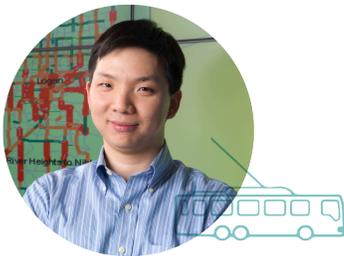


New Plans for the Road Ahead | College of Engineering

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Oct. 19, 2020 — In a few short years, USU has become a national hub for transportation engineering research. In addition to the groundbreaking work at the NSF-funded [ASPIRE Engineering Research Center](#), USU engineering faculty lead exciting transportation studies that may forever change how people and goods get around.



Dr. Ziqi Song Assistant Professor of Civil Engineering

Ziqi Song has a message for anyone interested in transportation engineering: A lot has changed. Gone are the days of engineers in ties sitting at drafting tables designing stretches of interstate. Today's transportation engineer works in many different areas, including transportation, mobility-as-a-service, autonomous vehicles, and UAVs. Song specializes in modeling and optimization of emerging transportation systems. In July, he received \$1.75 million from the U.S. Department of Energy to study the technical barriers to large-scale transit electrification. His work addresses electric bus infrastructure planning and operations, energy-efficient route optimization, grid impact analysis and travel behavior.



Dr. Patrick Singleton Assistant Professor of Civil Engineering

If given the choice, would you prefer your regular commute or teleportation? The thought experiment highlights an important question about travel behavior: Do commuters enjoy the journey, or would they prefer an instant arrival? Patrick Singleton is a transportation social scientist whose research covers transportation-related behaviors, attitudes and health & safety topics. One of his recent studies focuses on pedestrian data. Measuring pedestrian volume is difficult, so Singleton and a team of undergraduates watched 10,000 hours of video from 90 intersections across Utah. By comparing observed counts with activations of push-to-cross buttons at crosswalks, they developed a model to predict pedestrian volume, thus turning traffic signals into automated pedestrian counters.

[Learn more about Dr. Patrick Singleton](#)



Dr. Abhilash Kamineni Assistant Professor of Electrical and Computer Engineering

Electric vehicles are changing transportation. Yet questions remain about the necessary infrastructure needed to support them. Abhilash Kamineni is working with cybersecurity experts, vehicle manufacturers, national laboratories and utility companies to develop a smart charging management control system. The goal is to better support modern electric vehicle infrastructure

and distributed energy resources. The result will be improved control for grid operators. His work will mitigate cybersecurity threats by addressing vulnerabilities in existing and new grid technologies. Testing and hardware validation will take place at USU's state-of-the-art Electric Vehicle and Roadway Research facility.

[Learn more about Dr. Abhilash Kamineni](#)



Dr. Michelle Mekker Assistant Professor of Transportation Engineering

The next time you drive through a work zone on the interstate, consider the complexity involved in keeping roadways maintained without stopping traffic. Michelle Mekker studies traffic operations. She's exploring how connected & autonomous vehicles, or CAVs, generate loads of new data that can be used to improve roadway design or enforce speeding laws. The data can also be used to inform the design and operation of work zones. But as departments of transportation collect vehicle data, concerns about privacy and ethics will come up. Mekker and her colleagues are working on a new study aimed at measuring public perception of the collection and use of connected vehicle data.



Dr. Hongjie Wang

Assistant Professor of Electrical and Computer Engineering

Believe it or not, transportation electrification is happening and will change our future daily life. Efficient, reliable, secure, cost effective, and sustainable solutions for transferring energy from sources to electric vehicle batteries play a key role in transportation electrification. With expertise in power electronics, Hongjie Wang is working with industry and academia partners on the development of cyber-physical security-enhanced extreme fast chargers, megawatt-level wireless power transfer systems, and electric vehicle retired second-life battery reconditioning systems. His work is sponsored through U.S. Department of Energy grants. He is also exploring the health monitoring, failure prediction and reliability modeling of the chargers for electric vehicles.

[Learn more about Dr. Hongjie Wang](#)

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