

# Review of Public Safety Wireless Data Usage

State of Oregon, Portland Area



**Homeland  
Security**

**OEC/ICTAP**

*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

June 2012

# Workshop Agenda

- Introductions
- Objectives
- Methodology
- Survey Responses
- Administrative
- Contracts and Costs
- SOPs and Applications
- Current Technology
- Future Planning
- Summary



**Homeland  
Security**

**OEC/ICTAP**

*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

# Objectives

- Establish a baseline of data regarding the current state of wireless services in the Portland, OR region
- Identify the following issues as they relate to the implementation of a 700 MHz LTE Public Safety Broadband System:
  - *Future growth and potential need for wireless data services*
  - *Desired and critical public safety applications utilizing wireless data services*
  - *Wireless device utilization and desired form factors*
  - *Current infrastructure availability for potential utilization in a network build-out*
  - *Site hosting preferences*
- *UPDATE: Leverage data for coordination with FirstNet*



**Homeland  
Security**

***OEC/ICTAP***

*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

# Methodology

- On-Line Survey opened to Portland area agencies (February 1, 2012)
- Participants included 25 state, county and local agencies in the Portland area
- Survey questions focused on five general categories:
  - Administrative
  - Contracts and Costs
  - Standard Operating Procedures (SOPs) and Applications
  - Technology
  - Future Planning
- On-Line Survey data collector closed (April 15, 2012) and survey results were collected and organized into tables and charts.
- Survey results are presented to Portland area public safety stakeholders and other public agencies (June 2012).



**Homeland  
Security**

**OEC/ICTAP**

*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

# Survey Responses

- Survey Link sent to various agencies and jurisdictions in the Portland Area
- 25 agencies contributed to survey
  - 8 - Law Enforcement
  - 6 - Fire/Rescue
  - 5 - Multi-Discipline
  - 3 - Other
  - 2 - Public Works/DOT
  - 1 - Emergency Management
- Multi-Discipline consists mostly of agencies that provide IT or technical services to other agencies in that jurisdiction or region



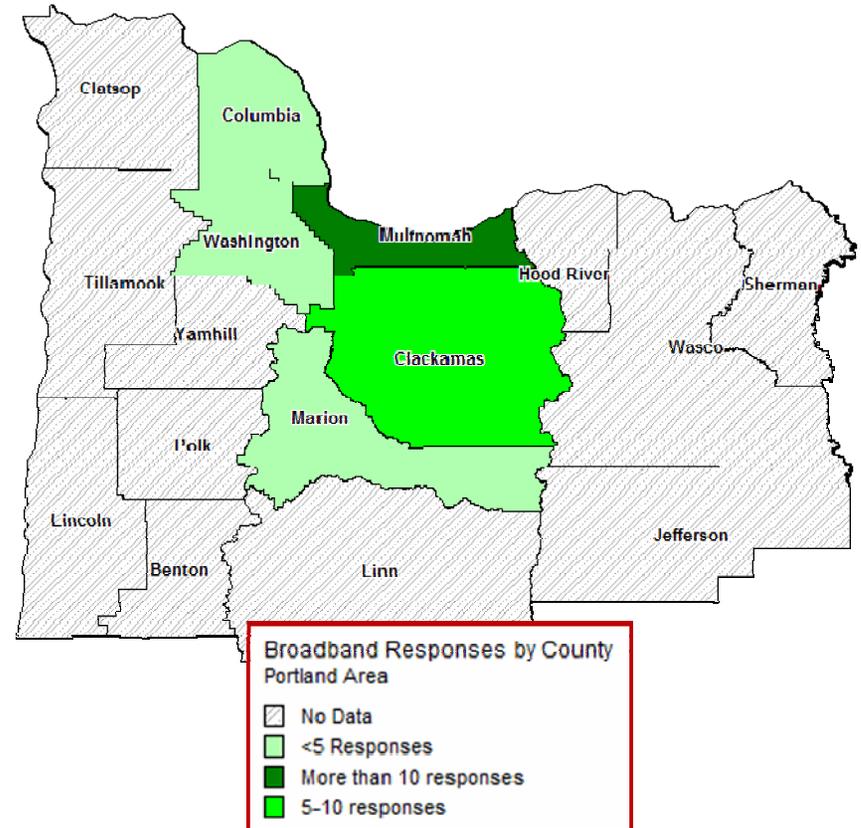
**Homeland  
Security**

**OEC/ICTAP**

*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

# Survey Respondents

- Boring Fire
- Clackamas Co Fire
- Gladstone Fire
- Gresham Dept of IT
- Gresham Police
- Lake Oswego Communications
- Multnomah Co Sheriff
- Oregon DOT
- Portland Airport
- Portland Emergency Mgmt
- Portland Police
- Sandy Police
- Canby Fire
- Columbia 9-1-1
- Gladstone Police
- Gresham Fire and Emergency Services
- Hoodland Fire
- Multnomah Co Community Services
- Oregon City Police
- Oregon State Police
- Portland Emergency Communications
- Portland Tech Services
- Salem Police Communications
- Troutdale Police
- Washington Co Communications

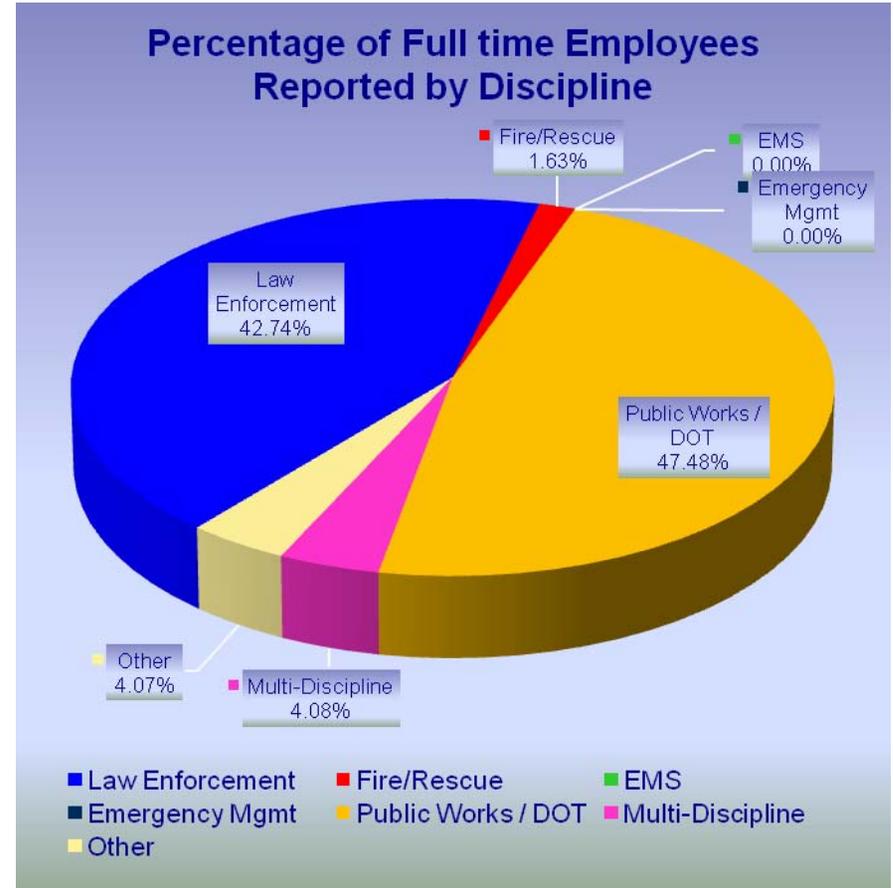
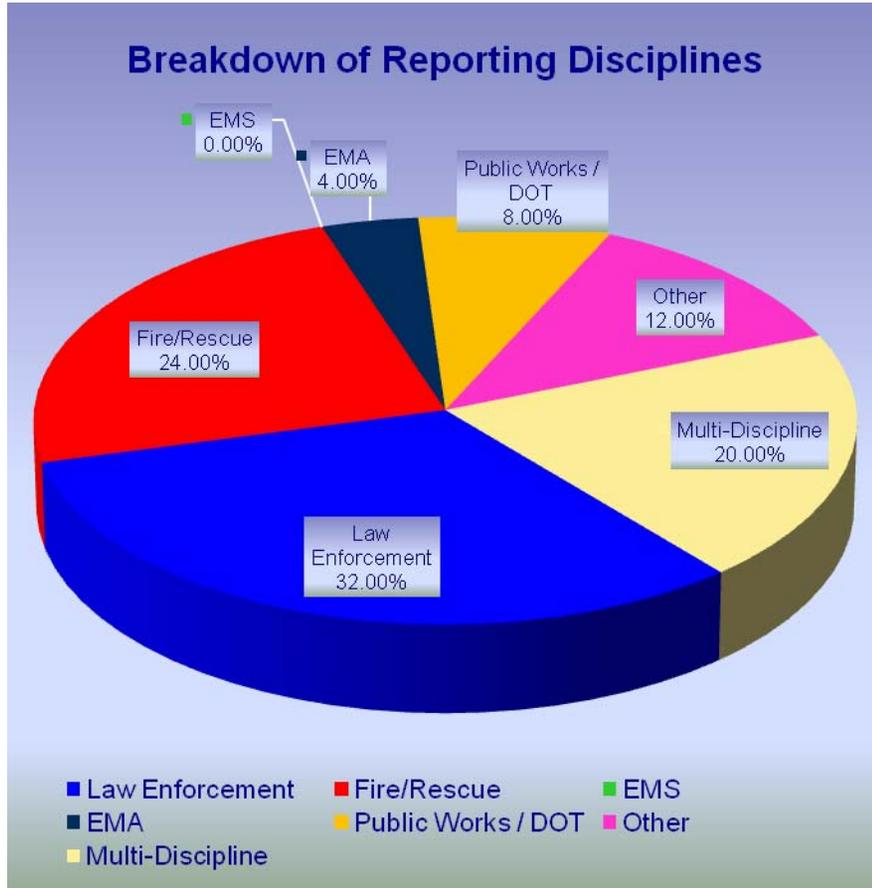


**Homeland Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Agency Information



**Homeland Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Administrative

- Completed by individual with knowledge of:
  - *Number of full time employees*
  - *Scope and makeup of wireless data system governance group (if any)*
  - *Currently existing barriers to fully implement wireless data capabilities*

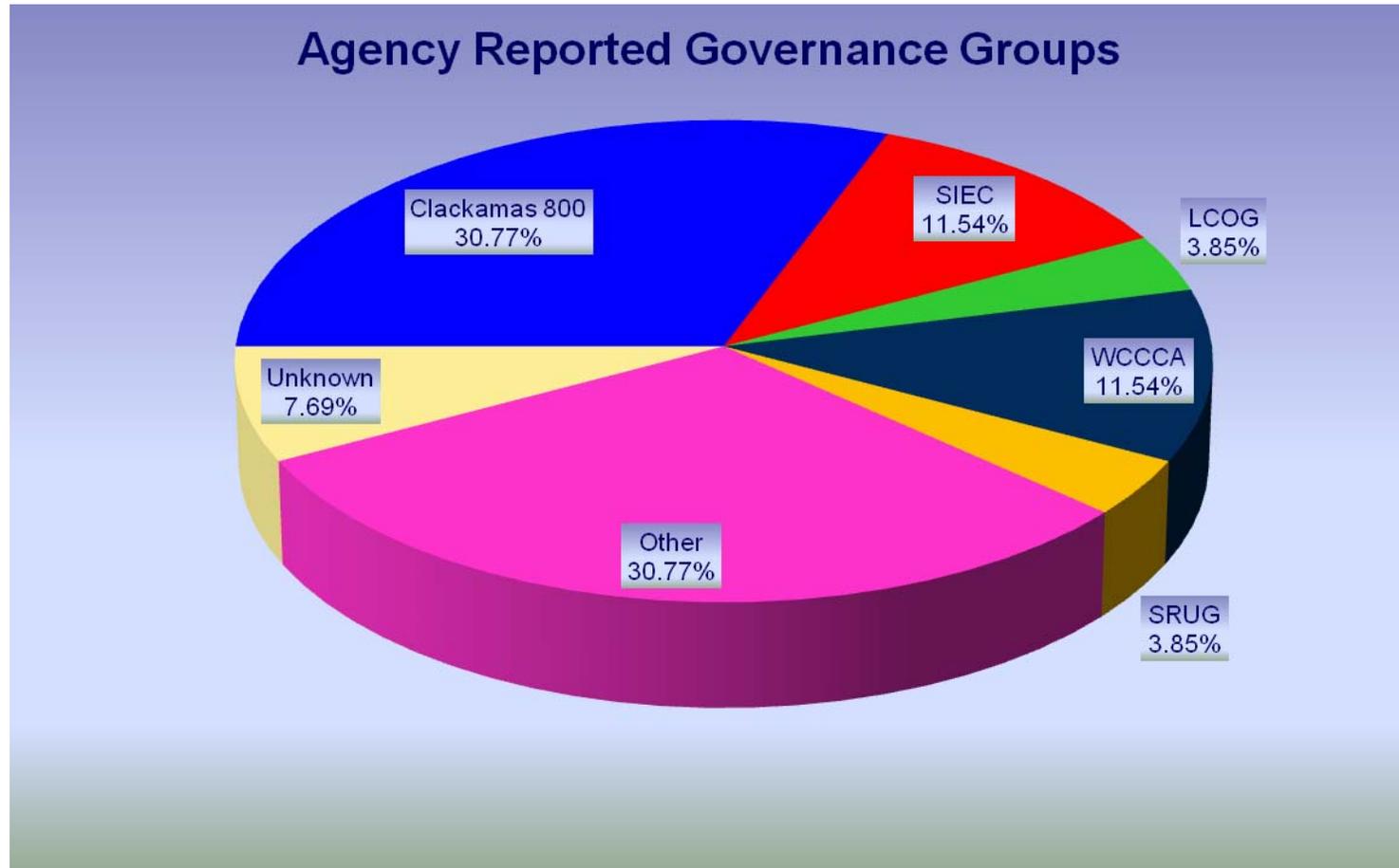


**Homeland  
Security**

**OEC/ICTAP**

*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

# Wireless Governance



**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Wireless Governance

Governance Group Name	Governance Type				Originating Authority						System Scope					
	Legislative/Executive Sub-Committee	Representative Council	Director or Manager	Other	State Statute	Local Ordinance	Executive/Administrative Order	Intergovernmental Agreement	Charter and Bylaws	Other	Multi-State System	Statewide System	Regional/Multi-County System	Countywide System	Local System	Not Applicable
Clackamas 800		X						X					X			
SIEC	X						X					X				
LCOG		X					X						X			
WCCCA		X					X						X			
SRUG		X						X			X					

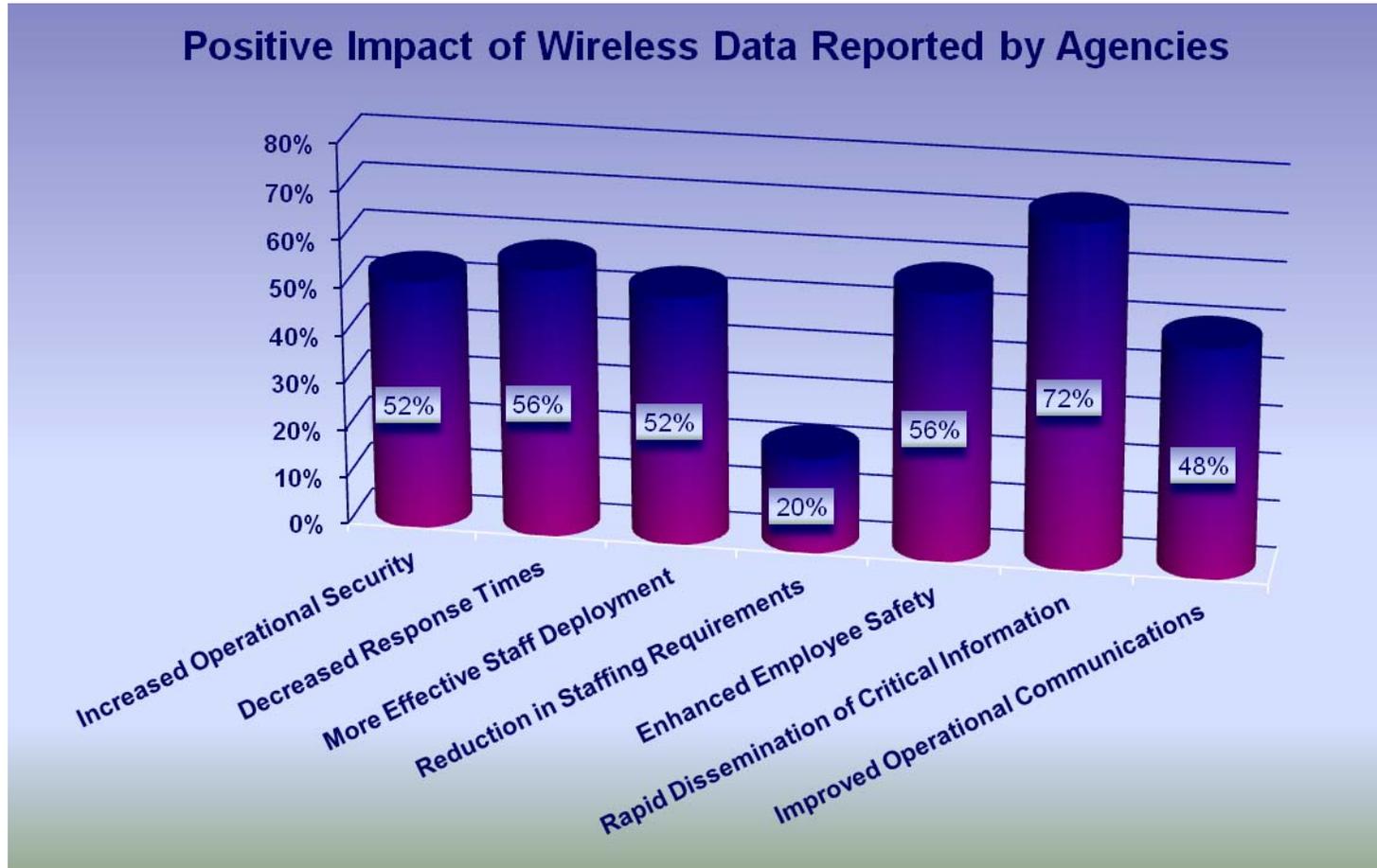


**Homeland Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Positive Impact of Wireless Data

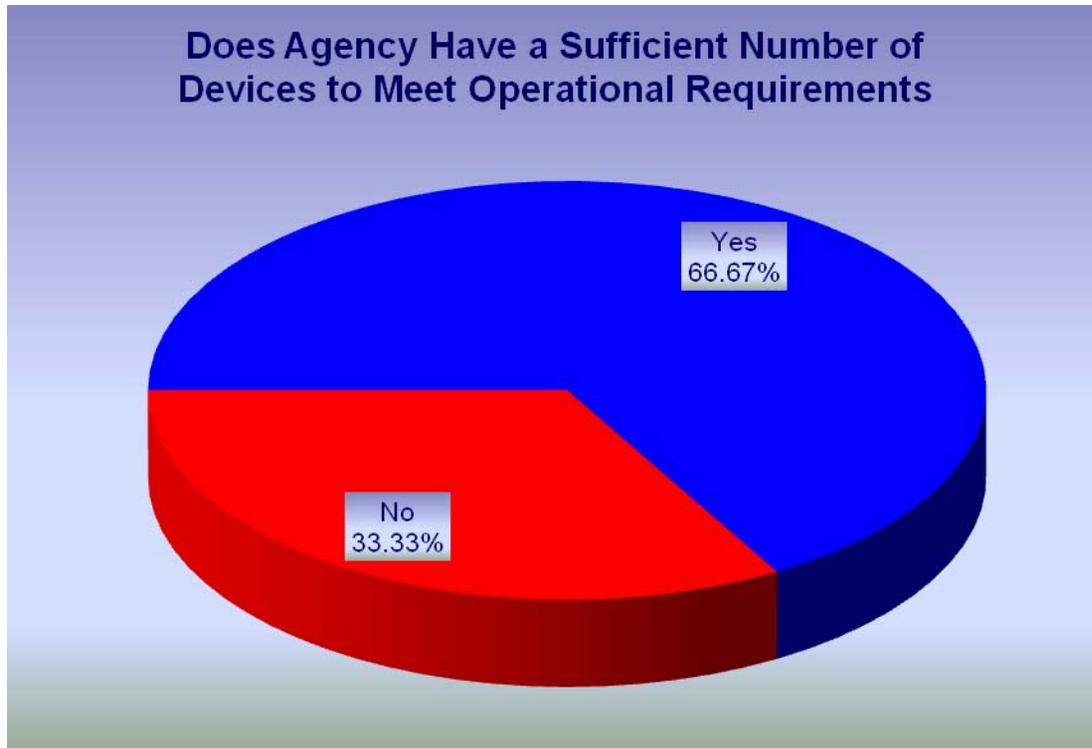


**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Adequate Deployment of Current Devices



## TOP EXPLANATIONS

- Old or outdated equipment
- Not all vehicles are equipped with mobile data devices
- Need to make better use of new technologies and features

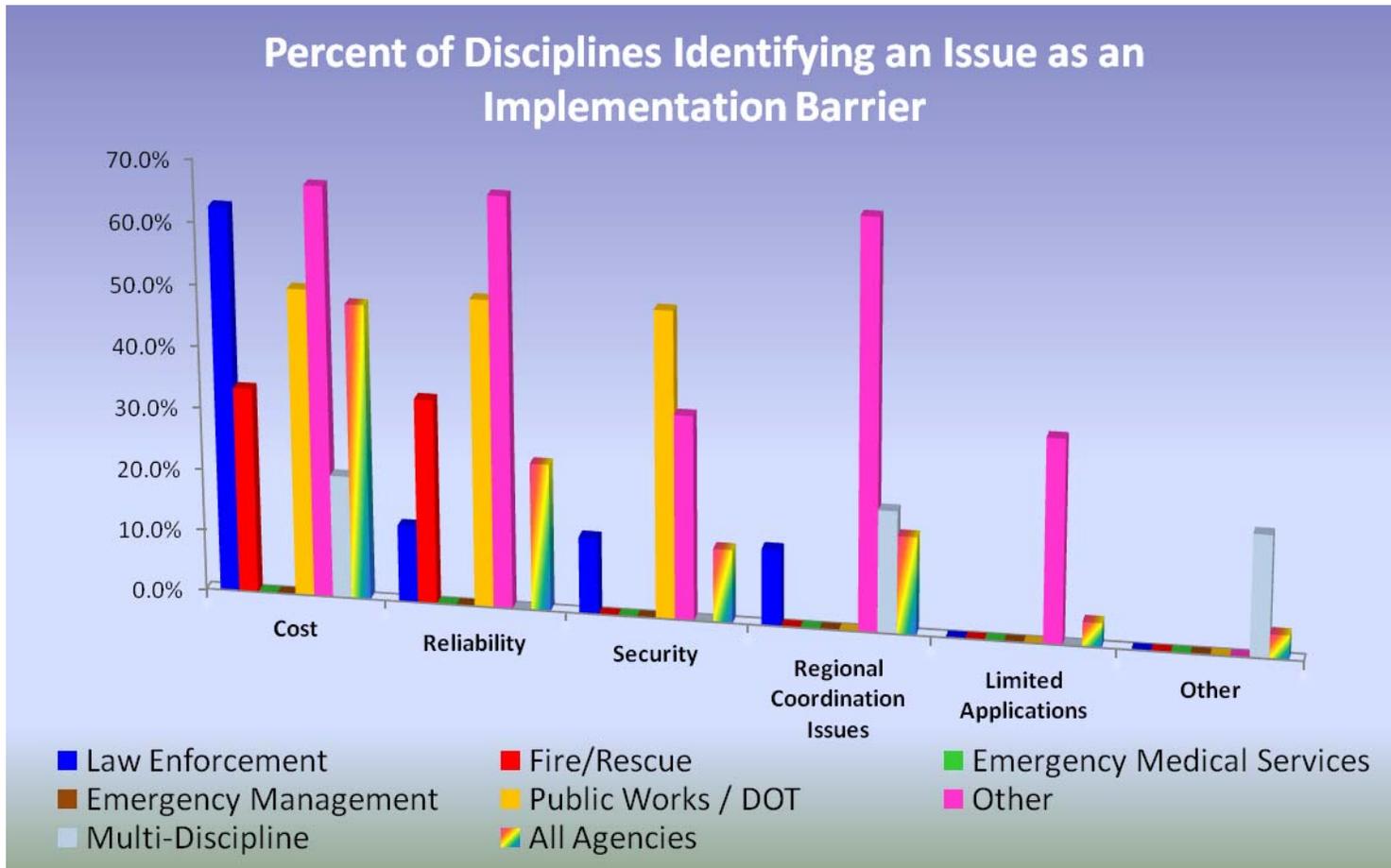


**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Implementation Barriers

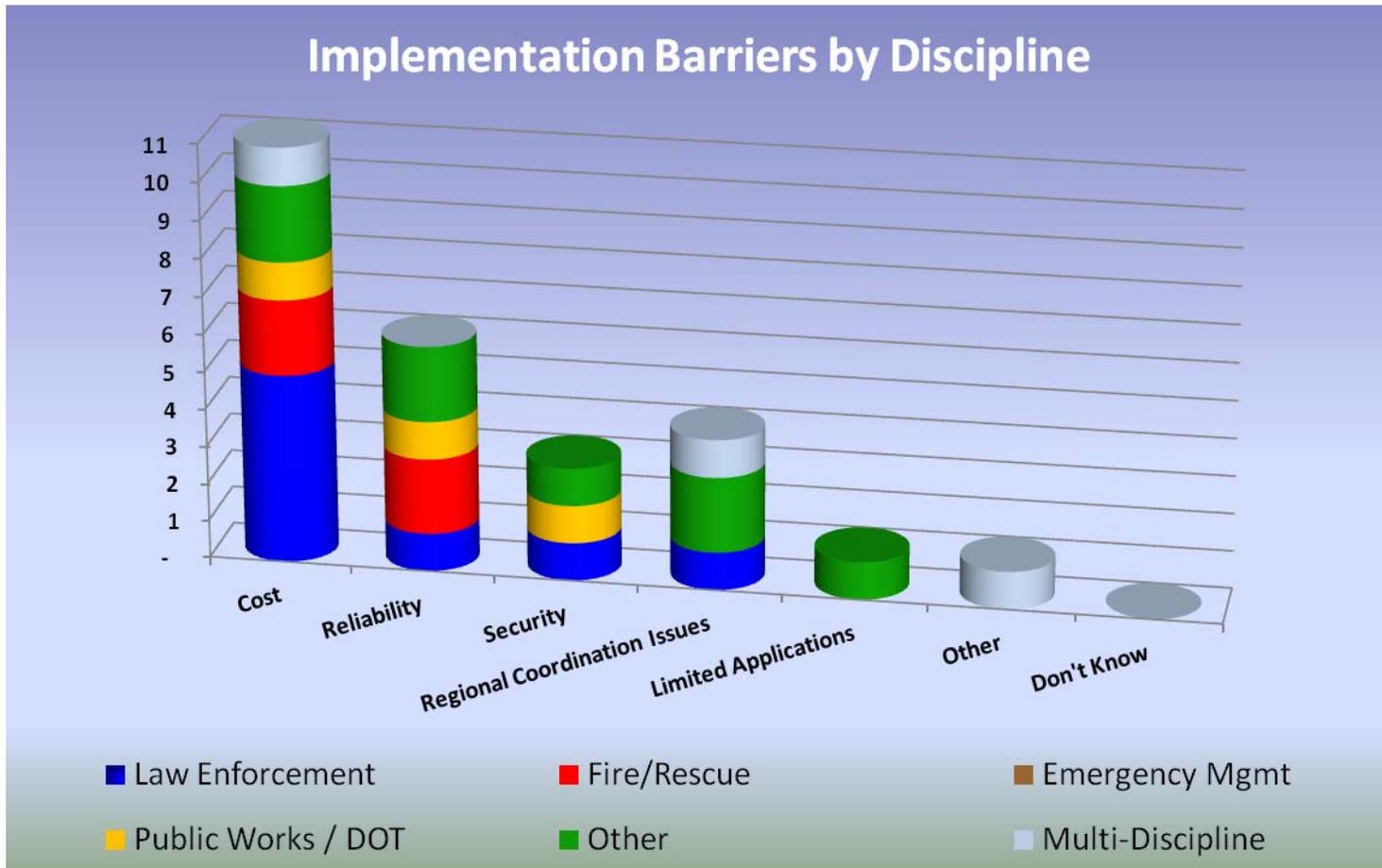


**Homeland Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Implementation Barriers



**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Contracts and Costs

- Completed by individual with knowledge of:
  - *Types and identification of wireless services used (Commercial, Private, Agency-Owned)*
  - *Criteria used to select service provider*
  - *Wireless service contracts, rate structure and billing type*
  - *Costs for provision of wireless services*

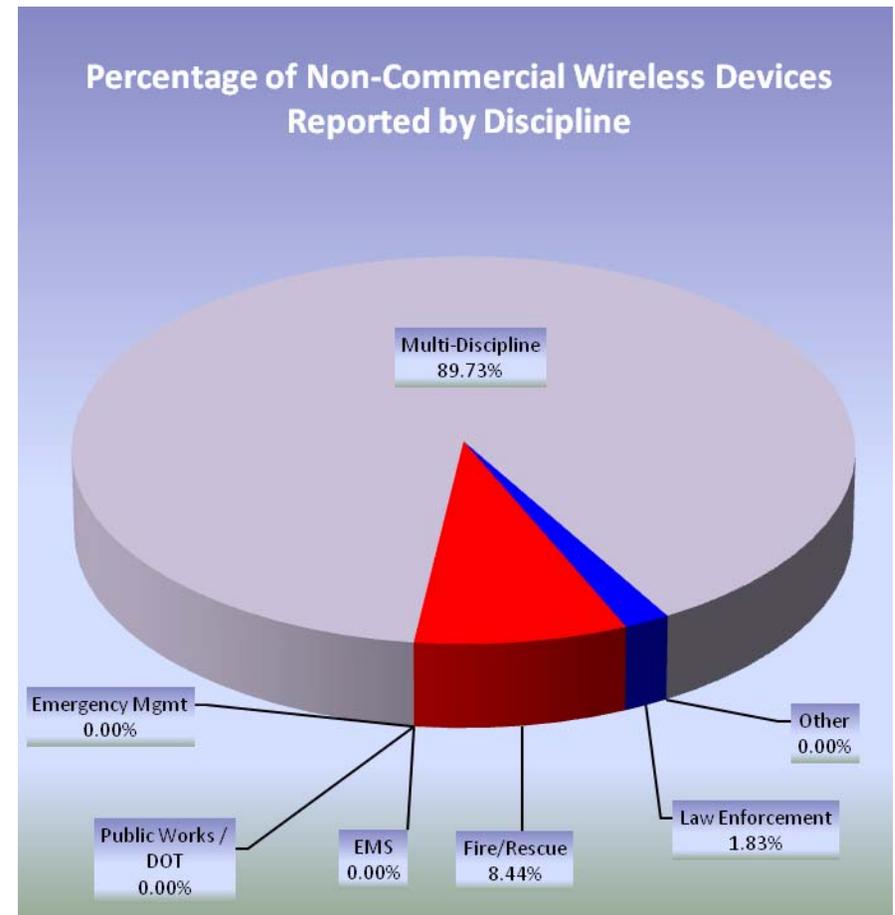
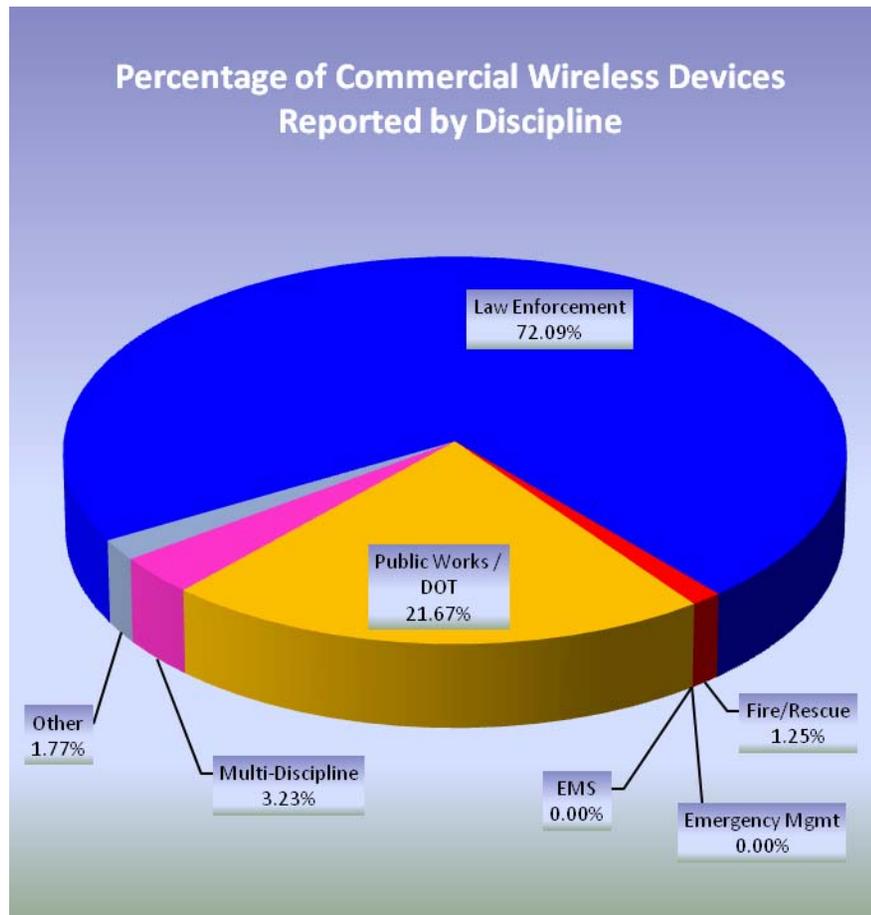


**Homeland  
Security**

**OEC/ICTAP**

*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

# Current Status of Wireless Device Implementation



Multi-Discipline agencies refer to organizations that provide devices for other agencies such as communications centers or IT departments.



**Homeland Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Criteria for Wireless Provider Selection

## Criteria used to select wireless provider

(in order of popularity)

- Coverage
- Cost
- Availability
- Features
- Reliability
- Security
- Multiple Vendors for Diversity
- State Contract



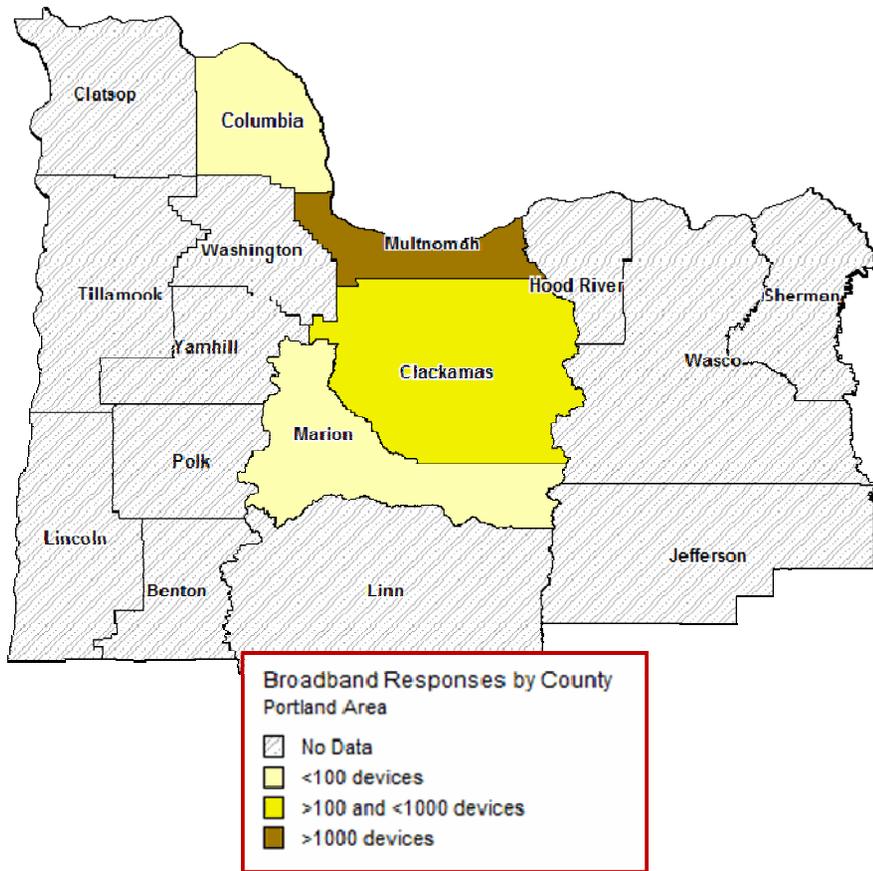
**Homeland  
Security**

**OEC/ICTAP**

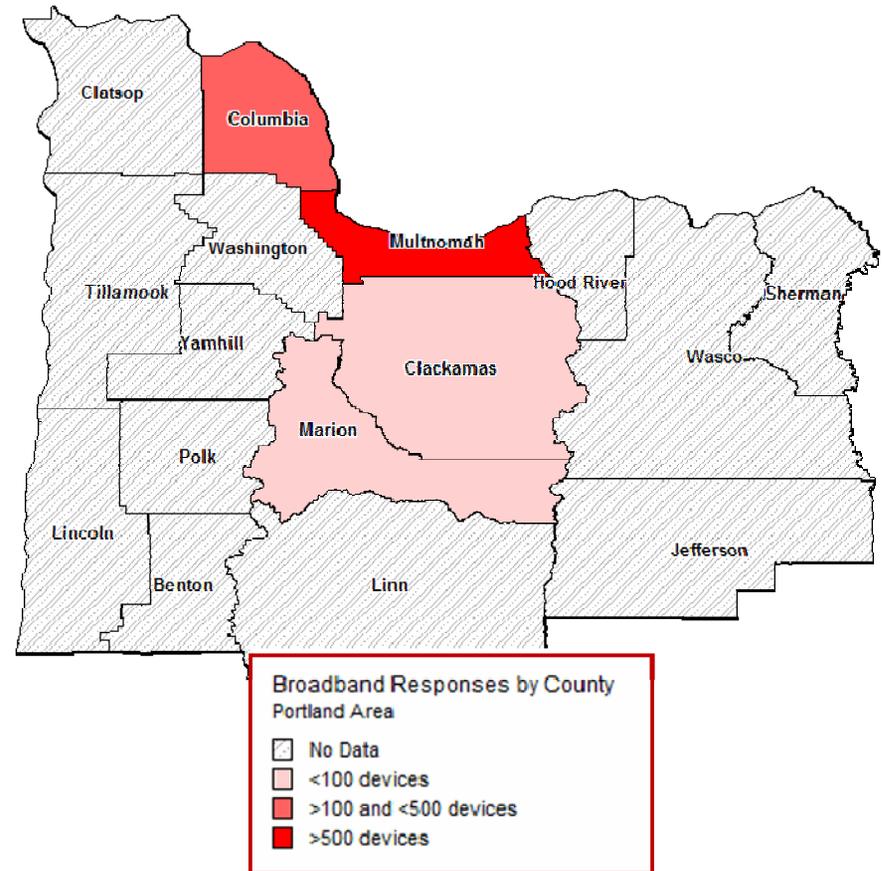
*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

# Number of Wireless Devices Reported by Respondents

## Commercial System Devices



## Private System Devices



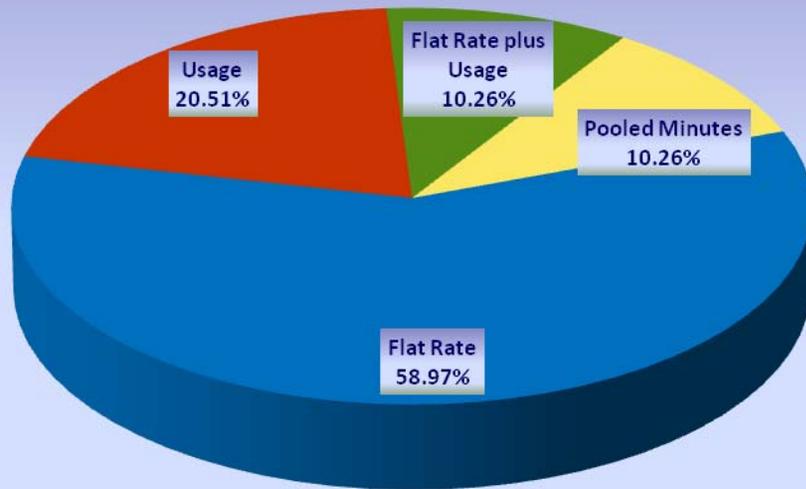
**Homeland  
Security**

**OEC/ICTAP**

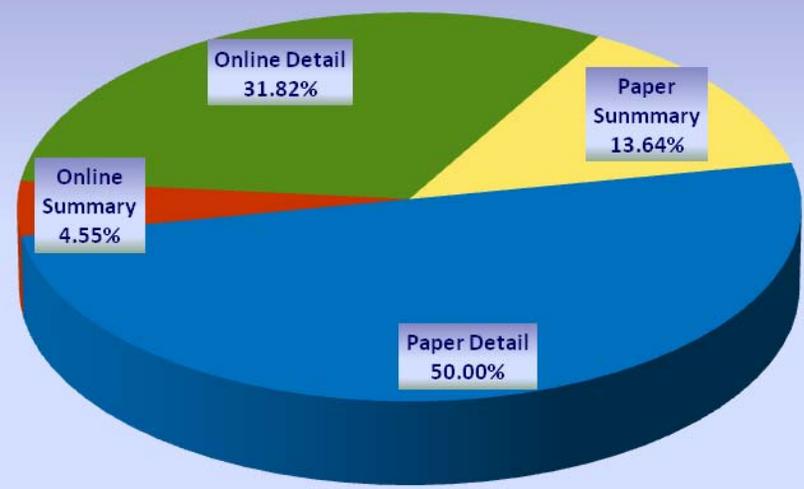
Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Commercial Device Billing

Reported Rate Structures for Commercial Wireless



Reported Billing Statement Formats for Commercial Wireless



All private system rate structures were reported as flat rate per device



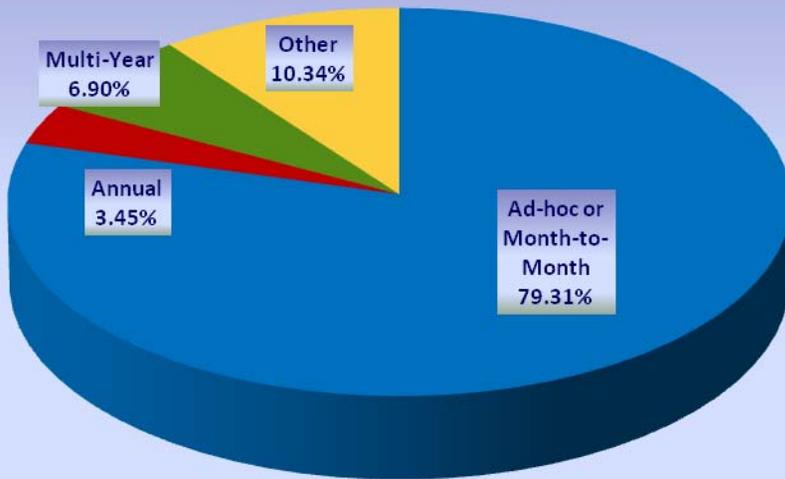
**Homeland Security**

**OEC/ICTAP**

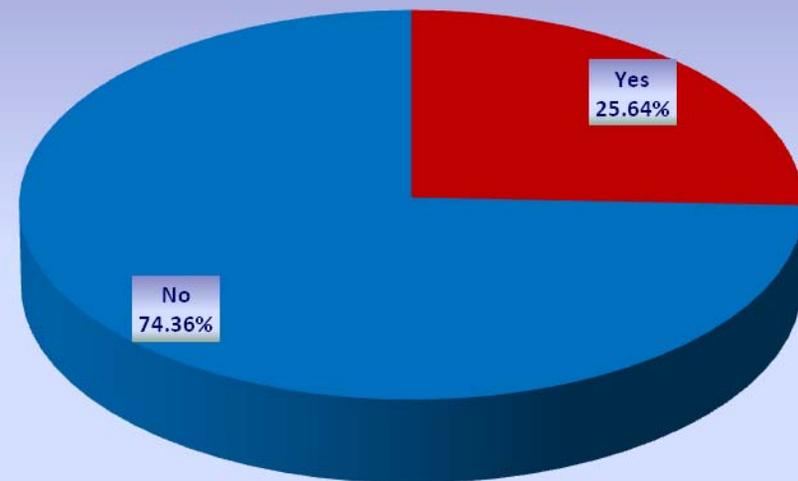
Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Commercial Provider Contracts

## Breakdown of Commercial Provider Contracts



## Penalty for Early Termination

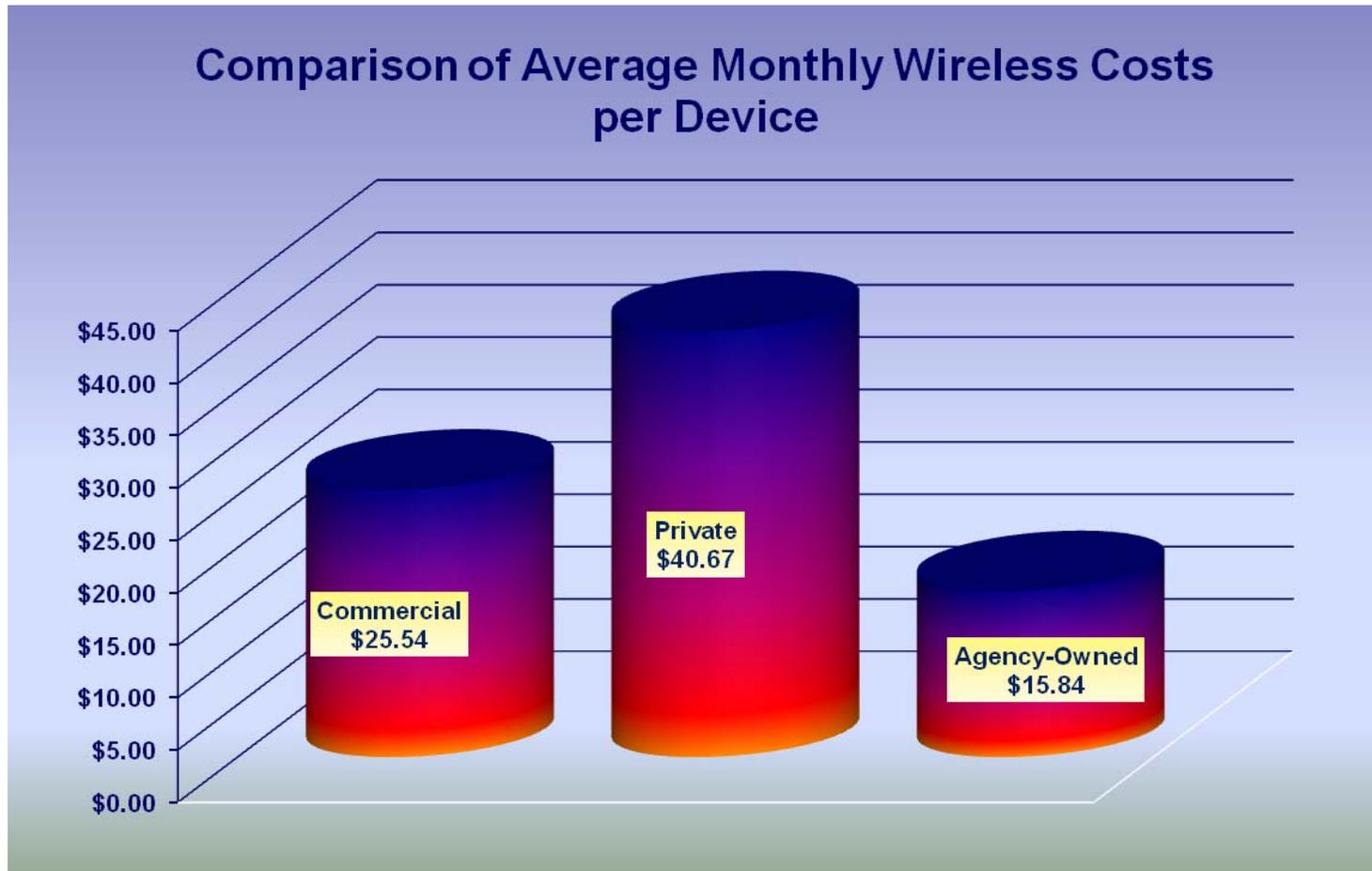


**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Monthly Subscriber Costs



**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# SOPs and Applications

- Completed by individual with knowledge of:
  - *Standard Operating Procedures (SOP) relating to wireless data that are currently in effect*
  - *Importance of different types of wireless data-based applications*
  - *Implementation status of different types of wireless data-based applications*
  - *Barriers to implementation of wireless data-based application*

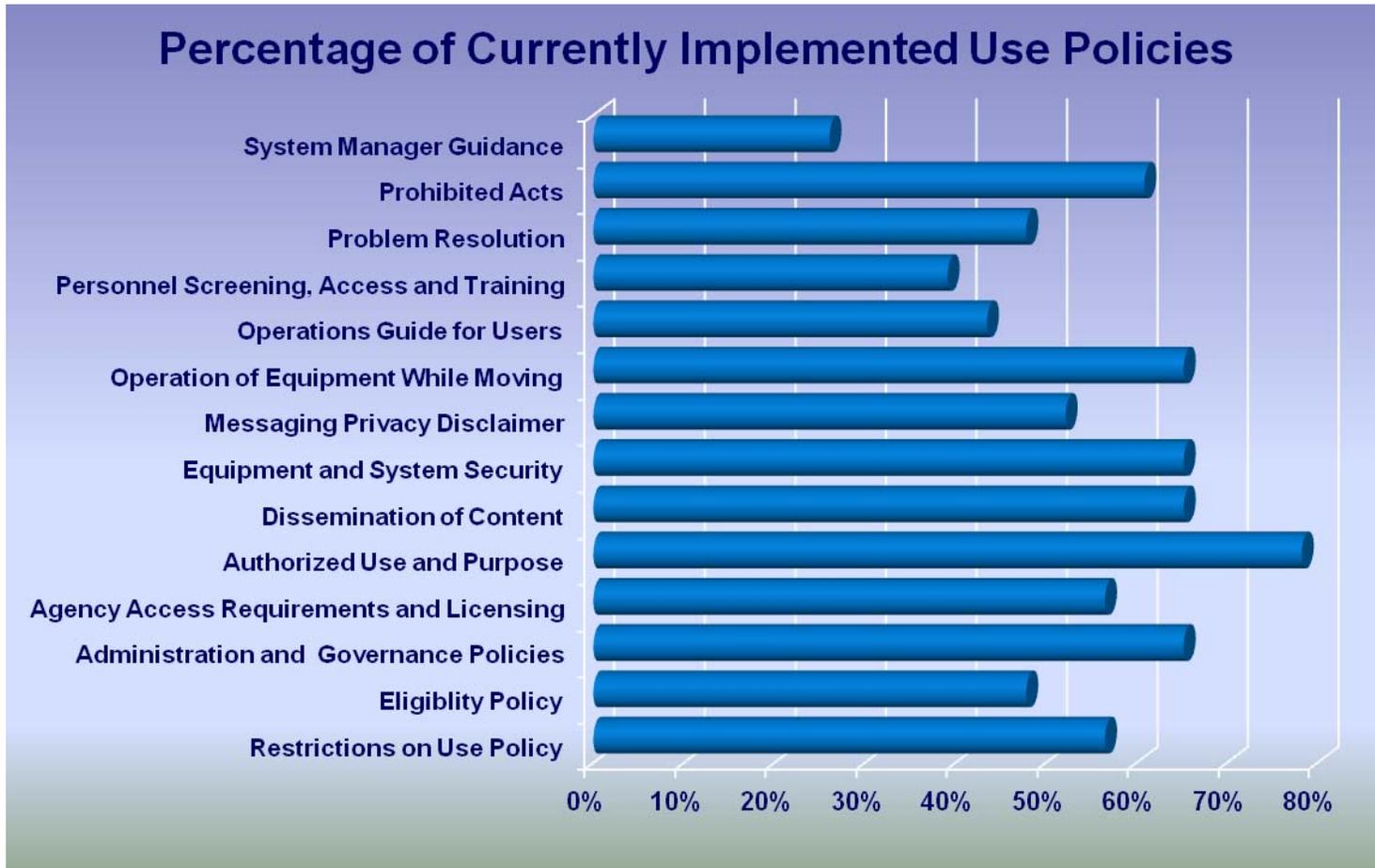


**Homeland  
Security**

**OEC/ICTAP**

*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

# Standard Operating Procedures and Policies

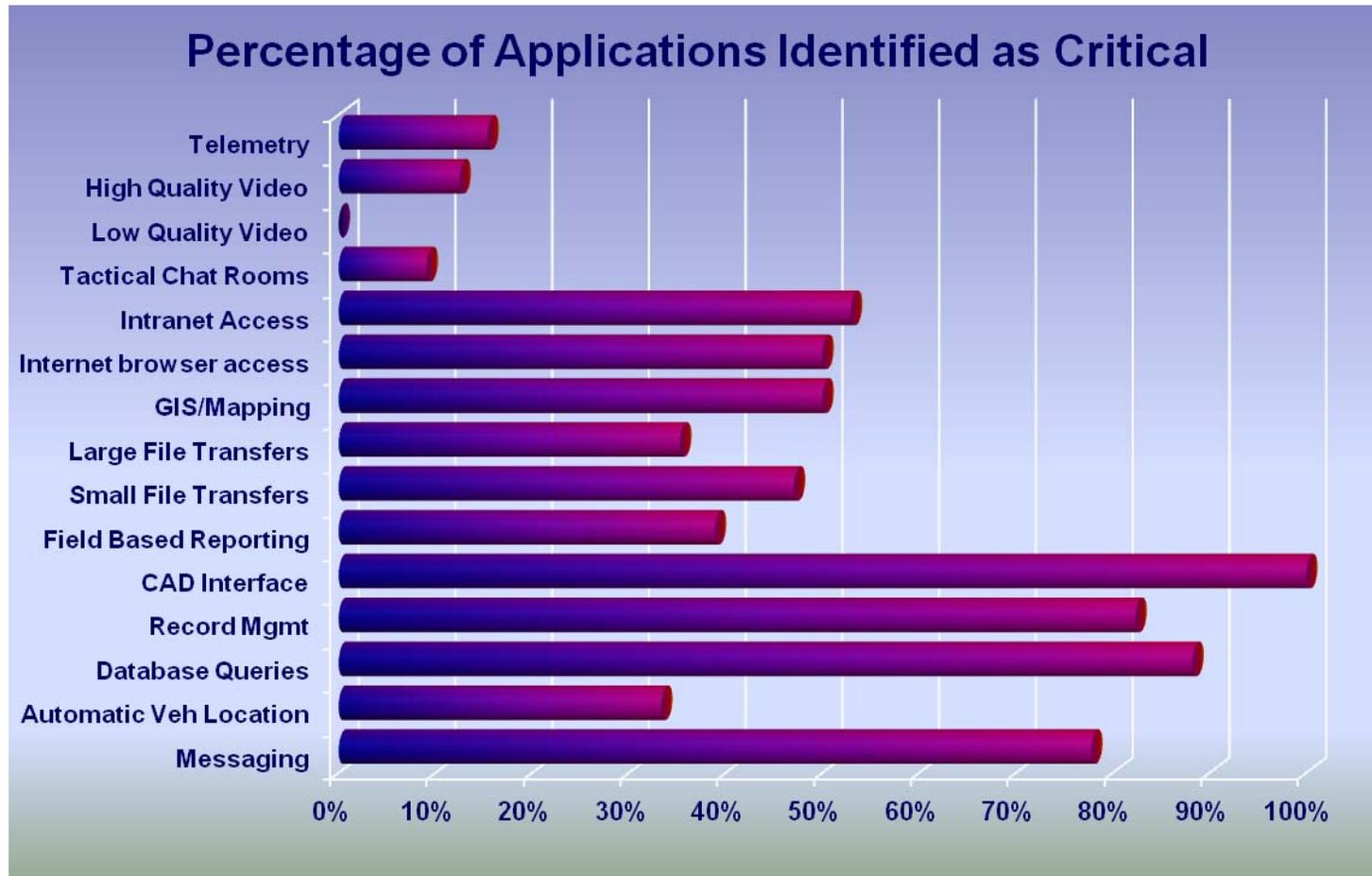


**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Mission-Critical Applications

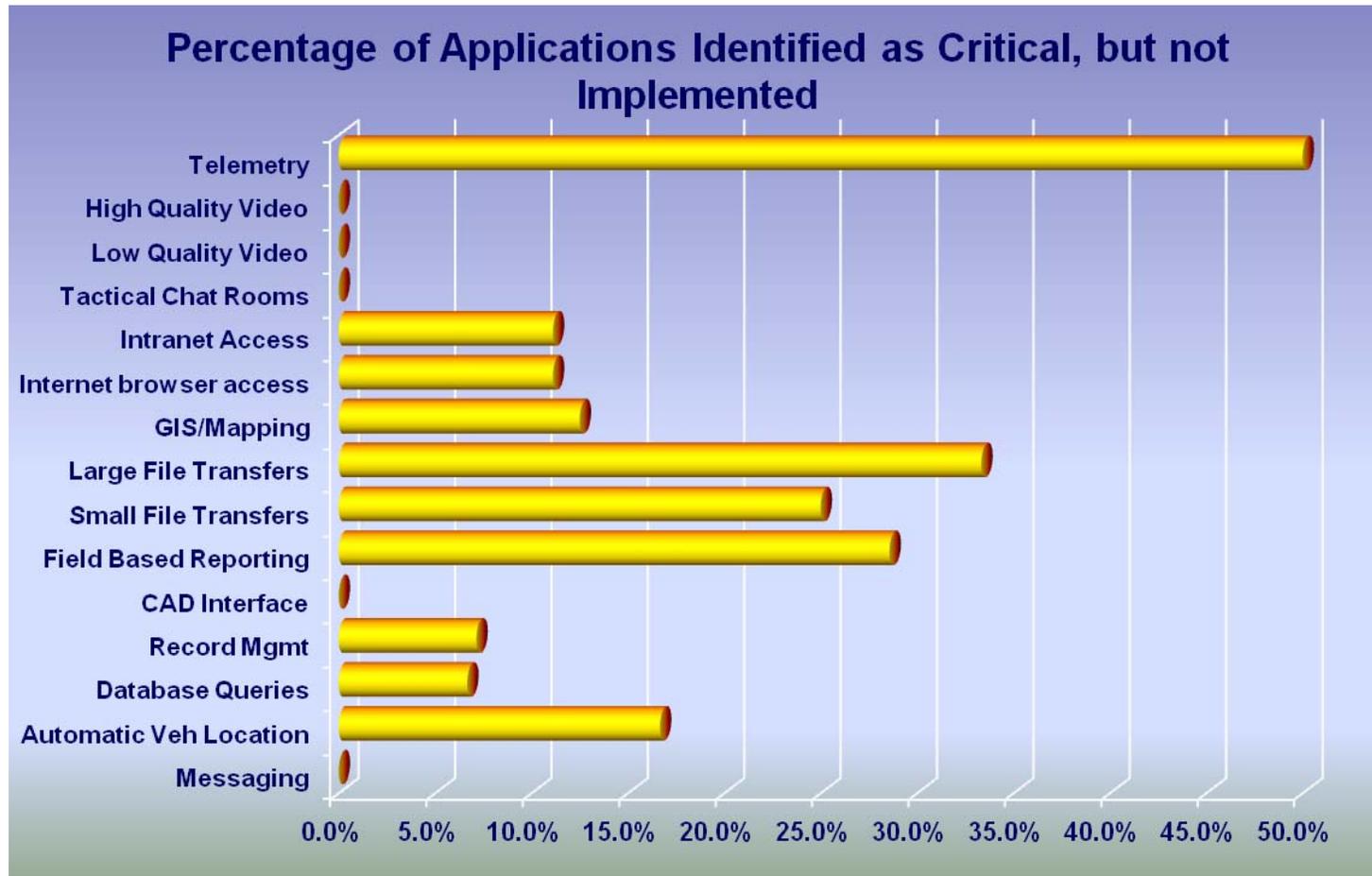


**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Mission-Critical Applications

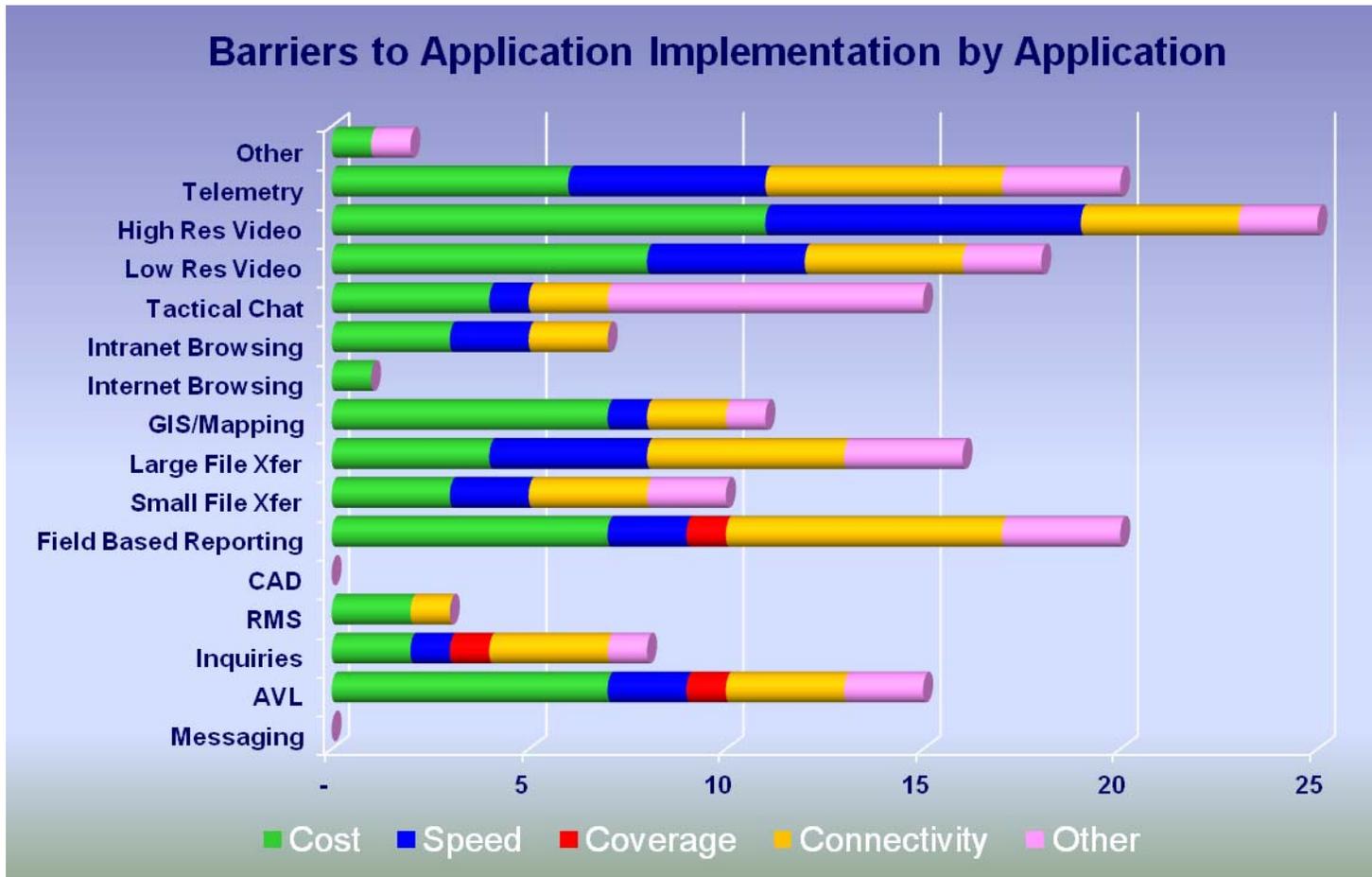


**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Barriers to Application Implementation

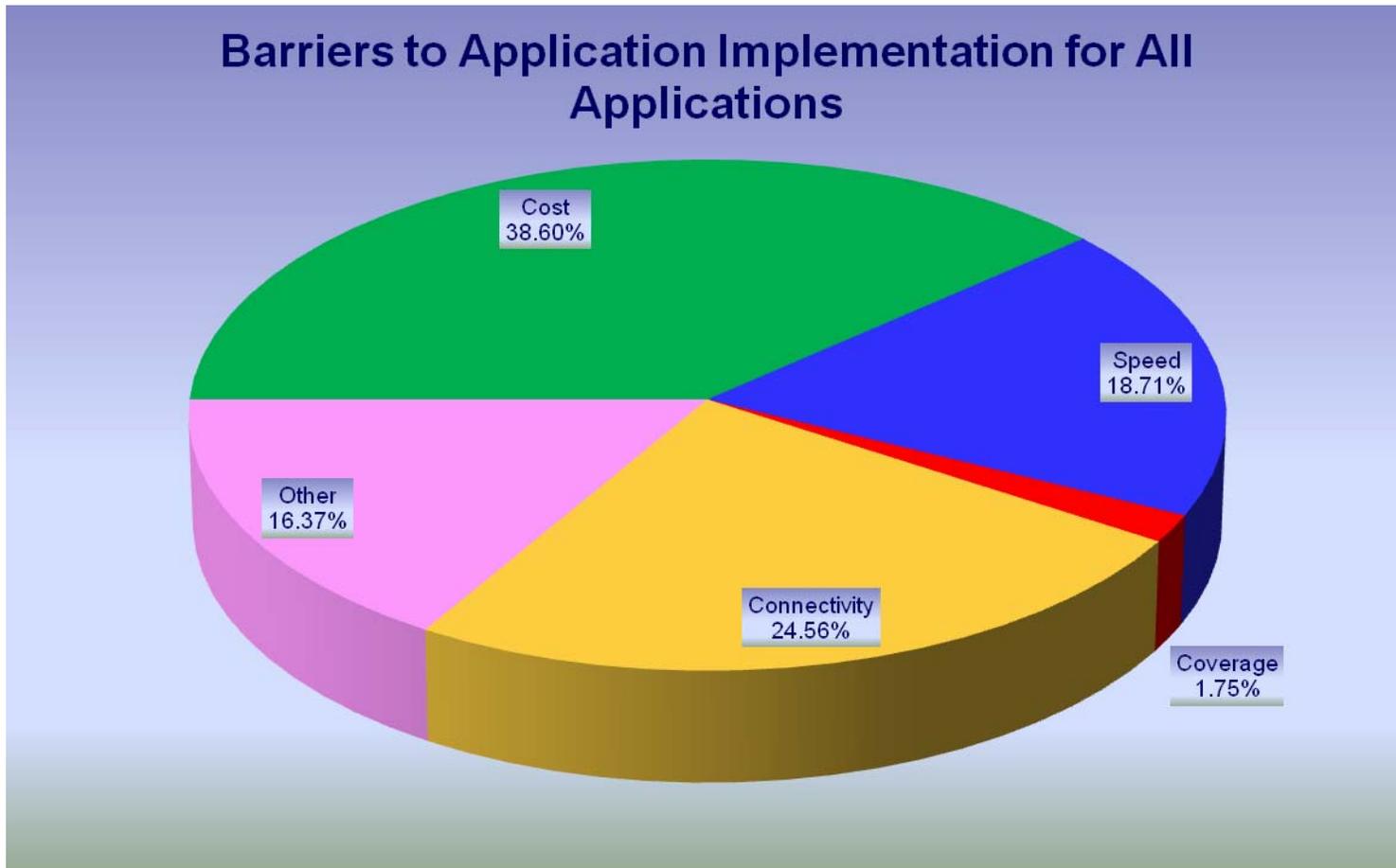


**Homeland Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Barriers to Application Implementation



**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Current Technology

- Completed by individual with knowledge of:
  - *Numbers of wireless devices needed to meet operational requirements*
  - *Types of wireless technologies and protocols (2G/3G, 802.11g/n) currently employed by the agency*
  - *Implementation dates for wireless technologies used by the agency*
  - *Availability of existing infrastructure (RF Sites, Network Backhaul) that could be used in a network build-out*
  - *Hosting preferences for a 700 MHz LTE-based public safety broadband system*

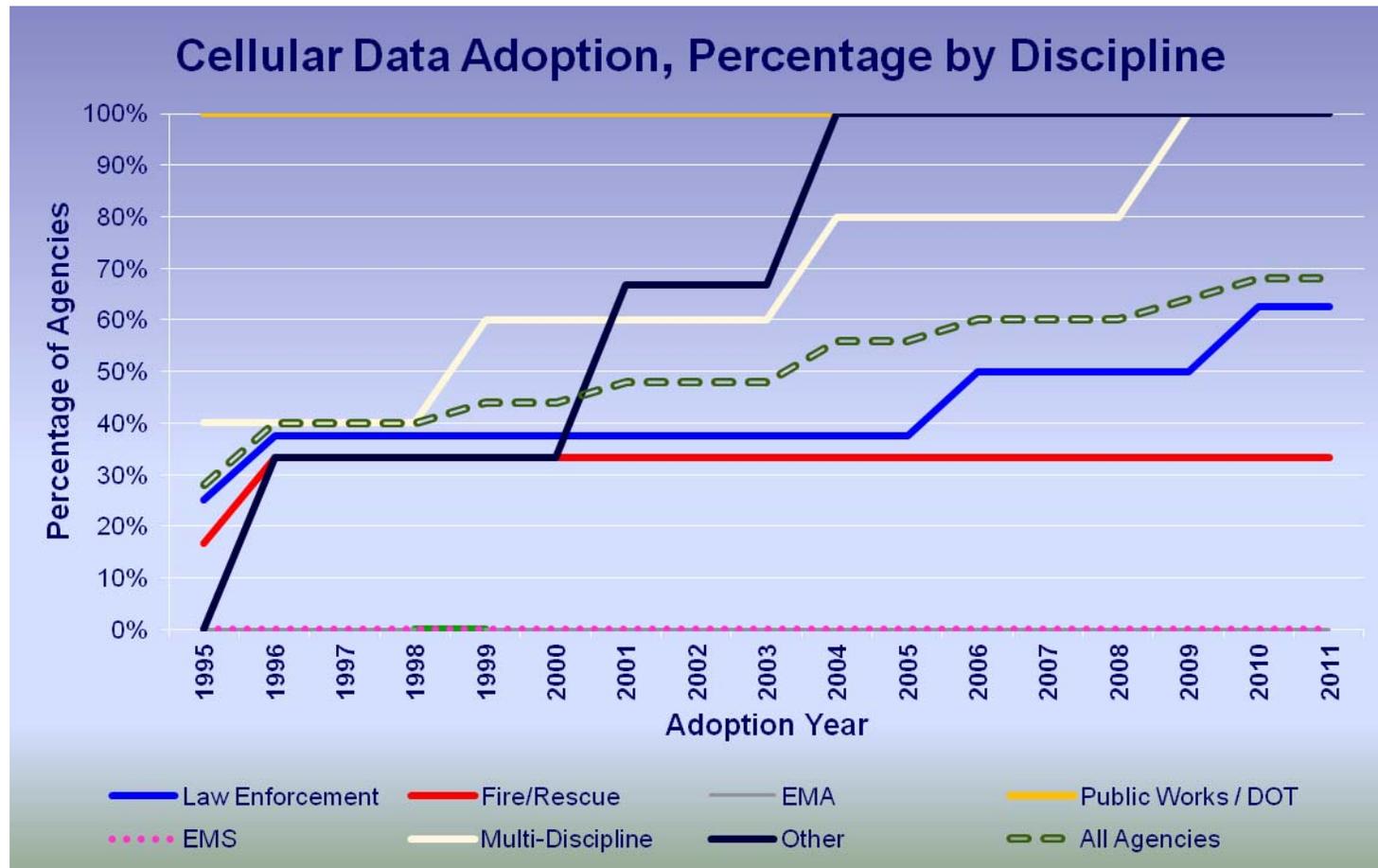


**Homeland  
Security**

**OEC/ICTAP**

*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

# Dates of Adoption – Cellular Services

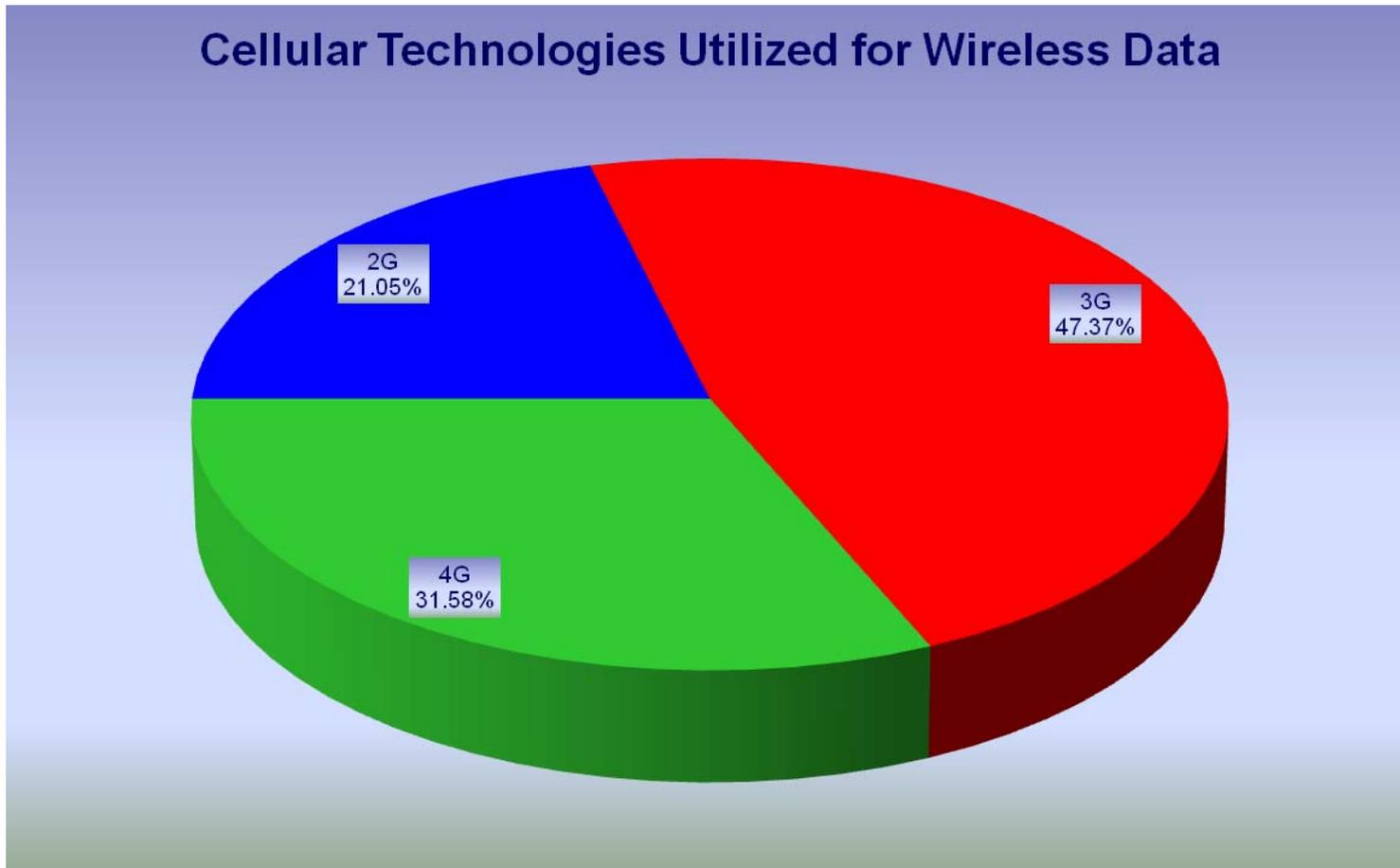


**Homeland Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Cellular Technology

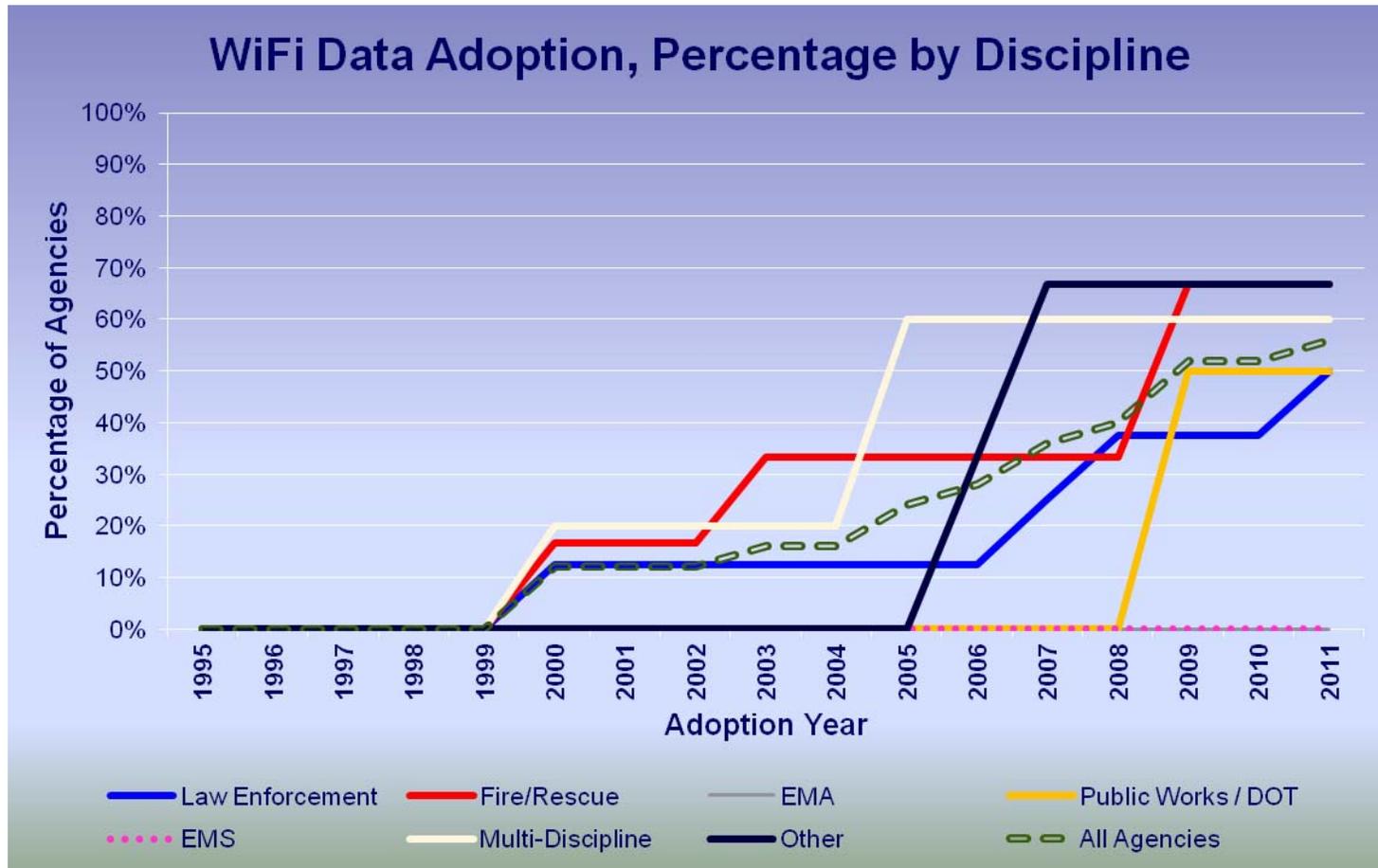


**Homeland  
Security**

**OEC/ICTAP**

*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

# Dates of Adoption – WiFi Services

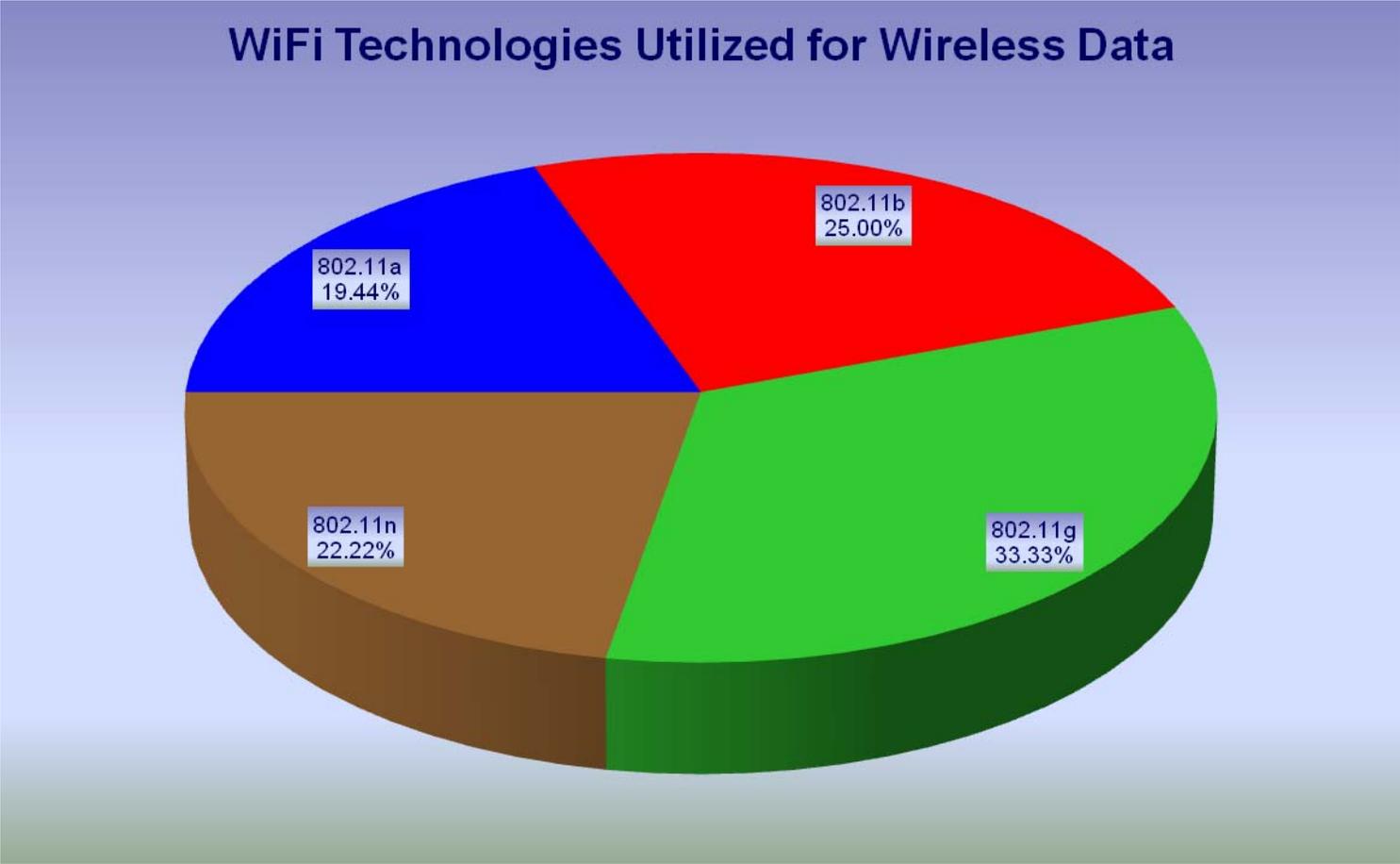


**Homeland Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# WiFi Technology

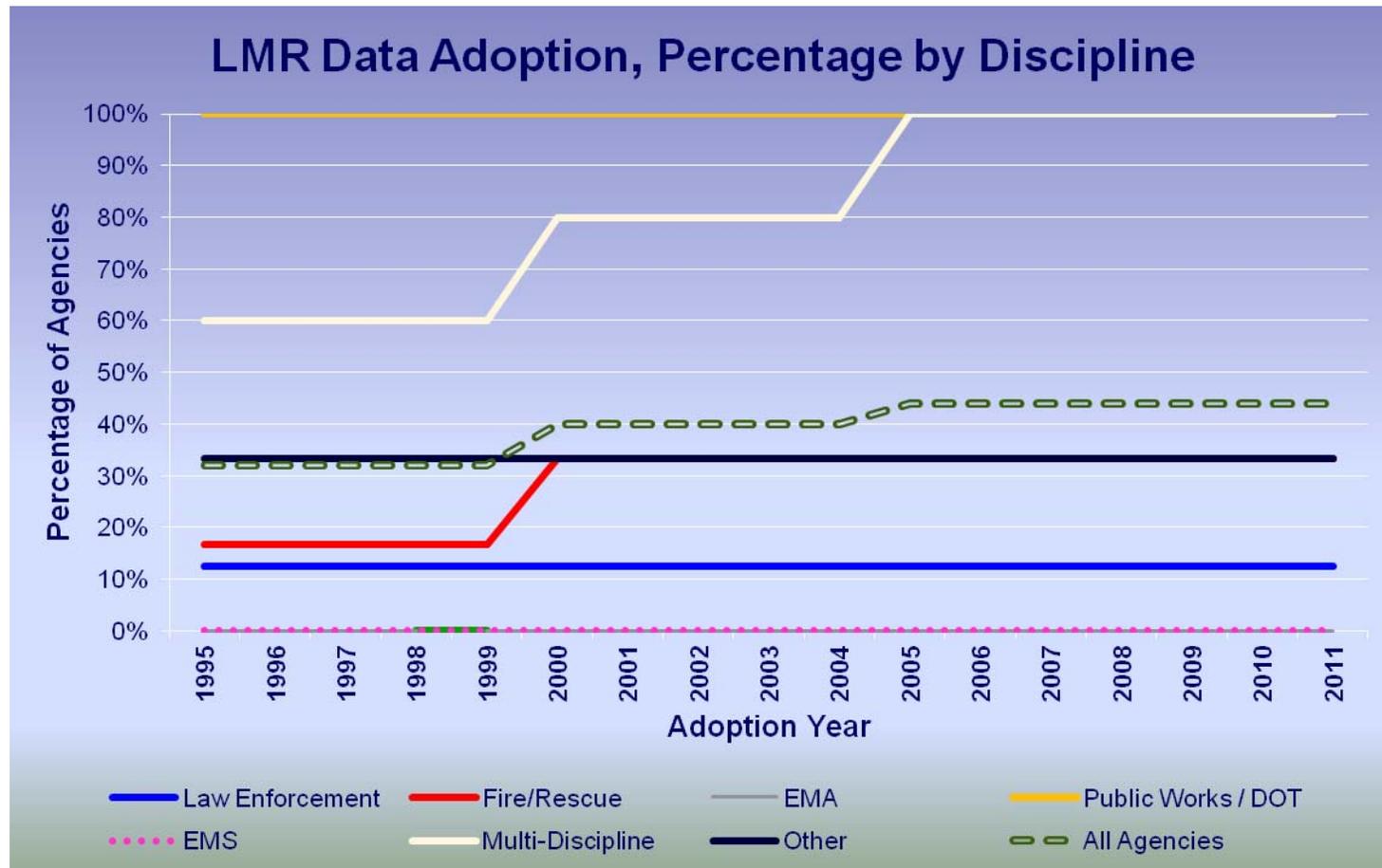


**Homeland Security**

**OEC/ICTAP**

*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

# Dates of Adoption – LMR-Based Data Services



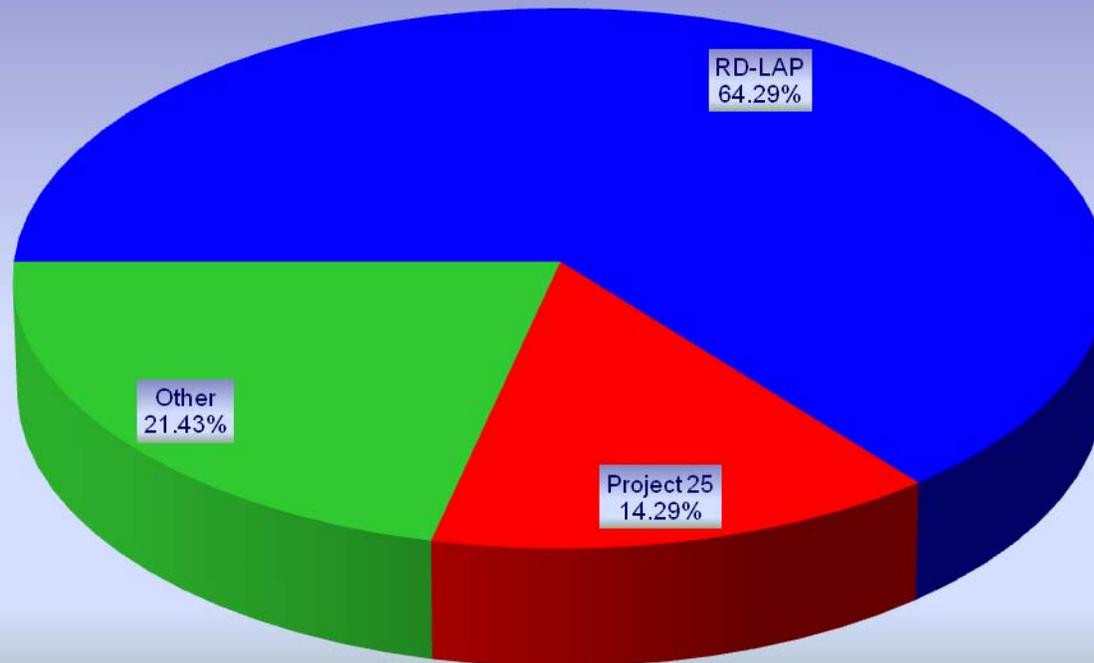
**Homeland Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Cellular Technology

LMR Technologies Utilized for Wireless Data

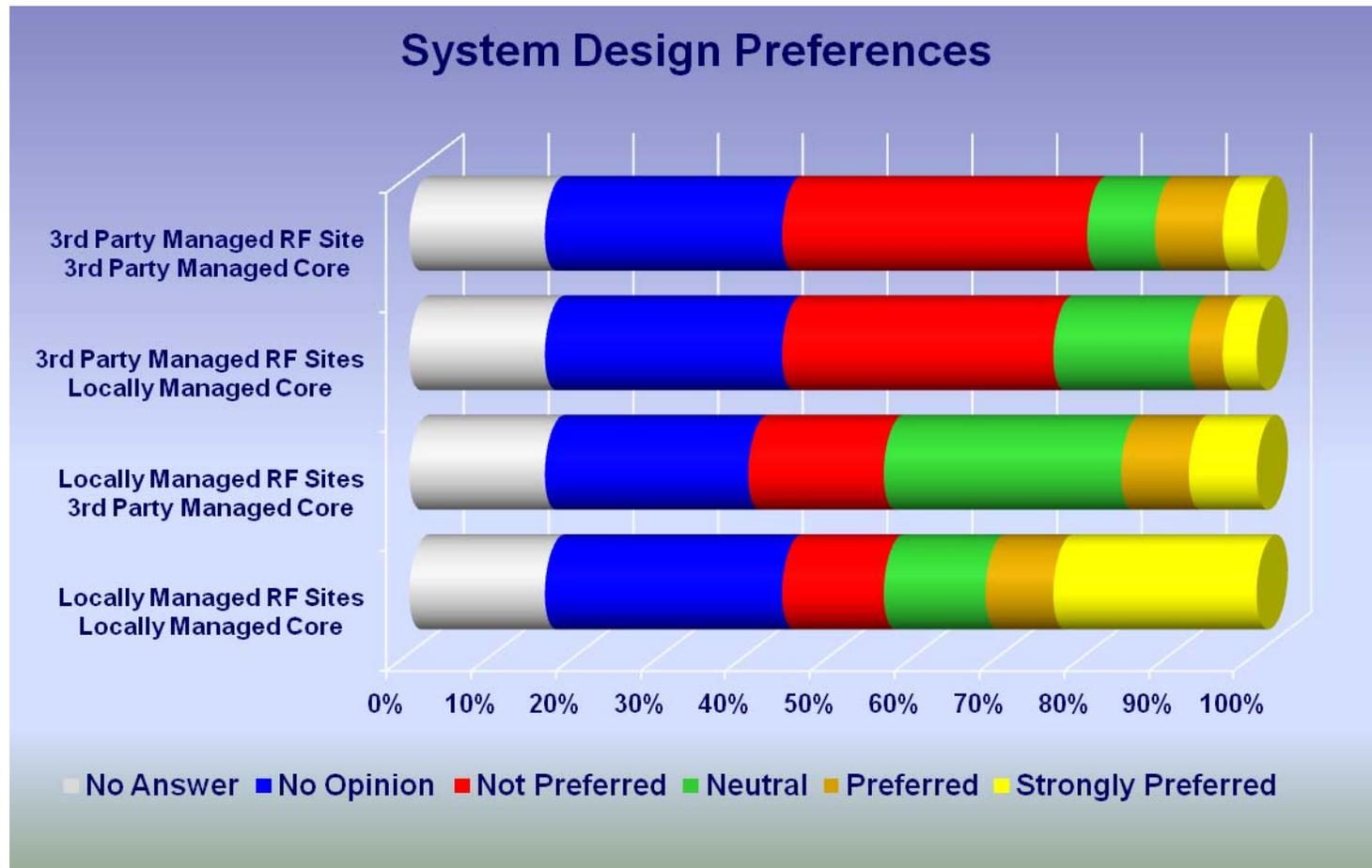


**Homeland  
Security**

**OEC/ICTAP**

*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

# Core and RF Site Hosting Preferences

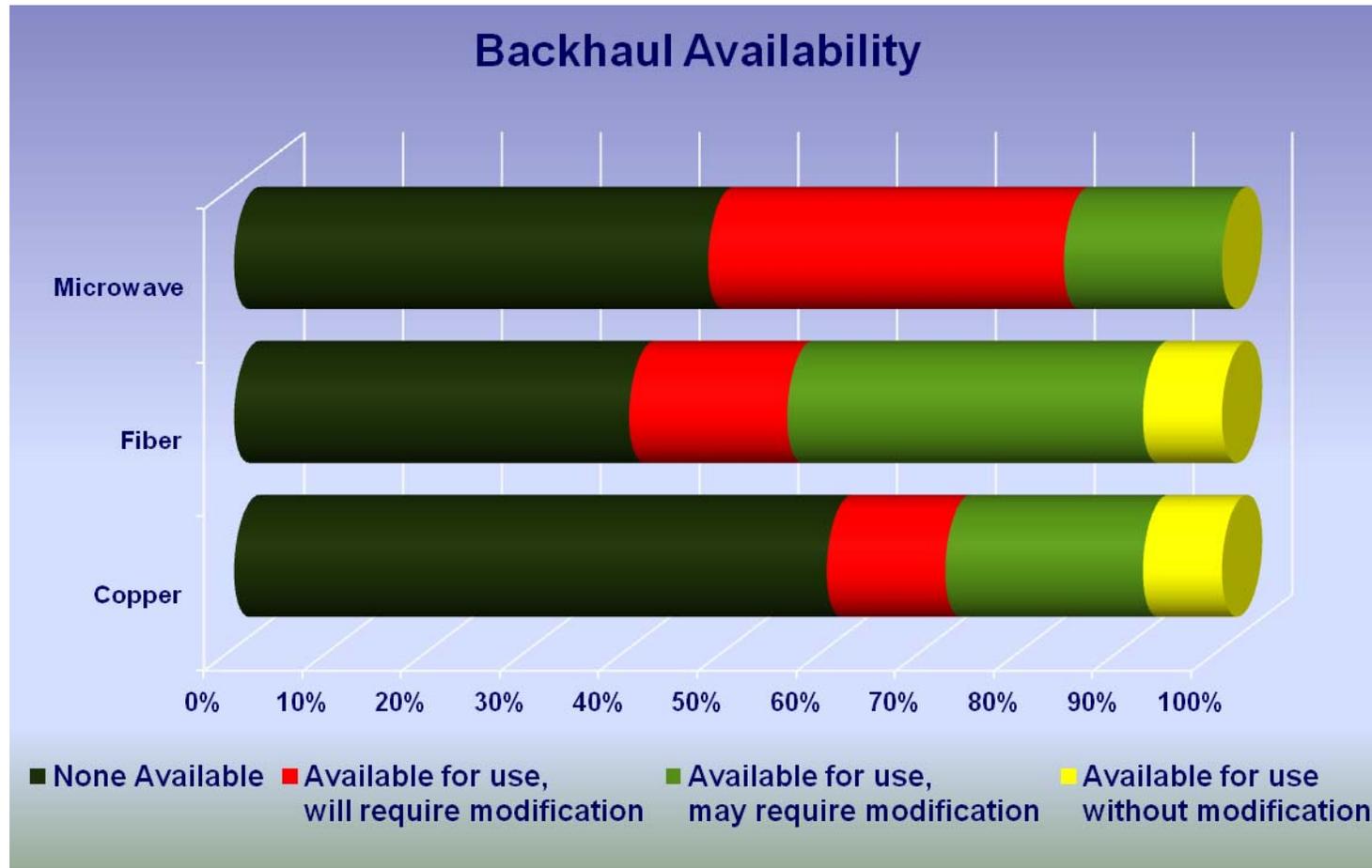


**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Backhaul Availability

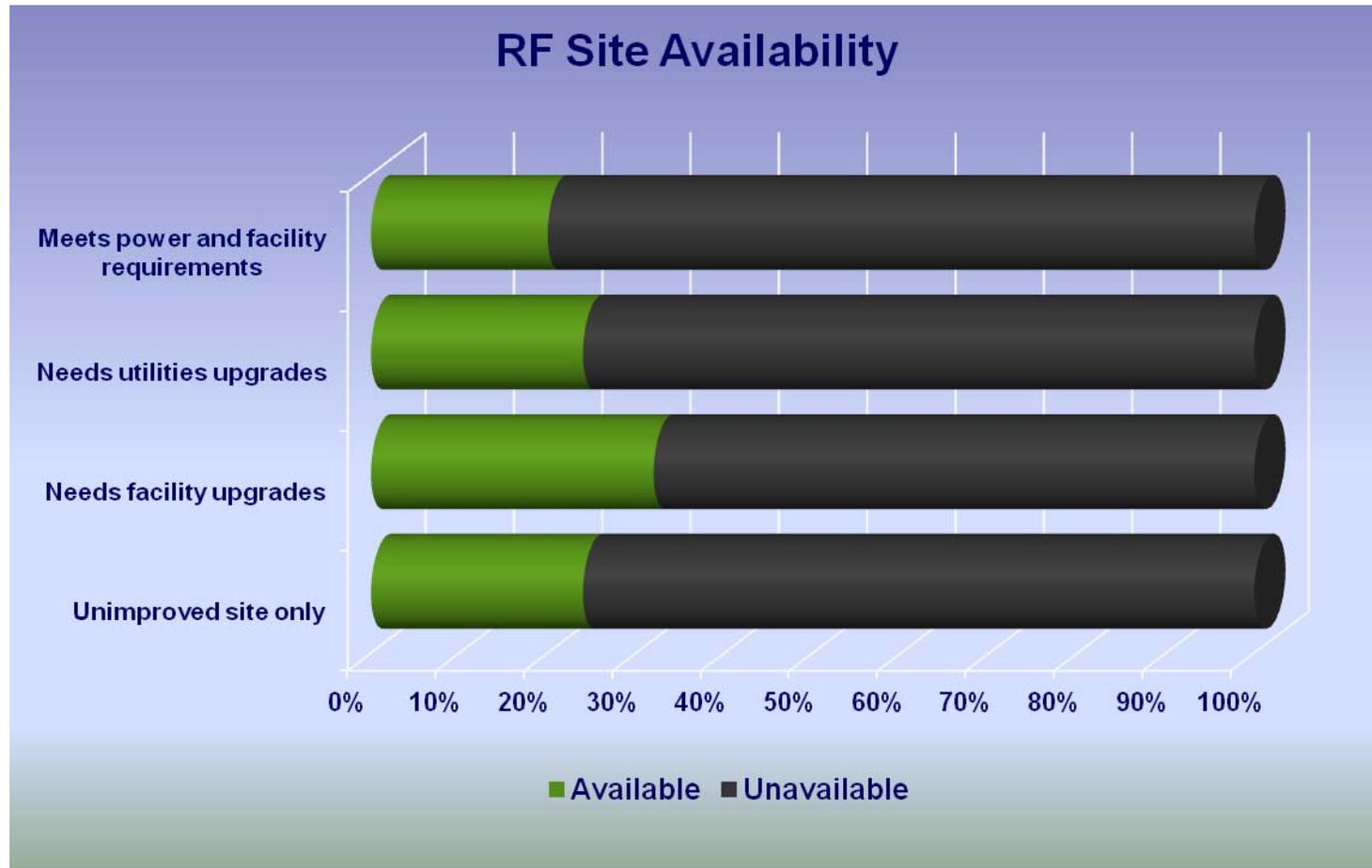


**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# RF Site Availability



**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Future Planning

- Completed by individual with knowledge of:
  - *Numbers of wireless devices of different form factors (modem, laptop, etc.) anticipated for use on a future wireless network system*
  - *Degree of customization required for wireless devices*
  - *Anticipated use of wireless network systems for voice communications*

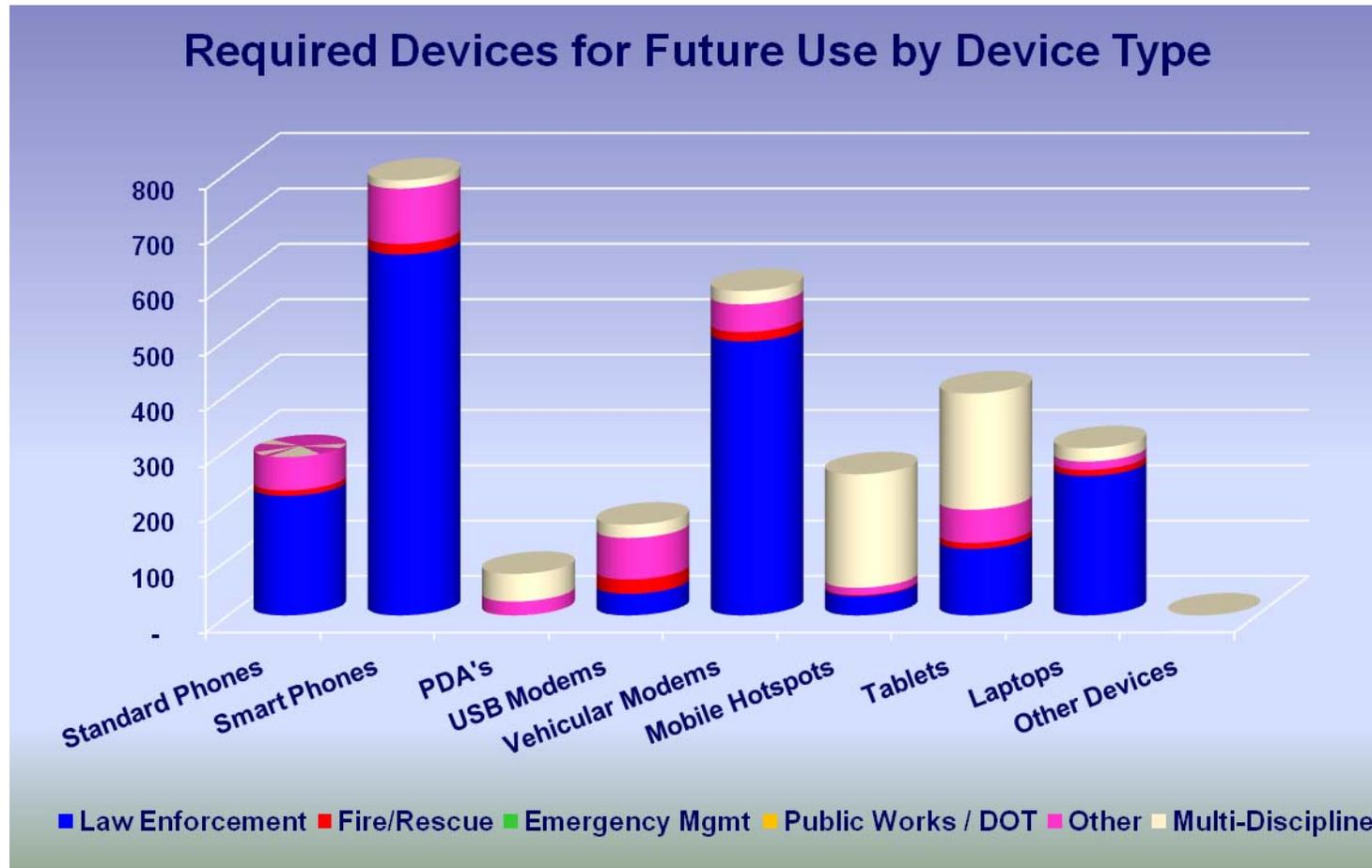


**Homeland  
Security**

**OEC/ICTAP**

*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

# Future Device Requirements



**Homeland  
Security**

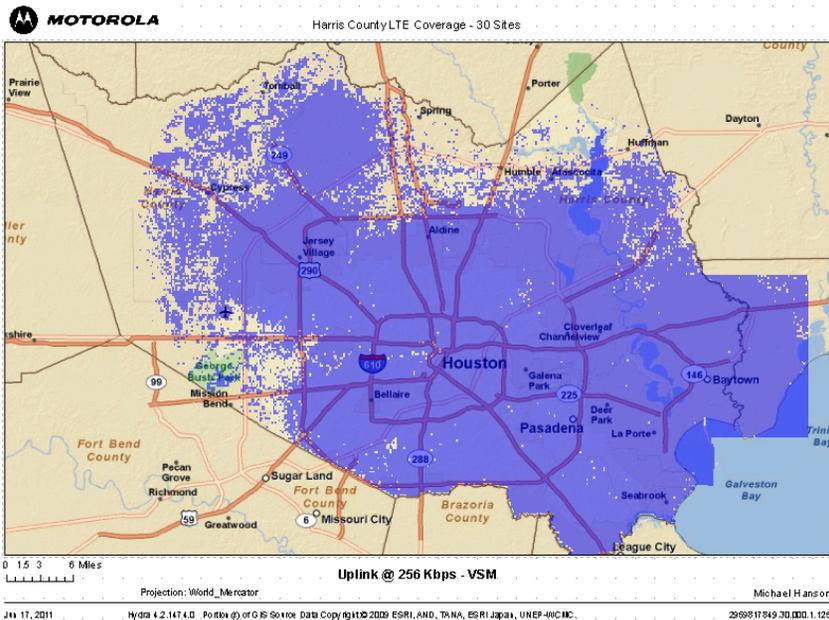
**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

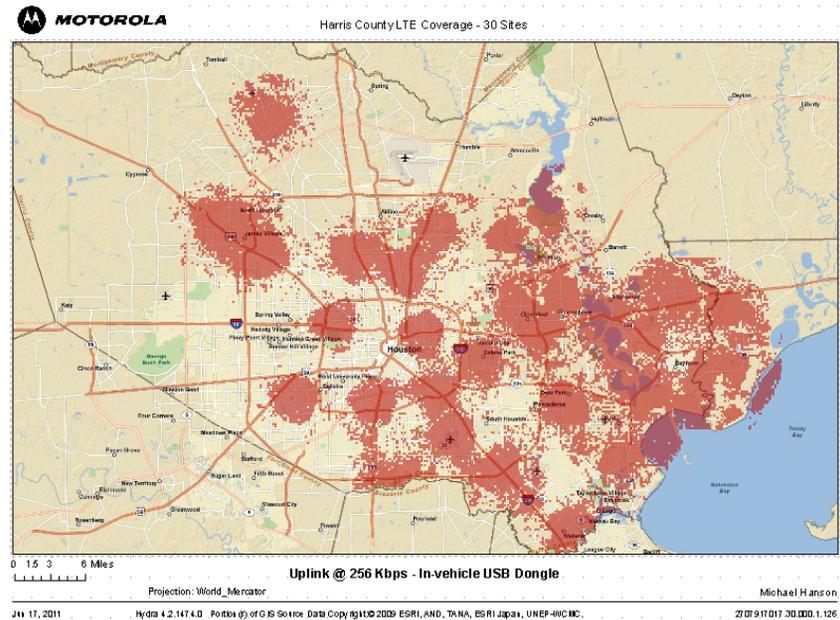
# LTE Coverage – Device Comparison

Source: Harris County Interoperability Showing

## Vehicular modem with antennas on exterior - Uplink



## USB dongle inside vehicle – Uplink = UE dongle to eNodeB



**Just as in LMR, device type and position of will have large effect on coverage**

*\*Old plan, shown for comparison purposes only*

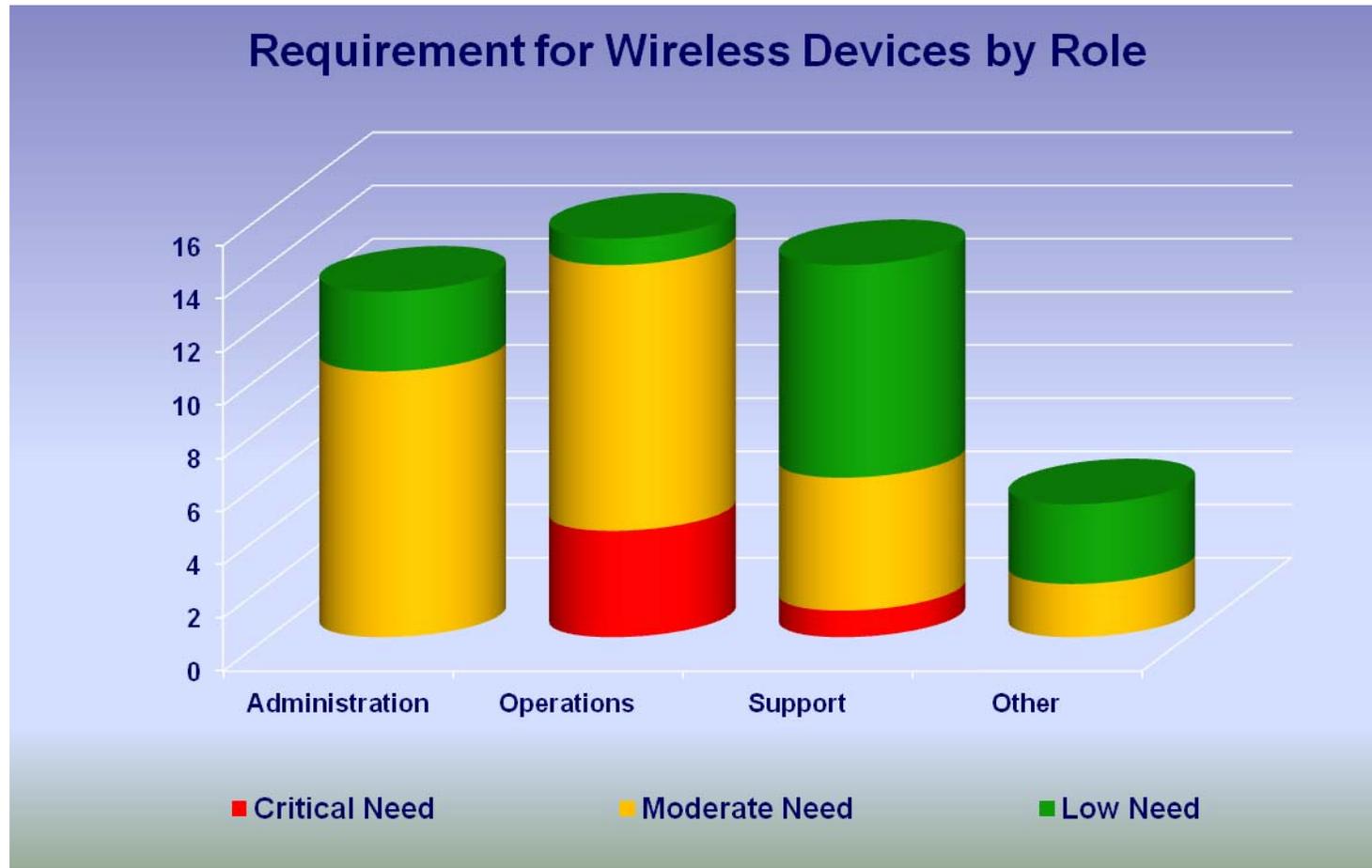


**Homeland Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Future Device Requirements

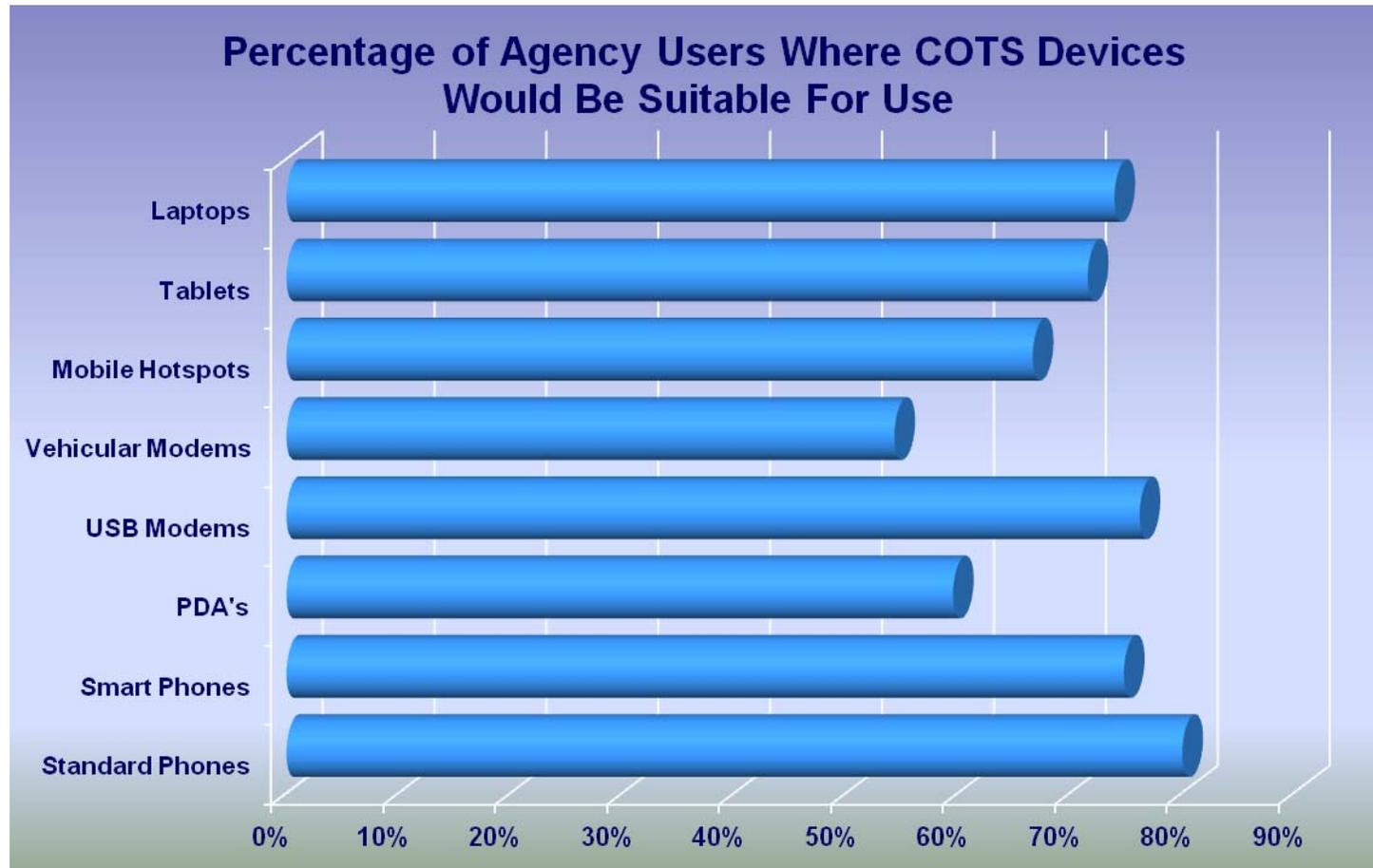


**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Future Device Requirements

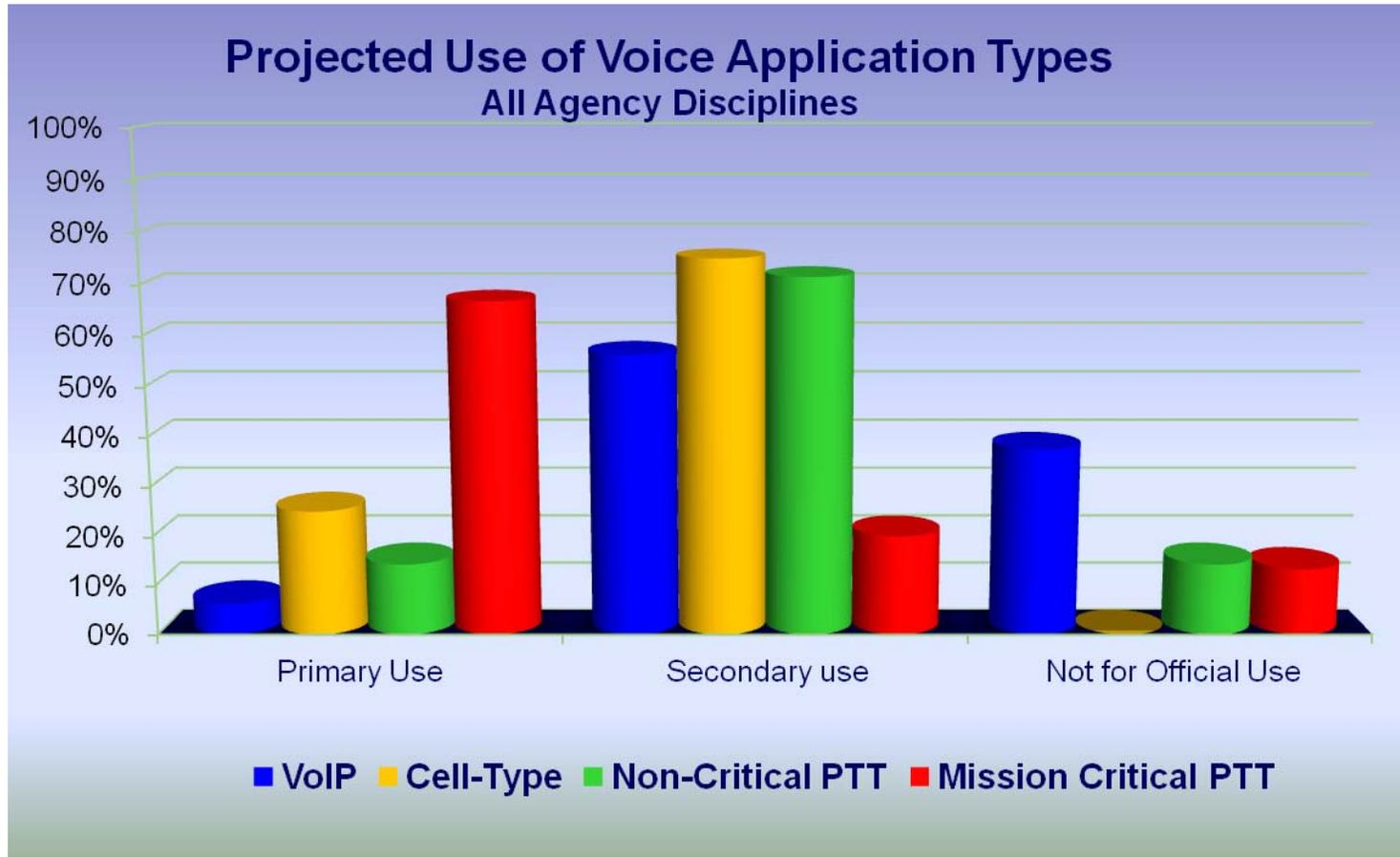


**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Voice Capabilities



**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Summary

## Administrative Findings

- *Five wireless system governance groups were identified by respondents*
- *30% of survey respondents did not identify a wireless system governance group for their agency*
- *The top three positive outcomes from the use of current wireless data systems are:*
  - *Enhanced employee safety*
  - *Rapid dissemination of critical information*
  - *Decreased response times*
- *One-third of reporting agencies indicated that they did not have a sufficient number of wireless devices to meet operational requirements*
- *Top three barriers to wireless data implementation are:*
  - *Cost*
  - *Reliability*
  - *Lack of regional coordination*



**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Summary

## Cost and Contract Findings

- ***Largest percentage of commercial device users are law enforcement***
- ***The top three criteria used to select a wireless service provider (in order of preference) are:***
  - ***Coverage***
  - ***Cost***
  - ***Availability***
- ***The most widely used rate structure for wireless device billing is a flat rate per device***
  - ***Commercial (80%)***
  - ***Private (100%)***
- ***80% of wireless services are provided on a month-by-month or ad-hoc basis***
- ***25% of wireless service contracts have an early termination penalty***



**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Summary

## SOP and Application Findings

- ***80% of the reporting agencies reported some type of SOP or policy governing the use of wireless devices in their organizations***
- ***Top three wireless data applications are:***
  - ***CAD system interface***
  - ***Messaging***
  - ***Database inquiries***
- ***100% of reporting agencies indicated that they have implemented CAD interface and messaging applications in their wireless data systems***
- ***Where applications were not implemented, the following factors were identified as the cause:***
  - ***Cost***
  - ***Speed***
  - ***Connectivity issues***



**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Summary

## Technology Findings

- *Of the cellular technologies in use, the 3G cellular protocol is the most popular (47%), followed by 4G (30%)*
- *High speed WiFi (802.11 g/n) account for more than half of WiFi protocols in use by the reporting agencies*
- *RD-LAP technology makes up 64% of the protocol types for agencies using LMR for wireless data*
- *Co-location or shared use of infrastructure for the build-out of a 700 MHz Public Safety Broadband System:*
  - *Backhaul*
    - *Fiber and Microwave available (60%)*
    - *Copper lines available (40%)*
  - *RF Sites*
    - *Improved site with building, structures and/or utilities (20-30%)*
    - *Unimproved site only (22%)*



**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Summary

## Future Use/Planning Findings

- ***The top three types of wireless devices envisioned for use in a future system are:***
  - ***Smart Phone***
  - ***Vehicular Modem***
  - ***Laptop***
- ***Reporting agencies indicated that they would be able to utilize commercial, off the shelf (COTS) or similar devices in 50-80% of their applications***
- ***65% of reporting agencies envision using Mission-Critical Push-to-Talk (PTT) as a primary voice communications method***



**Homeland  
Security**

**OEC/ICTAP**

*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

# State Planning Opportunity

- NTIA will have \$135 million for a State grant program
  - Match will be required
- Program will assist regional, State, tribal and local governments:
  - To plan for a single, nationwide public safety broadband network
  - To identify and plan the most effective way to utilize and integrate the infrastructure, equipment, and other architecture associated with network
- NTIA to establish requirements for grant program by Aug. 22nd, 2012 (6 months after legislation passed)
  - RFI released seeking input on the grant program
- Each State shall certify a single officer or government body to serve as coordinator of implementation grant funds
  - Same designee to be used for consultation with FirstNet



**Homeland  
Security**

**OEC/ICTAP**

*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

# FirstNet Consultation with State

- The single officer or governmental body is expected to consult with FirstNet on several policies, including:
  - Construction of a Core and RAN build out
  - Placement of towers
  - Coverage areas of the network
  - Adequacy of hardening, security, reliability and resiliency requirements
  - Assignment of priority to local users
  - Assignment of priority and selection of secondary users
  - Training needs of local users



**Homeland  
Security**

**OEC/ICTAP**

*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

# Summary – Further Uses of Data

- *Spreadsheet with all data and charts is provided*
- *Leverage data for coordination with FirstNet, for example:*
  - *Average Cost per Device*
  - *Billing plans*
  - *Desired Device Types*
  - *Desired Applications*
  - *POCs for Existing Sites/Backhaul*
  - *Identify Governance group for Single Point of Contact*
  - *Barrier with past implementations*
- *OEC is developing a State Broadband Planning template that can be used to assist with these efforts*



**Homeland  
Security**

**OEC/ICTAP**

*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

Questions?  
Comments?  
Observations?



**Homeland  
Security**

***OEC/ICTAP***

*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

# BACKUP



**Homeland  
Security**

***OEC/ICTAP***

*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

# Video



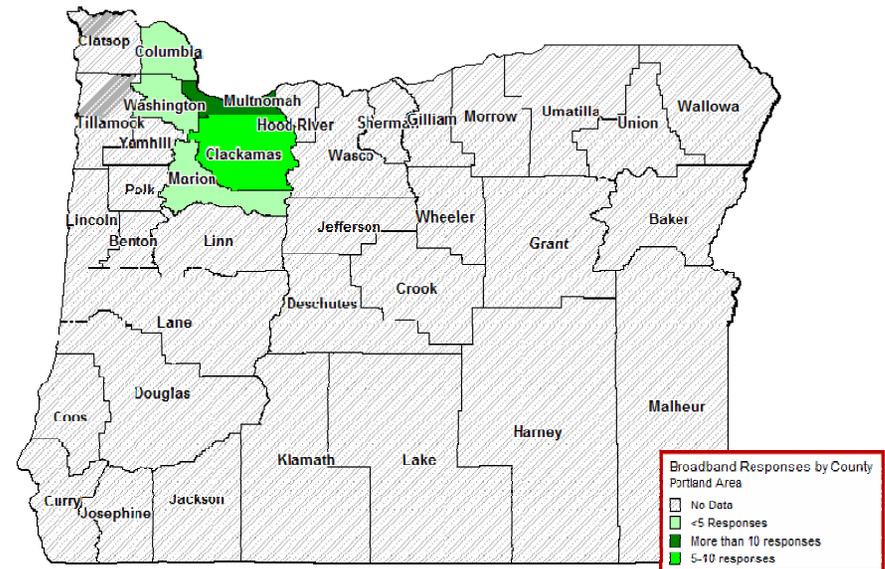
**Homeland  
Security**

***OEC/ICTAP***

*Office of Emergency Communications / Interoperable Communications Technical Assistance Program*

# Survey Respondents

- Boring Fire
- Clackamas Co Fire
- Gladstone Fire
- Gresham Dept of IT
- Gresham Police
- Lake Oswego Communications
- Multnomah Co Sheriff
- Oregon DOT
- Portland Airport
- Portland Emergency Mgmt
- Portland Police
- Sandy Police
- Canby Fire
- Columbia 9-1-1
- Gladstone Police
- Gresham Fire and Emergency Services
- Hoodland Fire
- Multnomah Co Community Services
- Oregon City Police
- Oregon State Police
- Portland Emergency Communications
- Portland Tech Services
- Salem Police Communications
- Troutdale Police
- Washington Co Communications



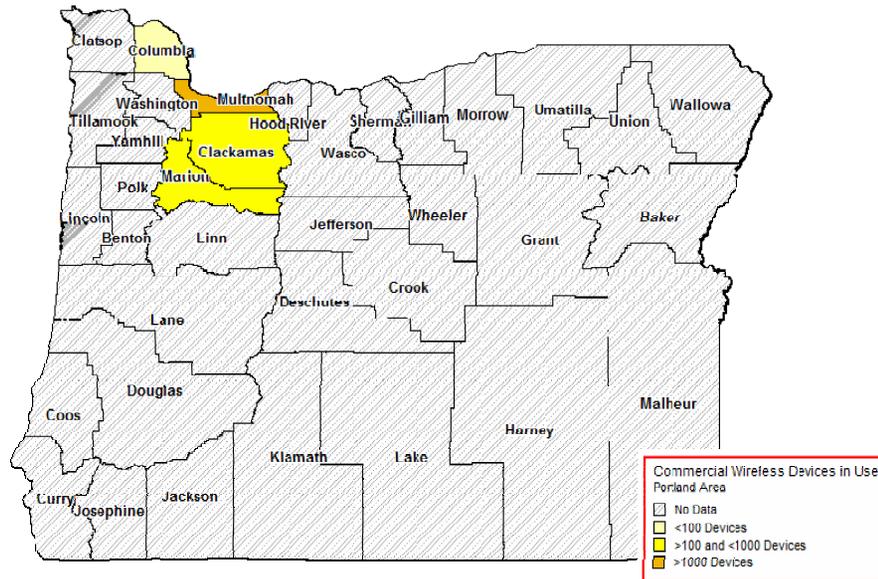
**Homeland Security**

**OEC/ICTAP**

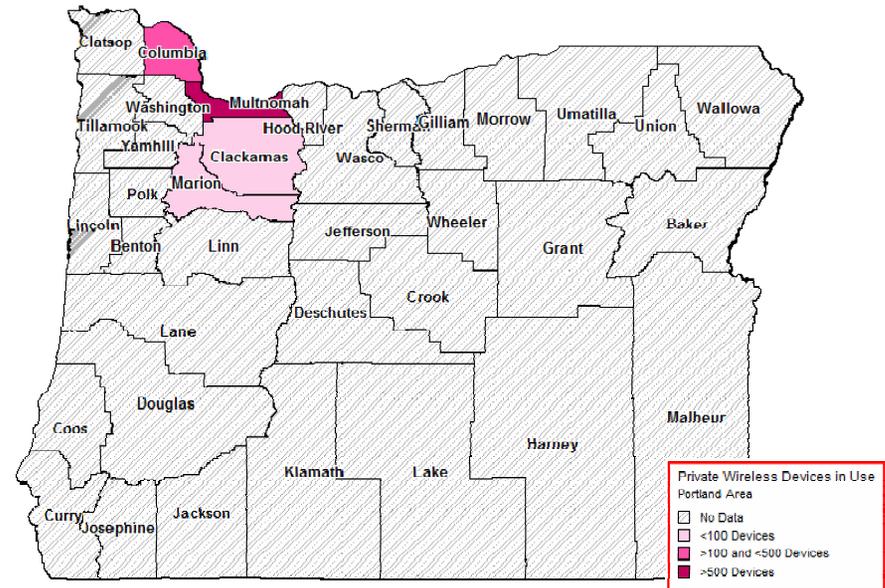
Office of Emergency Communications / Interoperable Communications Technical Assistance Program

# Number of Wireless Devices Reported by Respondents

## Commercial System Devices



## Private System Devices



**Homeland  
Security**

**OEC/ICTAP**

Office of Emergency Communications / Interoperable Communications Technical Assistance Program



# Homeland Security

## ***OEC/ICTAP***

*Office of Emergency Communications / Interoperable Communications Technical Assistance  
Program*