

National Transportation Safety Board

Office of the Chair

Washington, DC 20594



February 2, 2024

US Department of Transportation
V2XDeploymentPlan@dot.gov

Re: V2X Deployment Plan

Dear Sir or Madam:

The National Transportation Safety Board (NTSB) has reviewed the Department of Transportation's (USDOT) draft document titled "[Saving Lives with Connectivity: A Plan to Accelerate V2X Deployment](#)," released in October 2023. In this document, the USDOT outlines its draft plan for nationwide deployment of V2X (vehicle-to-everything) technology. The document identifies various stakeholders and specific actions they need to complete; describes support that the USDOT would provide; and presents short-, medium-, and long-term priorities along with plans for the technical and institutional framework necessary for V2X deployment in the United States.

The NTSB recognizes the USDOT's efforts and largely supports the draft plan. In our response to this document, we discuss our safety recommendations related to the development of V2X technology (also referred to as *connected vehicle technology*) and the history pertaining to deployment efforts. We have reviewed the draft plan within the context of the currently stalled V2X deployment environment and the critical necessity of the USDOT (at the Secretary level) taking a prominent leadership role in creating and implementing a plan for nationwide deployment, particularly following the Federal Communications Commission's (FCC) 2021 rule that reduced the wireless band for transportation safety applications to 30 MHz. We offer comments regarding specific components included in the draft plan and emphasize the following key points related to nationwide deployment of this life-saving technology:

- There is a crisis on our nation's roadways. With more than 40,000 deaths annually and millions more injured, the USDOT's commitment to V2X deployment must translate to rapid action.
- Continued regulatory uncertainty from the USDOT since 2018 led to industry and other government agencies losing faith in the deployment approach. The V2X deployment environment remains uncertain because of lack of leadership and regulatory action by the USDOT and the National Highway Traffic Safety Administration (NHTSA), and because of a considerably reduced

transportation safety band with high risk of interference problems from non-transportation users. The possible role for regulatory action should be part of the long-term plan.

- The NTSB has been recommending V2X since 1995 and has nine open safety recommendations to the USDOT or one of its agencies; four of these recommendations are classified Open–Unacceptable Response, and one is classified Open–Await Response.
- The timeframes presented in the USDOT’s draft plan do not lay out a bold vision for V2X deployment in vehicles. The NTSB is concerned that the draft plan is targeting only 6% of passenger vehicle models by 2030-2034. Automakers must deploy faster and more widespread to ensure a safer roadway for all.

NTSB Safety Recommendations and the History of V2X Deployment Activities

NTSB Safety Recommendations and V2X Development. The NTSB first identified the potential benefits of collision warning technology in 1995 as a result of our investigation of a crash in Menifee, Arkansas. The multivehicle collision occurred in foggy conditions and involved nine vehicles and a series of rear-end collisions, resulting in five fatalities.¹ As a result of the Menifee investigation and recognizing the limitations of collision avoidance systems at the time, particularly in inclement weather, we recommended that the FCC allocate a dedicated wireless band for collision warning technologies.² In 1999, the FCC allocated 75 MHz for transportation safety applications, prompting extensive research by federal and state agencies, industry groups, and academic institutions to examine the implementation, application, and effectiveness of V2X technology. For the last 20+ years, various federal and state DOT agencies as well as vehicle manufacturers have been conducting collaborative research to refine and advance V2X applications. One such project identified seven crash-imminent scenarios that could be addressed by vehicle-to-vehicle (V2V) technology.³ Another project was a large-scale naturalistic study–Safety Pilot Model Deployment–which produced clear evidence of the benefits

¹ NTSB. 1995. *Multiple Vehicle Collision with Fire During Fog Near Milepost 118 on Interstate 40, Menifee, Arkansas, January 9, 1995*. [NTSB/HAR-95-03](#).

² See Safety Recommendation [H-95-46](#). As a result of the FCC allocating 75 MHz within the 5.850–5.925 GHz band, the NTSB classified H-95-46 Closed–Acceptable Action on November 17, 1999.

³ (a) National Highway Traffic Safety Administration (NHTSA). 2011. *Crash Avoidance Vehicle Safety Communications –Applications (VSC-A) Final Report*. ([Report No. DOT HS 811 492A](#)). Washington, DC: NHTSA. (b) The 7 identified safety applications were: (1) emergency electronic brake light, (2) forward collision warning (FCW), (3) blind spot warning, (4) lane change warning, (5) do not pass warning, (6) intersection movement assist, and (7) control loss warning.

of V2V technology.⁴ One of the most remarkable findings from this 1.5-year-long pilot model deployment was that no missed forward collision warning alerts occurred; of the 368 encountered rear-end near-crash scenarios, the V2V devices alerted the drivers in all cases.

The comprehensive V2X research and the robust findings provided continual evidence to the NTSB that many of the crashes that we have investigated could have been mitigated or even prevented through the use of V2X technology.⁵ In fact, since our 1995 safety recommendation concerning collision warning technology, more than a million people have died on our nation's roads.

In 2012, the NTSB investigated an intersection crash in Chesterfield, New Jersey, between a school bus transporting 25 elementary school students and a roll-off truck.⁶ The bus driver failed to yield as the bus entered the intersection and was then struck by the oncoming truck, resulting in the death of one student and injuries to 15 students. We determined that connected vehicle technology could have provided warnings to both drivers about the impending collision, possibly preventing it from occurring. As a result, the NTSB issued safety recommendations to NHTSA to develop performance standards for connected vehicle technology and mandate that the technology be installed on all new vehicles ([H-13-30](#) and [-31](#)).⁷

Our recommendations for NHTSA to require connected vehicle technology, in conjunction with the collaborative research that various USDOT agencies continued conducting with industry and research groups, resulted in NHTSA issuing a notice of proposed rulemaking (NPRM) in January 2017 to mandate V2V communication for new passenger vehicles based on the dedicated short-range communication (DSRC) standard and to standardize the communication requirements of the V2V messages.⁸ The proposed mandate was based on several anticipated V2V applications, including a forward collision warning application and an intersection movement assist application, which are designed to address crash scenarios such as the one in the

⁴ See the 2015 USDOT report *Independent Evaluation of Light-Vehicle Safety Applications Based on Vehicle-to-Vehicle Communications Used in the 2012–2013 Safety Pilot Model Deployment* ([Report No. DOT HS 812 222](#)). Washington, DC: NHTSA.

⁵ See the following reports for additional V2X research: (1) NHTSA. 2010. *Frequency of Target Crashes for IntelliDrive Safety Systems*. ([Report No. DOT HS 811 381](#)). Washington, DC: USDOT/Volpe Center; (2) USDOT. 2011. *USDOT Connected Vehicle Research Program. Vehicle-to-Vehicle Safety Application Research Plan*. ([Report No. DOT HS 811 373](#)). Washington, DC: USDOT. For recent pilot deployments, see the Intelligent Transportation Systems Joint Program Office [website](#).

⁶ NTSB. 2013. *School Bus and Truck Collision at Intersection Near Chesterfield, New Jersey, February 16, 2012*. [NTSB/HAR-13/01](#).

⁷ Safety Recommendations H-13-30 and -31 are currently classified Open–Unacceptable Response.

⁸ (a) See Docket No. [NHTSA-2016-0126](#), NPRM "Federal Motor Vehicle Safety Standards (FMVSS): V2V Communications," published at 82 *Federal Register* 3854, January 12, 2017. (b) DSRC is a communication protocol/technology for V2X applications. NHTSA's proposed standard largely adopted the DSRC standards developed by SAE International: SAE [J2735](#) and SAE [J2945](#).

Chesterfield crash. The NTSB supported the proposed rule but criticized the exclusion of heavy vehicles from the mandate.⁹

As the NTSB continued investigating crashes that could have either been prevented or their severity mitigated by V2X technology, we also identified the need to expand V2X technology to include vulnerable road users—such as pedestrians, bicyclists, and motorcyclists—that are experiencing large increases in fatalities. As a result, from 2018 to 2019, the NTSB issued six safety recommendations to incorporate bicyclists and motorcyclists in the performance standards for vehicle-to-pedestrian (V2P) technology.¹⁰

Further Deployment Activities and the Environment. As we evaluate the current draft plan, it is important to do so within the context of today’s deployment environment and review how the V2X technology, void of USDOT leadership and follow-through, has languished after NHTSA published an NPRM related to connected vehicle technology. In 2017, NHTSA’s proposed rule provided concrete steps toward regulatory certainty, and the 75-MHz transportation safety band provided sufficient bandwidth for deployment of approved V2X technology, such as DSRC, and testing of new technologies, such as cellular-based C-V2X technology. Further, vehicle manufacturers were committed to deploying the technology. Two automakers had started or announced plans to equip their vehicles with V2X capabilities (General Motors and Toyota), and collaboration between various USDOT agencies and industry groups created a relatively broad industry consensus regarding deployment of V2X technology.¹¹

However, since that time, numerous actions and *inactions* by the USDOT, the FCC, and industry have created regulatory uncertainty and gradually dismantled the environment that was being prepared for broad-scale V2X deployment:

- USDOT. In December 2018, the USDOT issued a request for comments (RFC) seeking input regarding differences between DSRC and cellular-based communication technology, which raised uncertainty regarding the 2017 NPRM about which communication protocol technology would be mandated.

⁹ See the [NTSB letter](#) sent on March 29, 2017, to Rules Docket No. NHTSA-2016-0126 in response to the NPRM.

¹⁰ (a) NTSB. 2019. *Bicyclist Safety on US Roadways: Crash Risks and Countermeasures*. [NTSB/SS-19/01](#). See Safety Recommendations [H-19-35](#), [-37](#), and [-43](#). (b) NTSB. 2018. *Select Risk Factors Associated with Causes of Motorcycle Crashes*. [NTSB/SR-18/01](#). See Safety Recommendations [H-18-30](#), [-31](#), and [-37](#).

¹¹ (a) Starting with the 2017 model year, General Motors equipped its Cadillac CTs with DSRC-based V2X capabilities; this vehicle model continued being equipped with V2X capabilities through model year 2019. In 2018, General Motors also announced plans to start expanding V2X deployment across its Cadillac fleet in 2023 (see the [General Motors letter to the FCC docket](#)). (b) In April 2018, Toyota [announced](#) plans to start equipping a portion of its fleet with DSRC-based V2X capabilities by 2021.

The NTSB responded to the RFC, reiterating our support for connected vehicle technology, stating that “. . . DOT should not put existing lifesaving technologies, such as DSRC, on hold while waiting for the next emerging technology to arrive . . .”.¹² From 2018 to 2023, the USDOT ceded leadership and took no regulatory action toward V2X nationwide deployment. In November 2023, NHTSA withdrew the 2017 NPRM to mandate V2V communication technology in all new light vehicles, stating that “. . . given the advent of new V2V communications protocol, and the revised regulations governing the 5.9 GHz band, the agency believes a regulatory action to revise the proposed rulemaking cannot be reasonably accomplished at this time.”¹³

- **FCC.** In October 2021, the FCC finalized a rule that decreased the transportation safety band from 75 MHz to 30 MHz. The rule also allowed unlicensed devices not associated with transportation to operate in the reallocated lower 45-MHz band, allocated the remaining 30-MHz band only for C-V2X, and ordered discontinuation of DSRC-based V2X technology.¹⁴ The FCC’s rulemaking had a widespread impact. First, because most of the deployments (primarily vehicle-to-infrastructure or V2I) were based on DSRC technology, the ruling forced the infrastructure owner-operators (state DOTs and local governments) to end existing deployments. In 2021, 34 states had deployed 57 operational V2I projects that included more than 15,500 instrumented vehicles and 6,200 intersections and roadside V2I units.¹⁵ Second, the introduction of unlicensed devices, such as those that use wi-fi, into the neighboring band introduced a high risk of harmful interference to the communications between V2X devices.¹⁶ A broad range of stakeholders—including the NTSB, the automotive industry, and USDOT agencies—expressed concern to the FCC regarding interference.¹⁷ Finally, the reduction of the transportation safety spectrum severely impacts the feasibility of implementing advanced V2X applications, such as shared perception, V2P, vehicle-to-other vulnerable road users, and truck platooning, some of which were required by

¹² See the [NTSB letter](#) sent on March 11, 2019, published at 83 *Federal Register* 246, December 26, 2018, in response to the RFC.

¹³ See [88 Federal Register 80685](#) (November 20, 2023) for the withdrawal of the proposed rule.

¹⁴ See [86 Federal Register 58809](#) (October 25, 2021) for the final rule. The final rule from May 2021 ([86 Federal Register 23281](#)) reduced the transportation safety band to 30 MHz, while the October 2021 rule finalized the allocation of the band to the C-V2X technology and announced the effective date.

¹⁵ See NTSB Board Member Graham’s conversation with a representative of the American Association of State Highway and Transportation Officials in the [V2X: Preserving the Future of Connected Vehicle Technology](#) video series.

¹⁶ Multiple studies ([2019 NHTSA](#), [2000 CAMP](#)) showed that, in certain conditions, the intrusion of signals from unlicensed devices into the 30-MHz transportation safety band would severely compromise V2X applications that rely on low latency and high reliability.

¹⁷ (a) See [85 Federal Register 6841](#) (February 6, 2020) for stakeholder comments to the FCC’s NPRM. (b) See the [NTSB response](#) to the FCC’s 2020 NPRM.

the 2021 Infrastructure Investment and Jobs Act.¹⁸ As a comparison, the European Union has allocated 60 MHz for V2X applications, with an additional 20 MHz to be shared with urban rail applications.¹⁹

- **Industry.** After General Motors completed V2X pilot deployments on the Cadillac CTS in 2018, the automaker never initiated the previously announced plans to expand V2X deployment across its Cadillac fleet. In addition, about 4 months after the USDOT's RFC, Toyota suspended its plans for V2X deployment due to, as stated, regulatory uncertainty and lack of deployment plans from other automakers.²⁰ In 2019, Ford announced a plan to start equipping a portion of its fleet with C-V2X by 2022.²¹ This deployment has not occurred, and the automaker has made no further announcements about its plans and future commitments to deploy V2X technology.

The confluence of the action and inaction by the federal regulators and industry stakeholders discussed above underscore the importance of leadership from the USDOT, at the Secretary level, in resolving regulatory uncertainty and creating and supporting a path for nationwide V2X deployment.

The FCC, Industry, and the Waivers. Because the original 75-MHz transportation safety band was allocated for DSRC-based technology, entities testing C-V2X technology within that band had to obtain a waiver from the FCC before deployment. This requirement has continued since the transportation safety band was

¹⁸ (a) See the Intelligent Transportation Society of America ([ITS America](#)) [report](#) for more information for the feasibility of advanced V2X applications within the 30 MHz spectrum. (b) *Shared perception* refers to future automated vehicles sharing information about the environment and detected road users with other vehicles and infrastructure. (c) *Truck platooning* refers to two or more combination vehicles traveling on a highway and following each other very closely to improve fuel economy. (d) Section 24219 of the [Infrastructure Investment and Jobs Act](#), enacted on November 15, 2021, requires NHTSA and the FHWA to collaborate with the ITS Joint Program Office, to expand V2P research to incorporate bicyclists and other vulnerable road users, and to analyze how all these applications can be "accommodated within existing spectrum allocations for connected vehicle systems."

¹⁹ See the European Electronic Communications Committee [Decision \(08\) \(01\)](#), approved in March 2020. This decision was complemented by [Decision 2020/1426](#) of the European Economic Commission, as adopted in October 2020.

²⁰ (a) Toyota described its decision in a [comment letter](#), sent on April 26, 2019 to the FCC (ET docket No. 13-49, GN docket No. 18-357). (b) Following Toyota's announcement of its plan for broad deployment, the automaker received [a letter from the FCC](#) stating "that Toyota should keep in mind when committing capital expenditures to DSRC technology" that the FCC, the USDOT, and the National Telecommunications and Information Administration were currently evaluating the potential for DSRC sharing the 75-MHz safety spectrum with unlicensed devices and that technologies newer than DSRC (C-V2X) were being examined.

²¹ Ford described its deployment plan in a [letter](#) to the FCC Administrator, sent on November 21, 2019 (Proceeding OET-19-138).

reduced to 30 MHz and will remain in place until the FCC completes the Second Report and Order.²²

The primary reason for the continued waiver requirement is that the FCC's 2021 final rule did not specify a particular C-V2X technology. C-V2X is an umbrella term for LTE-V2X and 5G-V2X, which are distinct communication protocols that require separate frequency channels for communication.

After the 2021 final rule, numerous entities (state DOTs, local municipalities, automakers, and vendors manufacturing V2X devices) submitted waiver requests to the FCC to allow them to operate C-V2X devices in the newly established 30-MHz safety band. These were primarily individual requests, along with one joint waiver request representing 20+ entities including three automakers (Audi America, Ford, and Jaguar Land Rover).²³ The NTSB supported the FCC granting the waiver requests as "necessary to allow auto manufacturers, infrastructure owner-operators, and others to move forward with the development of connected vehicle technology."²⁴ In April, August, and November 2023, the FCC granted the majority of these waiver requests.²⁵

Further NTSB Safety Recommendations. Our investigation of a 2020 multivehicle crash in Mt. Pleasant Township, Pennsylvania, provided an opportunity for the NTSB to examine the obstacles preventing V2X deployment.²⁶ This crash occurred on the Pennsylvania Turnpike at nighttime and during inclement weather. Several vehicles were involved, including three truck-tractor combination vehicles traveling along a curve and encountering an overturned motorcoach lying on its side and blocking all travel lanes. The crash investigation exposed the limitations of vehicle-resident sensors and highlighted the benefits of V2X technology. As a result, the NTSB issued Safety Recommendation [H-22-1](#) to the USDOT in 2022:²⁷

Implement a plan for nationwide connected vehicle technology deployment that (1) resolves issues related to interference from

²² (a) The [FCC's Report and Order](#) may develop new rules, amend existing rules or make a decision not to do so. Report and Order summaries are published in the *Federal Register*. At times, the FCC may release a Second Report and Order to address outstanding items that were not finalized in the First Report and Order. (b) In the FCC's May 2021 ruling, when discussing the timeline of conversion from DSRC to C-V2X, the FCC refers to a specific period after release of a Second Report and Order.

²³ See the [request](#) submitted by joint waiver parties on December 13, 2021, along with a follow-up [submission](#).

²⁴ See [NTSB comments](#) to the FCC's August 2022 request for comments.

²⁵ See the waiver [approval for the joint waiver parties](#) and combined waiver approvals for [17](#) and [8](#) individual applications.

²⁶ NTSB. 2022. *Multivehicle Crash Near Mt. Pleasant Township, Pennsylvania, January 5, 2020*. [NTSB/HIR-22/01](#).

²⁷ In this report, the NTSB also issued Safety Recommendation [H-22-6](#) to the FCC to implement safeguards to protect V2X communication from harmful interference.

unlicensed devices, such as those that use wi-fi; (2) ensures sufficient spectrum necessary for advanced connected vehicle applications; and (3) defines communication protocols to be used in future connected vehicle deployment.

The USDOT's draft plan begins to address the three primary components of Safety Recommendation H-22-1.²⁸ It describes the USDOT's plan for resolving the concerns regarding interference from unlicensed devices (by conducting testing), states the intent to explore additional spectrum through collaboration and coordination with government and industry stakeholders, offers general discussion regarding the types of V2X applications to be used in the short and long term, and tangentially remarks on the communication protocols for V2X deployment. The FCC's Second Report and Order should define the communication protocol technology to be used within the 30-MHz transportation safety band and ensure that appropriate safeguards are implemented to protect V2X communications from harmful interference from unlicensed devices, such as those that use wi-fi.

NTSB's Comments on the USDOT Draft Plan

The NTSB continues to believe strongly in the lifesaving promise of V2X technology. V2X excels in several areas that are challenging for vehicle-resident sensors. Specifically, V2X systems are not affected by curves, visibility, or crash scenarios that are challenging for vehicle-resident sensors to detect. Further, V2X communications can provide information about a threat much earlier than radar or camera sensors, giving drivers more time and a better opportunity to avoid a crash. V2X technology also provides a complementary source of information to vehicle-resident collision avoidance systems, improves the reliability and accuracy of data, extends the range of hazard detection, and detects hazards that are outside a vehicle-resident sensor's field of view.

Despite the tremendous safety promise of V2X technology, regulatory uncertainty remains, in part due to slow and limited leadership from the USDOT and NHTSA, and the considerably reduced transportation safety band with high risk of harmful interference from non-transportation users. However, the NTSB is encouraged by the USDOT's current draft plan and views it as a notable step forward, considering the currently stalled deployment of V2X technology. Additionally, the draft plan presents activities that indicate the USDOT will take a leadership position, which the NTSB has maintained is an essential component for nationwide V2X deployment.

The NTSB Issued Safety Recommendation H-22-1 to the USDOT in February 2022. In August 2022, the USDOT held the first V2X Communications Summit, during

²⁸ Safety Recommendation H-22-1 is currently classified Open–Unacceptable Response.

which the USDOT agencies discussed recent research projects. In addition, various stakeholders—including the NTSB, industry, and state DOTs—expressed concern about regulatory uncertainty and called for the USDOT to assert its leadership.²⁹ At that time, it became evident that improving communication among USDOT agencies, such as NHTSA and the Federal Highway Administration, was also needed to establish a uniform USDOT approach to resolving the issues that stalled V2X deployment. The second V2X Communications Summit was held in April 2023.³⁰ During the third V2X Communications Summit in October 2023, the USDOT presented this draft plan for V2X deployment. The NTSB views the three V2X Summit meetings, along with the draft plan, as indicative of the USDOT’s commitment to resolve the current obstacles and foster a path for nationwide deployment of V2X. However, with more than 40,000 deaths annually on our nation’s roadways, the commitment must translate to rapid action.

The NTSB believes that the draft plan begins to address the existing impediments and offers the following comments on the plan:

- Although the draft plan does not include details pertaining to the proposed interference testing, the NTSB fully supports the USDOT taking a leading role in addressing harmful interference in the spectrum, one of the industry’s main concerns regarding deployment.
- The FCC’s granting of the waivers represents a positive step toward allowing deployment in the now-reduced transportation safety band, and the NTSB acknowledges the USDOT’s continued support on that issue.
- Ongoing coordination and collaboration among the USDOT, FCC, and National Telecommunications and Information Administration is important to ensure that the safety band is free from harmful interference, the FCC’s Second Report and Order is expeditiously completed, and the additional spectrum necessary for advanced V2X applications is identified.
- The NTSB supports the USDOT’s grant programs that would expand V2I capabilities, thus readying the nation’s infrastructure for broad-scale deployment of V2X-equipped vehicles.³¹ The grant programs may help

²⁹ See the USDOT [webpage](#) for additional information about the first V2X Communications Summit.

³⁰ The second V2X Communications Summit continued discussion about previous V2X projects and industry concerns. See [Intelligent Transportation Systems - Communications \(dot.gov\)](#).

³¹ The Bipartisan Infrastructure Law established the “Safe Streets and Roads for All” discretionary program, which has \$5 billion in appropriated funds over the years 2022–2026. (See [Safe Streets and Roads for All \(SS4A\) Grant Program | US Department of Transportation](#) for more information.) The Bipartisan Infrastructure Law also provided \$300 million in appropriated funds over the years 2022–2026 for the “Advanced Transportation Technologies and Innovation” (ATTAIN) grant program and

address the cost that infrastructure owner-operators incurred when the FCC ended DSRC-based V2I deployments and assist owner-operators in transitioning to C-V2X-based V2I-instrumented infrastructure.

- The NTSB is concerned that the draft plan does not describe additional incentives to the states and these governments beyond the identified grant programs to encourage them to implement eligible V2X deployments. The effectiveness of V2X relies on broad deployment, and its value increases as the number of instrumented roadway sections and V2X-equipped vehicles increases.
- The NTSB strongly supports the 2030-2034 infrastructure targets, including deployment on 85% of signalized intersections in the top 75 metro areas and full deployment on the National Highway System. Infrastructure deployment is a critical piece to realizing the safety benefits of V2X, and the targets outlined in the USDOT's draft plan will be helpful in finally achieving those safety benefits.
 - The NTSB recognizes the funding challenges of some infrastructure owner-operators in achieving the targets set forth in this plan. One solution to overcome these challenges is a dedicated funding stream.
- The uses of V2X technology are broad and include non-safety applications such as improved traffic flow and increased fuel efficiency. However, the NTSB's recommendations related to V2X are based on the technology's capacity to address imminent crash scenarios and to save lives. The NTSB believes that the USDOT's plan should better outline how it will promote and prioritize lifesaving V2X applications.
 - Crash-imminent applications require highly accurate and confident positioning of vehicles in all scenarios, including urban environments with tall buildings or roadways with tunnels. The NTSB encourages the USDOT to outline the expected fidelity of positioning in those challenging environments.
- As the automakers' primary regulator, NHTSA's involvement is crucial for the nationwide deployment of V2X. However, NHTSA is largely absent from the USDOT's draft plan. The NTSB strongly encourages the USDOT to include specifics of NHTSA's participation in its plan and how NHTSA may incentivize and accelerate vehicle deployment.

- The full safety promise of V2X is only realized when we reach a critical mass of vehicles on our roadways. The NTSB is concerned that the deployment plan is too slow, particularly for vehicles. The plan calls for only 20 vehicle models—which is about 6% of passenger vehicle models in the United States—to be deployed with 5.9-GHz capability by 2030-2034.³² Automakers must deploy faster and more widespread to ensure a safer roadway for all.
- The NTSB also recognizes that the USDOT anticipates that at least two automakers will in the near-term start deploying V2X technology on their vehicles. However, no automakers have yet committed to such deployment. The draft plan is unclear as to how the USDOT will encourage or incentivize automakers to begin initial deployment.
- The automakers' reluctance to deploy may be ameliorated by the FCC releasing the Second Report and Order that would specify the type of C-V2X technology (LTE- or 5G-V2X) to be used within the 30-MHz band, but also by resolving the issue of interoperability of V2X devices and specifying the types of V2X applications to be implemented. For that reason, the NTSB supports the USDOT issuing a plan to also address the interoperability-related issues.
- The NTSB, having commented on the necessity of V2X safety applications to include heavy vehicles and vulnerable road users, supports the inclusion of heavy vehicles in the vehicle deployment plans and the development of two use cases involving vulnerable road users in the benefits and technical assistance plan.
- The NTSB has long recognized the potential for pedestrian safety systems, including V2X technology, to save the lives of vulnerable road users, and have encouraged the inclusion of such systems into the New Car Assessment Program (NCAP).³³
- In the draft document, the USDOT states that "Bold leadership is needed to ensure connected V2X technologies are integrated into the surface transportation system." The NTSB agrees with this assessment and strongly encourages the USDOT to take a prominent leading role in reaching consensus and providing sufficient incentive to automakers to commit to deployment. Although the NTSB recognizes that the USDOT has adopted a

³² According to Consumer Reports data, there were 319 passenger vehicle models in model year 2022.

³³ (a) NTSB. 2018. *Pedestrian Safety*. [NTSB/SIR-18/03](#). (b) In this report, the NTSB issued Safety Recommendation [H-18-43](#) to NHTSA to incorporate pedestrian safety systems, including pedestrian collision avoidance systems and other more-passive safety systems, in NCAP. (c) See also the [NTSB's July 2023 comments](#) to NHTSA's NCAP RFC.

voluntary approach to deployment, bold leadership in V2X deployment should include a discussion of when and under what circumstances the USDOT would find it necessary to use its regulatory authority to ensure the full potential of this lifesaving technology.

The NTSB appreciates the opportunity to provide comments to the USDOT's draft plan to accelerate V2X deployment. We recognize the criticality of the USDOT taking steps in asserting its leadership role and developing a path for nationwide V2X deployment, as we cannot allow this lifesaving technology to stagnate.

Sincerely,

[Original signed]

Jennifer Homendy
Chair