza	3
Clay	4	Oldham	4	Hale	3
Cottle	4	Parmer	4	Hockley	3
Foard	4	Potter	4	King	3
Hardeman	4	Randall	4	Lamb	3
Jack	4	Roberts	4	Lubbock	3
Montague	4	Sherman	4	Lynn	3
Wilbarger	4	Swisher	4	Motley	3
Young	3	Wheeler	4	Terry	3
North Central Texas COG		***Permian Basin Regional Planning Commission***		Yoakum	3
Collin	4	Andrews	5	***South Texas Development Council***	
Denton	4	Borden	5	Jim Hogg	4
Ellis	4	Crane	5	Starr	4
Erath	4	Dawson	5	Webb	4
Hood	4	Ector	5	Zapata	4
Hunt	4	Gaines	5	***Texoma Council of Governments***	
Johnson	4	Glasscock	5	Cooke	2
Kaufman	4	Howard	5	Fannin	2
Navarro	4	Loving	5	Grayson	2
Parker	4	Martin	5	***West Central Texas COG***	
Rockwall	4	Pecos	5	Taylor	4
Somervell	4	Reeves	5	Brown	3
Tarrant	4	Terrell	5	Callahan	3
Wise	4	Upton	5	Coleman	3
Dallas	3	Ward	5	Comanche	3
Palo Pinto	3	Winkler	5	Eastland	3
Panhandle Regional Planning Commission		Midland	4	Fisher	3
Armstrong	4	***Rio Grande Council of Governments***		Haskell	3
Briscoe	4	Brewster	4	Jones	3
Carson	4	Culberson	4	Kent	3
Castro	4	El Paso	4	Knox	3
Childress	4	Hudspeth	4	Mitchell	3
Collingsworth	4	Jeff Davis	4	Nolan	3
Dallam	4	Presidio	4	Runnels	3
Deaf Smith	4	***South East Texas Regional Planning Commission***		Scurry	3
Donley	4	Hardin	4	Shackelford	3
Gray	4	Jefferson	4	Stephens	3
Hall	4	Orange	4	Stonewall	3
Hansford	4	***South Plains Association of Governments***		Throckmorton	3
Hartley	4	Bailey	3		
Hemphill	4	Cochran	3		

Communications Interoperability Status by Level and County (As of 7/28/14)

County	COG	Level
Andrews	Permian Basin Regional Planning Commission	5
Angelina	Deep East Texas Council of Governments	5
Bastrop	Capital Area Council of Governments	5
Bee	Coastal Bend Council of Governments	5
Bexar	Alamo Area Council of Governments	5
Blanco	Capital Area Council of Governments	5
Borden	Permian Basin Regional Planning Commission	5
Brazos	Brazos Valley Council of Governments	5
Burnet	Capital Area Council of Governments	5
Caldwell	Capital Area Council of Governments	5
Cameron	Lower Rio Grande Valley Development Council	5
Cass	Ark-Tex Council of Governments	5
Comal	Alamo Area Council of Governments	5
Crane	Permian Basin Regional Planning Commission	5
Dawson	Permian Basin Regional Planning Commission	5
Dimmit	Middle Rio Grande Development Council	5
Duval	Coastal Bend Council of Governments	5
Ector	Permian Basin Regional Planning Commission	5
Edwards	Middle Rio Grande Development Council	5
Gaines	Permian Basin Regional Planning Commission	5
Glasscock	Permian Basin Regional Planning Commission	5
Hays	Capital Area Council of Governments	5
Hopkins	Ark-Tex Council of Governments	5
Houston	Deep East Texas Council of Governments	5
Howard	Permian Basin Regional Planning Commission	5
Jasper	Deep East Texas Council of Governments	5
Jim Wells	Coastal Bend Council of Governments	5
Kenedy	Coastal Bend Council of Governments	5
Kinney	Middle Rio Grande Development Council	5
LaSalle	Middle Rio Grande Development Council	5
Lee	Capital Area Council of Governments	5
Live Oak	Coastal Bend Council of Governments	5
Llano	Capital Area Council of Governments	5
Loving	Permian Basin Regional Planning Commission	5
Martin	Permian Basin Regional Planning Commission	5
Matagorda	Houston-Galveston Area Council	5
Maverick	Middle Rio Grande Development Council	5
Nacogdoches	Deep East Texas Council of Governments	5

County	COG	Level
Newton	Deep East Texas Council of Governments	5
Pecos	Permian Basin Regional Planning Commission	5
Polk	Deep East Texas Council of Governments	5
Real	Middle Rio Grande Development Council	5
Reeves	Permian Basin Regional Planning Commission	5
Refugio	Coastal Bend Council of Governments	5
Sabine	Deep East Texas Council of Governments	5
San Augustine	Deep East Texas Council of Governments	5
Shelby	Deep East Texas Council of Governments	5
Smith	East Texas Council of Governments	5
Terrell	Permian Basin Regional Planning Commission	5
Travis	Capital Area Council of Governments	5
Trinity	Deep East Texas Council of Governments	5
Tyler	Deep East Texas Council of Governments	5
Upton	Permian Basin Regional Planning Commission	5
Uvalde	Middle Rio Grande Development Council	5
Val Verde	Middle Rio Grande Development Council	5
Victoria	Golden Crescent Regional Planning Commission	5
Ward	Permian Basin Regional Planning Commission	5
Washington	Brazos Valley Council of Governments	5
Wichita	Nortex Regional Planning Commission	5
Willacy	Lower Rio Grande Valley Development Council	5
Williamson	Capital Area Council of Governments	5
Winkler	Permian Basin Regional Planning Commission	5
Zavala	Middle Rio Grande Development Council	5
Anderson	East Texas Council of Governments	4
Aransas	Coastal Bend Council of Governments	4
Archer	Nortex Regional Planning Commission	4
Armstrong	Panhandle Regional Planning Commission	4
Austin	Houston-Galveston Area Council	4
Baylor	Nortex Regional Planning Commission	4
Bell	Central Texas Council of Governments	4
Bosque	Heart of Texas Council of Governments	4
Brewster	Rio Grande Council of Governments	4
Briscoe	Panhandle Regional Planning Commission	4
Camp	East Texas Council of Governments	4
Carson	Panhandle Regional Planning Commission	4
Castro	Panhandle Regional Planning Commission	4
Chambers	Houston-Galveston Area Council	4
Childress	Panhandle Regional Planning Commission	4

County	COG	Level
Clay	Nortex Regional Planning Commission	4
Collin	North Central Texas Council of Governments	4
Collingsworth	Panhandle Regional Planning Commission	4
Colorado	Houston-Galveston Area Council	4
Coryell	Central Texas Council of Governments	4
Cottle	Nortex Regional Planning Commission	4
Culberson	Rio Grande Council of Governments	4
Dallam	Panhandle Regional Planning Commission	4
Deaf Smith	Panhandle Regional Planning Commission	4
Denton	North Central Texas Council of Governments	4
Donley	Panhandle Regional Planning Commission	4
El Paso	Rio Grande Council of Governments	4
Ellis	North Central Texas Council of Governments	4
Erath	North Central Texas Council of Governments	4
Falls	Heart of Texas Council of Governments	4
Fayette	Capital Area Council of Governments	4
Foard	Nortex Regional Planning Commission	4
Fort Bend	Houston-Galveston Area Council	4
Freestone	Heart of Texas Council of Governments	4
Galveston	Houston-Galveston Area Council	4
Gillespie	Alamo Area Council of Governments	4
Gonzales	Golden Crescent Regional Planning Commission	4
Gray	Panhandle Regional Planning Commission	4
Gregg	East Texas Council of Governments	4
Guadalupe	Alamo Area Council of Governments	4
Hall	Panhandle Regional Planning Commission	4
Hamilton	Central Texas Council of Governments	4
Hansford	Panhandle Regional Planning Commission	4
Hardeman	Nortex Regional Planning Commission	4
Hardin	South East Texas Regional Planning Commission	4
Harris	Houston-Galveston Area Council	4
Hartley	Panhandle Regional Planning Commission	4
Hemphill	Panhandle Regional Planning Commission	4
Hidalgo	Lower Rio Grande Valley Development Council	4
Hill	Heart of Texas Council of Governments	4
Hood	North Central Texas Council of Governments	4
Hudspeth	Rio Grande Council of Governments	4
Hunt	North Central Texas Council of Governments	4
Hutchinson	Panhandle Regional Planning Commission	4
Jack	Nortex Regional Planning Commission	4

County	COG	Level
Jackson	Golden Crescent Regional Planning Commission	4
Jeff Davis	Rio Grande Council of Governments	4
Jefferson	South East Texas Regional Planning Commission	4
Jim Hogg	South Texas Development Council	4
Johnson	North Central Texas Council of Governments	4
Kaufman	North Central Texas Council of Governments	4
Kendall	Alamo Area Council of Governments	4
Kerr	Alamo Area Council of Governments	4
Kleberg	Coastal Bend Council of Governments	4
Lampasas	Central Texas Council of Governments	4
Liberty	Houston-Galveston Area Council	4
Limestone	Heart of Texas Council of Governments	4
Lipscomb	Panhandle Regional Planning Commission	4
McLennan	Heart of Texas Council of Governments	4
Midland	Permian Basin Regional Planning Commission	4
Milam	Central Texas Council of Governments	4
Mills	Central Texas Council of Governments	4
Montague	Nortex Regional Planning Commission	4
Montgomery	Houston-Galveston Area Council	4
Moore	Panhandle Regional Planning Commission	4
Navarro	North Central Texas Council of Governments	4
Nueces	Coastal Bend Council of Governments	4
Ochiltree	Panhandle Regional Planning Commission	4
Oldham	Panhandle Regional Planning Commission	4
Orange	South East Texas Regional Planning Commission	4
Parker	North Central Texas Council of Governments	4
Parmer	Panhandle Regional Planning Commission	4
Potter	Panhandle Regional Planning Commission	4
Presidio	Rio Grande Council of Governments	4
Randall	Panhandle Regional Planning Commission	4
Roberts	Panhandle Regional Planning Commission	4
Rockwall	North Central Texas Council of Governments	4
San Patricio	Coastal Bend Council of Governments	4
San Saba	Central Texas Council of Governments	4
Sherman	Panhandle Regional Planning Commission	4
Somervell	North Central Texas Council of Governments	4
Starr	South Texas Development Council	4
Swisher	Panhandle Regional Planning Commission	4
Tarrant	North Central Texas Council of Governments	4
Taylor	West Central Texas Council of Governments	4

County	COG	Level
Walker	Houston-Galveston Area Council	4
Webb	South Texas Development Council	4
Wharton	Houston-Galveston Area Council	4
Wheeler	Panhandle Regional Planning Commission	4
Wilbarger	Nortex Regional Planning Commission	4
Wilson	Alamo Area Council of Governments	4
Wise	North Central Texas Council of Governments	4
Wood	East Texas Council of Governments	4
Zapata	South Texas Development Council	4
Atascosa	Alamo Area Council of Governments	3
Bailey	South Plains Association of Governments	3
Bandera	Alamo Area Council of Governments	3
Bowie	Ark-Tex Council of Governments	3
Brazoria	Houston-Galveston Area Council	3
Brooks	Coastal Bend Council of Governments	3
Brown	West Central Texas Council of Governments	3
Burleson	Brazos Valley Council of Governments	3
Calhoun	Golden Crescent Regional Planning Commission	3
Callahan	West Central Texas Council of Governments	3
Cherokee	East Texas Council of Governments	3
Cochran	South Plains Association of Governments	3
Coleman	West Central Texas Council of Governments	3
Comanche	West Central Texas Council of Governments	3
Crosby	South Plains Association of Governments	3
Dallas	North Central Texas Council of Governments	3
Delta	Ark-Tex Council of Governments	3
Dewitt	Golden Crescent Regional Planning Commission	3
Dickens	South Plains Association of Governments	3
Eastland	West Central Texas Council of Governments	3
Fisher	West Central Texas Council of Governments	3
Floyd	South Plains Association of Governments	3
Franklin	Ark-Tex Council of Governments	3
Frio	Alamo Area Council of Governments	3
Garza	South Plains Association of Governments	3
Goliad	Golden Crescent Regional Planning Commission	3
Grimes	Brazos Valley Council of Governments	3
Hale	South Plains Association of Governments	3
Harrison	East Texas Council of Governments	3
Haskell	West Central Texas Council of Governments	3
Henderson	East Texas Council of Governments	3

County	COG	Level
Hockley	South Plains Association of Governments	3
Jones	West Central Texas Council of Governments	3
Karnes	Alamo Area Council of Governments	3
Kent	West Central Texas Council of Governments	3
King	South Plains Association of Governments	3
Knox	West Central Texas Council of Governments	3
Lamar	Ark-Tex Council of Governments	3
Lamb	South Plains Association of Governments	3
Lavaca	Golden Crescent Regional Planning Commission	3
Leon	Brazos Valley Council of Governments	3
Lubbock	South Plains Association of Governments	3
Lynn	South Plains Association of Governments	3
Madison	Brazos Valley Council of Governments	3
Marion	East Texas Council of Governments	3
McMullen	Alamo Area Council of Governments	3
Medina	Alamo Area Council of Governments	3
Mitchell	West Central Texas Council of Governments	3
Morris	Ark-Tex Council of Governments	3
Motley	South Plains Association of Governments	3
Nolan	West Central Texas Council of Governments	3
Palo Pinto	North Central Texas Council of Governments	3
Panola	East Texas Council of Governments	3
Rains	East Texas Council of Governments	3
Red River	Ark-Tex Council of Governments	3
Robertson	Brazos Valley Council of Governments	3
Runnels	West Central Texas Council of Governments	3
Rusk	East Texas Council of Governments	3
San Jacinto	Deep East Texas Council of Governments	3
Scurry	West Central Texas Council of Governments	3
Shackelford	West Central Texas Council of Governments	3
Stephens	West Central Texas Council of Governments	3
Stonewall	West Central Texas Council of Governments	3
Terry	South Plains Association of Governments	3
Throckmorton	West Central Texas Council of Governments	3
Titus	Ark-Tex Council of Governments	3
Tom Green	Concho Valley Council of Governments	3
Upshur	East Texas Council of Governments	3
Van Zandt	East Texas Council of Governments	3
Waller	Houston-Galveston Area Council	3
Yoakum	South Plains Association of Governments	3

County	COG	Level
Young	Nortex Regional Planning Commission	3
Coke	Concho Valley Council of Governments	2
Concho	Concho Valley Council of Governments	2
Cooke	Texoma Council of Governments	2
Crockett	Concho Valley Council of Governments	2
Fannin	Texoma Council of Governments	2
Grayson	Texoma Council of Governments	2
Irion	Concho Valley Council of Governments	2
Kimble	Concho Valley Council of Governments	2
Mason	Concho Valley Council of Governments	2
McCulloch	Concho Valley Council of Governments	2
Menard	Concho Valley Council of Governments	2
Reagan	Concho Valley Council of Governments	2
Schleicher	Concho Valley Council of Governments	2
Sterling	Concho Valley Council of Governments	2
Sutton	Concho Valley Council of Governments	2

Appendix E:
Associated Documents and Information

Associated Documents and Information

Additional supporting information such as the resources below can be found on the Texas Department of Public Safety website: http://www.dps.texas.gov/LawEnforcementSupport/communications/interop/

- "When They Can't Talk" brochure – from the National Association of Counties
- "Operation Texas Talks" brochure
- Texas Statewide Communications Interoperability Plan (SCIP)
- State of Texas Expedited Petition for 700 MHz Broadband Waiver, State of Texas Petition for Expedition, FCC 700 MHz Broadband Waiver Grant to State of Texas, and State of Texas Broadband Interoperability Showing to the FCC
- Texas Statewide Interoperability Channel Plan
- SCIP Implementation Reports to U.S. Dept. of Homeland Security, Office of Emergency Communications for 2008, 2009, 2010, 2011, and 2012
- National Emergency Communications Plan, 2008