

DJ Segler

The morning commute may never be the same. Just a few minutes behind the wheel of our EvoCar demonstration makes this point abundantly clear.

The EvoCar demo was built to highlight multiple TI technologies and how they can enhance the driving experience. The finished result is in large part thanks to DLP® Products – and what some might refer to as the ultimate driving simulator.



Figure 1. DJ Segler at the wheel of the TI EvoCar

The EvoCar made its public debut this past January at the Consumer Electronics Show (CES) in Las Vegas. Today, the demonstration is on display at our headquarters. It is a two-seat vehicle mock-up, custom built by several teams at TI. Among other things, it includes leather seating, a large instrument cluster display, an interactive center console display, double head-up displays (HUDs), haptics, driver monitoring, Advanced Driver Assist Systems (ADAS), and even red underbody LEDs.

The augmented reality [head-up display \(HUD\)](#) and passenger HUD displays used in the demo rely on DLP technology. It has the right size, brightness, reliability, and resolution to handle the demands of automotive applications, where diverse and unpredictable environmental factors are common.

While this driving experience is really just a video simulation through the busy streets of Dallas, the capabilities it demonstrates offer a real glimpse to the very near future of what driving might be like.

DLP technology enabled two HUDs in the demo – one for the driver as well as the passenger. The HUD for the driver offers an industry leading 10- by 5-degree field of view (FOV) at a comfortable viewing distance of 8 meters, projecting full color images and animated graphics that appear to float out over the road in front of the vehicle. This HUD provides useful contextual information and content that supplements what's already available on the instrument cluster and center console displays – without duplicating it. Helpful traffic information such as navigation, braking distance, blind spot warnings, immediate lane change recommendations, and obstructions in other lanes are a few examples of what DLP technology enables with this augmented reality HUD prototype.

The driver HUD is supplemented with a combiner HUD display for the passenger that offers a 12- by 4-degree FOV at a viewing distance of 2.5 meters, showing full motion video to illustrate a unique approach to passenger entertainment – all without distracting the driver. Federal safety standards currently limit the use of motion displays in the front seat, but having the content visible only to the passenger through the head up display eliminates this concern.



Figure 2. EvoCar combines numerous TI technologies into a single driving experience

Part of a Family of TI Technology

DLP technology isn't the only piece in the simulation puzzle. The demo is encrusted with Advanced Driver Assistance Systems (ADAS), [infotainment](#), [haptics technology](#) and driver monitoring as well.

The team was passionate about creating a real world experience that fuses TI technologies with our unique capabilities in automotive displays, driving analytics, smart lighting, and driver awareness. Creating a solution that closely resembles an actual car was critical to creating a complete experience.



Figure 3. The team constructed the EvoCar last year and continues to demonstrate its unique capabilities

For example, the seat and steering wheel vibrate with haptic feedback to indicate if you've drifted out of your lane. A facial recognition camera sees if you are looking down to check a text instead of what you should be doing – staying focused on the road.

ADAS solutions are featured prominently for vehicle, lane and passenger detection, as well as to generating the content for the HUD units. ADAS technology also monitors driver awareness by tracking the driver's head and eye movement. The team also incorporated headlights using TI power technology to provide control of light beams to help detect hazards on the road and reduce glare to oncoming drivers.

A Bright Future in Automotive Applications

The EvoCar is a compelling way to demonstrate the value of DLP technology collaborating with other TI technologies in automobiles for high-brightness, interactive display systems that enhance the driving experience. If you haven't had a chance to experience the EvoCar firsthand, check out this [walkthrough video](#) for more details.

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