

Department of Public Safety Communications and FirstNet Overview

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 VERMONT

Department of Public Safety

DPS Radio Technology Service

- State Land Mobile Radio (LMR) networks
 - Maintains networks for SOV agencies: DPS, AOT, ANR
 - Maintains mobile and portable radios for SOV users
 - Used by first responders from many non-SOV agencies
- Tower sites
 - Maintains over 40 towers at remote sites
 - Used by many local dispatch agencies for their LMR networks
- Statewide microwave network
 - Private network for reliability and security
 - Connects towers in redundant rings
- DPS telephone systems
 - Over 700 telephone lines including in PSAPs and DPS administrative offices
- Interoperability
 - VCOMM Interoperability LMR network for first responders
 - Subject matter expertise support for local and county officials.

Mt. Mansfield DPS tower



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Public Safety Communications

Several methods of communications are available to first responders, including:

- Land Mobile Radio (LMR)
- Mobile Wireless Service
- Smart phone applications
- Internet
- Pagers
- Satellite telephones
- Amateur Radio (HAM)



LMR Features

- LMR is the primary voice communication method used by first responders
- One-to-Many transmission
- Immediate connection to dispatch
- LMR is also used for tactical officer-to-officer communications

VSP Williston Dispatch



LMR Technology

- LMR Towers
 - LMR uses mountain-top locations for wide-area voice coverage
 - Mobile wireless service has shorter range and requires many more towers
- VHF: Very High Frequency
 - Longer range, fewest towers required
 - Used by Fire & EMS in Vermont
- UHF: Ultra High Frequency
 - Shorter range, requires more towers
 - Has better building penetration than VHF
 - Used by Law Enforcement in Vermont
- Channel use
 - Very limited availability of unused channels in either band
 - Most radios are single-band (either UHF or VHF)
 - Dual-band radios are available but are expensive



LMR Radio Types

(Two types of LMR radios)

Mobile

- In-vehicle
- High power
- Long range



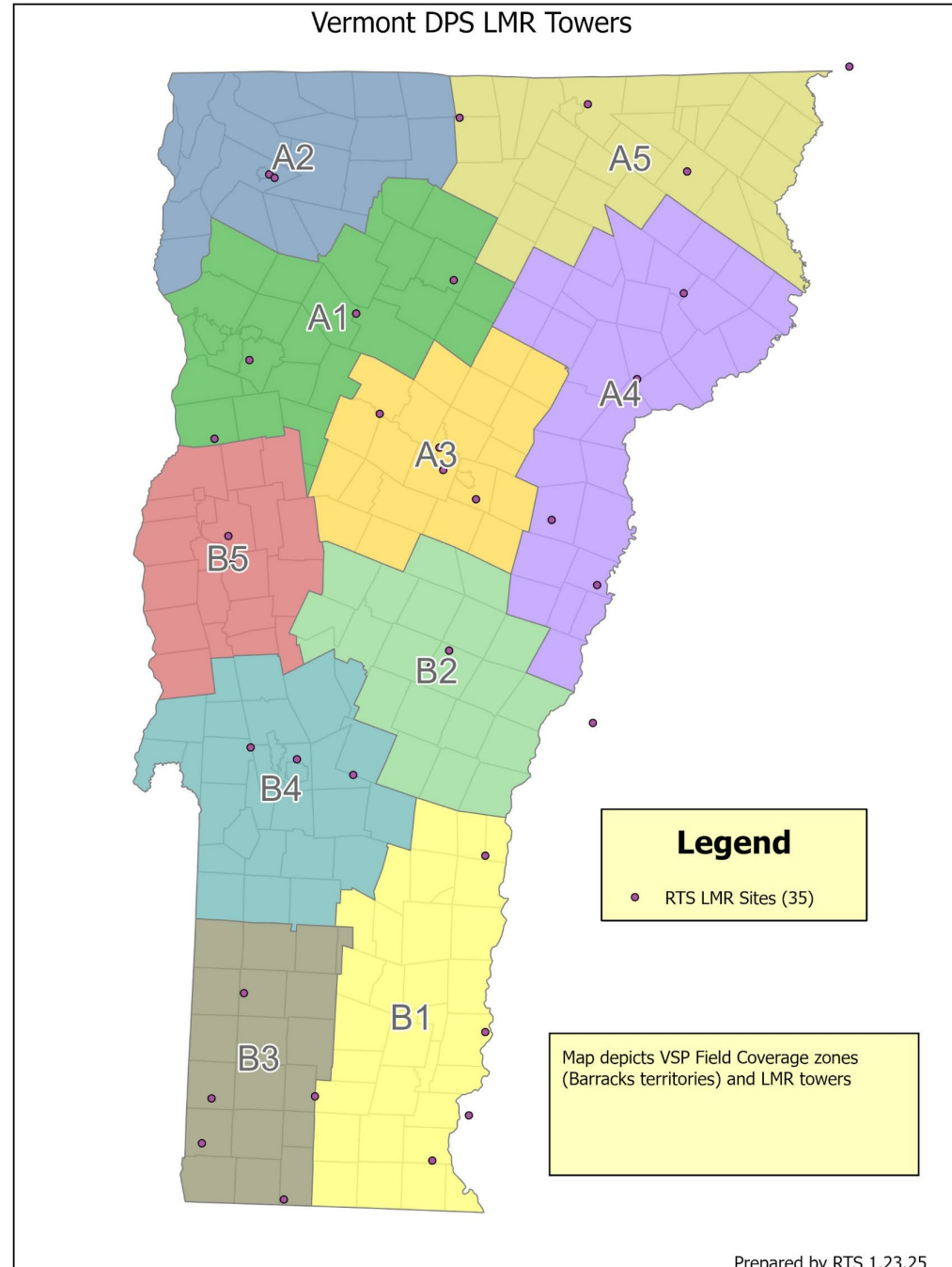
Portable

- Handheld
- Low power
- Short range
- Lapel microphone
- Hardened



VSP LMR Network

- Separate UHF channels for each VSP Barracks
- Each channel monitored by VSP telecommunicator
- Two VSP dispatch centers
 - Williston: Troup A
 - Westminster: Troup B
- 35 primary tower sites
- Two deployable towers



FirstNet Background

- In 2004 the 9/11 Commission determined that first responders were challenged because they lacked interoperable communications
- Commission recommended development of a nationwide network for public safety communications
- Congress dedicated prime RF spectrum and funding to build a nationwide broadband network for first responders
- Federal Government engaged in a selection process and ultimately selected AT&T to provide FirstNet cellular service
- States given opportunity to “opt-in” or build their own statewide public safety networks with their share of funds
- All states decided to “opt-in” to become beneficiaries of FirstNet’s contract with AT&T



FirstNet Service

- Mobile wireless service is a highly competitive market with multiple providers
- AT&T operates over 250 towers in Vermont, all support both AT&T and FirstNet customers
- There is no expectation or requirement that
 - FirstNet has universal coverage, or
 - Individual first responders subscribe to FirstNet
- FirstNet service is available to all eligible first responders, who may subscribe to service online or at any AT&T store



FirstNet Benefits

- The prime FirstNet RF spectrum is used for both AT&T and FirstNet customers
- FirstNet customers have Priority and Preemption across all AT&T and FirstNet spectrum
- This means that during periods of congestion FirstNet customers have priority over AT&T customers
- AT&T and FirstNet customers in Vermont have improved coverage from the additional 35 towers and the addition of prime FirstNet RF spectrum



FirstNet Obligations

- FirstNet Commitments to Vermont
 - Construct 35 towers, with site input from the State
 - Provide deployable systems
- AT&T Commitments to FirstNet
 - Include target coverage and customer counts by state
 - Targets and results are proprietary and are not shared with states
 - FirstNet reports that AT&T has met its requirements
- Both Verizon and T-Mobile offer similar, competing services to first responders
- They claim include these plans include similar priority and preemption features



FirstNet Deployables

- Compact Rapid Deployable (CRD)
 - Provided by FirstNet
 - Satellite connectivity
 - FirstNet coverage
 - Local WiFi
 - 3 CRDs, 2 mini-CRDs



FirstNet CRD

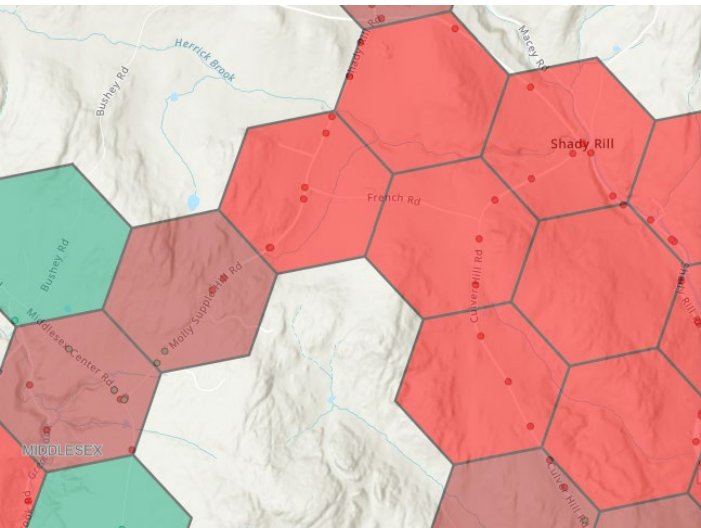
FirstNet mini-CRD



Coverage

- Difficult to assess
- Propagation maps are not reliable predictors of coverage quality
- PSD conducts drive tests
 - 6 carriers including FirstNet
- Many areas with poor coverage identified

PSD Drive Test Results in Middlesex, VT



VoiceTest

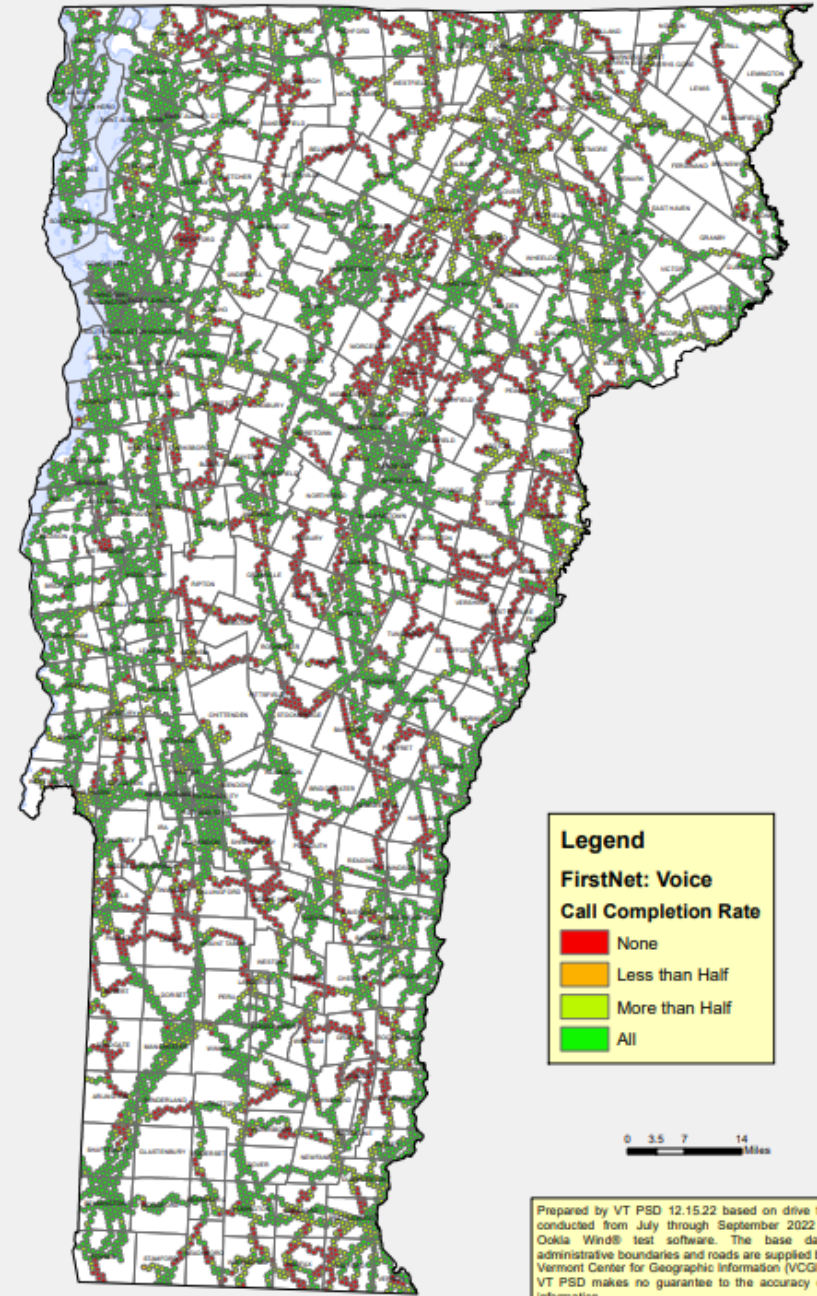
FirstNet

- firstnet_pass_rate
- All completed
 - More than half completed
 - Less than half completed
 - None completed

Voice Test Points

FirstNet

- Success
- Fail
- End by user
- Drop



Legend

FirstNet: Voice

Call Completion Rate

- None
- Less than Half
- More than Half
- All

Prepared by VT PSD 12.15.22 based on drive testing conducted from July through September 2022 using Ookla Wind® test software. The base data of administrative boundaries and roads are supplied by the Vermont Center for Geographic Information (VCGI). The VT PSD makes no guarantee to the accuracy of this information.

DPS Mobile Wireless

- Mobile wireless is essential for DPS operations
 - Primary use is for data (email, text, etc.)
 - Voice used to augment or backup LMR
- DPS Mobile Wireless use
 - All VSP cruisers are equipped with computers that access DPS data networks through both Verizon and FirstNet wireless services
 - Most DPS personnel have mobile wireless cellular phones
 - Individual personnel have their choice of provider
 - FirstNet CRDs used regularly by DPS for incident command in rural areas
- Cellular industry is developing “LMR over LTE” technology
 - Smartphone applications for “LMR-Like” talk groups already exist
 - Public safety community assessment is that this is not yet viable
 - LMR coverage, especially in rural areas, is judged better than LTE
 - LMR networks expected to be essential for many years to come

