



Radio Communications

New Challenges, New Solutions

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CHP Radio System History – *The early years*

- Experimentation with radio communications began in 1931
 - First stations were AM – Base transmit, and mobile receive only
 - 1933-38 – Allied agencies assisted by dispatching CHP units on shared channels in some areas
- 1941 – First lowband mobile transmitters ordered (39.78 MHz mobile with AM link back to dispatch)
 - After December 7, 1941 - CHP expanded radio communication for all mobile units, including transmitters for cars which continued through 1943
 - By mid 1950's, all communications are FM – Initially on one frequency!
 - Channels added to meet operational need (Color System)

CHP Radio System History – *Progress through the decades*

- Late 1970's through early 1980's – First VHF highband vehicle repeaters introduced
- Late 1980's – GE RangR radio system introduced - Still in use today!
- Mid 1990's – Inherited former State Police UHF radio system
- 1990's through 2000's – Introduction of specialty radios for use with newer allied agency radio systems

CHP Communications Challenges and Opportunities

- CHP's traditional challenges:
 - Providing statewide two way radio communications with large mobile fleet
 - Providing portable radio communications
 - Maintaining effective communications with allied agencies implementing new technologies
- CHP's traditional opportunities:
 - Partnerships with other allied agency stakeholders
 - Willingness to explore and pursue new technologies

Public Safety Communications Changing Rapidly

- New York city 9/11 Attacks
- Hurricane Katrina
- Increasing diversity in public safety communications
- New and emerging technologies
- Project 25
- Narrowbanding
- Re-banding

CHP Changes to Meet New Operational Realities

The purpose of the California Highway Patrol Enhanced Radio System (CHPERS) project is to address the CHP's deteriorating radio communications infrastructure and improve communications *operability* and *interoperability*.

This critical project will enhance public safety and protect the assets of the State of California.

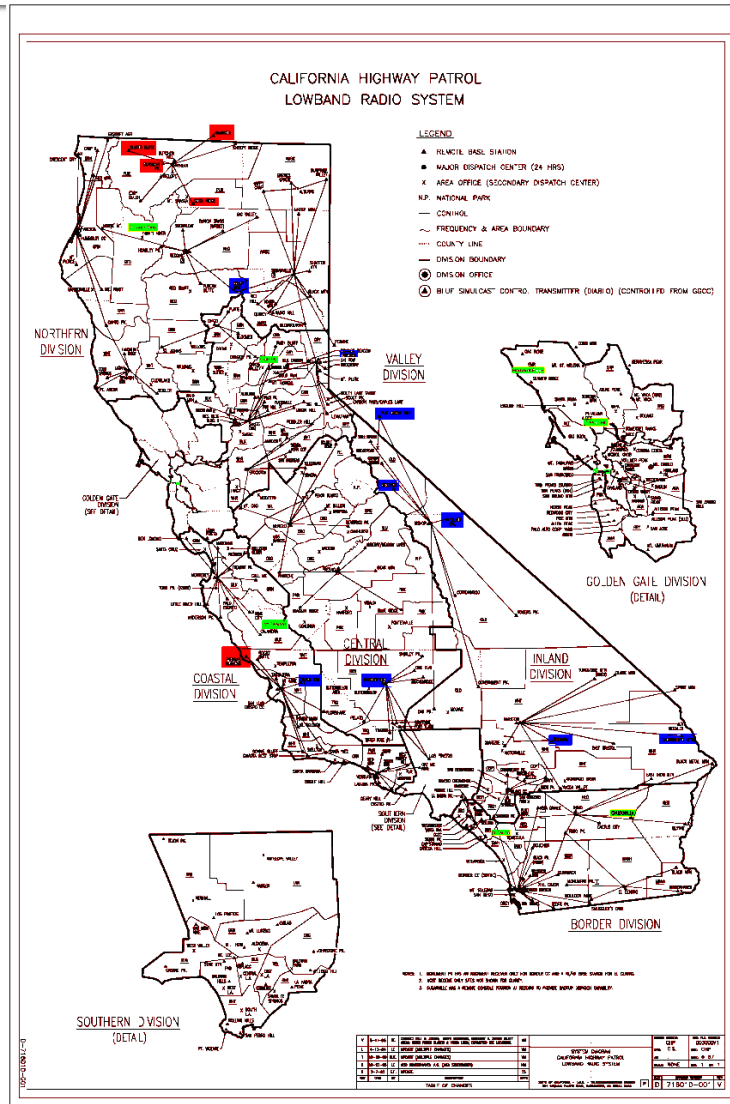
CHPERS Simplified

- Infrastructure Enhancement – 447 locations:
 - 272 remote radio vault sites
 - 103 Area offices
 - 25 communications centers
 - 17 inspection facilities and 30 platform scales
- Tactical Channels - Independent Operation
- Vehicle Tactical Network – Consolidated Patrol Vehicle Environment (CPVE) and new VRS
- Acquisition of spectrum

Radio Site Development

- Renovation
 - New radio equipment, antenna and cabling and repair of existing structures
- Construction
 - 15 construction projects for new standardized 120' self-supporting tower – many with vaults
- Partnerships
 - Radio site development mutually beneficial to all tenants
 - Collaboration to address unique challenges

Radio Site Development



Radio Site Development



Developing Partnerships

- The CHP is continuing to explore and work towards further developing productive partnerships
- Sacramento Regional RCS
- Orange County RCS
- San Diego RCS
- East Bay RCS
- BayRICS
- Municipalities throughout the state
 - 350+ radio communications MOU / FUA

Specialty Equipment Acquired

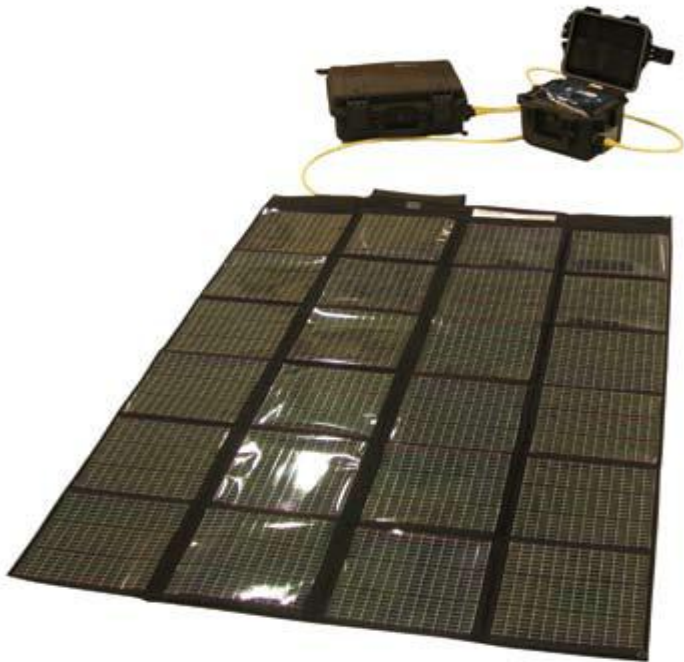
- Mobile radio vault trailer (4+ racks) (2 each)
- Mobile tower trailer platform, 50 ft. (2 each)
- Mobile tower trailer platform , 75 ft. (2 each with MW)
- Mobile tower trailer platform, 100 ft. (2 each with MW)
- Mobile Consolidated Command Center (MCCC) (2 each)
- Transportable radio repeaters (31)
- ACU1000 and ACU2000
- Pre-Fabricated Radio Vaults
- 120' Four-legged self supporting towers

Mobile Communication Platforms



Transportable Cross-band Repeaters

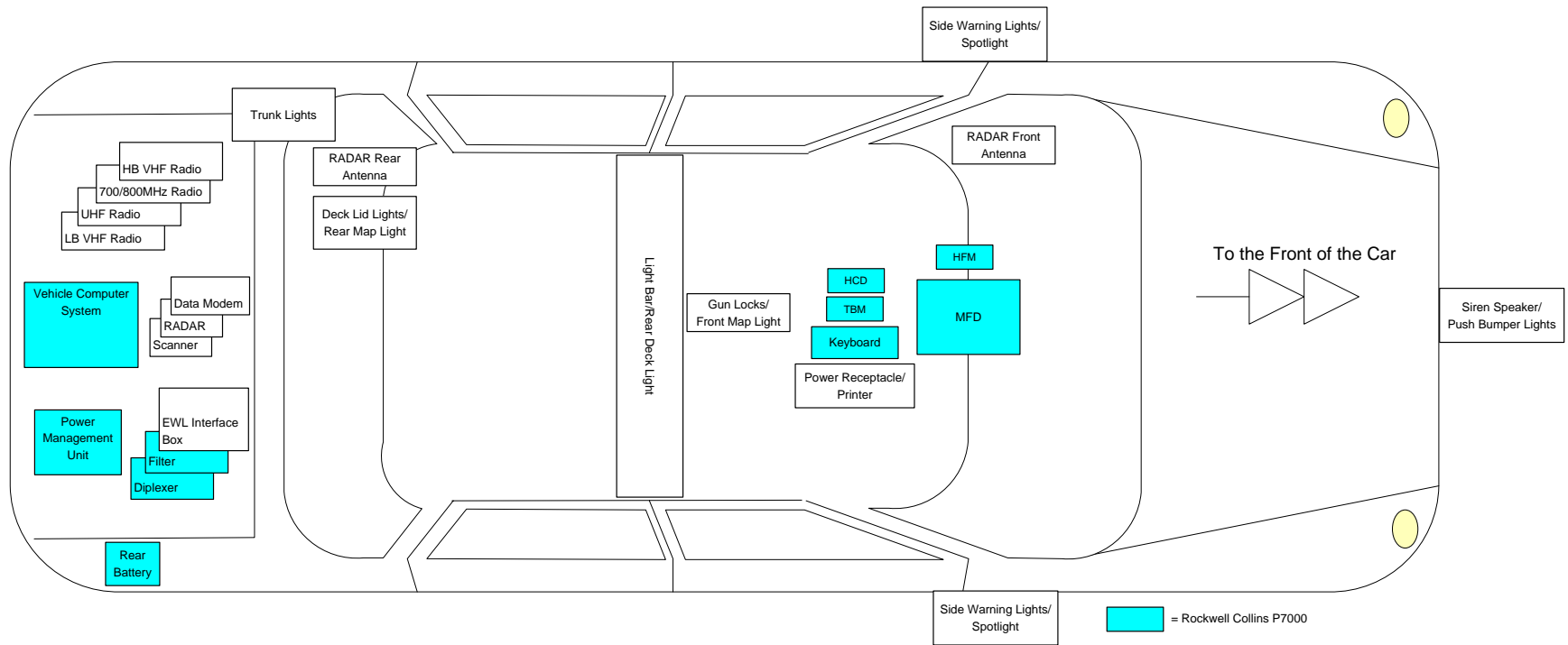
- Transportable radio repeater



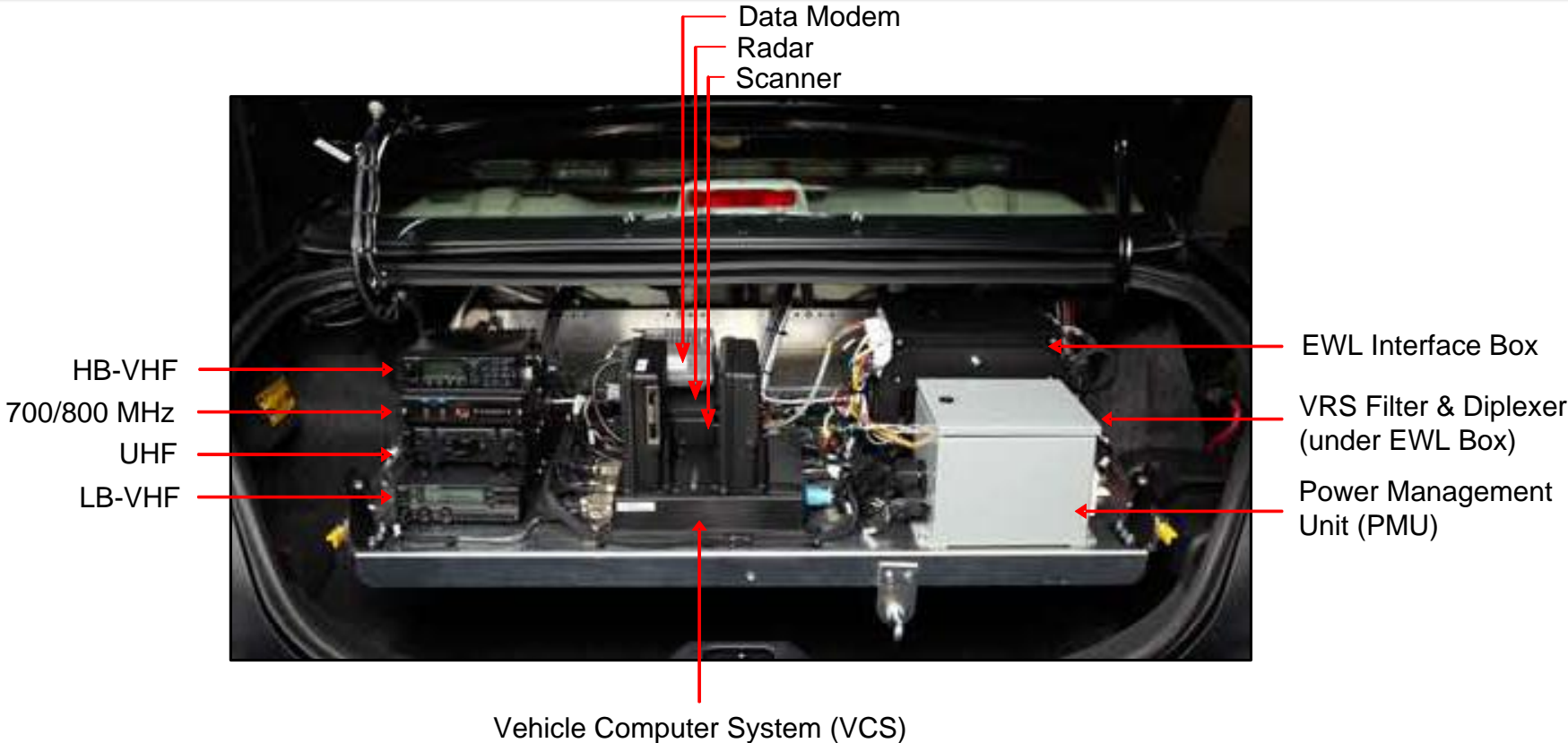
Consolidated Patrol Vehicle Environment (CPVE)

- Develop and implement a vehicle tactical network that will provide comprehensive and flexible public safety communications:
 - VHF Low Band
 - VHF High Band with P25 capability
 - UHF (including T-Band) with P25 capability
 - 700/800 MHz with p25 and proprietary trunking capability
 - 700 MHz P25 full-duplex vehicle repeater system (VRS)
- Capability to connect disparate bands
 - First units at scene can interoperate
 - All patrol cars can operate on all bands

System Diagram



Emergency & Patrol Equipment



User Interface Devices



Multi-Function Display
& Touch-Screen

Keyboard & Touchpad

Three-Button
Microphone

Hand Control Device

Hands-Free Microphone
(mounted above rearview mirror)

Radio Operation

Listen to up to four radios



CHP Low Band



High Band



UHF

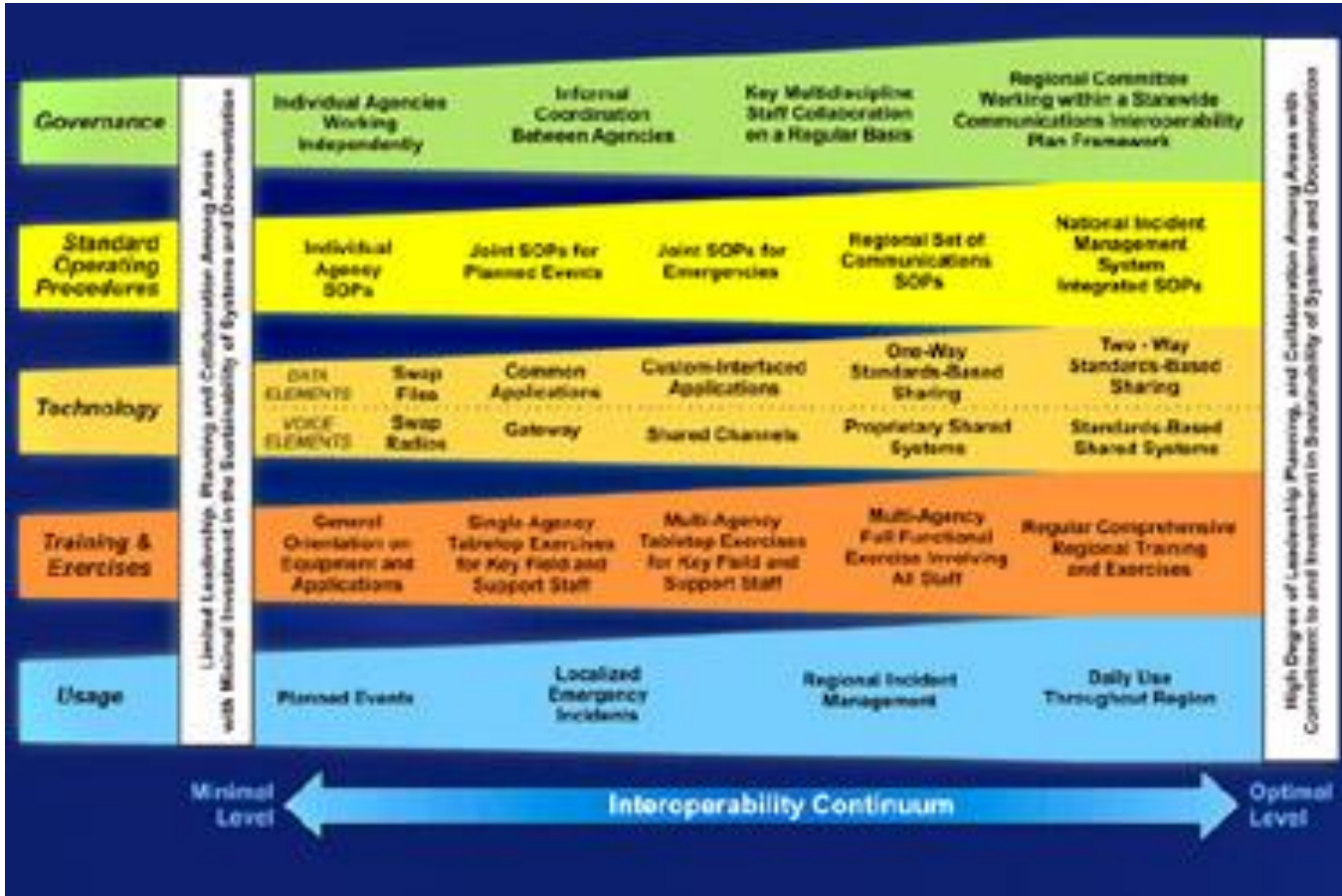


Talk on one at a time
or crosspatch



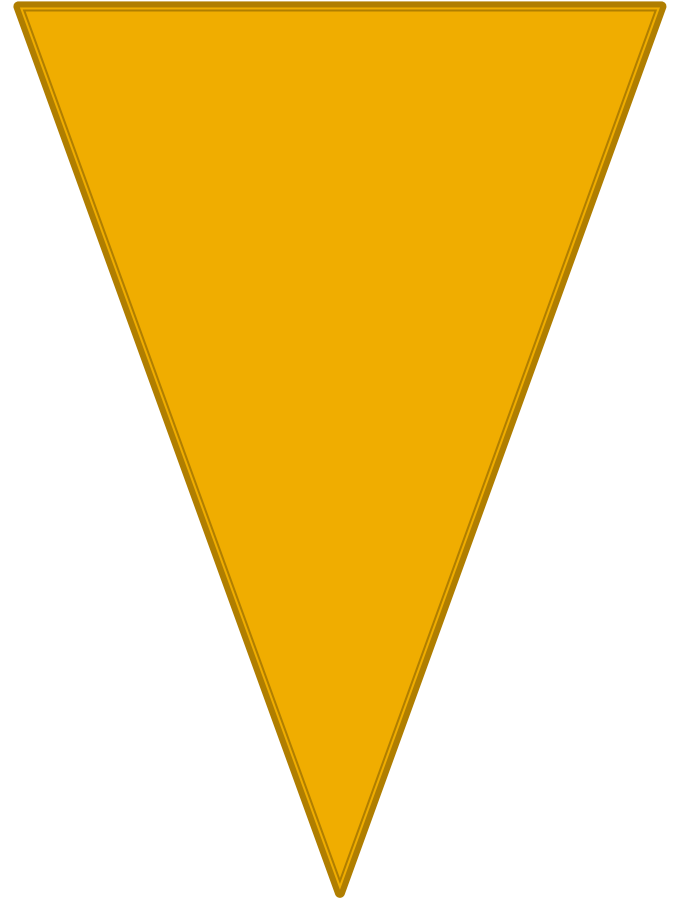
700/800

Navigating the Continuum



Scalable Communications Capabilities

- CPVE - First Unit At Scene
- RRV - Secondary Response
- Interoperability Gateway Use
- Deployable repeater systems
- Deployable communications Trailers
- MCCC - Command, Control and Communicate



Changing World of Portable Radios



Future Endeavors

- Expansion of 700 MHz tactical and dispatch network
- Introduction of 4G / LTE broadband capability through commercial carrier and FirstNet
- Continued exploration of partnerships and ability to leverage shared resources to meet common goals
 - Operational SOP's
 - Training and Exercises
 - Increased use of assets during non-emergency events
- Development of volunteer opportunities for operational support

Question and Answer



- Questions?