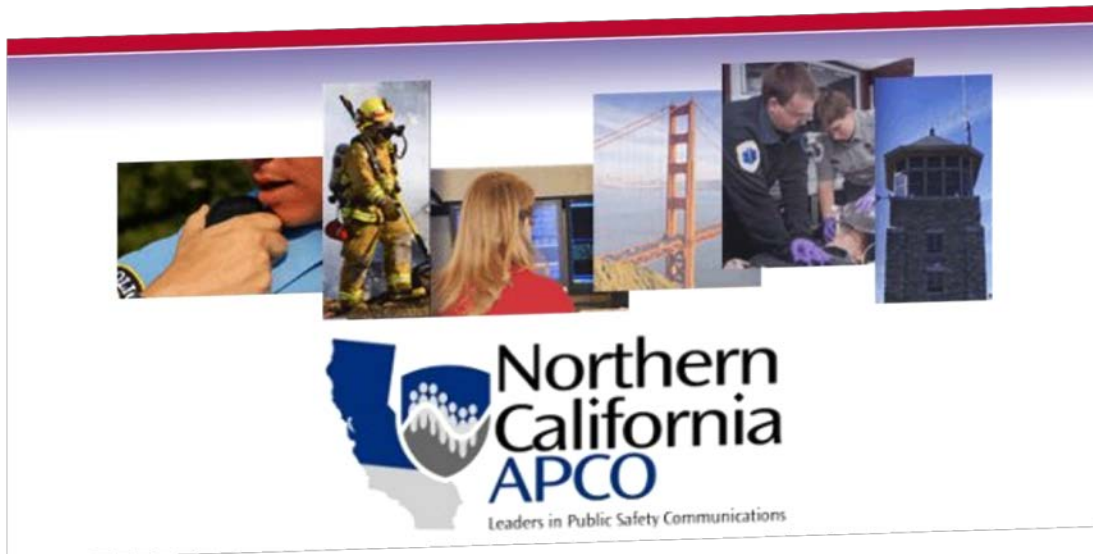


BAY AREA REGIONAL INTEROPERABLE COMMUNICATIONS SYSTEMS AUTHORITY (BAYRICS) UPDATE



Barry Fraser
General Manager
BayRICS Authority
May 14, 2015

bfraser@acgov.org
925-803-7882

BAYRICS AUTHORITY

- 12-Member Joint Powers Authority established in August 2011
- Chair: Alameda County Undersheriff Rich Lucia
- Members:

**Alameda County
City of Oakland
East Bay Hub Cities
Marin County
Santa Clara County
State of California**

**City/County of San Francisco
City of San Jose
Contra Costa County
San Mateo County
Sonoma County
South Bay Hub Cities**



- Purpose: To oversee planning, funding, policy, and operations of regional interoperable communications networks, including the “FirstNet” nationwide public safety broadband network.

A BRIEF HISTORY OF BAYWEB

- August 2010 – Broadband Technology Opportunities Program (BTOP) grant awarded to Motorola to build Bay Area Wireless Enhanced Network (BayWEB)
- February 2012 – Middle Class Tax Relief and Job Creation Act of 2012—established First Responder Network Authority (FirstNet)
- March 2012 – BayWEB project suspended; spectrum lease with FirstNet required
- December 2013 – Spectrum lease negotiations with FirstNet break down, BayWEB project ends



BAYRICS AFTER BAYWEB

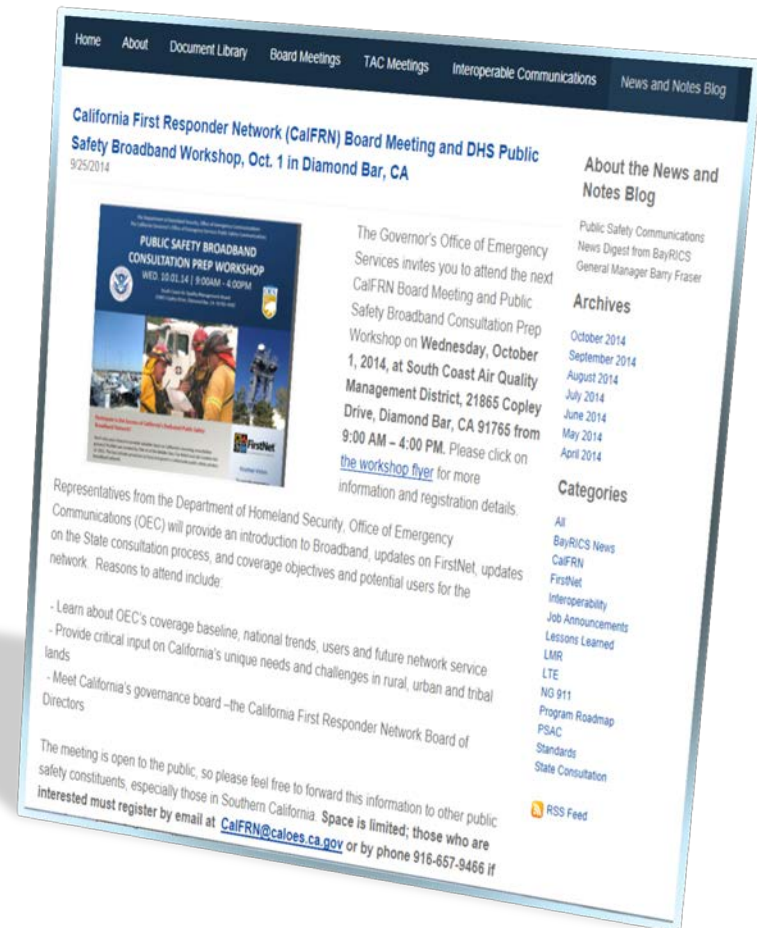
In April 2014, the BayRICS Board of Directors adopted a new strategic vision:

- Strategy 1: Stable and Sustainable Funding Plan
- Strategy 2: Communicate the Value of Interoperability
- Strategy 3: Bridge the Voice-Data Communications Gap
- Strategy 4: Planning for FirstNet & State Consultation



STRATEGY 2: COMMUNICATE THE VALUE OF INTEROPERABILITY

- ▶ BayRICS Blog & Weekly Digest
- ▶ Web Resources and Tools:
www.BayRICS.net
- ▶ Stakeholder Outreach/Education



STRATEGY 3: BRIDGE THE VOICE-DATA COMMUNICATIONS GAP

BayRICS Technical Advisory Committee (TAC) to research and make recommendations about current and future technology developments in public safety communications:

- **P25 System Operators Advisory Group**
- **BayLoop Advisory Group**
- **BayRICS Pilots and Demonstration Projects**
- **Plan for Future Voice and Data Convergence**
 - At some point in the future there will be a convergence of public safety voice and data communications technologies into one combined network and service
 - It may be a 10 year timeline, but this convergence is already beginning

P25 SYSTEM OPERATORS ADVISORY GROUP

Bay Area has adopted a “system of systems” approach – multiple P25 subsystems with shared interoperability goals

- Advisory Group Tasks:
 - Track regional sub-system progress and share lessons learned
 - Address interoperability issues as they arise
 - Manage regional Fleetmap channel guide and *System Key Exchange* guidelines
- Planning for 2015:
 - Mutual aid communications outreach & education
 - Mutual aid exercise across multiple P25 systems

BAYLOOP ADVISORY GROUP

BayLoop is an 8-County digital microwave loop with equipment owned by each participating county and regional administration handled by BayRICS

- BayLoop Advisory Group Tasks:
 - Identify needs for system completion
 - “Phase One” equipment installation and activation
 - Certify regional applications to run on the network
 - Self-sustainment planning



BAYRICS PILOTS AND DEMOS

- Build on BayWEB planning and groundwork
- Device testing
- Broadband network pilot testing



900 MHz PILOT SYSTEM*



Alameda County
Sheriff Regional
Training Center, Dublin



Alameda County
Fairgrounds, Pleasanton



City Fields,
Pleasanton

***Provided at no cost to BayRICS by
xG Technologies, Inc.**

“xMAX” 900 MHz PILOT TESTING

- System deployment
 - Use of COWS (cell on wheels) and Self-Organizing Network (SON) allowed full deployment in an matter of hours (not days or weeks)
- Questions about 900 MHz spectrum
 - “Cognitive Radio” solution - No interference issues detected
 - Reliability difficult to field test; signal jamming not attempted
- Field testing of mobility and access point handoff
 - Successful at speeds exceeding 70 MPH

STRATEGY 4: PLANNING FOR FIRSTNET

- **WHAT IS FIRSTNET?**
- February 2012 – Congress enacted legislation creating the First Responder Network Authority (FirstNet):
 - Governance (FirstNet Board of Directors)
 - 700 MHz spectrum
 - \$7 Billion in funding
- The first nationwide wireless broadband network for local public safety users
- Private, secure, high-speed data communications
- Smart phone “apps,” photos, video and more
- **Not a replacement for LMR trunked voice systems**



WHEN WILL WE SEE FIRSTNET?

- Progress under new Chairwoman Sue Swenson
 - Three Public Notices requesting comments on Legal Issues
 - Draft Request for Proposals (RFP) for Comprehensive Network Solutions: Issued April 27; Comments due July 27
 - Final RFP to be released by end of 2015
- State consultation process will run concurrently with RFP Process
 - FirstNet must consult with States, Local Agencies, Tribes, and the Public Safety Advisory Committee (PSAC)
- Final State plans delivered after RFP award (2017?)
- FirstNet goal to be “substantially complete” by 2022

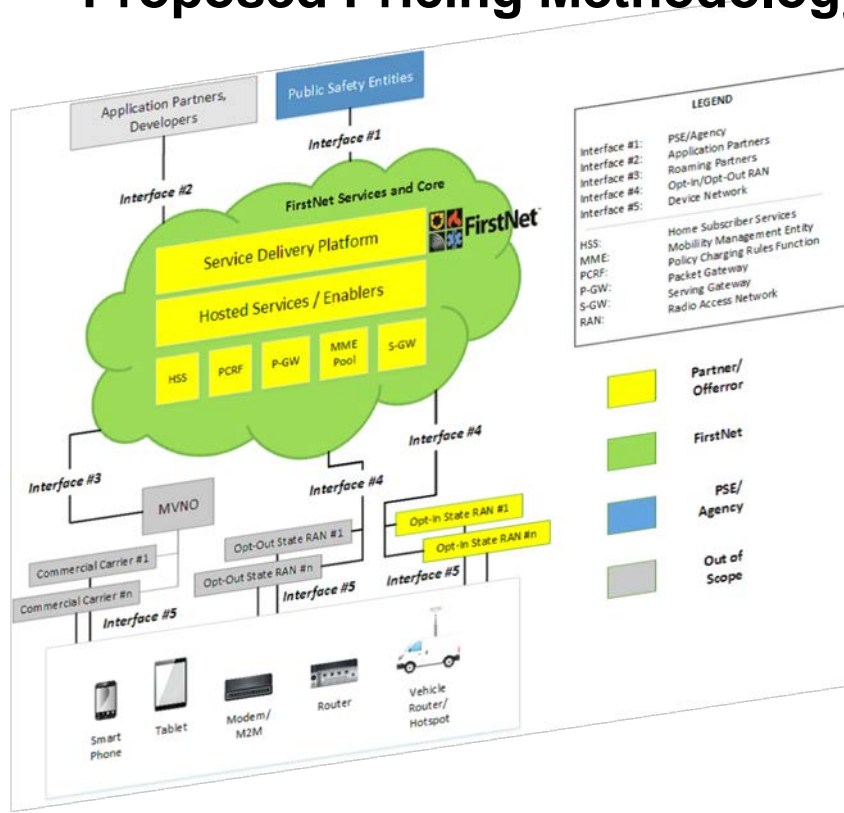
FIRSTNET'S SPECIAL NOTICE & DRAFT "RFP"

- The Special Notice includes “draft sections that may be included in a subsequent RFP used to competitively procure a comprehensive technical and business solution.”
- The Notice provides the opportunity for “interested parties, including states, tribes, territories, public safety stakeholders, and market participants . . . to understand and provide input regarding FirstNet’s proposed acquisition strategy/approaches.”
- BayRICS TAC is reviewing the Special Notice Documents (300+ pages) and will provide feedback to FirstNet as appropriate. Comments accepted online at:
<http://www.bayrics.net/comments.html>

FIRSTNET'S SPECIAL NOTICE & DRAFT "RFP"

Key Elements:

- Definition of High Level Functions included in Scope of Work
- Nationwide or Regional Radio Access Network Approach
- Proposed Pricing Methodology (but no pricing detail)



- Proposed Coverage Methodology and Maps
- Proposed Quality Assurance Surveillance Plan (QASP)
- Proposed Operational Architecture (634 Elements)
- Proposed Performance Timeline (5 years)
- Vendor Capabilities Statements and Teaming List

FIRSTNET PUBLIC SAFETY ADVISORY COMMITTEE (PSAC)

- 41-member advisory committee to FirstNet Board
- Current focus on critical elements of local control:
 - Priority, Preemption and Quality of Service (PQoS) - Ensuring connectivity and quality in critical situations
 - Public Safety Grade (PSG) Hardening - Ensuring availability and resiliency, especially in emergencies
- National Public Safety Telecommunications Council (NPSTC) - QoS & Local Control Working Groups – providing technical support and requirements to PSAC

Public Safety Grade (Hardening)

- FirstNet must provide a network that delivers reliable and effective access to first responders, especially during natural disasters.
- Radio sites & network elements must be hardened beyond today's commercial network standards (power back-up, redundant connectivity, structural reinforcement, etc.).
- FirstNet has limited budget and may lack the resources to harden every site, especially commercial sites used for the network.
- Can we develop a prioritization framework for selective site hardening based on site location, critical infrastructure protection, and specific network threats?



PRIORITY & PREEMPTION QUESTIONS

- What will be the impact of congestion on the proposed FirstNet network during large scale events or disasters?
- What will be the impact of secondary users of excess network capacity (under “covered leasing agreements”)?
- Can we prioritize specific communications: “Responder Emergency” and “Imminent Peril” priority functions, for example?
- What technical capabilities are available to prioritize voice, data and video applications (“mission critical” and “non-mission critical”)?
- What technical capabilities are available to prioritize public safety users?
- Can we rely on “dynamic” priority, or the application of pre-defined QoS settings to automatically manage the network when it becomes congested?
- How to ensure local control/shared management of these functions?

PRIORITY, PREEMPTION AND QoS

Public Safety Network Priority and Preemption Framework

NO CONGESTION:

In most day-to-day operations with no network congestion, priority/preemption will not be necessary (default level QoS settings).

MODERATE CONGESTION:

When the network begins to exhibit moderate congestion, dynamic QoS settings automatically engage to reduce or limit non-mission critical usage, in the following order:

1. Secondary (non-public safety) users shall be throttled back or preempted as necessary, unless they are authorized to access the mission critical apps

2. After secondary users are preempted, usage of non-essential applications, such as non-mission critical video shall be throttled back or preempted as necessary

3. After all usage of non-essential applications is preempted, public safety users shall be throttled back or preempted in the order of their designated priority status

HEAVY CONGESTION:

As the incident status changes, or if the network begins to exhibit heavy congestion, designated local public safety officials may need to manually override the dynamic QoS settings and re-prioritize or preempt public safety users and applications if necessary to respond to the incident. Actions may include:

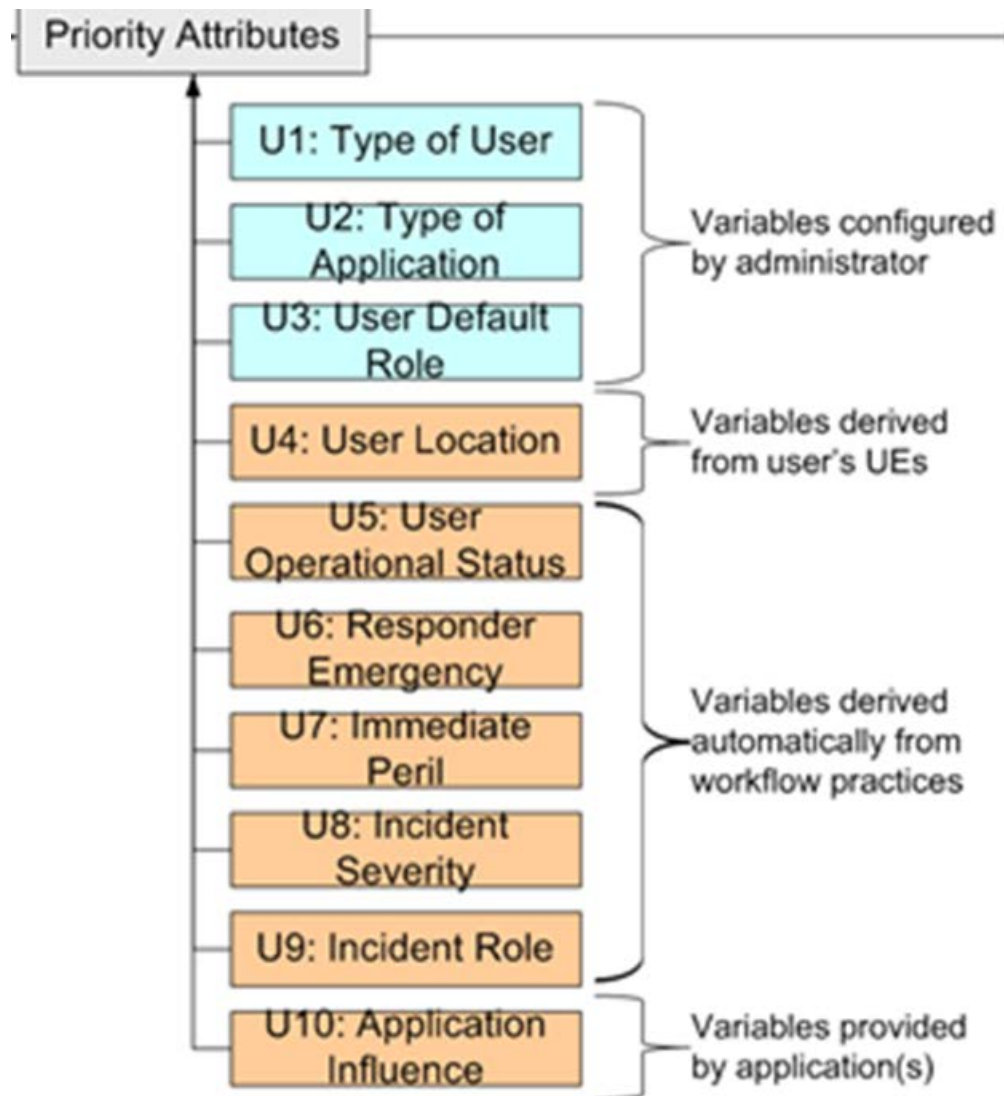
Non-mission critical applications, including video streams, may be reassigned to a higher priority as necessary.

Public safety users may be reassigned to lower or higher priority as necessary

Users may be given access to mission critical applications as necessary

New public safety users may be added to the system on-the-fly (or secondary users moved to public safety status)

NPSTC PQoS FRAMEWORK



- **User attributes** are collected and analyzed to calculate a priority value which would be assigned to a user or application.
- They include **Static** (default) attributes assigned at the time the device is provisioned and **Dynamic** attributes that change based on the user's assignment and incident severity.

California First Responder Network Authority (CalFRN)

- 13-member governing body
- Provide recommendations to Governor whether to assume responsibility for Radio Access Network (RAN) build out (“Opt In” or “Opt Out” of FirstNet state plan)
- Slow start compared to other states
- Focused on outreach: town hall meetings, public safety survey, information-gathering
- Initial consultation meetings with FirstNet will take place July 28-29, 2015
- <http://www.caloes.ca.gov/cal-oes-divisions/public-safety-communications/telecommunications-governance-services-branch/california-first-responder-network>

STATE & LOCAL “OPT IN” QUESTIONS

- Cost?
- Coverage?
- Level of Service Provided?
- Technical Requirements:
 - Security?
 - Priority and Preemption?
 - Infrastructure Hardening?
 - Availability of user devices, open standards for connectivity and encouraging device competition?
 - Useful Applications?
- Local Control?
- FirstNet Network Policies?
- Considerations for those states that choose to build their own RAN (opt-out)?





THANK YOU!

