



April 24, 2023

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National Telecommunications and Information Administration  
1401 Constitution Ave NW  
Washington, DC 20230

**RE: Development of a National Spectrum Strategy; [Docket No. NTIA-2023-0003; 80 FR 16244]**

Dear Ms. Weiner, Esq.,

Continental Automotive (Continental) welcomes the opportunity to comment on the National Telecommunications and Information Administration's (NTIA) request for comment regarding the Development of a National Spectrum Strategy published in the Federal Register on March 15, 2023 (80 FR 16244).

Continental is a Tier 1 international supplier of automotive electronics and mechatronics that provides Original Equipment Manufacturers with sustainable solutions to enhance automotive safety. In the U.S., Continental employs more than 15,000 people in more than 20 States, and globally it has more than 200,000 employees across 57 countries. Continental plays an important role in the development of innovative safety, driver assistance, and intelligent and automated driving technologies. For more than a decade, Continental has been directly involved in the design and development of connected vehicle technology, including vehicle-to-everything (V2X) technology.

Continental wholeheartedly supports NTIA’s commitment to develop a national spectrum strategy that, among other things, prioritizes “advanced transportation technologies.”<sup>1</sup> Providing sufficient spectrum for future wireless-based advanced transportation technologies is critical for many reasons, including to greatly improve the safety of the American public on our nation’s roads.

For more than 60 straight years, each year in the U.S. at least 32,000 people die in automobile crashes,<sup>2</sup> and an even far greater number are seriously injured. In many of those years, including in each of the last two years, i.e., 2021 and 2022, more than 40,000 people in the U.S. died in auto crashes.<sup>3</sup> Advanced transportation technologies can significantly reduce these deaths and injuries, but only if sufficient suitable spectrum is available in the U.S. for those technologies.

If the spectrum needed for advanced transportation technologies is available in the U.S., numerous people who will otherwise die or incur life-altering injuries will not suffer such a cruel fate. For many types of technologies outside of the automotive field, whether a person lives or dies does not depend at all on the availability of such technologies. But this is different.

With respect to the types of advanced transportation technologies discussed below, countless people’s lives in the U.S. will depend on one thing: whether these advanced transportation technologies receive or are refused sufficient suitable spectrum. It is that simple.

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<sup>1</sup> 80 FR 16244, 16245.

<sup>2</sup> U.S. DOT, National Highway Traffic Safety Administration, *NHTSA Quick Facts* (2020).

<sup>3</sup> U.S. DOT, National Highway Traffic Safety Administration, *Early Estimate of Motor Vehicle Fatalities in 2022* (2023); David Shepardson, *U.S. traffic deaths in 2021 jump to highest number since 2005*, REUTERS (May 17, 2022) <https://www.reuters.com/world/us/us-traffic-deaths-jump-105-2021-highest-number-since-2005-2022-05-17/>

Each automobile crash is either a line-of-sight crash or a non-line-of-sight crash. In line-of-sight crashes, the driver of the first vehicle should be able to see the other vehicle or person in time, but for whatever reason the driver does not react quickly enough to prevent the crash. Non-line-of-sight crashes, on the other hand, occur when a driver (due to, for example, an obstruction) cannot see the other vehicle, pedestrian, bicyclist, or road worker until it is too late to avoid the crash.<sup>4</sup>

While there are many types of technologies that are currently used in the U.S. to reduce the number of line-of-sight crashes, there is only one type of technology that can significantly reduce the number of non-line-of-sight crashes in the U.S.: V2X.<sup>5</sup> Without question, V2X technology is critical if we are going to prevent the vast majority of non-line-of-sight crashes that will otherwise continue to occur in the U.S. Indeed, NTSB Chair Jennifer Homendy used her speech at the ITS World Congress in Los Angeles in September 2022 to highlight the crucial importance of V2X technology, saying “We’ve seen tons of crashes that could have been prevented with V2X technology . . . I say that as someone who often meets a victim’s family. It is the hardest part of

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<sup>4</sup> Continental 6/12/20 Ex Parte at 2. For the purpose of this Comment, all reference to *ex parte* writings refer to submissions made by Continental Automotive to the Federal Communications Commission (FCC) in OET 19-138.

<sup>5</sup> There is no valid argument that ADAS or technologies using Wi-Fi or Bluetooth can generally prevent non-line-of-sight crashes. V2X has significant technical and practical advantages to any of those alternatives. See Comment by Continental Automotive in Response to Department of Transportation Request for Information on Enhancing the Safety of Vulnerable Road Users at Intersections, 87 FR 57019 (comment made November 15, 2022); Feifel et. al., *Reducing Fatalities in Road Crashes in Japan, Germany, and USA with V2X-Enhanced-ADAS*, 27 ESV 23-0082. In addition, any solution that relies on vulnerable road users, such as pedestrians, bicyclists, or road workers, to receive alerts on their personal devices is doomed to fail most of the time. A vulnerable road user may not even have an equipped device, and even if a vulnerable road user does have one, he or she may not check the device, possibly buried in his or her pocket or bag, and then react in time. The vulnerable road user may have only a second or two to see the alert, understand what the alert is indicating, and then react by getting out of harm’s way. That is not going to happen very often.

my job to meet with families and look them in the eye and tell them that the crash was preventable, that we've issued recommendations, but there was no action.”<sup>6</sup>

The simple truth is that if V2X has sufficient suitable spectrum, it will be a crucial part of this country's advanced transportation future, saving numerous Americans from preventable roadway deaths and injuries (RDIs) in non-line-of-sight crashes. Otherwise, these RDIs will continue to mount year after year after year to the grave detriment of countless Americans as well as their families and close friends.

Currently, however, V2X does not have sufficient spectrum allocated to it in the U.S.: instead of at least 75 MHz of suitable spectrum for V2X, there is only 30 MHz.<sup>7</sup> While there are three major types of V2X messaging technologies (Basic Safety Messages, Cooperative Perception,<sup>8</sup> and Maneuver Coordination<sup>9</sup>), 30 MHz is, at most, enough allocated spectrum to

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<sup>6</sup> Tom Stone, *NTSB chair Jennifer Homendy calls out '27 years of inaction' on V2X*, TRAFFIC TECHNOLOGY TODAY (September 21, 2022), <https://www.traffictotechnologytoday.com/news/event-news/ntsb-chair-jennifer-homendy-calls-out-27-years-of-inaction-on-v2x.html>.

<sup>7</sup> In 2020, the Federal Communications Commission reallocated 45 MHz of the 5.9 GHz band for use unrelated to automotive safety, leaving only 30 MHz available for V2X. See *Use of the 5.850-5.925 GHz Band*, First Report and Order, Further Notice of Proposed Rulemaking, and Order of Proposed Modification, 35 FCC Rcd. 13440 (2020) (2020 FCC Order). The national Department of Transportation, in addition to all fifty state Departments of Transportation, opposed this reallocation. Continental is not asking in this Comment for a reinstatement of the other 45 MHz for V2X in the 5.9 GHz band, but in any event, to fully implement Cooperative Perception and Maneuver Coordination, and not just BSM, there must be at least 75 MHz of spectrum allocated for V2X below 6.0 GHz.

<sup>8</sup> In this Comment, Continental refers to collective perception messages applications as Cooperative Perception. In other filings, Continental has referred to these messages as Collective Perception Messages (CPM). Other organizations have referred to these same types of applications as extended sensor sharing, sensor data sharing messages, cooperative sensing driving, or object sharing. All of these terms refer to the same set of V2X messaging technology.

<sup>9</sup> In this Comment, Continental refers to maneuver coordination messages as Maneuver Coordination. In other filings, Continental has referred to these as messages Maneuver Coordination Messages (MCM). Other organizations have referred to these same types of applications as trajectory/intention sharing, maneuver sharing/coordination messages, cooperative driving, cooperative maneuver coordination, or cooperative automated driving. All of these terms refer to the same set of V2X messaging technology.

implement one of these three: Basic Safety Messages (BSM).<sup>10</sup> To implement all three, and therefore save the most lives, a total of 75 MHz of spectrum below the 6.0 GHz range is needed.<sup>11</sup> Continental recommends that sufficient spectrum below 6.0 GHz be promptly studied for repurposing in this regard.

If this situation is not adequately remedied, the lack of spectrum for Cooperative Perception and Maneuver Coordination will have consequences to the American public that are not only unnecessary, but tragic. While BSM, if it is even deployed given the issues referenced in footnote 10, can help prevent non-line-of-sight crashes between vehicles that are both V2X-enabled, it cannot prevent non-line-of-sight crashes involving, among other things, (i) vehicles, where one vehicle has V2X technology and the other does not, or (ii) between vehicles and vulnerable road users (VRUs), such as pedestrians, bicyclists, and road workers.<sup>12</sup> The only way to prevent so many of the deaths and serious injuries currently caused by these types of non-line-of-sight crashes in the U.S. is by deploying Cooperative Perception and Maneuver Coordination, yet there is not sufficient suitable spectrum currently allocated in the U.S. to deploy either of them, let alone both of them.<sup>13</sup>

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<sup>10</sup> Continental 10/7/20 Ex Parte Notice; Continental 8/31/20 Ex Parte Notice at 1; Continental 7/10/20 Ex Parte Notice at 1-2. In fact, it may not even be practical to deploy BSM because there is tremendous competition for space within the currently available 30 MHz, leading to the potential for interference and other detrimental issues preventing BSM deployment.

<sup>11</sup> Position Paper, *Frequency Bands for V2X*, European Automobile Manufacturers Association (November 2018).

<sup>12</sup> See Continental 7/10/20 Ex Parte Notice.

<sup>13</sup> *Id.*

- Cooperative Perception allows drivers of vehicles to receive messages from other Cooperative Perception-enabled vehicles or infrastructure about what those other vehicles or infrastructure see.<sup>14</sup> Cooperative Perception essentially enables the driver of a vehicle to see through the eyes of others. For example, consider a car at an intersection. It is about to turn right, but a large building is blocking its driver’s vision. The driver cannot see that, on the other side of that building, a pedestrian is about to cross the street. Without Cooperative Perception, the driver of the car would make the turn, unaware that it is about to hit or possibly even kill the pedestrian. However, if both the car and a nearby traffic signal are enabled with Cooperative Perception technology, while the driver of the car could not see the pedestrian, the traffic signal could “see” the pedestrian through its sensors and send an alert about the location of the pedestrian to the driver, preventing the crash altogether. Thus, not only is no one killed or seriously injured, there is not even a crash at all.<sup>15</sup>
- Maneuver Coordination can prevent non-line-of-sight crashes between vehicles by alerting drivers about what another vehicle has not done yet but is *about* to do.<sup>16</sup> In this way, Maneuver Coordination allows drivers of vehicles to in essence see into the immediate future, preventing vehicles from making potentially deadly maneuvers. For example, consider a pair of cars on the highway. Between them, in the middle lane, is a large bus.

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<sup>14</sup> Continental 10/7/20 Ex Parte Notice.

<sup>15</sup> For further examples, *see* Continental 6/12/20 Ex Parte Notice.

<sup>16</sup> Continental 4/27/20 Reply Comments at 18; Continental 7/10/20 Ex Parte Notice at 1, 4-5; Continental 6/12/20 Ex Parte Notice at 1; Continental 6/8/20 Ex Parte Notice at 1, 4-5.

Each car wants to merge to the center lane. Without Maneuver Coordination, the cars may try to pass the bus and merge at the same time, causing a crash that could be deadly not only for the cars' drivers but for their passengers, the occupants on the bus and on any nearby vehicles. If both cars have Maneuver Coordination equipped, however, they will receive real-time alerts about what the other car is about to do, preventing this potentially fatal or life-altering crash.<sup>17</sup>

Maneuver Coordination is also helpful in the case of fully autonomous vehicles, which, without Maneuver Coordination, would engage in stop-and-go driving, confusing human drivers and potentially causing crashes.<sup>18</sup>

In short, without Cooperative Perception and Maneuver Coordination in the U.S. so many preventable RDIs simply will not be prevented.

NTIA is committed to ensuring that the U.S. maintains leadership in advanced wireless technology and services.<sup>19</sup> But if the U.S. does not have sufficient spectrum to fully implement V2X, including Cooperative Perception and Maneuver Coordination, the U.S. will fall far short of this commitment.<sup>20</sup> Without sufficient spectrum allocated for V2X, the U.S. will be a straggler,

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<sup>17</sup> For further examples, *see* Continental 6/12/20 Ex Parte Notice.

<sup>18</sup> Continental 4/27/20 Reply Comments at 18; Continental 7/10/20 Ex Parte Notice at 1, 4-5; Continental 6/12/20 Ex Parte Notice at 1, Attachment at 8; Continental 6/8/20 Ex Parte Notice at 1, 4-5.

<sup>19</sup> 80 FR 16244, 16245.

<sup>20</sup> Other developed nations have seen the importance of allocating far more than 30 MHz for V2X; the U.S. has already fallen behind in this area and must take decisive action if we are to keep up with much of the rest of the developed world. Continental 10/19/20 Ex Parte Notice at 1; Continental 4/27/20 Reply Comments at 18; Official Journal of the European Union, *Commission Implementing Decision*, 2 Aug. 2019; Continental 10/7/20 Ex Parte Notice at 2.

not a leader, in automotive safety, allowing Americans to die needlessly in preventable crashes every single year.

To fully implement Cooperative Perception and Maneuver Coordination, the automotive industry needs two things: sufficient suitable spectrum allocated for V2X, as discussed above, and regulatory certainty, as discussed below. Without both, these life-saving technologies will not be implemented.

“Regulatory certainty” means knowing what spectrum band(s) will be available for the implementation of V2X, including for Cooperative Perception and Maneuver Coordination. For too long the automotive industry has been stuck in limbo, wondering if it will have the spectrum necessary to develop and implement these life-saving technologies. Automotive manufacturers will not spend the tremendous amount of resources and time necessary to fully deploy V2X, including Cooperative Perception and Maneuver Coordination, in the U.S. until they know with certainty that they will actually have sufficient suitable spectrum to do so.<sup>21</sup>

Without regulatory certainty, only one thing will be certain: Americans will continue to needlessly be killed or suffer serious injuries in preventable RDIs arising from non-line-of-sight crashes that Cooperative Perception or Maneuver Coordination technologies would have prevented.

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<sup>21</sup> The automotive industry has had the rug pulled out from under them before with respect to V2X. See 2020 FCC Order. In addition, a couple of years before the Federal Communications Commission issued the 2020 FCC Order, Toyota Motor North America had plans to implement DSRC (a type of V2X) using the 5.9 GHz band, but it then received a letter from two Federal Communications Commission Commissioners indicating that there may soon be regulatory changes in the 5.9 GHz band.

The Request for Comment asks how much the national strategy should be informed by standards-setting bodies.<sup>22</sup> Regardless of who helps direct the national strategy, the national strategy should be based on the best interests of the public, rather than any particular private party.

NTIA is committed to developing a “long-term strategic spectrum planning process” that will involve affected stakeholders.<sup>23</sup> With respect to advanced transportation technologies, NTIA should pay particular attention to and (unless there is a strong reason otherwise) adopt the views of automotive suppliers—those who actually manufacture the critical V2X components that will be installed in vehicles. Automotive suppliers have a deep understanding of this country’s advanced transportation technology spectrum needs, understand the need for life-saving technologies, and understand how such technologies can be best and most efficiently deployed. If NTIA wishes to build trust among spectrum stakeholders, it is crucial that NTIA include representatives from automotive suppliers.

Respectfully submitted,

/s/ Kirby Howard

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<sup>22</sup> 80 FR 16244, 16245.

<sup>23</sup> 80 FR 16244, 16246.