DRAFT

Saving Lives with Connectivity:

A Plan to Accelerate V2X Deployment

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EXECUTIVE SUMMARY

The U.S. Department of Transportation (USDOT) is committed to reducing deaths and serious injuries on our nation's roadways. As it implements the National Roadway Safety Strategy, the USDOT is actively pursuing a comprehensive approach to reduce the number of roadway fatalities to the only acceptable number: zero.

A powerful tool for achieving this ambitious, long-term goal is vehicle-to-everything (V2X) technology, which enables vehicles to communicate with each other, with other road users such as pedestrians and cyclists, and with roadside infrastructure. Deployments utilizing V2X technologies have demonstrated the safety benefits on a smaller scale. However, to realize the full lifesaving potential of V2X technology will require vehicles and infrastructure to communicate safely, securely and without harmful interference across a variety of devices and platforms.

V2X can save lives by enabling vehicles to communicate with each other, with other road users such as pedestrians and cyclists, and with roadside infrastructure.

Integrating technology and connectivity into a vision zero approach requires that technology operates with many other devices, users, vehicles, and infrastructure. We call this "interoperable connectivity," where a diverse range of mobile, in-vehicle, and roadside technologies must be able to communicate everywhere, efficiently, securely and protect personal information. Connected V2X technology must be reliable and seamless to allow communities and users to effectively move across boundaries, meeting their needs and destinations every day.

The Draft National V2X Deployment Plan sets the USDOT's vision, goals, and milestones, and issues a call to action for stakeholders, including the USDOT, public agencies, and the private sector. It describes how deployments can start now and defines the specific actions needed across stakeholder groups. It also identifies support available from the USDOT and other sources.

V2X technology can improve safety on a national scale, but only if it is interoperable — and the time to invest is now.

The USDOT has a significant role in coordinating, facilitating, and supporting V2X deployments, including such activities as resolving regulatory uncertainty; providing technical assistance and resources; and providing seed funding for deployments across the nation. The USDOT is challenging other public agencies, the transportation industry, communities, and researchers to do their part.

The USDOT has established a set of short-term, medium-term, and long-term deployment goals and targets to focus activity and coordinate stakeholder actions for making progress toward achieving the vision. Reaching these goals will depend on the coordinated actions of multiple stakeholders. No one group can achieve interoperable connectivity on its own.

VISION

Enable a safe, efficient, equitable, and sustainable transportation system through the national, widespread deployment of interoperable V2X technologies.

MISSION

Deploy interoperable V2X connectivity using the dedicated 5.9 GHz spectrum and other available spectrum through collaboration and coordination across federal government, the public sector, and private industry.

Short Term (2024–2026)

Infrastructure Deployments

- V2X deployed on 20% of National Highway System
- Top 75 metro areas have 25% of signalized intersections V2X enabled
- 12 interoperable, cybersecure deployments
- 20 grants to 10 states for 5.9 GHz band use

Vehicles

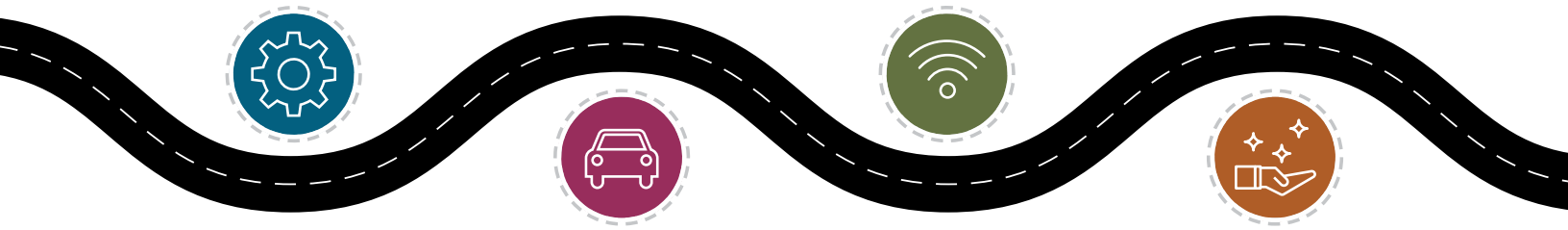
- 2 Original Equipment Manufacturers (OEMs) commit to 5.9 GHz capable vehicles by 2027 model year

Spectrum and Interoperability

- 2 SCMS providers demonstrate interoperable security credentials management
- 3 device suppliers and 2+ OEMs demonstrate interoperability
- FCC completes 2nd Report and Order on 5.9 GHz band

Benefits and Technical Assistance

- 3 case studies on deployed V2X benefits/costs
- 25 active Accelerating V2X Cohort members
- 10 regional hands-on training events



Source: USDOT

Medium Term (2027–2029)

Infrastructure Deployments

- V2X deployed on 50% of National Highway System
- Top 75 metro areas have 50% of signalized intersections V2X enabled
- 25 interoperable, cybersecure deployments
- V2X installed in 40% of the nation's intersections

Vehicles

- 5 vehicle models are 5.9 GHz capable
- 3 active deployments generate Infrastructure Owner-Operator (IOO) data used by 2 OEM production vehicles
- 4 suppliers, 3 OEMs demonstrate interoperable connectivity

Spectrum and Interoperability

- 5 V2X use cases demonstrated in the 5.9 GHz band
- 5 V2X use cases demonstrated beyond the 5.9 GHz band
- 20 public agencies demonstrate interoperability
- 2 providers utilize interoperable SCMS credentials
- 10 certified devices on the market

Benefits and Technical Assistance

- 6 use cases (2 involving vulnerable road users) document V2X safety benefits
- 50 active Accelerating V2X Cohort members author progress report

Long Term (2030–2034)

Infrastructure Deployments

- V2X fully deployed on National Highway System
- Top 75 metro areas have 85% of signalized intersections V2X enabled
- 50 interoperable, cybersecure deployments
- Interoperable 5.9 GHz operations across 50 states
- V2X installed in 75% of the nation's intersections

Vehicles

- 6 OEMs have 5.9 GHz capable production vehicles for safety use cases
- 20 vehicle models are V2X capable

Spectrum and Interoperability

- 5 V2X use cases operational in the 5.9 GHz band in all 50 states
- 5 V2X use cases operational beyond the 5.9 GHz band in 5 states
- 20 certified devices dominate deployed V2X technology base

Benefits and Technical Assistance

- 10 deployments in operation for 5 years streaming benefits/cost data
- 75 active Accelerating V2X Cohort members sponsor pooled fund projects

POTENTIAL ACTIONS FOR MAJOR STAKEHOLDER GROUPS

USDOT

Provide federal leadership by hosting events and documenting a national vision and action plan for deployment.

Provide seed funding and investment to accelerate V2X deployments.

- Launch a new program focused on V2X investment in 2023.
- Promote use of discretionary grant programs like ATTAIN, SMART, and SS4A grants to launch V2X deployments.

Convene and facilitate stakeholders to share information / best practices.

- Establish an Accelerating V2X Cohort and document benefits, costs, and lessons learned.
- Fund detailed technical assistance training at conferences, annual meetings, and regional events.
- Operate training and equipment loan programs.
- Fund the Connected and Automated Transportation Coalition program.
- Update websites and the Smart Community Resource Center.
- Host regular webinars for training and to engage stakeholders as Plan is finalized and implemented.
- Enable interoperability through coordination with stakeholder groups and standards-related activities.
- Publish a final National V2X Deployment Plan in early 2024.
- Organize and deliver a 4th V2X Summit in 2024, specifically providing a venue for states and private industry to register their commitments to actions aligned with the Plan.

Provide support for standards, architecture, and testing to accelerate interoperability.

- Conduct additional spectrum testing to provide data to FCC/NTIA to ensure release of FCC's Second Report and Order on C-V2X.
- Work with NHTSA to explore data-driven strategies that could effectively incentivize interoperable systems and accelerated deployment.
- Assess rules and guidance to ensure alignment with the Plan.

FCC

Work with USDOT and industry to determine rules for use of 5.9 GHz 30 MHz spectrum allocation to ITS services.

NTIA

Coordinate and convey federal (USDOT) interests in spectrum decisions and rules to FCC.

OEMs

Develop, test, and deploy interoperable V2X safety applications.

- Initiate deployment of C-V2X technology and safety applications in new vehicles of all types (including fleet vehicles).
- Deploy interoperable safety and non-safety applications utilizing 5.9 GHz and other spectrum approaches.
- Actively partner with IOOs to enable national rollout of interoperable applications in production vehicles.
- Support precompetitive R&D and standardization.
- Collaborate on message sets and standards for interoperability.
- Provide sustained input to FCC regarding impact of V2X technologies.

Automotive Suppliers

Develop V2X-enabled vehicle components and applications for OEMs to include in production vehicles.

Support precompetitive R&D and standardization.

Collaborate on message sets and standards for interoperability.

States, Local Governments, Tribes, and Public Agencies

Update investment and transportation plans to include V2X technology.

Deploy and operate interoperable, cybersecure infrastructure-based V2X technologies and applications.

- Leverage federal seed funding to inform and test interoperability.
- Collaborate on message sets and standards for interoperability.
- Work with local emergency services, transit, school bus, and other public sector vehicle fleets to enhance vehicle participation.
- Ensure interoperability is a routine element of state long-range and Metropolitan Planning Organization (MPO) plans.
- Participate in national events to remain up-to-date on V2X technology.

Transit Operators

Deploy and operate on-board and center-based V2X applications to enhance transit safety, efficiency, and performance.

Freight Operators

Deploy V2X applications that provide internal return-on-investment, including safety and efficiency applications and driver support.

App Developers

Design and develop applications that utilize connectivity.

Service Providers

Develop and operate supporting services that enable interoperable connectivity applications.

ITS Equipment/Software Vendors

Develop infrastructure-based components and software to fulfill public agencies' interoperable connectivity needs.

Design/Integration/Deployment Consultants

Provide support for public agencies to design, procure, integrate, and deploy solutions for interoperable connectivity.

Security Credential Providers

Provide security credential-related services (i.e., SCMS, certificates) to enable trust among interoperable connectivity entities and applications.

Test Certification Providers

Provide testing and certification services to enable trust in interoperable connectivity component functionality, performance, and standards conformance.

Standards Development Organizations

Develop standards to realize interoperability and support cooperative applications.

Trade and Industry Associations

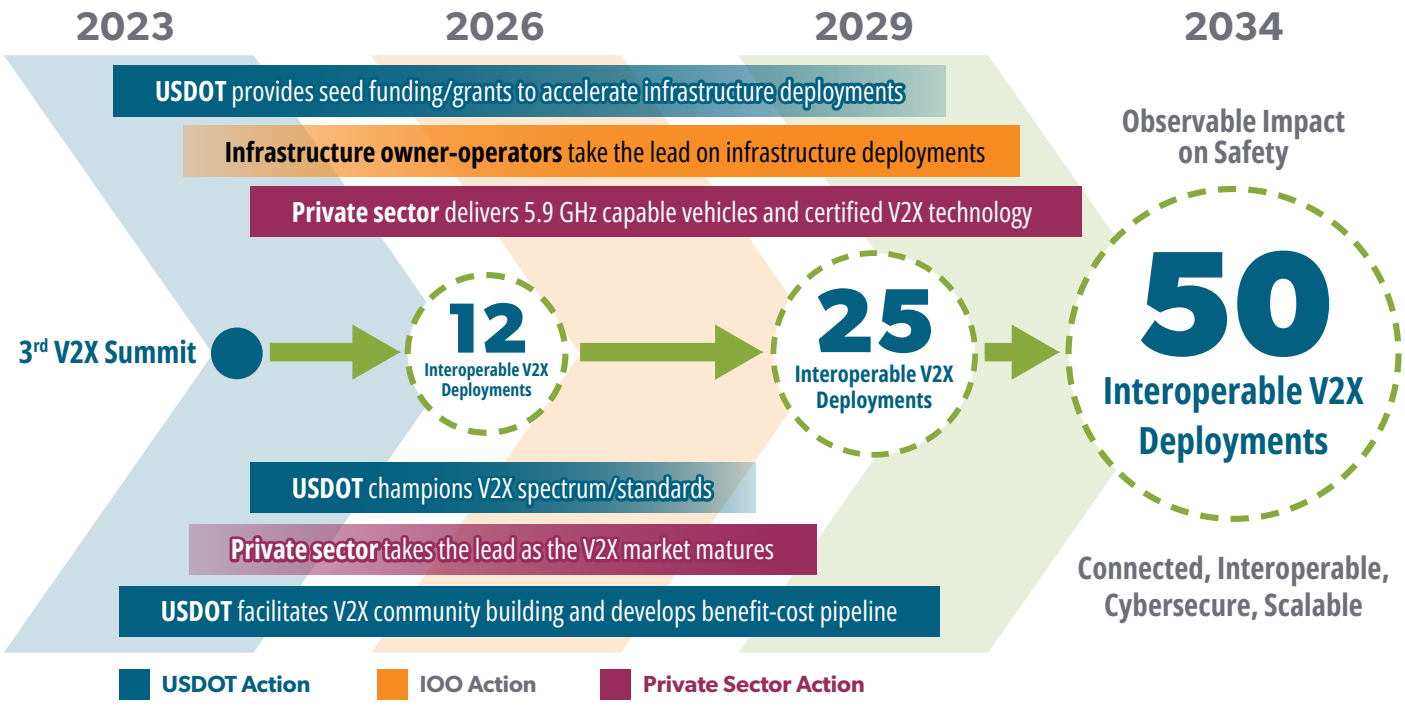
Provide industry stakeholder feedback to inform USDOT and provide expertise.

Communications Providers

Build, operate, and maintain private communications networks to provide communications services to customers.

Past V2X research and deployments using DSRC show the promise and benefits of this technology. However, the opportunity exists only now, with the clarity on the 5.9 GHz spectrum, to begin realizing the benefits for technologies that can save lives today. The need for action is urgent. V2X is fundamentally a cooperative technology where the benefits on a large scale are many times greater than the benefits of individual systems. Achieving and sustaining interoperability is necessary to fully realize the benefits across the nation. Interoperable V2X deployments will rely upon standards, supporting trust systems, and wireless technologies that must work together to function effectively. Transportation agencies will need to take bold actions toward shaping the direction of the future in concert with the USDOT and the private sector. The USDOT remains committed to supporting and advancing the deployment of V2X technologies and capabilities that enable the vision of a future with zero transportation-related fatalities and serious injuries, and the transformation to a modern transportation system for today and for decades to come.

V2X connectivity is a critical transformational technology that not only advances safety but also enhances mobility, bolsters efficiency, and reduces negative environmental impacts. Accelerating V2X deployment now is a crucial step toward saving lives with connectivity.



Source: USDOT

For more information, please visit the Smart Community Resource Center: https://www.its.dot.gov/scrc