Where Are We Now with Connected Vehicle Technology in New England?

Presented by
Matthew Picanso

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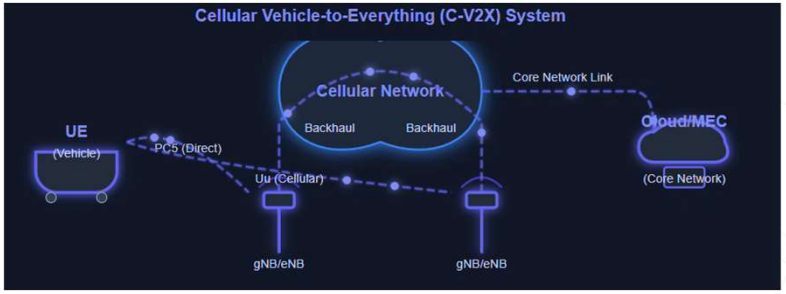
Why CV Technology Matters to New England

- **Safety Imperative:** Reducing fatal and serious-injury crashes (Vision Zero goals).
- **Efficiency:** Optimizing traffic flow and emergency response times across New England's dense urban centers and rural corridors.
- **The Technology Tipping Point:** The recent FCC mandate and industry pivot to C-V2X offers a standardized path forward.
- **NE Focus:** Highlighting two foundational projects (Maine DOT & MassDOT) that are defining the region's approach.

CV History: The DSRC Era (Dedicated Short Range Communications)

- **FCC allocated the spectrum:** On October 1999 the FCC allocated 75 MHz for the use of DSRC, in the United States
- **The Original Vision (V2X):** Using 802.11p Wi-Fi technology for direct, low-latency vehicle-to-everything communication.
- **Initial Applications:** Basic Safety Messages (BSMs), collision warning, and Signal Phase and Timing (SPaT) broadcasting.
- **Key Challenge:** Lack of widespread automotive commitment and the long-standing uncertainty over the 5.9 GHz spectrum allocation.
- **Conclusion:** DSRC provided a critical proof-of-concept but lacked the necessary scalability and regulatory stability for mass deployment.

The Technology Shift: Moving to C-V2X (Cellular V2X)
Why C-V2X Became the Standard Focus



- **Technology Foundation:** Uses established cellular standards (4G LTE-V2X and future 5G).
- **Dual Communication Modes:**
  - **Direct Communication (PC5):** High reliability, low-latency vehicle-to-vehicle/infrastructure (V2I) communication, similar to DSRC.
  - **Network Communication (Uu):** Utilizes existing cellular towers for longer-range applications (e.g., remote traffic management, firmware updates).
- **Regulatory Certainty:** FCC allocated 30 MHz in the 5.9 GHz band specifically for C-V2X safety applications, accelerating industry momentum.
- **Scalability:** Leverages existing cellular infrastructure and follows a clear 5G roadmap, encouraging rapid adoption by OEMs and agencies.

C-V2X Deployment in New England: A Two-Pronged Approach

- **Regional Coordination:** New England states, through ITS and regional efforts, are actively defining interoperability standards.
- **Technology Mandate:** Plan specified installation of a Hybrid DSRC and Cellular V2I technologies (demonstrating the dual-tech transitional nature).
- **Maine DOT BUILD Project:** A major federal grant project focused on modernizing signal systems and deploying connected vehicle capability across multiple corridors.
- **MassDOT Route 9 SPaT Challenge:** Focused effort to achieve national SPaT (Signal Phase and Timing) Challenge criteria along a major arterial corridor.
- **Vendor Consistency:** Both projects utilize equipment from the same CV vendor, establishing a foundation for regional consistency and interoperability.

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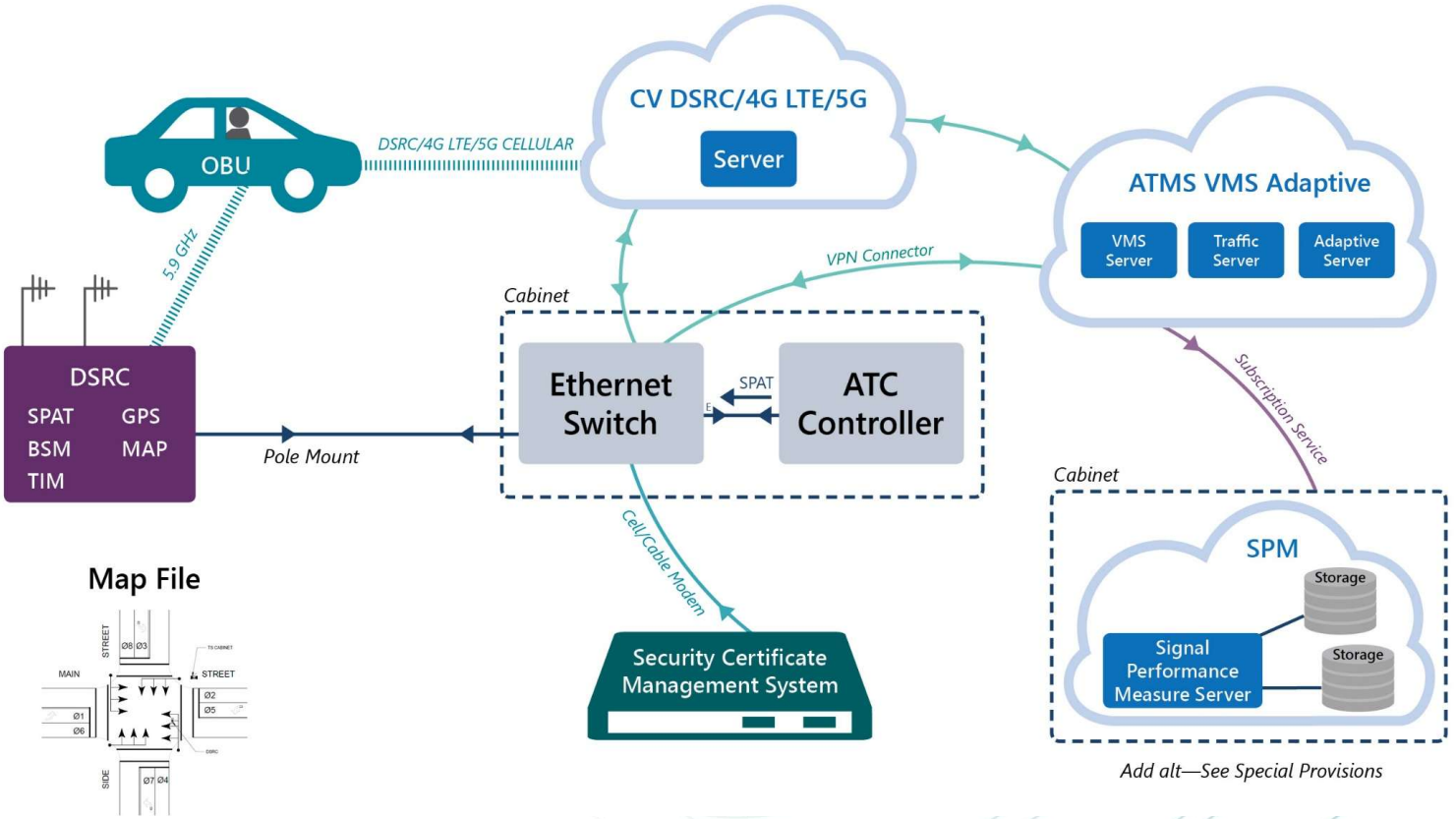
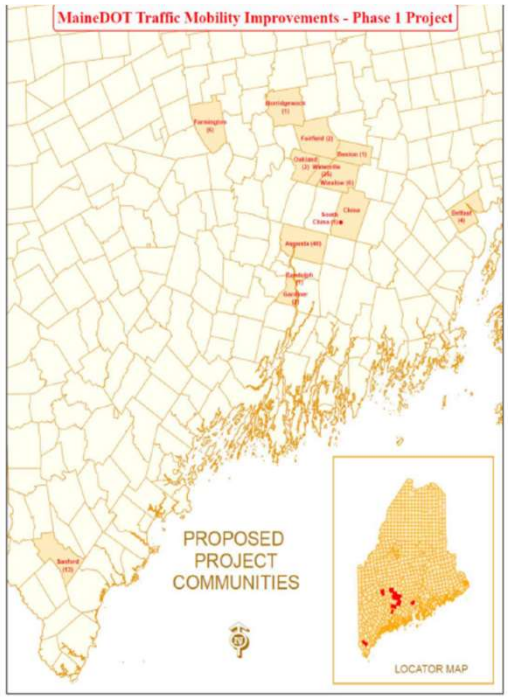


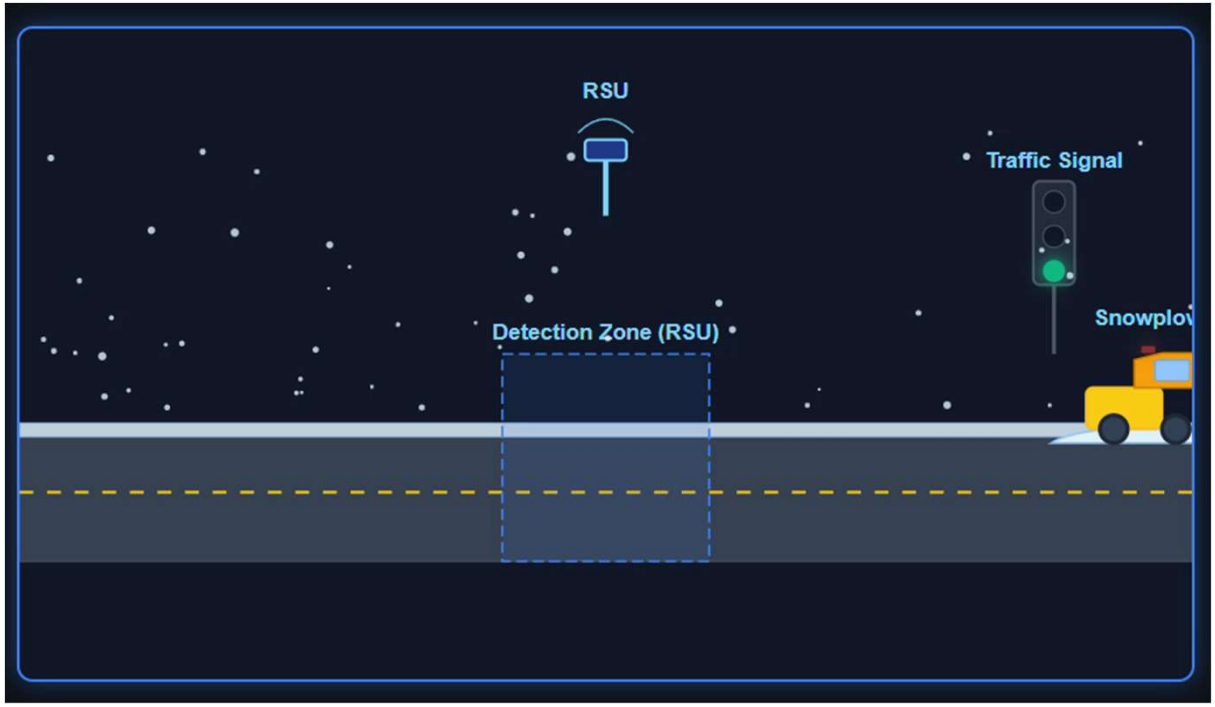
Hybrid Dual mode DSRC/C-V2X

Case Study 1: Maine DOT Build Project



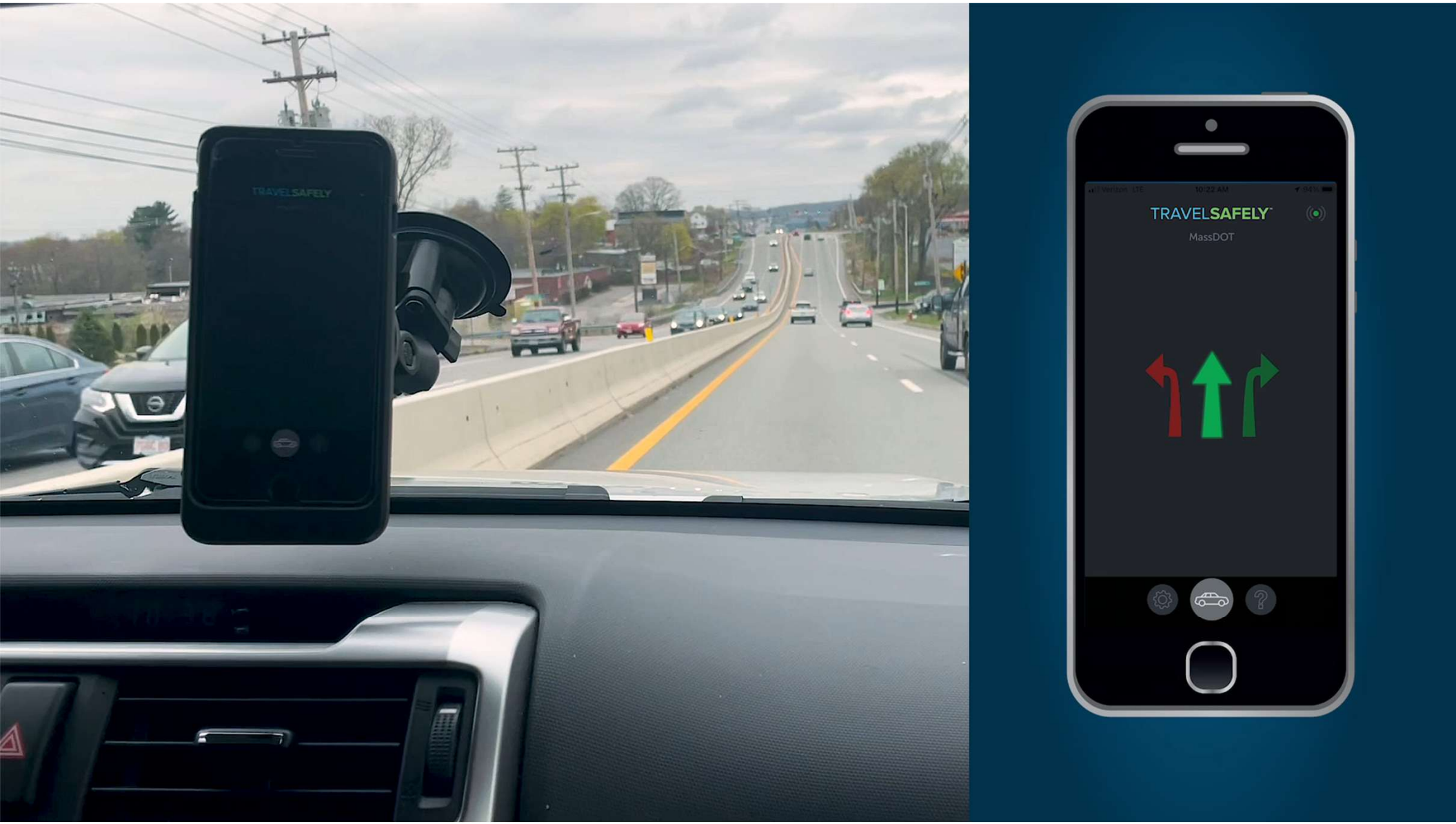
- **Project Scope:** Funded by the BUILD/ATCMTD grant programs.
- **Infrastructure Upgrade:** Replacement of 104 traffic signal controllers and cabinets with new Advanced Traffic Controllers (ATCs), new detection (single point cameras), and fiber/cellular interconnect.
- **Central System:** New cloud hosted central management ATMS and system monitoring and control systems
- **Applications:** Emergency vehicle pre-emption, improved traffic flow, remote access to ATC signal, foundational infrastructure for Autonomous Vehicles (AVs) and Snowplow TSP system.

MaineDOT Snowplow Priority



Case Study 2: MassDOT Route 9 SPaT Challenge

- **Location/Scope:** Deployment across 38 intersections on Route 9 between Wellesley and Worcester.
- **SPaT Challenge:** Pilot project designed to meet the national goal of deploying Signal Phase and Timing (SPaT) infrastructure.
- **Technology Implemented:** Deployment of Hybrid DSRC/5G Roadside Units (RSUs) and C-V2X capabilities.
- **Goals:**
  - Provide foundation for future safety and mobility applications (e.g., Red Light Warning).
  - Access to Signal Performance Measures (SPMs) for optimization.
  - Demonstrate a commitment to the C-V2X deployment roadmap.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CV RSU/OBU Ecosystem

- **Core Technology:** Roadside Units (RSUs) and in-vehicle devices capable of broadcasting V2I messages (e.g., SPaT, MAP).
- **Interoperability:** Providing solutions that support the required Hybrid DSRC/C-V2X environment during the transition period.
- **Regional Consistency:** The use of the same technology in both MassDOT and Maine DOT projects creates a common technology baseline for New England, simplifying maintenance and future cross-border compatibility.
- **Key Application:** Emergency Vehicle Pre-emption (EVP) and Transit Signal Priority (TSP) using reliable cellular communications

The Road Ahead: Next Steps for New England

- **Interoperability:** Ensuring message integrity and consistency among multiple vendors and state lines remains a critical goal (ITS research focus).
- **5G Integration:** Leveraging next-generation 5G connectivity for higher bandwidth, massive sensor data processing, and advanced applications (e.g., edge computing).
- **Funding Opportunities:** Utilizing new V2X-eligible grants (e.g., SMART, SS4A, ATTAIN) to expand core corridors.
- **Vulnerable Road Users (VRU):** Incorporating infrastructure-based detection and connectivity to improve safety for pedestrians and cyclists.

Conclusion & Q&A

- The evolution from DSRC to C-V2X is complete, providing regulatory certainty.
- New England is actively deploying C-V2X infrastructure through major state-led projects (ME & MA).
- Standardized vendor technology is creating a strong foundation for regional growth.
- The focus now shifts to interoperability, leveraging 5G, and advanced safety applications.