

**Wireless Communications  
Interoperability Status  
Phase I Report to the  
Western Governors Association**

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**Prepared by  
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WITC/ IAC West Wireless Communications Interoperability  
Phase I Report

**Table of Contents**

Table of Contents .....	2
1 Executive Summary .....	4
2 Introduction .....	5
2.1 Background .....	5
2.2 Intended Audience.....	5
2.3 Objectives.....	5
3 Study Analysis.....	7
3.1 Western State CIO Issues .....	7
3.2 National Activities.....	7
3.2.1 SAFECOM Program .....	7
3.2.1.1 Purpose .....	7
3.2.1.2 Initiatives .....	8
3.2.1.3 SAFECOM Grant Standards .....	8
3.2.2 PSWN.....	9
3.2.2.1 The State of Interoperability .....	9
3.2.2.2 Policy Solutions.....	10
3.2.2.3 Technical Solutions .....	10
3.2.2.4 Piloted Solutions .....	11
3.2.3 AGILE.....	12
3.2.3.1 Standards .....	12
3.2.3.2 Technology.....	13
3.2.4 Summit on Interoperable Communication for Public Safety .....	14
3.2.5 National Association of State CIOs (NASCIO).....	15
3.2.5.1 NASCIO Enterprise Architecture Development Tool-Kit.....	15
3.2.5.2 Concept for Operations for Integrated Justice Information Sharing .....	16
3.2.6 USNORTHCOM.....	16
3.2.6.1 Spectrum Management Strategy .....	16
3.2.6.2 Determined Promise 03.....	17
3.2.7 Homeland Security Command and Control ACTD .....	18
3.2.8 Standards Activities.....	19
3.2.8.1 Project 25.....	19

# WITC/ IAC West Wireless Communications Interoperability Phase I Report

3.2.8.2	MESA.....	21
3.2.8.3	IPv6 .....	23
3.3	Technology Trends.....	23
3.3.1	ERT Program.....	23
3.3.2	Software Radios .....	24
3.4	Key Lessons Learned .....	25
3.4.1	Extensive National Activity .....	25
3.4.2	Major Process Issues .....	25
3.4.3	Funding Available .....	25
3.4.4	Standards Incomplete .....	25
3.4.5	Processes vs. Technology.....	25
3.4.6	Voice vs. Data Interoperability .....	25
3.4.7	Access Rights .....	26
3.4.8	Federal Infrastructure Development.....	26
4	Recommendations .....	27
4.1	State Participation Opportunities .....	27
4.1.1	Participate in Federal Architecture Definition .....	27
4.1.2	Develop Regional Public Safety “Business Processes” .....	27
4.1.3	Define “Need to know” for “Business Processes” .....	27
4.1.4	Participate as Users in Standards Development.....	28
4.1.5	Create Regional Interoperability Pilot Projects.....	28
4.2	Potential Pilot Projects .....	28
4.2.1	Multi State Integrated Justice Demonstration .....	28
4.2.2	Multi State Integrated Public Health Demonstration .....	28
4.2.3	Integrated Multi State and Federal Forest Fire Demonstration.....	28
4.2.4	Single State/Multi-Department Interoperational Demonstration .....	29
	Appendix A SAFECOM Grant Resources Listing .....	30

# WITC/ IAC West Wireless Communications Interoperability Phase I Report

## 1 Executive Summary

The Western Governors Association (WGA) has expressed concern about aspects of “Interstate Interoperability”. The Western Information Technology Council (WITC), in activities to support the WGA chartered a study in May 2003 to collect information related to Federal Wireless Interoperability activities, assess the trends in the field, and make recommendations to the WGA relative to potential activities to reduce their interoperability concerns. This report covers the first phase of that activity.

There is much Federal activity related to Interoperability in general, and specifically wireless communications interoperability. Potential architectures for a federally funded infrastructure and being studied, defined and proposed by both Federal Agencies and national trade/special interest groups. Technical standards such as P-25 and IPv6 are being developed, and information process templates are being developed. Development and testing of new technology related to wireless interoperability is underway, with some relatively mature technology, such as audio switches, emerging. To encourage interoperability of wireless communications among Federal, state, tribal and local authorities, the Federal Government, is creating common Federal Grant evaluation criteria which emphasize the use of technical standards and creation of multi-jurisdictional governing bodies for federally funded pilot projects.

An analysis of reported national activity led to several “Lessons Learned” in the report. Technical solutions to wireless communications interoperability are available, but are not always feasible from a financial or jurisdictional aspect. The interoperability of both voice communications and data communications should be considered, and in a digital communications world, these types of data “look the same” to the system in many cases. Potentially cooperating organizations, at all governmental levels, need to predefine baseline processes for passing and using information among themselves. This includes determining “who” needs “what” information and “when” should they be allowed access.

WITC recommends the Western Governors and their CIOs participate in a range of activities, from more completely defining processes related to public safety (law, fire and public health), to participating in Standards and IT Architecture activities, to seeking Federal funding to support pilot projects to resolve issues of wireless interoperability. WITC is prepared to work with the Western Governors and their staff to assist in implementing these recommendations.

# WITC/ IAC West Wireless Communications Interoperability Phase I Report

## 2 Introduction

### 2.1 Background

At the Winter 2002 meeting of the Western Governors Association (WGA) on December 6, 2002, Governors Geringer and Johanns sponsored WGA Policy Resolution 02–29, entitled “Interstate Interoperability”. In part that resolution stated:

“In particular, the following initiatives would be foreseeably beneficial:

- a. Coordinated communications planning and development to enable a digital, interoperable communications system based upon common standards for cross-border car-to-car voice and data communication for law enforcement agencies.”

In addition the Western Information Technology Council (WITC), the Industry Advisory Council West Chapter (IAC West), the Rocky Mountain Chapter of the Armed Forces Communications and Electronics Association (AFCEA), Social Security Administration (SSA) Denver, and the Government Services Administration (GSA) Federal Technology Service (FTS) Rocky Mountain Region co-sponsored a conference on February 20, 2003 in Denver, Colorado entitled “The Homeland Security IT Challenge”. That conference was intended to address concerns raised at the 2002 Western CIO Conference, specifically the challenge of sharing critical information among the countless organizations with homeland security responsibilities.

At the February 2003 conference, the Executive Director of the WGA confirmed that one of the top Information Technology (IT) priorities of the WGA was communications interoperability. At the conclusion of the conference, the steering committee for the conference determined again that there were still many open issues related to interoperability across the states. These issues included frequency management, coverage across a state, standards, funding, training and maintenance. At this time WITC and IAC-West determined that they would pursue some of these issues on behalf of the WGA, and would provide study results to the WGA and their CIOs. Subsequently IAC West took responsibility for this study, with inputs from both the WGA and WITC.

### 2.2 Intended Audience

The intended audience for this Study and any follow-on studies are the Western State Governors and the Western State CIOs. This and later studies will include actionable recommendations.

### 2.3 Objectives

The objective of this study is: Identify completed or on-going projects which can be used as models for establishing Homeland Security related wireless Information Technology interoperability standards at the state, regional and national level. Initial planning suggested that the study should be done in progressively more detailed phases, with the first investigative phase to be completed in time to report to the August 2003 Western CIO Forum and the September 2003 WGA meeting. Phase I is the subject of this report.

# WITC/ IAC West Wireless Communications Interoperability Phase I Report

## Scope

The scope of Phase I of the project was approved by the Steering Committee for the study, which consisted of WITC and IAC-West leaders, and included the activities listed below.

- Identify relevant wireless interoperability related projects at the state, regional and national level which touch state/local government on at least one side of the interface;
- assess the success or lack of success of projects identified relative to interoperability issues;
- assess gaps in State/local level interoperability standards indicated by National level projects; and
- recommend Western States support for the continuation of identified high potential interoperability related projects or initiation of interoperability related projects to fill identified gaps at the State level.

The scope of Phase I of the project did *not* include:

- identification or assessment of interoperability issues which are not related to wireless communications (e.g. process interoperability or land line interfaces); or
- detailed definition of recommended interoperability projects within the WGA region. This is assumed to be part of a follow-on activity.

## Follow on Phases

The intent of the Steering Group for this study was that there would be a Phase II, which would develop more detailed plans for specific Pilot Project(s) and submit resource grant applications for them. Phase III would be the implementation of successful Pilot Projects.

# WITC/ IAC West Wireless Communications Interoperability Phase I Report

## 3 Study Analysis

### 3.1 Western State CIO Issues

Western State CIO's were informed of this study, and were asked to submit wireless interoperability related issues to the study group, but no issues were received. Further telephone solicitations have not resulted in any issues from the State CIOs.

### 3.2 National Activities

There are several national, federally sponsored activities on-going relative to wireless interoperability, but there are no integrating studies released as of August 2003. There are demonstration activities which are increasing in scope, and these will be reported in the following sections. There are several technology solutions which could be introduced on a wider scale, and these will be reported. Finally, there are Standards activities underway which are partially completed, and these will be documented. In many cases the text describing these activities is taken directly from web sites or written material of the organizations. The purpose here is to introduce the audience to the range of activities now underway.

#### 3.2.1 SAFECOM Program

SAFECOM is currently the central Federal program related to public safety wireless interoperability. It has been located organizationally in other Federal departments, but was moved to the Department of Homeland Security (DHS) with the establishment of that Department in Spring 2003. Leadership of SAFECOM has been assumed by Dr. David Boyd, SAFECOM Program Manager. The program is located within the DHS Directorate of Science and Technology, headed by Undersecretary Dr. Charles McQueary.

##### 3.2.1.1 Purpose

From recent SAFECOM information releases, the purpose/mission of the SAFECOM program is:

"SAFECOM was established by the Office of Management Budget and approved by the President's Management Council. Its mission is to serve as the umbrella program within the Federal government to help local, tribal, State and Federal public safety agencies improve public safety response through more effective and efficient interoperable wireless communications. Communications interoperability is the ability of public safety agencies to talk across disciplines and jurisdictions via radio communications systems, exchanging voice and/or data with one another on demand, in real time, when needed."

"As a *public safety practitioner driven program*, SAFECOM is working with existing Federal communications initiatives and key public safety stakeholders to address the need to develop better technologies and processes for the cross-jurisdictional and cross-disciplinary coordination of existing systems and future networks. The scope is broad. The customer base includes over 44,000 local and State public safety agencies and organizations. Federal customers include over 100 agencies engaged in public safety disciplines such as law enforcement, firefighting, public health and disaster recovery."

# WITC/ IAC West Wireless Communications Interoperability

## Phase I Report

### 3.2.1.2 Initiatives

SAFECOM's near term initiatives are:

- “Fully integrate grant guidance across federal grant programs with interoperable communications funding.”
- “Develop and operate an interoperable communications repository on the web that will allow public safety users to identify the best solutions for their jurisdiction.”
- “Develop and promote a national guide and handbook that includes common interoperability terminology for public safety and further addresses communications-related issues to improve the use of Incident Command Systems.”
- “Develop fully interoperable demonstrations across the country and create interoperability models out of the successful demonstrations.”

The grant guidance will be discussed separately below. The demonstrations are still in planning form and will be reported in later phases of this study. Undersecretary Dr. McQueary is required to report planning for these demonstrations to Congress late in 2003.

### 3.2.1.3 SAFECOM Grant Standards

SAFECOM has been working on writing “Federal Grants Guidance for Public Safety Communications and Interoperability Grants” for some time. These guidelines are still in Draft format, but there are some concepts and trends already apparent in the draft version which should be considered by any organization intending to seek Federal grant funding for interoperable communications projects. Some of these follow:

- Applicants should demonstrate how funds would be used to upgrade or enhance mission critical networks with interoperable communications equipment for everyday use to ensure the safety and well being of first responders and the public they serve.
- Applicants should provide a clear plan for accomplishing improved interoperability between among first responders at local, tribal, regional, and State public safety agencies as well as between them and other coordinating organizations to include Federal jurisdictions.
- Applications should be clearly organized:
  - Define objectives
  - Describe need being satisfied
  - Identify partnering organizations
  - Estimate cost and schedule
  - Include an long term plan (operations and funding)



## WITC/ IAC West Wireless Communications Interoperability Phase I Report

- New equipment should be compatible with ANSI/TIA/EIAA-102 Phase 1 (Project 25) suite of standards
- A governing, cross agency group should be established with responsibility for multi-jurisdiction projects
- Grants can be used to build, upgrade, enhance or replace communications equipment.

SAFECOM is in the process of developing checklists which grant seekers can use to evaluate their grant proposals before submitting them. They have also provided a list of web sites which may be useful in developing grants. This information is provided at Appendix A – SAFECOM Grant Resources

### 3.2.2 PSWN

The Public Safety Wireless Network (PSWN) Program, a joint program of the Department of Treasury and the Department of Justice, has developed Public Safety WINS: Wireless Interoperability National Strategy to serve as a roadmap for improving interoperability among public safety wireless networks around the Nation. Public Safety WINS provides solutions to the technical and policy issues that are critical to improving interoperability. The program envisions that Public Safety WINS will be used by the entire public safety community, as well as senior leaders at all levels of government, to improve and implement interoperable wireless communication networks. The PSWN Program may be absorbed in either SAFECOM or elsewhere within DHS. The results of analyses by the PSWN Program are available at [www.publicsafetywins.gov](http://www.publicsafetywins.gov). This analysis has been grouped in four categories:

- The State of Interoperability
  - By State
  - By Federal Agency
- Policy Solutions
- Technical Solutions
- Piloted Solutions

The details of these analyses will not be repeated here, but the structure of the analysis will be explained. Interested readers are urged to go to the web site for complete results. Because PSWN is part of the Federal homeland security programs being moved around, the web site has not been updated since March 2003. PSWN may become part of DHS and perhaps SAFECOM.

#### 3.2.2.1 The State of Interoperability

The PSWN report on the State of Interoperability rates the States in the following:

- Shared System Development
- Coordination and Partnerships

# WITC/ IAC West Wireless Communications Interoperability Phase I Report

- Funding
- Spectrum Management
- Standards and Technology
- Security

The levels of rating relate to whether the activities in question are new, developing or established.

## **3.2.2.2 Policy Solutions**

The PSWN information on Policy Solutions is categorized in the same areas as the list given above for rating the states, and is aimed at policy makers of various levels. This report will not discuss this work further, as it is outside the scope of our scope.

## **3.2.2.3 Technical Solutions**

The Technical Solutions section was of high interest to this study, and will probably be of major interest to State CIO's and their staff when faced with potential technical implementation questions. PSWN categorized interoperability technical solutions into the following general categories:

- Commercial Services
- Console-to-Console Patch
- Crossband Repeater
- Cross-System Interconnect
- Trunked/Conventional Interconnect
- Dispatch Handoff
- Multiband, multimode Radios
- Proprietary Trunked Systems
- Radio Exchange
- Software Defined Radio
- Secure two-Way Paging
- Voice-Over-Internet Protocol

For each of these technical solutions the following information is provided:

- Technical Description
- Conceptual Implementation
- Appropriate Uses
- Advantages
- Disadvantages

# WITC/ IAC West Wireless Communications Interoperability

## Phase I Report

- Costs
- Spectrum Requirements
- Management Issues
- Securities and Standards Issues

It is also possible to calculate a PSWN estimate of the Probability of Success for these various technical solutions after answering a two page questionnaire regarding funding, current equipment, implementation objectives and other pertinent issues. This quick analysis will allow a potential implementer to at least focus on those technical solutions having a higher probability of success. As should be expected, there is no clear cut “best solution”, because each implementation will have differing priorities among cost, security, ease of implementation, and availability of radio spectrum. States also need to take a realistic look at their ability to orchestrate the coordination issues involved in most of these candidate technical solutions.

A February 2003 Report, “Local and Regional Interoperability Solutions Map”, summarizes a slightly different categorization of technical solutions in terms of cost, security, implementation issues, spectrum efficiency and coordination difficulty. The major categories are:

- Multiple Subscriber Units
- Shared Channels
- Interconnects
- Standards Based Systems

For each of these categories and subcategories, the report provides advantages, disadvantages and examples. The examples specifically list the jurisdictions involved and the technology involved in the examples. Again there are no clear “best” solutions without accounting for the relative importance of the various evaluation factors.

### **3.2.2.4 Piloted Solutions**

A major activity of the PSWN Program has been sponsoring pilot programs and demonstrations of new technology and improved practices across the United States since its establishment in 1996. Detailed reports are available on line of the following pilot projects:

- Console-Console Patch - South Florida
- Consolidated Communications Site – Montana
- Cross-System Interconnect – Salt Lake City
- Interstate Interoperability – New Hampshire/ Vermont
- In-Tunnel Interoperability – Washington, D.C.
- Linked Proprietary Trunked Systems – Southwest Border (Texas, New Mexico)
- Maritime Interoperability – Southwest Louisiana

## WITC/ IAC West Wireless Communications Interoperability Phase I Report

- Mutual Aid Radio System – Washington, D.C.
- Secure Two-Way Paging – Washington, D.C.
- Transportable Communications System

### 3.2.3 AGILE

The National Institute of Justice's AGILE (Advanced Generation of Interoperability for Law Enforcement) Program has a mission to assist State and local law enforcement agencies to effectively and efficiently communicate with one another across agency and jurisdictional boundaries. It is dedicated to studying interoperability options and making valuable information available to law enforcement, firefighters, and emergency technicians in different jurisdictions in communities across the country.

Interoperability is one of the research missions of the National Institute of Justice (NIJ) and the AGILE program. Through AGILE, NIJ hopes to solve both short- and long-term interoperability problems involving wireless public safety telecommunications and information technology applications.

AGILE is helping bridge the gap in emergency communication by identifying, adopting, and developing interoperability solutions that include open architecture standards for voice, data, image, and video communication systems. These solutions will allow multiple parties to exchange information on the spot—no matter where that "spot" is. It will let users exchange information among fixed facilities, mobile platforms, and even personal devices.

AGILE also researches new technology solutions when existing technologies used in an emergency response fall short, and aims to raise the awareness of interoperability issues through various outreach programs so that policymakers and public safety leaders can make informed and cost-effective decisions.

#### 3.2.3.1 Standards

Through NIJ's Office of Law Enforcement Standards (OLES), located within the National Institute of Standards and Technology (NIST), NIJ has partnered with the National Telecommunications and Information Administration (NTIA) and other key organizations to identify, develop and adopt open architecture standards for voice, data, image, and video communication systems for the public safety community.

Wireless interoperability and information sharing among various law enforcement and corrections agencies, as well as other public safety organizations such as fire departments and emergency medical services, continues to be a challenge. At best, the professionals are forced to work ineffectively. At worst, the public's safety is potentially jeopardized.

The purpose of the *Standards Project* within the AGILE Program is to effectively and efficiently provide the mechanisms to allow interoperability and information sharing among heterogeneous public safety wireless (radio) and information technology (IT) systems. The key to the effort is the identification and/or development of interoperability standards that will allow local, State, and Federal agencies to communicate and exchange

# WITC/ IAC West Wireless Communications Interoperability

## Phase I Report

information among organizations without requiring substantial changes to internal systems or procedures.

The *AGILE Standards Project* will identify a suite of relevant standards developed by standards development organizations (like the Telecommunications Industry Association (TIA), the Institute of Electrical and Electronics Engineers (IEEE), etc.) and adopt them as NIJ interoperability standards. (In rare cases, new standards may need to be developed.) Before NIJ Standards can be identified/developed and adopted, however, a great deal of preparatory work has to be completed. The results of this work will be incorporated into a Strategic Plan that will guide the standards selection and adoption process. A process plan will delineate the path to the Strategic Plan, which will include a review and analysis of:

- User requirements for wireless telecommunications and information technology applications
- Current and planned assets --legacy systems, replacement plans, and status of jurisdictions' systems for wireless systems and information technology
- Internal and external factors (such as radio frequency allocations for wireless systems, and state privacy laws on sharing of information gathered on individuals)
- Technologies appropriate to satisfying the requirements

In addition, the formal structure of the standards organization(s) needed to adopt NIJ Standards will be thoroughly documented, as well as the procedures for conducting business.

### 3.2.3.2 Technology

In order to consider the latest technologies that may impact short and long-term interoperability planning, NIJ/OST released a focused solicitation in May 2000 for research and development proposals that addressed the areas of convergence of wireless and information technologies, software radios and general interoperability technologies. The proposals were reviewed by a peer panel and NIJ, resulting in four awards in September 2000.

To assist State and local agencies that are in immediate need of interoperability assistance, NIJ has developed partnerships to technically and operationally evaluate interoperability solutions. A Federal laboratory will provide technical assessments, while public safety agencies (such as the Alexandria, Virginia, Police Department) are integrating, testing, and evaluating products in actual operational environments. Some of the first products that are being evaluated are the ACU-1000, an audio gateway technology that ties incompatible radio systems together, a means for rapidly disseminating information on missing children, and the INFOTECH informational technology system providing inter-regional information sharing among law enforcement agencies.

- Voice Communications Interoperability using the ACU-1000
- Rapid Image Dissemination for missing and exploited children

# WITC/ IAC West Wireless Communications Interoperability

## Phase I Report

- INFOTECH – Information sharing between law enforcement agencies
- Capital Wireless Integrated Network (CapWIN)

The AGILE Program will use operational test beds, such as the Alexandria Police Department, to integrate, test, and evaluate technologies that can contribute to addressing interoperability needs. The test beds will:

- Demonstrate capability of existing technology to address some key critical interoperability requirements;
- Identify shortfalls in the current technology base;
- Investigate policy and procedure issues associated with introduction of technology to support interoperability;
- Identify the impact of interoperability technology on the organization of law enforcement and public safety agencies; and
- Share the results of the operational evaluation to the State and local law enforcement community.

Evaluations of technologies within the operational test beds will span a number of issues beyond how well the technologies worked to include impact on operations, organization, and infrastructure. Operational evaluations will be conducted over an extended period to ensure a comprehensive perspective on such issues.

Reports on completed tests are also available from the AGILE Program. The most useful may be the report on the TRP-1000 Transportable Intelligent Interconnect System and the ACU-1000 audio gateway switch which integrated into the system. These tests were accomplished by the National Telecommunications and Information Administration's (NTIA) Institute for Telecommunications Sciences (ITS). This system is one of the most thoroughly tested of the "new" generation of interoperable systems.

### **3.2.4 Summit on Interoperable Communication for Public Safety**

The *Summit on Interoperable Communications for Public Safety*, held at the National Institute of Standards and Technology (NIST) in Gaithersburg, Maryland, on June 26 and 27, 2003 was a joint effort among NIST, the Department of Homeland Security's Science and Technology (S&T) Directorate, Project SAFECOM, and the National Institute of Justice's AGILE Program. The Summit brought together a variety of programs that were created to assist public safety practitioners, including the First Responders.

This summit was restricted to Federal agencies and national, state, and local organizations with responsibility for first responder communications.

The Summit was the initial step in familiarizing key interoperability players with the work being done by others so that mutually-beneficial coordination, and collaboration, among the various technical programs could be established. The Summit also provided insight into where additional Federal resources might be warranted, and has helped us all maximize the limited resources that are available across all government levels by leveraging program successes and developed standards, approaches, products, and services for the benefit of all.

# WITC/ IAC West Wireless Communications Interoperability Phase I Report

Among the most significant outputs of the summit was a compilation of federal interoperability programs called the “Briefing Book”. These files are updated periodically, as information is gathered from the groups and organizations listed. The following information is available at <http://pssummit.its.bldrdoc.gov>.

[\*Briefing Book\*](#) of Public Safety Related Groups and Programs on Interoperable Communications and Information Sharing. Version 1.01, ~85 pages. Sorted by programs, this document contains summary descriptions for each program (contact information, sponsors, program goals, etc.).

[\*Program Summary and Capabilities\*](#) Survey Report. Version 1.01, ~160 pages. Sorted by programs, this document includes Briefing Book material plus survey responses regarding functional capabilities for interoperability.

[\*Summary of Functional Capabilities\*](#) for Public Safety Groups and Programs. ~60 pages. Sorted by functional capability, this document lists the programs that have indicated that they address a particular capability, and includes their comments.

Figure 3.2-1 Public Safety Summit Documents

## **3.2.5 National Association of State CIOs (NASCIO)**

NASCIO represents state chief information officers and information resource executives and managers from the 50 states, six U. S. territories, and the District of Columbia. State members are senior officials from any of the three branches of state government who have executive-level and statewide responsibility for information resource management. NASCIO has been active in developing high level documents such as information architectures and concepts of operation for information sharing. Two of these documents are expanded below, and are available from NASCIO.

### **3.2.5.1 NASCIO Enterprise Architecture Development Tool-Kit**

The Enterprise Architecture Tool-Kit and NASCIO's Adaptive Enterprise Architecture Development Program are the products of a partnership effort between NASCIO and its Architecture Working Group and the U.S. Department of Justice. The Tool-Kit document presents NASCIO's architectural framework for integrated information and data sharing between state and local governmental entities. The document contains sections addressing the business case for enterprise architecture, governance models that support implementation and management of the necessary architecture, an instruction set for developing or modifying enterprise architecture, templates for architecture design, samples provided by state and local governments with established architecture and an appendix containing a lexicon and descriptions of the NASCIO architecture framework disciplines

# WITC/ IAC West Wireless Communications Interoperability

## Phase I Report

### **3.2.5.2 Concept for Operations for Integrated Justice Information Sharing**

ConOps provides a discipline-specific focus for justice information sharing, which in turn can be used to identify and expose broader IT architectural and infrastructure issues that must be addressed by CIOs. While this ConOps focuses primarily on information sharing in the justice arena, many concepts are applicable to any business domain.

ConOps defines the discipline-specific business functions for integrated justice and explores the architectural implications for state CIOs, who are responsible for planning the IT enterprise architecture. Additionally, ConOps defines fundamental concepts, principles, functions and operational requirements for integrated justice information sharing, presents a scenario of integrated justice information sharing and a general methodology for states to use in validating their IT architecture for information sharing characteristics. Finally, this document articulates an action plan for the validation, implementation and expansion of this ConOps to other disciplines.

### **3.2.6 USNORTHCOM**

U.S. Northern Command (NORTHCOM) was established in 2002 to provide command and control of Department of Defense (DoD) homeland defense efforts and to coordinate military support to civil authorities. NORTHCOM's specific mission:

- Conduct operations to deter, prevent, and defeat threats and aggression aimed at the United States, its territories and interests within the assigned area of responsibility (AOR); and
- As directed by the President or Secretary of Defense, provide military assistance to civil authorities including consequence management operations.

NORTHCOM's civil support mission includes domestic disaster relief operations that occur during fires, hurricanes, floods and earthquakes. Support also includes counter-drug operations and managing the consequences of a terrorist event employing a weapon of mass destruction. The command provides assistance to a lead federal agency when tasked by DoD. Per the Posse Comitatus Act, military forces can provide civil support, but cannot become directly involved in law enforcement.

In providing civil support, NORTHCOM generally operates through established Joint Task Forces subordinate to the command. An emergency must exceed the capabilities of local, state and federal agencies before NORTHCOM becomes involved. In most cases, support will be limited, localized and specific. When the scope of the disaster is reduced to the point that the lead federal agency can again assume full control and management without military assistance, NORTHCOM will exit, leaving the on-scene experts to finish the job.

#### **3.2.6.1 Spectrum Management Strategy**

NORTHCOM continues to take an active spectrum management role in support of HLS and HLD missions. In October of 2002, NORTHCOM transitioned to its initial operational capability (IOC) phase and is establishing its presence in many areas



# WITC/ IAC West Wireless Communications Interoperability

## Phase I Report

including spectrum management. The initial cadre of spectrum managers assigned to the command has made significant progress, but a fair amount of work lies ahead in terms of spectrum and information interoperability.

NORTHCOM has recently established the following as its spectrum strategy:

- Provide unfettered access to all appropriate frequency spectrums for supported forces engaged in the deterrence, prevention and ultimate defeat of threats and aggression aimed at the United States, its territories, its population, and interests within the assigned area of responsibility
- Provide an unbiased DoD leadership role for complete information interoperability in support of HLS and HLD mission areas
- Embrace existing and emerging technologies and procedures that result in responsible and efficient spectrum utilization and ultimately full interoperability

NORTHCOM is also embarking on a study to examine architectures to enable communications within the command, with other Department of Defense organizations, other Federal organizations and with State, tribal and local responders as their mission may require.

### **3.2.6.2 Determined Promise 03**

In the later part of August, 2003, NORTHCOM will be engaged in a Command Post and Field Training Exercise to test their capability to fulfill their operational capability. The following events will be simulated over approximately a one week period.

- Wildfires in West
- 2003 World Gymnastics Championships in CA
- OPLAN load-out beginning
- Bio terrorist induced plague in NV
- Sustained, diverse maritime events
- Air threat to AK (Amalgam Chief)
- High Interest Vessel threat
- Strategic infrastructure threats in NW
- Threat to load-out ports
- Cat III hurricane in SE US
- QRF Deployment
- Shipping, security issues in AK

Successful completion of this exercise will require interoperable communications among all levels of government, from the FEMA to the State houses to the dock worker and the local hospitals. Certainly many lessons will be learned which will impact the design of a Federal information infrastructure.

# WITC/ IAC West Wireless Communications Interoperability

## Phase I Report

### 3.2.7 Homeland Security Command and Control ACTD

The Homeland Security Command and Control Advanced Concept Technology Demonstration (HLS C2 ACTD) is a five-year program (FY 2002-2006) to define, refine and transition technologies and concepts of operations that significantly increase DoD Homeland Security responsiveness in consequence management, crisis response, deterrence and intelligence coordination. The capabilities identified as central to accomplishing this vision are assured communications, interoperability, threat attribution and alert and command, control and coordination. The HLS C2 ACTD is a cooperative effort among DoD, National Guard, Federal, State and Local agencies and commercial participants.

Broad ACTD objectives include improvements in:

- DoD's ability to understand the homeland security environment nationwide, to obtain situational awareness of emerging conditions and events, to assess courses of action, and to respond effectively and efficiently to requests for DoD support.
- DoD's ability to coordinate promptly and effectively with Federal, State, and Local agencies.
- Intelligence sharing and information exchange in a protected environment.
- DoD understanding of Force Protection and Anti-Terrorism at military installations.
- Communications and information with DoD and HLS first responder teams.
- Command, Control and Coordination among intra-agency HLS participants.

The ACTD has four technology focus areas -- *assured communications, interoperability, threat alerting/attribution, and command, control, and coordination*. The ACTD's broad metrics for each of these four technological focus areas include:

- Assured Communications -- deployable, flexible, redundant, wireless, and protected.
- Interoperability – software and hardware that operates among all levels of government during three conditions: *daily operations*, situations with *increased vigilance*, and *crisis*.
- Threat Attribution – prediction, alerts, warnings, prevention, and pattern and relationship identification.
- Command, Control, and Coordination – full range of capabilities to plan, assess, make decisions, communicate decisions, and receive feedback.

The December 2002 demonstration involved a scenario driven by the approach of shipping that has terrorist nuclear weapons aboard. The intent of the terrorists involved attacking and destroying one or more U.S. ports. Simultaneously, small groups of terrorists conducted reconnaissance and intelligence collection operations at numerous ports and other locations, setting up physical preparations for attacks against U.S. bases and critical infrastructure, establishing deceptive measures to confuse law enforcement, and establishing a loose command and control apparatus. The terrorists intended to

# WITC/ IAC West Wireless Communications Interoperability

## Phase I Report

attack and destroy a symbol of American power – aircraft carriers – in the U.S. Ports of Norfolk and San Diego – with small boats. The terrorists also planned other activities such as attacks against critical infrastructure in Norfolk and Chesapeake, Virginia, Baton Rouge, Louisiana, and Tacoma, Washington.

### 3.2.8 Standards Activities

There are many Standard develops related to wireless communications interoperability underway in the various accrediting organizations. The most significant of these pertaining to wireless interoperability is the “P-25” Standard.

The Telecommunications Industry Association (TIA) is an American National Standards Institute (ANSI) accredited standards development organization. TIA maintains a number of standing committees to develop standards in various telecommunications fields. One of these subcommittees is the TR-8 Committee for *Mobile and Personal Private Radio Standards*. The TR-8 Committee has standing subcommittees for numerous areas, including such things as encryption, signaling and data transmission, wireline systems interfaces and more.

#### 3.2.8.1 Project 25

Recognizing the need for common standards for First Responders and Homeland Security/Emergency Response professionals, representatives from the Association of Public Safety Communications Officials International (APCO), the National Association of State Telecommunications Directors (NASTD), selected Federal Agencies and the National Communications System (NCS) established Project 25 (P25), a steering committee for selecting voluntary common system standards for digital public safety radio communications. TIA TR-8 facilitates such work through its role as the ANSI-accredited Standards Development Organization (SDO), and has developed in TR-8 the 102-series of technical documents.

P25-compliant systems are being increasingly adopted and deployed. Radios can communicate in analog mode with legacy radios and in either digital or analog mode with other P25 radios. Additionally, the deployment of P25-compliant systems will allow for a high degree of equipment interoperability, compatibility and economy of scale. Specifically, P25 systems can be maintained and upgraded cost effectively over the system's life cycle, thus meeting user requirements, achieving interoperability and security, promoting committed manufacturers to provide compliant products, fostering competition and achieving cost-effective emergency/safety communication solutions. In light of recent worldwide terrorist activities, interoperability among first responders is a key initiative of many countries.

The P25 suite of standards involves digital Land Mobile Radio (LMR) services for local, state and national (federal) public safety organizations and agencies. P25 is applicable to LMR equipment authorized or licensed, in the U.S., under the National Telecommunications and Information Administration (NTIA) or Federal Communications Commission (FCC) rules and regulations. However, use of such equipment is not limited to public safety, and P25 equipment has also been selected and deployed in other private system applications, for example, to serve the needs for a high-

# WITC/ IAC West Wireless Communications Interoperability

## Phase I Report

quality, secure digital radio system for a railroad system, including rolling stock, personnel, and transportation vehicles.

P25-compliant technology is being deployed in several phases, based on TIA Engineering Committee work and the P25 standards TIA ultimately publishes. Vendors are currently shipping Phase I P25-compliant systems. These systems involve standardized service and facility specifications, ensuring that any manufacturers' compliant subscriber radio has access to the services described in such specifications. Abilities include backward compatibility and interoperability with other systems, across system boundaries, and regardless of system infrastructure. In addition, the P25 suite of standards provide an open interface to the radio frequency (RF) subsystem to facilitate interlinking of different vendors' systems.

The P25 Project defined eight interfaces for which standards need to be written. These interfaces and their status as of mid-2003 are:

- Common Air Interface – completed and robust
- Subscriber Data Peripheral Interface – Complete but not well tested
- Fixed Station Interface – Standards not complete– Complete but not well tested
- Inter RF SubSystem Interface – Complete but not well tested
- Console Interface – Complete but not well tested
- Telephone Interconnect Interface – Complete but not well tested
- Network Management Interface – Complete but not well tested
- Data Network Interface – Complete but not well tested. IP Standards may suffice

P25 Phase II implementation involves time and frequency modulation schemes (e.g., TDMA and FDMA), with the goal of improved spectrum utilization. Significant attention is also paid to interoperability with legacy equipment, interfacing between repeaters and other subsystems, roaming capacity and spectral efficiency/channel reuse. In addition, Phase II work involves console interfacing between repeaters and other subsystems, and man-machine interfaces for console operators that would facilitate centralized training, equipment transitions and personnel movement.

Recognizing the need for high-speed data for public-safety use, as expressed in the Public Safety Wireless Advisory Committee (PSWAC) Final Report, the P25 standard committee established the P25/34 Committee to address Phase III implementation. Phase III activities are addressing the operation and functionality of a new aeronautical and terrestrial wireless digital wideband/broadband public safety radio standard that could be used to transmit and receive voice, video and high-speed data in a ubiquitous, wide-area, multiple-agency network. Due to common needs, the European Telecommunications Standards Institute (ETSI) and TIA agreed to work collaboratively for the production of next-generation mobile broadband specifications for public safety users. Today, this international collaboration is known as Project Mesa (Mobility for Emergency and Safety Applications)

# WITC/ IAC West Wireless Communications Interoperability

## Phase I Report

### 3.2.8.2 MESA

Threats and challenges to the fabric of society are growing in complexity, frequency of occurrence, and scope. Responses to natural and man-made disasters are hampered by the inability to communicate simultaneous voice, data, imaging, and live video. Network communications facilities can bog down when called upon to support thousands of transmissions related to a blizzard, train wreck or other catastrophic or criminal act. Both Public Safety personnel and citizens are raising concerns over needed improvements in emergency medical services, fire prevention and suppression, public protection, disaster response, civil defense, and infrastructure maintenance and expansion. On a more sinister level, criminal and terrorist elements are coordinating their illicit activities with increasingly sophisticated communications, in many cases matching or exceeding the level of technology available to the local law enforcement community. In these and similar cases, orchestrating any kind of coordinated response invariably places an overwhelming demand upon communications facilities.

In light of the aforementioned scenario, calls have been made for new services and capabilities designed to effectively, efficiently and economically meet emerging public safety challenges and needs. Early in the year 2000, the Telecommunications Industry Association (TIA) and the European Telecommunications Standards Institute (ETSI) recognized a unique opportunity to jointly address similar Public Safety problems and scenarios plaguing North America and Europe. Specifically, both organizations realized the importance of starting now to progress specifications for advanced emergency service applications that would address the Public Safety needs of not only the 800 million citizens in North America and Europe, but also those in other parts of the world. This realization led to the Public Safety Partnership Project (PSPP); a joint project aimed at addressing common standardization needs of Public Safety users and in North America and Europe, before any product development begins. The result of this Public Safety-oriented activity will be harmonized specifications for broadband terrestrial mobility applications and services, driven by common scenarios and spectrum allocations.

One of the drivers of the project is the fact that criminal activities are aided by communications technologies more advanced than those currently available to law enforcement and other public safety purposes. Critical uses include multimedia applications such as two-way imaging, real-time mobile full-motion video and wireless telemedicine (remote patient monitoring). Such applications require a large data pipe for delivery, well in excess of what is currently being developed for third-generation (3G) mobile standards.

The initial Partnership Project Agreement (PPA) for the PSPP was ratified by TIA and ETSI on May 22, 2000, and was updated in January of 2001 in Mesa, AZ., where it was renamed PSPP Project: Project MESA (Mobility for Emergency and Safety Applications). Besides the U.S. and European Union (EU), other regions standards groups (e.g., Asia and Canada) and international organizations (e.g., UN/NATO) are also becoming engaged in Project MESA activities. Because MESA is attempting to harmonize user input from various nations, it is crucial that the U.S. and EU's voice be heard loud and clear. With full participation and input to allow for American, European and other regional Public Safety needs and requirements to be fully vetted and

# WITC/ IAC West Wireless Communications Interoperability

## Phase I Report

harmonized into any final Project MESA deliverables, the US Public Safety community will have a significant opportunity to influence the final result and ability downstream to procure standardized systems at lower cost.

Understandably, various Public Safety services may have very different communication needs, which may differ between agencies and countries. Having a common standardized broadband communication system will help to ensure interoperability of Public Safety services and applications, within and between agencies and/or countries. Public safety and law enforcement issues are now, more than ever, a worldwide problem. Also, to facilitate effective communication and interoperability during emergency situations, it is crucial that both users and various types of terminals understand each other, allowing for information exchange via multiple and divergent facilities, platforms and devices.

Project MESA exists to facilitate dependable, advanced, efficient, effective and interoperable equipment, specifications and applications that are involved with public safety-oriented broadband communication needs. Additionally, MESA will attempt to harmonize existing specifications and scenarios as part of its mandate.

While the objectives of Project MESA entail advanced specifications that are well beyond the scope of currently known technologies, they also involve important milestones in the range of two to five years. One important milestone will be the ITU-R WRC-2003, where spectrum allocations for public protection and disaster relief will hopefully be addressed. Any initial spectrum allocation will be utilized for test beds, live tests and demos by 2004. In parallel, Project MESA is progressing towards the completion of a first draft of the user- defined Statement of Requirements (SoR) document by 2002, thus underlining the need for full U.S. representation and input. This SoR will describe and define future MESA specifications involving air interface data rates beyond current standards, including multiple levels of security and encryption to allow public safety professionals to communicate over a wide area, using a myriad of technological platforms and applications that would include, but not be limited to, secure information, voice, video and infrared video, high-speed data, still photos, enhanced patient and firefighter bio-telemetry information. Specifically, public safety "users" includes all criminal justice services, emergency management, emergency medical services (EMS), fire, land, natural resource management, military, transportation, wildlife management, and other similar governmental functions that have a need for aeronautical and terrestrial, high-speed, broadband, digital, mobile wireless communications and telemetry-related services and applications.

The end result will be a suite of standards and specifications harmonized for broadband terrestrial mobility operations, including connectivity to broadband satellite communications (SatCom) services, driven by common scenarios and spectrum allocations. Benefits to the Public Safety community and to the citizens they serve, will be realized in two distinct but highly related areas:

- System end-users:
  - In-building, portable voice and data coverage.
  - Real-time support for wireless portable computer applications.
  - Rapid messaging, including email, free-form text, and file transfers.
  - Constantly updated personnel and equipment location data.

# WITC/ IAC West Wireless Communications Interoperability

## Phase I Report

- Ariel video for major events, or disaster response coordination.
- Transmission and reception of high-resolution digital images.
- Satellite connectivity of disaster "hot-spots."
- Real-time incident video and Internet protocol (IP) voice communications overlay.
- Full robotics remote control, including audio/video monitoring and transmission.
- Remote sensing and aeronautical connectivity (Air-Ground-Air).
- Economies of scale for Public Safety equipment acquisition; also allowing for increased Public Safety Department access to technology and information.
- System owner/operators:
  - Local, national, regional and international interoperability.
  - Frequency neutral technology.
  - Accommodation of multiple agency networks.
  - Network authentication and encryption.
  - Competition in system life cycle procurement.

### 3.2.8.3 IPv6

The Internet Engineering Task Force (IETF) is the standards body responsible for the design of the protocols that operate the internet. By tradition, all IETF documents are published as "Requests for Comments", or RFCs. IPv6 is short for "Internet Protocol Version 6". IPv6 is the "next generation" protocol designed by the IETF to replace the current version Internet Protocol, IP Version 4 ("IPv4").

Most of today's internet uses IPv4, which is now nearly twenty years old. IPv4 has been remarkably resilient in spite of its age, but it is beginning to have problems. Most importantly, there is a growing shortage of IPv4 addresses, which are needed by all new machines added to the Internet.

IPv6 fixes a number of problems in IPv4, such as the limited number of available IPv4 addresses. It also adds many improvements to IPv4 in areas such as routing and network autoconfiguration. IPv6 is expected to gradually replace IPv4, with the two coexisting for a number of years during a transition period.

## 3.3 Technology Trends

### 3.3.1 ERT Program

The Emergency Response Technology (ERT) Program at the National Technology Transfer Center was formed to develop and carry out an active, broad-based program for commercializing new Health and safety related products for the emergency response community. This program was established under Federal Emergency Management Agency (FEMA) with additional support and funding from the National Aeronautics and Space Administration (NASA).

The ERT Program is anchored by an elite group of expert emergency managers that bring talent, experience and resources from ten of the most notable fire and emergency management associations in the United States. This ERT Group (ERTG) is tasked with

# WITC/ IAC West Wireless Communications Interoperability

## Phase I Report

identifying technology needs in areas of first responder health and safety. The technologies listed below are existing products that meet specific needs identified by the ERTG.

- The Homeland Commander™ 2003 Mobile information Center
- Incident Commanders Radio Interface™ (ICRI)
- ACU-1000 Modular Interconnect System

The *Homeland Commander™ 2003* mobile information center is designed to expedite and assist emergency response before, during, and after incidents involving hazardous materials. The easily utilized, portable, rugged Homeland Commander rapidly provides accurate, useful information about major characteristics and features of thousands of hazardous materials liable to be encountered in accidental or deliberately provoked hazmat emergencies. The Homeland Commander information center can be effectively used by a variety of safety personnel responsible for planning or directly managing emergency response to hazmat incidents and containing their impact on persons and surroundings.

*The ICRI system* offers radio interoperability for emergency responders and their commanders. ICRI is a highly portable, easy to set-up "switch" joining different department / agency radios and telephones in a common voice "net"... across bands and across platforms, for mutual aid operations. ICRI Interconnects multiple military and/or public safety radios in moments through the unmanned ICRI (800/400/150MHz, low band VHF, AM/FM, digital/analog, trunked/talk-around) and cellular telephone. ICRI is capable of operating two independent nets. With optional circuitry, the five radio ports and telephone port can be "programmed" (actually low tech switches on the front panel) so that two nets with any combination of interfaced radios can be placed in either net. A remote "all call" override capability can be provided.

*The ACU 1000* is a rack-mounted modularized system for controlling and interconnecting various types of communications systems. The basic components of the system are interface modules, each designed to connect a specific communications medium (VHF/UHF radio, telephone, Satcom, HF radio, local operator, etc.) , a control module, a power supply module, a chassis to accommodate up to 12 device modules, and a backplane to route audio and control systems between modules. The system is displayed on a user friendly Graphical User Interface (GUI) which can be used to link up to 12 communication devices in 7 separate communications nets.

### 3.3.2 Software Radios

Although the term "Software Defined Radio", or SDR, was coined in the early 90's, the concepts have been around much longer. An SDR can work with various wireless technologies, frequencies and signal formats, by using software in the device's onboard memory. SDRs use a common hardware basis, with software doing the radio-signal generation and frequency tuning. It is possible for an SDR to download software to reprogram itself to new frequencies and signal formats.

There are two major drawbacks to SDRs at the present time. The first is cost. Both the hardware and software used is specialized and relatively expensive. The second is that



# WITC/ IAC West Wireless Communications Interoperability

## Phase I Report

these systems currently require a great deal of complex signal processing, thus introducing significant power and Central Processor Unit requirements. Some implementations have been done in base stations where these limitations are not as severe as in individual subscriber units. The ACU-1000 Modular Interconnect System can be considered a base station implementation of some SDR concepts

### 3.4 Key Lessons Learned

#### 3.4.1 Extensive National Activity

– Many Federal agencies, especially the Department of Homeland Security and the Department of Defense are actively examining needs, existing capabilities, national infrastructure and process changes relating to wireless interoperability. In a similar manner national professional groups are actively pressing proposals, developing technical standards and advocating functional requirements.

#### 3.4.2 Major Process Issues

– First responders and other public safety organizations are faced with the same issues as other organizations who have moved to more automated, information intensive operations. There is a real need to define and improve “business processes” associated with public safety.

#### 3.4.3 Funding Available

– Grant funding is available from several sources for both hardware and process improvement. Emphasis on hardware will be P-25 compliance and demonstrated capabilities. Grant programs are more likely to be funded if they are interjurisdictional in scope and governance. SAFECOM grant standards place a significant emphasis on the proposed governance model for interoperability demonstrations.

#### 3.4.4 Standards Incomplete

– Although interoperability standards are underway in the US and Europe, they are incomplete. Only 1 of 8 interfaces in the widely acclaimed P-25 Standard family is complete and tested. It appears that data standards will probably default to Internet standards, which are themselves changing from IPv4 to IPv6 over the next few years.

#### 3.4.5 Processes vs. Technology

– Although there are still technical challenges to implement seamless, interjurisdictional responses to emergencies, there is technology available to address most pure technical (frequency, coding, switching) issues. Defining public safety processes, and developing cooperative operational concepts appears to be much more difficult and limiting. In some cases, changing processes can make the technical solution much easier. There are few if any examples of technology overcoming organizational coordination issues.

#### 3.4.6 Voice vs. Data Interoperability

– Effective public safety operations will be at least as dependent on a seamless flow of data between organizations as it will on seamless voice communications. Data

## WITC/ IAC West Wireless Communications Interoperability Phase I Report

interoperability is a major issue, from the format of the data itself, to ability to uniformly describe data (so-called meta-data) to what is perhaps the most difficult data issue- that of access rights for various organizations.

### **3.4.7 Access Rights**

– There is an open issue related to how access is granted to either data or voice circuits. Security issues have been of major concern, but privacy and other considerations are leading to a need to develop access rights which are context sensitive. Just because two systems are interoperable does not mean they should be allowed to indiscriminately “interoperate”.

### **3.4.8 Federal Infrastructure Development**

- It is likely that the Federal government will eventually develop some sort of information infrastructure, following the Interstate highway system model, to support the needs of the Department of Defense and the Department of Homeland Security. States will be able to access this infrastructure, but cannot develop or procure systems which are interoperable until the Federal standards are set. Several architecture studies are underway.

# WITC/ IAC West Wireless Communications Interoperability Phase I Report

## **4 Recommendations**

### **4.1 State Participation Opportunities**

#### **4.1.1 Participate in Federal Architecture Definition**

It is in the best interests of the States for a Federal IT Infrastructure to be defined, and standards for interfacing with it developed as soon as possible. States run the risk of procuring “orphan” equipment, and establishing incompatible public safety processes until the infrastructure is defined. Alternatively the States will be forced to work in smaller regional consortia, which will improve operations, but which cannot fully leverage Federal expenditures. State executives should encourage the definition of the Federal Infrastructure (perhaps along the lines of the “Interstate Communications Expressway”), and participate as interested users of the infrastructure. States should actively support exercises such as the Homeland Security Command and Control ACTD and NORTHCOM exercises, which will help define requirements for the infrastructure.

#### **4.1.2 Develop Regional Public Safety “Business Processes”**

States should work together to develop “Business Process” descriptions and “Concepts of Operations” for public safety related activities such as firefighting and health care. These should be modeled after the work done in the Law Enforcement arena and by NASCIO in their “ConOps for Integrated Justice Information Sharing”. States which have not done so should compare their law enforcement processes with those defined in the Justice Information Exchange Model (JIEM) developed by SEARCH, the National Consortium for Justice Information and Statistics.

Some of the principles used in the NASCIO ConOps would be valid for implementing IT systems to support any other public safety activity, especially:

- There must be clear traceability from explicit strategic business intent, as articulated in the business architecture, to the functionalities described in the information systems, and technical architectures;
- Technical solutions must be driven by business requirements;
- Information is captured once and reused, rather than re-captured when needed again;
- Whenever appropriate, standards will be defined, with user input, in terms of performance requirements and functional capabilities, rather than hardware and software brand names;
- Security and privacy are priorities in the development of integrated capabilities and in the determination of standards

#### **4.1.3 Define “Need to know” for “Business Processes”**

After defining the processes and information flow for a public safety process (law enforcement, fire fighting, public health or some other), examine the potential participants at each step of the process, and determine who should have access to what information, under what conditions. Indiscriminate access by any possible user could

# WITC/ IAC West Wireless Communications Interoperability

## Phase I Report

result in loss of communication effectiveness (talking over each other), loss of procedural effectiveness (inundation with unnecessary information), or violation of private rights (organizations having access to private, attributable data when not required). Some of these access rules may already in place, some may be implementable using current communications control capabilities, and some may need pilot demonstrations of enabling technology and the impact on operations.

### **4.1.4 Participate as Users in Standards Development**

There are currently few representatives of State and local jurisdictions involved in P-25 Standard development or any of the other wireless interoperability standard development activities. States should consider at least monitoring these activities, and insuring that their functional requirements are being considered as part of the process.

### **4.1.5 Create Regional Interoperability Pilot Projects**

Wireless Interoperability within the Western Region has been a stated concern of the Western Governors. More generally, information interoperability has been an implied, if unstated concern (with the exception of Geographical Information Systems which has explicitly been mentioned). The Federal Government is concerned with these same issues and is making grant funding available on an increased scale. The Western State Governors and CIO's should take advantage of this availability by proposing mutually (State and Federal) beneficial pilot projects to leverage Federal funding in the Interoperability area. Several potential projects are outlined in Section 4.2. WITC recommends that groups of Western States define projects of potential interest such as these. WITC is prepared to support this activity when appropriate.

## **4.2 Potential Pilot Projects**

### **4.2.1 Multi State Integrated Justice Demonstration**

- Scenario based – include emergencies and daily operations
- Use voice interoperable technology such as ACU 1000
- Demonstrate multi- jurisdiction oversight/ cooperation
- Develop and demonstrate “need to know” rules

### **4.2.2 Multi State Integrated Public Health Demonstration**

- Expand the concept of current Public Safety Institute demonstration
- Set in a context of public health concern- West Nile, SARS, biological attack
- Coordinate between states and CDC

### **4.2.3 Integrated Multi State and Federal Forest Fire Demonstration**

- USDA Forest Service, local fire fighters, tribal firefighters, National Guard, DoD resources, Bureau of Land Management

## WITC/ IAC West Wireless Communications Interoperability Phase I Report

- Coordinate with USDA Forest Service National Interagency Fire Center and National Interagency Incident Communications Division
- Consider Four Corners, or Yellowstone areas for demo

### **4.2.4 Single State/Multi-Department Interoperational Demonstration**

- Consider Departments of Health, Public Safety, Transportation, Natural Resources
- Develop stressing scenarios – emergencies and normal operations
- Use voice interoperable technology such as ACU 1000
- Demonstrate multi- jurisdiction oversight/ cooperation
- Develop and demonstrate “need to know” rules

# WITC/ IAC West Wireless Communications Interoperability Phase I Report

## Appendix A SAFECOM Grant Resources Listing

Homeland Security secretary Tom Ridge announced on September 2, 2003 that the Department of Homeland Security will create a single point of contact--including a new portal--to help local and state governments obtain grants to fund anti-terrorism and emergency preparedness projects.

Ridge said the overall benefit is clear--a single point of contact and portal for government grants will streamline the application process. "No longer will our state and local partners have to go to different places within the department to apply for terrorism-related funding," Ridge said. "It ensures that nationwide, homeland security officials have one place where they can tap into the resources and information they need--from applying for funds to protect critical infrastructure to securing guidance and expertise for first responders. It's a clear win-win for state and locals and DHS."

Until the new web site/portal is available, additional information for applicants to use when constructing their grant applications and for seeking additional funding sources can be obtained at the following websites:

AGILE Program The AGILE Program within the Office of Science and Technology at the National Institute of Justice has a mission to assist State and local law enforcement agencies to effectively and efficiently communicate with one another across agency and jurisdictional boundaries. It is dedicated to studying interoperability options and making valuable information available to law enforcement, firefighters, and emergency technicians across the country.

<http://www.agileprogram.org/>

Association of Public Safety Communications Officials – International, Inc. (APCO) APCO is the world's oldest and largest not-for-profit professional organization dedicated to the enhancement of public safety communications.

<http://www.apcointl.org/>

Bureau of Justice Assistance Local Law Enforcement Block Grants (LLEBG) Funds from the LLEBG program may be used for procuring equipment, technology, and other material directly related to basic law enforcement functions.

<http://www.ojp.usdoj.gov/BJA/>

Federal Emergency Management Agency (FEMA) This site offers information on Federal disaster assistance and funding.

<http://www.fema.gov/>

# WITC/ IAC West Wireless Communications Interoperability

## Phase I Report

[Justice Technology Information Network \(JUSTNET\)](#) The official web site for the National Law Enforcement and Corrections Technology Center system, JUSTNET lists many grants and funding sources in the Virtual Library. It also contains various publications on communications interoperability issues.

<http://www.justnet.org/>

[Making Officer Redeployment Effective \(COPS MORE\) Grants](#) This grant program, provided through the Community Oriented Policing Services (COPS) office, is designed to expand the time available for community policing by current law enforcement officers through the funding of technology, equipment, and support personnel.

<http://www.usdoj.gov/cops/>

[National Institute of Justice \(NIJ\)](#) NIJ is the research and development agency of the U.S. Department of Justice and is the only Federal agency solely dedicated to researching crime control and justice issues. This page lists the most recent solicitations issued by NIJ.

<http://www.ojp.usdoj.gov/nij/>

[National Public Safety Telecommunications Council \(NPSTC\)](#) NPSTC is a federation of associations representing public safety telecommunications. NPSTC serves as a resource and advocate for public safety telecommunications issues.

<http://www.npstc.du.edu/>

[National Task Force on Interoperability \(NTFI\)](#) Recognizing that solutions to the national problem of public safety communications interoperability could only be achieved through cooperation between all levels of government, 18 national associations representing State and local government and public safety officials formed a task force to address this issue. NTFI's recommendations have been published in the form of a brochure, guide, and supplemental resources.

<http://www.agileprogram.org/ntfi/>

[National Telecommunications and Information Administration \(NTIA\)](#) NTIA, an agency of the Department of Commerce, works to spur innovation, encourage competition, help create jobs, and provide consumers with more choices and better quality telecommunications products and services at lower prices.

<http://www.ntia.doc.gov/publicsafety/>

[Office for Domestic Preparedness \(ODP\) Equipment Grant Program](#) The goal of the ODP Equipment Grant Program is to provide funding to enhance the capacity of state and

## WITC/ IAC West Wireless Communications Interoperability Phase I Report

local jurisdictions to respond to, and mitigate the consequences of, incidents of domestic terrorism involving the use of a Weapon of Mass Destruction (WMD). Communications equipment is included on the authorized equipment purchase lists for these ODP grants.

<http://www.ojp.usdoj.gov/odp/>

Office of Justice Programs (OJP) Information Technology Initiatives The OJP Information Technology Initiatives web site offers access to timely and useful information on the information sharing process, initiatives, and technological developments. The funding section of this site provides information on both federal and private funding sources, examples of innovative funding ideas, and tips on researching funding legislation.

<http://www.it.ojp.gov/>

Office of National Drug Control Policy, Counterdrug Technology Assessment Center (CTAC) Technology Transfer Program The CTAC Technology Transfer Program assists State and local law enforcement agencies in obtaining the necessary equipment and training for counterdrug deployments and operations.

<http://www.whitehousedrugpolicy.gov/>

Public Safety Wireless Network (PSWN) A joint Department of Justice and Department of Treasury program, PSWN is dedicated to the establishment of a seamless, coordinated public safety communications system for the safe, effective, and efficient protection of life and property.

<http://www.pswn.gov/>

Technology Opportunities Program (TOP) The Technology Opportunities Program (TOP) from the National Telecommunications and Information Administration gives grants for model projects demonstrating innovative uses of network technology.

<http://www.ntia.doc.gov/top/>

U.S. Department of Homeland Security (DHS) A cornerstone of the DHS philosophy revolves around a commitment to partner closely with other federal agencies, State and local governments, first responders, and law enforcement entities to ensure the security of the United States. Its website explains how DHS and local governments can work together.

<http://www.dhs.gov/>

U.S. Department of Justice (DOJ) DOJ offers funding opportunities to conduct research, to support law enforcement activities in state and local jurisdictions, to provide training and technical assistance, and to implement programs that improve the criminal justice system.

<http://www.usdoj.gov/>



# WITC/ IAC West Wireless Communications Interoperability

## Phase I Report

U.S. Fire Administration Assistance to Firefighters Grant Program The purpose of the program is to award one-year grants directly to fire departments of a State to enhance their abilities with respect to fire and fire-related hazards. <http://www.ntia.doc.gov/top/>