

## How Spectrum and Spectrum Policy Drive the Connected Car and Autonomous Vehicles

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### **What do the Internet of Things (IoT) and the Connected Car have in common?**

**Fitzgerald:** The connected car was the first major example of the Internet of Things (IoT). Communications technology and capabilities were introduced into automobiles more than ten years ago. I think people understand the IoT to mean machines communicating with each other. So when you think about it, the connected car, with its ability to communicate with other machines and infrastructure outside the vehicle, is the first example of the IoT.

### **What role does harmonization and economies of scale play in the connected car and autonomous driving?**

**Fitzgerald:** As we move toward autonomous driving, communications technology and spectrum becomes very important. In order to reach the vision of truly autonomous vehicles, you have to have sensors and radar in the vehicles that operate in the radio spectrum. And that requires interference-free access to specific frequencies. In order to make that radar and sensor equipment affordable, we need economies-of-scale. Globally harmonized frequency assignments for vehicular radar and sensors make it more likely that equipment vendors will achieve the economies-of-scale necessary to make the equipment affordable. You essentially want to make sure that the same frequencies that are used in the U.S. for these types of wireless operations are also used in Western Europe, Russia, Japan, and China. If that is the case, if there is global harmonization with respect to the frequencies that are allocated and used — that makes the equipment a lot cheaper to manufacture.

How do they do that? Manufacturers make sure that the rules of the road are harmonized across jurisdictions. This is done through a UN agency called the International Telecommunications

Union (ITU), which is based in Geneva. So, for a technology like vehicular radar that requires certain frequencies, you start at the ITU and try to get it to globally allocate spectrum in a certain frequency band. The ITU's global regulations can then be implemented in all the countries that are party to the ITU Treaty. And once the international global allocation has been effected, you implement at the national level.

### **How important has spectrum policy become to the automobile industry and the connected car?**

**Fitzgerald:** Spectrum and spectrum policy has become extremely important to auto companies because of the wireless communications and other technology in the vehicle. Auto companies are using that technology to distinguish themselves in the marketplace. Spectrum and wide area connectivity are essential to providing a host of valuable services, such as navigation services, concierge services, emergency calling and road-side assistance, door unlock, stolen vehicle tracking, crash notifications, and hands-free voice calling. Just about every automobile on the road today has some form of wireless technology, and you need interference-free access to spectrum in order for that technology to work as expected.

### **What are some of the hot frequency issues before the U.S. Federal Communications Commission (FCC) right now?**

**Fitzgerald:** A big spectrum policy issue of interest to the auto industry is the FCC's 5 GHz proceeding, which has implications for whether cars will be able to communicate with other cars on the road as part of intelligent transportation systems (ITS). You need frequencies to facilitate communication from one vehicle to another — this is something that is just starting to come on to the market. The FCC allocated 75 MHz of spectrum in the 5 GHz band for this purpose a few years ago. Frequencies in this range are now used for Wi-Fi. Some Wi-Fi and cable companies would like the FCC to allocate the ITS frequencies for Wi-Fi, especially in outdoor urban areas. These companies are very keen to have ubiquitously deployed, high capacity Wi-Fi networks available because those networks are free and are not necessarily under the control of the mobile operators.

The 5 GHz ITS frequencies are key to a mandate the government has proposed that would require all new light vehicles on the road to be equipped with the ITS radio equipment starting in 2020. That equipment will allow cars to communicate with each other when they are about to get into an accident — or to send messages to each other to let them know where they are on the road, and therefore reduce accidents. The National Highway Traffic Safety Administration (NHTSA) believes this technology would save tens of thousands of lives every year and reduce up to 70 percent of nondistracted driving accidents.

### **What should automotive companies be doing now to plan for future growth?**

**Fitzgerald:** There's spectrum and there's connectivity — and spectrum allows connectivity. The

auto industry knows that it is now selling cars based on their communications capabilities. There is no doubt about that. If you ask the high-end manufacturers and OEMs — they will tell you that their customers really care about these capabilities. What the auto manufacturers and OEMs don't always realize is that they are entering into another heavily regulated field. Communications is almost as heavily regulated as auto safety, so they have to be smart and strategic about the communications services they offer and how they deal with the communications regulators. They need to educate communications regulators, who are not used to dealing with auto companies, on the unique challenges of introducing communications in the automobile environment. They also need to be sensitive to the regulator's concerns about privacy and cybersecurity, and take proactive steps to address those concerns. I believe the auto industry is doing a very good job in those areas.

Some auto companies are better at engaging communications regulators strategically than others. The ones that get it — they tend to be the ones that are much more focused on autonomous driving and connected car services. And their engagement is paying off. This level of engagement requires both in-house capabilities and expertise from outside communications counsel or consultants. Both are required — and the most forward-looking auto companies understand this.

## Contacts



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