<u>Communicating Vehicles (V2X Technology)</u>
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V2X (Vehicle to Everything) technology is becoming a major factor in the future of the car industry. As of right now, cars merely have technological tools like lights on the side mirrors and backup cameras to allow drivers to know what is surrounding their car. Using cellular technology like LTE, 4G, and 5G, V2X technology would allow cars to communicate with things like other vehicles and machines in order to increase safety on roads. A car installed with V2X technology, for example, would be able to notify a driver if a biker was coming before the driver could see it. In another example, V2X technology would be able to alert drivers where speeding emergency vehicles are in order to prevent any possibly fatal crashes.[1]

V2X technology has other benefits outside of driver safety. It could also potentially reduce nervousness among people about driving cars. For example:

> Some Audi vehicles in 103 U.S. cities, using a different technology, can already communicate with traffic lights, with a countdown to a green light appearing on the instrument panel. Simply knowing when the light will change can make driving in stop-and-go traffic less stressful.[2]

V2X technology also has several environmental benefits. The primary environmental advantage of V2X technology is the ability to make cars more fuel-efficient.

> With V2X, cars are able to collect data on traffic jams, stop lights and speed zones. Then the car is able to translate this data into a route that increases fuel efficiency and avoids unnecessary stopping. In the case of electric cars, V2X connects with infrastructure to alert drivers where nearby charging stations are located.[3]

Fuel-efficiency, in turn, leads to another benefit for drivers: the ability to save money. With more fuel-efficient cars, drivers would pay less for gas than they would have without V2X.[4]

In the United States, Audi has implemented V2X technology into several of their vehicles and is testing them in Georgia and California. These tests appear to be going well:

> In a recent demonstration of the technology at Audi's offices in Oxnard, Calif., a bicyclist equipped with a V2X sensor drove across the path of an Audi e-tron. Before the cyclist

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[1] Taub, Eric A. "Hello, Fellow Driver. We've got a Problem. Let's Talk." New York Times. October 5, 2022. Available at https://www.nytimes.com/2022/10/05/business/c-v2x-car-communication-technology.html Accessed on June 8, 2023.
[2] Ibid
[3] Biba, Jacob "What is Vehicle-to-Everything Technology?" Built In. March 29, 2023. Available at: https://builtin.com/transportation-tech/v2x-vehicle-to-everything. Accessed on June 8, 2023.
[4] Ibid

was visible to the driver, a warning sound and icon appeared on the instrument panel, giving the driver time to brake.[5]

The Future of V2X Technology and its Implementation into Society

In China and Europe, there haven't been many problems and V2X is starting to be implemented in everyday driving. In the United States, however, companies working on V2X technology in vehicles have faced numerous recent challenges. With the advent of V2X technology, the US government at first required every new car to have V2X technology but then this policy was withdrawn.[6] What's more, during the COVID-19 pandemic, the U.S. government took away a large quantity of the radio spectrum V2X companies needed to create and sell their cars.[7]

In Spring of 2023, several major companies including Audi of America and Ford backlashed against the US government in a petition to reacquire radio spectrum. Their plans succeeded and the US government gave them back the spectrum they had previously lost. As a result of this recent help from the government, the future looks bright for V2X car technology. Not only are these companies gaining the support of the US government however, they also have support from US people.[8]

In a 623-person study from a company called Commsignia, over 95 percent of respondents believed V2X technology to be very or somewhat useful at "providing real-time information on hazards such as black ice, slippery roads, objects in road," "communicating with traffic lights to maximize cycles and reduce stop time at red lights," and "providing real-time information on hazards such as black ice, slippery roads, objects in road." Overall, 97 percent of people in the study found V2X technology to be very or somewhat useful. With the government and the population backing V2X technology the future is promising for its growth and takeover in the United States.[9]

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[5] Taub, Eric A. "Hello, Fellow Driver. We've got a Problem. Let's Talk." New York Times. October 5, 2022. Available at https://www.nytimes.com/2022/10/05/business/c-v2x-car-communication-technology.html Accessed on June 8, 2023.

[6] Ibid

[7] Markus, Frank. "Feds Finally Get Out of the Way to Enable Cellular V2X Communication" Motor Trend. Available at https://www.motortrend.com/news/fcc-ruling-dsrc-5g-v2x-communication-technology/. Accessed on June 8, 2023.

[8] Ibid

[9] Garsten, Ed "Overconfident but Stressed Drivers Open to V2X Assistance, Study Shows." March 2, 2023. Available at https://www.forbes.com/sites/edgarsten/2023/03/02/overconfident-but-stresed-drivers-open-to-v2x-assistance-study-shows/?sh=61063f7262fd. Accessed on June 8, 2023.