

V2X IN DANGER:

How the FCC's 5.9 GHz Proposal Threatens Transportation Safety

Imagine if your vehicle could actually “see” the bicyclist coming around the corner, out of view, before you did. Imagine if your vehicle got an alert from the roadway indicating there is dangerous ice ahead and to reduce speed. Imagine if your vehicle got a notice of an airbag deployment seven cars ahead on the highway due to a crash, allowing you to safely brake in time and avoid a vehicle pileup. Vehicle-to-Everything (V2X) technologies can do all of that and more.

These technologies allow vehicles to communicate with other vehicles, infrastructure, and road users to avoid crashes, fatalities, and injuries by providing near-instant, highly accurate alerts of hazards drivers may not be able to see, so that they can take action to avoid a crash. This technology requires dedicated spectrum to ensure uninterrupted high-speed communication. The FCC has proposed to give away more than half of this dedicated spectrum, significantly undermining transportation safety now and into the future. Many of the safety benefits of V2X will be lost if the FCC moves forward with this decision – including applications enhancing the safety of automated vehicles and protecting vulnerable road users. In an ever more connected world, this decision is a loss for all travelers.

V2X NEEDS SPECTRUM THAT THE FCC IS TAKING AWAY

V2X technologies need dedicated spectrum to ensure uninterrupted high-speed communication and 75 MHz of the 5.9 GHz spectrum band was allocated for exclusive use by these technologies, ensuring that messages can travel fast and without interference. The FCC has proposed to give away 45 MHz of the 75 MHz in the 5.9 GHz band for use by unlicensed devices, such as Wi-Fi, **cutting the spectrum available for V2X safety technologies by more than half.**

To quantify what V2X messages and applications would likely fit in a 30 MHz environment scenario, the Intelligent Transportation Society of America (ITS America) convened a working group made up of infrastructure owners and operators, automakers, and technology companies and tasked this group with developing a preliminary framework, or application map, for V2X in 30 MHz. The results are concerning. While some basic V2X message types and applications will likely fit in 30 MHz, **many advanced applications, such as those that enhance the safety of automated vehicles (AVs) and protect vulnerable road users (VRUs), will likely be lost.** While other technologies may be able to provide some additional benefits, they are not a substitute for high-speed, reliable V2X communications.

WHAT WILL LIKELY FIT

ITS America's working group found that some message types, including Basic Safety Messages, Signal Phase and Timing messages, Traveler Information messages, and certain others, could potentially be deployed in the remaining spectrum. These message types would likely allow applications such as forward collision warning, pre-crash sensing, emergency vehicle warning and signal preemption, and infrastructure-to-vehicle warning messages to be deployed in 30 MHz.

WHAT IS LIKELY LOST

Numerous V2X applications that rely on perception sharing messages and maneuver coordination messages, which allow vehicles to share information about their surroundings with other vehicles to provide

THE UNCERTAIN FUTURE OF V2X IN A 30 MHz WORLD

The Federal Communications Commission (FCC) has proposed to give away 45 MHz of the 75 MHz in the 5.9 GHz band for use by unlicensed devices, such as Wi-Fi, cutting the spectrum available for V2X safety technologies by more than half, leaving only 30 MHz.

The FCC plan does not provide enough spectrum for advanced V2X applications - particularly those expected to enhance the safety of automated vehicles and protect vulnerable road users.

ITS AMERICA CONVENED A GROUP TO EVALUATE WHAT V2X IN A 30 MHz ENVIRONMENT WOULD LOOK LIKE. THIS IS WHAT THEY FOUND.



BASIC MESSAGES WILL CLAIM THE BULK OF THE REMAINING 30 MHz OF SPECTRUM, SUPPORTING LIMITED APPLICATIONS

Automated Vehicle Safety
NO ROOM FOR ADVANCED MESSAGES. RESTRICTING AVS ABILITY TO SEE BEYOND LINE-OF-SIGHT AND MOVE COOPERATIVELY



Pedestrian Safety
PERSONAL SAFETY MESSAGES, DESIGNED TO PROTECT VULNERABLE ROAD USERS SUCH AS PEDESTRIANS AND BICYCLISTS, WILL LIKELY BE LOST

USDOT, NHTSA, and a coalition of transportation industry stakeholders comprised of state, city, and county departments of transportation, transportation safety groups, and organizations representing public transportation, automakers, vehicle suppliers, trucking, law enforcement, first responders, auto insurers, infrastructure equipment suppliers, bicyclists, pedestrians, and numerous other safety-oriented groups have spoken out against this reallocation.

enhanced situational awareness and coordinate movements among vehicles, and personal safety messages, are unlikely to fit in 30 MHz. These messages are particularly important for enhancing the safety of AVs and protecting VRUs. These applications would enhance AV safety, complementing other sensors by allowing AVs to cooperatively share information and react to information in non-line-of-sight conditions. Advanced Vehicle-to-Pedestrian (V2P) applications are also unlikely to fit in 30 MHz. These applications can warn vehicles about VRUs such as pedestrians or bicyclists who are outside a vehicle's line-of-sight but are about to enter the vehicle's path. **AV and pedestrian applications are two of the main casualties of the FCC's proposal.**

RISK OF INTERFERENCE

Not only will this proposed spectrum reallocation reduce the safety functions of V2X technologies, but USDOT and other stakeholders have raised significant concerns that the remaining spectrum will be subject to harmful interference, threatening **the ability of even limited V2X applications to operate in the remaining 30 MHz.** To safely move forward with any reallocation of the 5.9 GHz band, the FCC must work with USDOT and the transportation industry to ensure that the remaining 30 MHz is free of outside interference and usable for V2X technologies.

THE POTENTIAL OF V2X TECHNOLOGY

If used optimally, Vehicle-to-Everything (V2X) technology can reduce vehicle crashes and fatalities, improve pedestrian safety, reduce vehicle emissions, and produce economic savings by avoiding the cost associated with crashes on American roads.

37,000 DEATHS	3 Million INJURIES	
OCCUR EVERY YEAR IN THE UNITED STATES		
	80%	OF NON-IMPAIRED VEHICLE CRASHES CAN BE ELIMINATED OR THE SEVERITY MITIGATED BY V2X TECHNOLOGIES.
\$800 billion		
SIGNIFICANTLY REDUCE THE \$800 BILLION IN ANNUAL COSTS ASSOCIATED WITH CRASHES ON AMERICAN ROADS	22%	ANNUAL FUEL SAVINGS, SAVING CONSUMERS MONEY AND MITIGATING EMISSIONS
		

In order to realize these benefits and achieve large-scale deployment of V2X, the technology requires dedicated spectrum. The future of V2X is currently under threat as the Federal Communications Commission (FCC) has advanced plans to strip V2X of the needed spectrum.

BENEFITS OF V2X

The National Highway Traffic Safety Administration (NHTSA) predicts that the safety applications enabled by V2X technologies could eliminate or mitigate the severity of up to 80 percent of non-impaired crashes, significantly reducing the nearly 37,000 lives lost and three million injuries that occur on U.S. roadways each year. V2X technologies will provide real economic savings as well by significantly reducing the more than \$800 billion in annual costs associated with crashes on American roads. Research by the United States Department of Transportation (USDOT) additionally indicated that applications enabled by V2X technologies could yield fuel savings of up to 22 percent, saving consumers money and mitigating the environmental impact of transportation emissions.

CONCLUSION

USDOT, NHTSA, and a coalition of transportation industry stakeholders comprised of state, city, and county departments of transportation, transportation safety groups, and organizations representing public transportation, automakers, vehicle suppliers, trucking, law enforcement, first responders, auto insurers, infrastructure equipment suppliers, bicyclists, pedestrians, and numerous other safety-oriented groups have spoken out against this reallocation, asking the FCC to prioritize transportation safety over video streaming speeds. **ITS America continues to believe that the FCC should listen to the safety experts and rethink its decision to reallocate this important safety spectrum.** If it is set on this path, however, the Commission must work with USDOT to ensure that the spectrum remaining is usable for a robust and fully deployed V2X safety network.

ITS America's 30 MHz Application Map can be found here:

<https://itsa.org/wp-content/uploads/2021/01/ITS-America-30-MHz-Application-Map-1-27-21.pdf>

