Session 3: Nexus of Road User Fees and In-Vehicle Technologies
Speaker 6: Jeremy Salinger, General Motors
"Future Vehicle Technologies"

At General Motors research and development, Jeremy Salinger is Innovations Program Manager. He focuses on implementing vehicle technologies that sense what is going on around the vehicle and then provide for the driver either increased safety or increased convenience. This is the essence of what is known as automated driving.

Slide 2 – Vehicle Electronics and Sensors
Today's vehicles already perform many functions that rely on electronics, including electronic sensors, communication networks, controllers and actuators. These automated functions affect all aspects of the driving experience.

Slide 3 – Cadillac Driver Assistance/Active Safety
Features introduced in select 2013 GM models exemplify new electronics-based technologies that may be relevant to implementing MBUF. Other manufacturers have similar technologies. There are two packages that drivers can buy, offering two levels of interaction: Driver Awareness *provides information* to help the driver take action to avoid collisions, and includes things like lane departure warning and forward collision alert. Driver Assistance actually *intervenes* with the driving activity before the driver does; it includes features such as automatic collision preparation and low speed front and rear automatic braking.

Slide 4 – Cars That Don't Crash
These technologies transition the fleet toward vehicles that don't crash, and ultimately toward vehicles that can drive themselves. GM is currently developing connected vehicle and self-driving technologies that will enable semi- and fully autonomous driving, and it is anticipated that these applications will be available to the general public by the end of this decade. A driver will be able to engage these systems in certain situations such that for substantial distances the driver will not have to directly control the car's steering or speed.

Slide 5 – Transponder Integration
GM is also working with systems that work with the connected vehicle systems Chris Hill talked about. GM is developing vehicle-to-vehicle and vehicle-to-infrastructure transponders that could be installed in vehicles as an aftermarket device to broadcast and receive information so that positions of vehicles and driving behavior can be observed and accounted for in the driving environment.

Slide 6 – Smartphone Integration

GM is also working to develop apps that would allow drivers to exploit the DSRC communication systems to receive information and warnings about what is on the road ahead, including traffic congestion, construction warnings, or other issues that need an immediate response.

Slide 7 – "Super Cruise"

We have already deployed what we call full speed range adaptive cruise control in Cadillacs this year that will control a car's speed at highway speeds, but also take it down to stop-and-go speeds. The car responds to the surrounding traffic to control its speed.

Vehicles with automated functions are already being tested on test tracks and a few are out on public roads. In acceptable driving conditions these functions will control not only the speed of the vehicle but its maneuvering as well. The ultimate goal is to have them drive on freeways, but such vehicles will need to be equipped with radars, cameras, GPS and maps that allow them to not only figure out where the roadway is going but to also respond to traffic conditions around them.

The question for this group is, what possibilities are there for facilitating MBUF implementation by exploiting the additional information collected in these new technologies, such as traffic conditions?

Slide 8 – Electric, Connected, Autonomous

In summary, the auto industry is moving over the next decade and beyond toward vehicles that are more electronically controlled, more connected, and more automated. This progression opens opportunity for more interaction and convergence with systems that are collecting MBUF.