Research Recap

Mobility21
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Spectrum for Connected Vehicles

Purpose: One of the many roles of the US government is to regulate wireless technologies and spectrum policies. This includes choosing the amount of radio frequency spectrum dedicated to connected and autonomous vehicles. In the past year, the US spectrum policy has taken two new turns - the US Department of Transportation (USDOT) has said that connected vehicles need access to 75 MHz of spectrum, while the Federal Communications Commission (FCC) has stated that the Intelligent Transportation Systems (ITS) should tentatively lose 60% of the current allocated spectrum of 75 MHz. This research aims to understand how much spectrum is needed for safety critical applications, how this technology might change in the years to come, and how policy makers might approach the allocation of spectrum to connected and autonomous vehicles.

Approach: The research team focused on three key areas of interest: 1) to determine the difference between two different types of spectrum technologies and how much spectrum regulators should allocate in order to maintain the ability of select safety-related applications to prevent crashes; 2) to determine the potential role of spectrum sharing with other unlicensed devices such as Wi-Fi; 3) how the federal government currently assesses spectrum regulation, and how policies might change in the future. They considered how the government has approached other issues that multiple agencies might regulate, such as the construction of the US National Broadband Plan.

Key Findings: Because research is still ongoing, the team could not determine the potential role of spectrum sharing with other unlicensed devices, as they have only just begun developing simulation tools to assess new kinds of spectrum arrangements. With regards to assessing the differences between DSRC and C-V2X spectrum technologies, the team determined that the FCC's decision to use C-V2X was consistent with their findings. However, it should be noted that while differences were observed, these differences did not necessarily translate to better safety outcomes. Finally, with respect to policy initiatives, the team determined that the federal government should consider establishing an interagency task force to convene players from various sectors to make decisions about infrastructure and spectrum policies.

Conclusion: As the research continues, the team will continue to research the potential role of spectrum sharing with other types of devices. Additionally, the team will advocate for evidenced-based research regarding spectrum regulation decisions. The past two decisions related to spectrum policy established by the FC and the USDOT were vastly different, and both agencies put forth limited evidence in support of their respective cases. In the future agencies should look to research and hard evidence to make decisions related to spectrum technology.

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Project Record:

- https://ppms.cit.cmu.edu/projects/detail/322

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