Interfacing with the Driver in an Increasingly Automated & Connected Operating Environment
The Future is More & Larger Screens
The Future is More Devices
The Future is More Information
The Future is More Connected Vehicles
The Future Has More Older Drivers
and Expanding Automation
The Future May Be One of More Novice Interface Users & “Novice” Drivers

Vehicle Miles Traveled (VMT)
Vehicle Miles Driven (VMD)

Today
VMT = VMD

Tomorrow?
VMT ≠ VMD
Workload & Performance

Yerkes-Dodson Law
Workload & Performance

More Information Tends to Increase Workload
Workload & Performance

Automation Tends to Lower Workload
Cognitively Oriented Interfaces.....

Voice and hands-free technologies offer the promise of reducing the time a driver’s eyes are drawn away from the roadway, however....
“Significant” Visual Demands Still Appear

Total Glance Time (Seconds)

- Study I
- Study II (Default Mode)
- Study III (Expert Mode)

- Destination Cancel (Voice)
- Destination Entry (Voice)
- Radio Tuning (Voice)
- Radio Preset (Voice)
- Radio Tuning (Knob)
- Radio Preset (Button)
Multi-Modal HMI's

Classical Thought

- Manipulative
- Visual
- Cognitive

Modern Reality

- Manipulative
- Visual
- Cognitive
A Shift to Driver Focus
Context relevant technological support
Leaving the Consumer Behind

Updates can be detrimental to driver attention

Overnight Upgrades → Temporary Confusion
A Need for Seamless Connectivity
A New Look at Technology Learning

Where the rubber meets the road!

- DVD’s & the web?
- Sales staff?
- Friends?
- Trial and error?
- “The Genius Bar”? 
The Challenge in a Connected World

How to develop safe interfaces that provide drivers with enjoyable easy to access information while using automation and other safety technologies to help maximize driver focus on the road?

Achieving this goal will require a better understanding of how different forms of task load impact driver focus under different operating contexts.