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Weekly Newsletter

DVN
Interior

NEWSLETTER #228

Editorial

Rearview Mirror Projects Into The Future

CADILLAC CT6 – GM IMAGE

At DVN Interior, we're constantly publishing stories about design, safety, HMI, seats, consoles, materials, sustainability, and more. That "…and more" covers a lot of ground; some parts of the interior have less visibility. Like overheads, headrests, and doors, for example. But we don't ignore those; we cover them from time to time as they play their role in interior innovations. The rearview mirror, for example. It is a crucial safety item, for it provides situational awareness. With AR, cameras, sensors, and other new technology, the mirror is becoming a key element in DMS, navigation (compass), augmented visibility, communication (phone calls), and ever more and more functions. It combines optics, electromechanics, electronics, electrochromics, and now lighting and software. It lets you look rearward, of course, and in a way it also lets us look ahead into the future—by dint of the innovations being added. This week's in-depth article presents the rearview mirror we use so often when driving.

Don’t miss DVN Interior Torino Workshop on October 22-23, 2024, it will focus on the close connection between design and sustainability in the interior. The docket includes lectures from the likes of Stellantis, Italdesign, Ford Forvia, Dow, Covestro, AMS Osram, NBHX, and Mario Levi. In addition, we will have two high-level panel discussions on sustainable design and sustainable materials for interior design. The first morning also includes a Stellantis lab visit in Mirafiori (registration is required), and lunch at Pista 500, the historic Fiat test track on the roof of Lingotto Building. Don’t miss it, **register here!**

Sincerely yours,

Philippe Aumont
DVN-Interior General Editor

In Depth Interior Technology

Rearview Mirror: Innovating Forward to See Rearward

Rearview mirrors play a crucial role in road traffic safety. Understanding how they work is both fascinating and illustrative.

For every driver, as it helps to enhance situational awareness and reduces the risk of accidents.

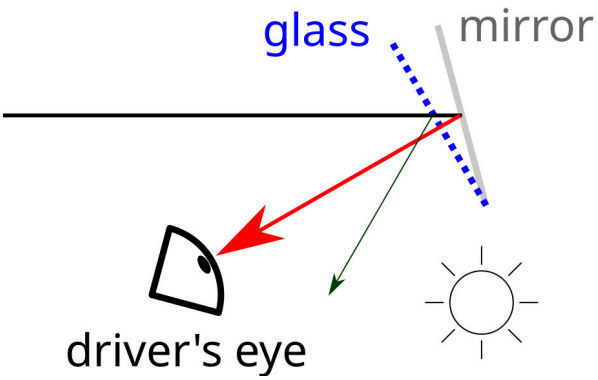
First put in cars in the 1930s, the rearview mirror greatly aided road safety by allowing drivers to see traffic and objects behind them, so they can make informed decisions about turns, lane changes, and other maneuvers without having to turn around and take their eyes off the road ahead.

Although reversing cameras and parking aids can provide an overview of the rear of the vehicle, they do not completely replace the rearview mirror's real-time and continuous image of the traffic behind. The interior rearview mirror remains an essential part of driving, providing direct visual information which electronic systems cannot completely replace.

One of the key benefits of a rearview mirror is situational awareness. It provides a wider field of view compared to turning one's head—so without requiring the driver to take their main focus off the road ahead, or to shift their arms and shoulders out of optimal control position. That's several major safety improvements right there.

Another crucial purpose of the rearview mirror is to assist in parking and reversing. By using the mirror, a driver can accurately judge the distance between their vehicle and objects behind, ensuring a smooth and safe parking or reversing maneuver.

Constituent parts



The reflective surface is typically made of glass, carefully shaped to minimize distortion and provide an accurate representation of the area behind the vehicle. The glass is usually not an ordinary pane with parallel faces. Instead, it is a wedge shape, as shown in the illustration here; the dotted blue line represents the front face, while the rear face is the solid grey line. As in most general-purpose mirrors, the shiny reflective material is applied to the rear face.

When the mirror is in the "Day" position, the driver sees the reflective surface (red arrow in the diagram). Shifting the mirror to the "Night" position swings the reflective surface upward, so the driver's eyes are no longer in position to see it. Instead, the driver sees reflections off the unreflectorized front face of the glass (green arrow in the diagram). They are much dimmer, which cuts headlight glare from vehicles behind.

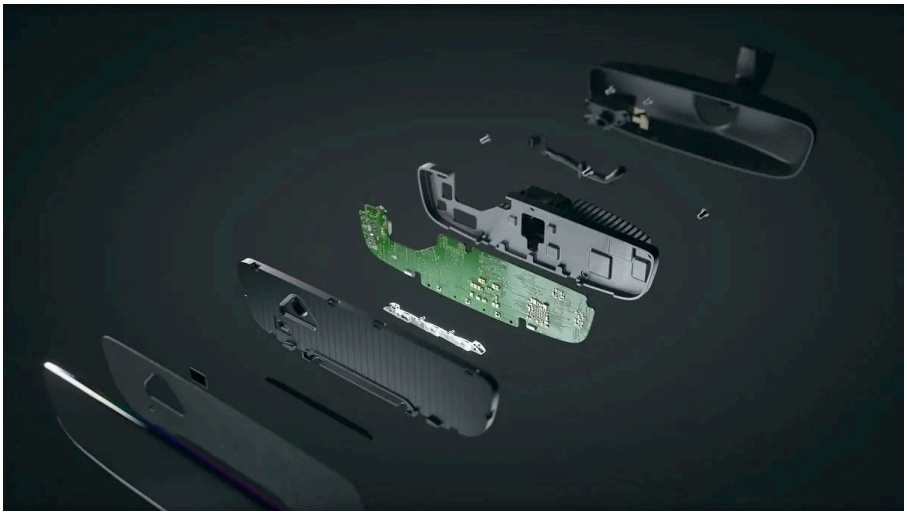
The first automatic day/night mirrors shifted the mirror with an electric solenoid to the "Night" position when a certain amount of light hit a rearward-facing light sensor. These gave way to electrochromic mirrors, which use liquid crystal or another technology to variably dim the reflection, still in response to an inbuilt light sensor. Either way, usually the reflective surface is flat, though some mirrors use a convex or aspheric shape to embiggen the field of view. This can reduce or eliminate blind spots, but at the same time it minifies reflected objects—they appear smaller and further away than they really are.

A housing or frame holds the glass in place. This housing can be made of a sustainable material, with a mount which allows the mirror to be positioned according to the driver's preference; it is a single or double swivel joint, often a ball-and-socket mechanism, which also permits the mirror to break away safely in the event an occupant's head should hit it during a crash.

Emerging Technologies

Rearview mirrors have come a long way since their inception, and advancements in technology continue to improve their functionality and safety features. Innovations include:

- Digital mirrors, which replace the traditional reflective surface with an LCD or OLED screen to display a live video feed from a rear-facing camera mounted on the back of the vehicle. By eliminating the obstruction caused by passengers, cargo, or vehicle structures, digital rearview mirrors provide an unobstructed and wider view of the rear. It's much more of a 1:1 replacement than camera-based replacement for sideview mirrors, which pose challenges of how and where to display the images.
- Integrated camera systems use multiple cameras on the exterior of the vehicle to provide an all-round view of the surroundings. The images from these cameras are stitched and displayed on the rearview mirror or the infotainment screen to assist with parking and maneuvering.



MAGNA IMAGE

- Driver monitoring cameras, as built by the likes of Magna and Gentex
- Antiglare coatings to reduce dazzle caused by strong light sources, such as headlamps or sunlight. These coatings redirect and diffuse the reflected light, improving visibility and creating a clearer reflection of the objects behind the vehicle.
- Lane departure warning systems, which use sensors to detect lane markings on the road. If the vehicle begins to drift out of its lane without signaling, the mirror may provide visual or audible alerts to warn the driver and encourage them to correct their course.
- Augmented reality (AR) technology is being introduced, enhancing the driver's perception of the rear environment. AR mirrors overlay additional information onto the mirror display, such as navigation cues, object detection warnings, and the speed of trailing vehicles. This provides real-time information and improves situational awareness without distracting the driver's attention from the road.
- Gesture and voice control are being integrated into rearview mirrors to optimize the HMI. Drivers can adjust the mirror settings, activate camera systems, or access other functions using simple gestures or voice commands. These intuitive controls promote safe and seamless operation of the mirror without the need to take hands off the steering wheel or eyes off the road.

These new technologies are the result of ongoing efforts to make driving safer and more convenient.

Rearview mirrors were mechanical devices for many years, then electromechanical, and now are becoming electronic and software-driven.

Suppliers

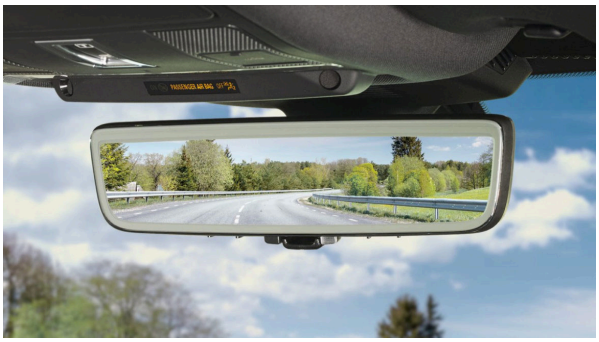
SMR Automotive

Prominent rearview mirror suppliers offer a range of products with advanced features. Here are a few examples:

HYUNDAI/KIA SMR MIRROR (SMR IMAGE)

Part of the Motherson Group, SMR develops and manufactures rearview mirror systems and intelligent camera technologies for the automotive industry. They offer interior and exterior mirrors with features like integrated turn signals and blind spot detection.

Gentex



Known for their auto-dimming mirrors, Gentex has been adding features like digital video recorders, multi-view trailer cameras, touchscreen 'full display' panoramic digital mirrors, and more. They also integrate features like HomeLink garage door openers, compass displays, and reversing camera displays.

Magna

Magna provides a variety of mirror systems, including with auto-dimming and integrated camera systems. Their ClearView technology provides an unobstructed rearward view from cameras integrated into the exterior of the vehicle, and allows drivers to customize the display—including the ability to zoom, pan, and

tilt. An optional additional camera can also add a trailer view. ClearView+ adds driver and occupant monitoring and drunk-driver detection; it won a 2024 PACE Award.

Ficosa

FICOSA IMAGE

Ficosa, founded in 1949 and headquartered in Barcelona, Spain, offers a range of rearview mirrors with features like automatic dimming, integrated cameras, and blind spot detection.

Murakami

MURAKAMI IMAGE

Murakami specializes in safety visibility systems, including high-quality rearview mirrors with advanced features such as automatic dimming. They supply to major automakers.

Outlook

Rearview mirrors have long contained map/reading lights, and new lighting features will likely come along, too. Mirrors are also incorporating electronic displays to show information such as temperature, compass direction, or even incoming calls or messages from a connected smartphone.

Because of substantial opportunities for progress in ADAS, rearview mirrors are now an inevitable part of interior solutions, surround-view systems, and autopark features integrated with autonomous vehicles.

The subjective psychological feel of this evolutionary process is what Canadian philosopher Marshall McLuhan (1911-1980) described in terms of a rearview mirror effect: "We see the world through a rearview mirror. We march backwards into the future".

Interior News

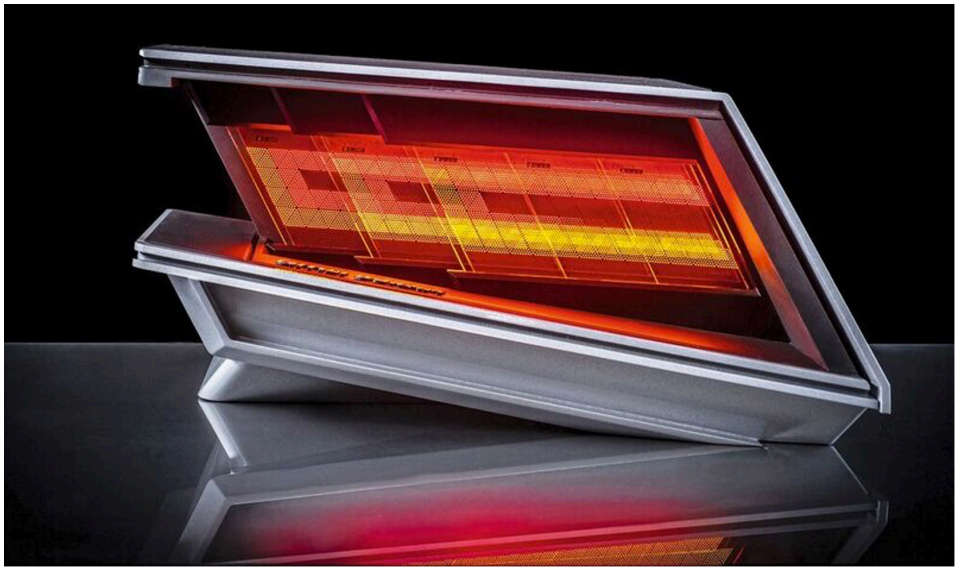
AMS Osram Changes MicroLED Strategy

INTERIOR NEWS

AMS OSRAM IMAGE

AMS Osram had a solid first quarter, but savings still had to be made in microLEDs. The first consequence of the loss of the major customer is a reduction in development activities in Malaysia and in Germany. Instead, the company plans to concentrate on a small core development of microLEDs designed for automotive applications.

Nevertheless, they are optimistic on being able to resume microLED efforts before too long if a customer will decide to source microLEDs from AMS Osram. A new lessee is being sought so that the costs associated with the microLED project can be reduced. There are also plans to sell those semiconductor activities not part of AMS Osram's core business.



AMS OSRAM IMAGE

At the same time, AMS Osram is working on films with printed LEDs for automotive use. MiniLEDs can be used for warning lights as well as for graphics and animations.

If miniLEDs are applied to a thin, flexible, transparent substrate and connected with almost-invisible wires, the miniLEDs can be freely arranged in individually-controllable segments of any shape. On this basis, AMS Osram has now developed a technology for Aliyos LEDs on foil.

This enables it to produce standard lighting functions (brake lights, indicators) and customer-specific shapes and animation effects. The miniLEDs can also be used to create symbols, words, images, or even abstract patterns, as well as information or warnings. The miniLED foils' flexible structure means they can also be arranged one behind the other to create 3D lighting and animation effects.

Preh Operating System for New Minis

INTERIOR NEWS

MINI-MEDIATHEK IMAGE

Preh is supplying a system with many haptic operating options for the interior of the new MINI models. The supplier has developed a compact switch module with a special haptic that serves as the central control unit directly below the round OLED display. Intuitive toggle switches are used to control the functions of the gear selector lever and driving experience switch, among other things. The overall design impression is reminiscent of the classic Mini models.

The design of the starting/stopping control is new: instead of pressing a button, there's a knob with a vertical grab bar, reminiscent of a conventional ignition switch with the key inserted: turn the knob clockwise to start the car, then it springs back into its home position. Switch off the car by turning the switch anticlockwise.

Functions such as parking brake, defrost, heated rear window, parking assistant and radio operation can also be selected in the new Mini via separate haptic controls.

BMW, Bcomp Share Altair Award for Seat

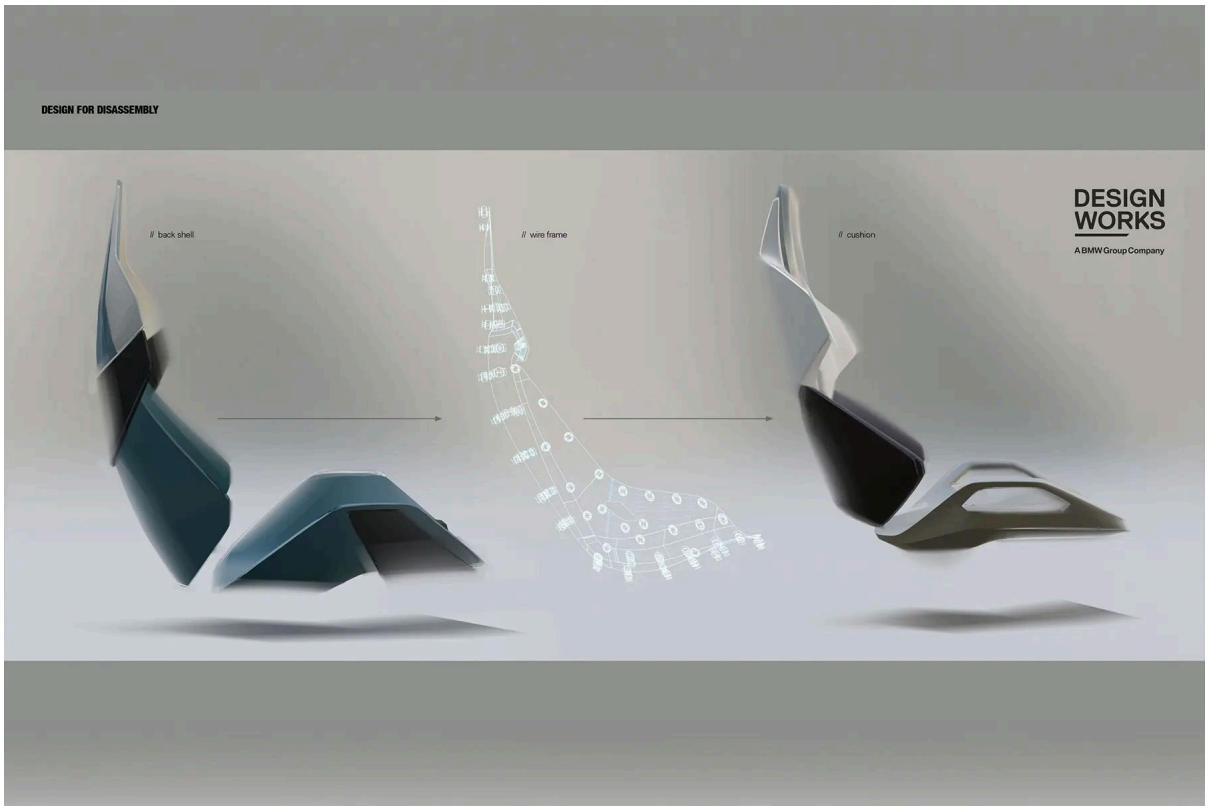
INTERIOR NEWS

BCOMP IMAGES

Computational-intelligence company Altair has named the winners of the 2024 Altair Enlighten Award. Presented in association with the Center for Automotive Research (CAR), the award honors the greatest sustainability and lightweighting advancements that successfully reduce carbon footprint, mitigate water and energy consumption, and leverage material reuse and recycling efforts.

The award given to BMW and Bcomp recognizes a partnership milestone between the two companies to integrate flax fiber-based composites into high-performance vehicles, reducing CO_2 emissions and improving recyclability.

Bcomp will be speaking at the upcoming **DVN Interior Torino Workshop**; they specialize in high-performance, natural fiber composites for the mobility, recreational, and mass transport sectors, and are listed as a Top 100 Global Cleantech companies.



The arm of BMW involved with this project is BMW M, the maker's performance car subsidiary, and the object of the award is their BMW M Visionary Materials Seat.

Manufactured with Bcomp's ampliTex bio-based materials, the seat won in the Sustainable Process category. The award highlights the sustainable production-orientation of the seat design including its lifecycle focus as one of the global automotive sector's most innovative new sustainable developments, the best of which are showcased by Altair's Enlighten Awards.

The seatback features a fully bio-based, high-performance natural fiber layup with ampliTex PP composite. By combining the structural and aesthetically pleasing visual properties of the material in one manufacturing step, production is both more efficient and dematerialized.

The accent has been on Design for Circularity: in addition to using natural and recycled materials, the seat's recyclability has been considered from the start of development. Less complex assemblies and mono-materials that can be separated by type enable the recyclability of the seat at the end of its life. Flax fiber composites are CO_2-neutral from cradle to gate, and can reduce manufacturing-related emissions of high-performance composite parts by up to 85 per cent compared to carbon fiber, depending on the application. Compared to current large-scale automotive plastic parts, Bcomp's material solutions can reduce component weights by up to half, thanks to their low density and high stiffness.

New Nissan Patrol's Intuitive Interior Tech

INTERIOR NEWS

NISSAN IMAGES

Nissan's newest, seventh-generation Patrol ("Armada", in the US and Canada) was unveiled by the company's President and CEO, Makoto Uchida, at an event in Abu Dhabi with royals, VIPs, global Nissan executives, dealers, partners, media, customers, and employees in attendance.

The new Patrol is packed with intuitive technologies including NissanConnect 2.0, ProPilot Assist, and a Klipsch Premium Audio System; it delivers a superior driving experience in a crafted interior that harmonizes premium comfort with cutting-edge technology.

The interior features quilted leather seats, with detailing inspired by the traditional Japanese woodcraft, *Kumiko*. On selected trims, the seats feature massage functionality and eight-way adjustment.

The cabin is roomy, enhanced by a standard panoramic sunroof.

An advanced infotainment system, anchored by a 28.6" horizontal 'monolith' display, features twin 14.3" displays that provide a comprehensive view of navigation, entertainment, and vehicle information. Rear-seat passengers are also catered for with optional dual 12.8" screens, supporting entertainment on the go via Miracast, HDMI or USB inputs.

Complementing the visual experience is a 64-color ambient lighting system with customizable live backgrounds.

The audio experience comes from a 12-speaker Klipsch premium audio system in select trims. This system delivers a soundscape that integrates seamlessly into the Patrol’s interior, thanks to precision-engineered components developed by Nissan and Klipsch engineers. DynamicAudioReveal technology ensures consistent clarity and depth by adjusting audio equalization based on environmental conditions, while DJX 3D Surround provides a rich, concertlike sound experience.

This car also offers biometric cooling technology. When activated, a built-in infrared sensor detects the body temperature of front passenger seat and second row occupants, and automatically adjusts air flow settings to provide what is said to be an optimal cooling experience.

The 'EZ flex' seats facilitate easier access to the third row without removing a child seat, while the 3rd-row power fold and return function offers flexible storage solutions with a touch on the Monolith screen to adapt seamlessly to varying needs.

It introduces NissanConnect 2.0 with Google Built-In, an advanced technology suite that seamlessly integrates navigation, security, and entertainment into a unified platform.

Desay SV Tech Fest: 'Unlimited Intelligence'

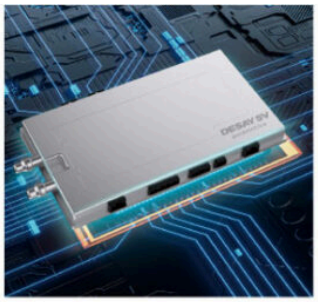
INTERIOR NEWS

DESAY SV IMAGES

Desay SV hosted their 4th Technology Festival and the first Media Day under the theme "Unlimited Intelligence" in China. Headquartered in Huizhou, China, the company's name harks to **S**iemens **V**DO. Desay came in 1986 through the fusion of Dutch Philips, Hong Kong's Kingsun, and Huizhou Industrial Development Corporation. With the acquisition of Philips car audio systems by German Mannesmann VDO in 1998, the company changed its trademark from Philips to VDO. In 2002, Car Audio Electronics Co also changed its name to Siemens VDO Automotive (Huizhou), holding 70 per cent of the shares, while the rest was held by Desay Group. The company was one of the important global R&D centers and manufacturing bases of Siemens VDO.

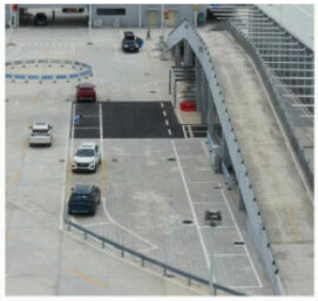
In 2021, which marks the 35th anniversary of its establishment, Desay SV officially announced their new brand proposition: 'Beyond Mobility'. Company specialties include autonomous driving algorithms, display optics, network communication, cybersecurity, and OTA technology, and they're putting emphatic focus on automotive electronics.

We are the first in the world to launch next-generation Hypervisor architecture-based intelligent cabins



Intelligent driving domain controller with the highest computing power in the world

Display Optics Technology



Intelligent Driving Test Ground

Desay SV has been the subject of previous DVN Interior coverage, and their interior expertise includes:

- HMI methods based on user-centered design concept, and the deep analysis of applied scenarios are deployed in identifying difficulties users face. Through the establishment of such user models and multimodal HMI design approaches, we provide users a pleasant and safe driving experience
- In-vehicle infotainment: with road testing tools and global testing using AR navigation, they work to bring out the greatest potential of the vehicle's speakers to create music hall effects for the driver. A futuristic-looking display system with an æsthetic design coupled with a joyful interaction experience and a high-definition display with a wide view angle provides a highly integrated and personalized information display and entertainment.
- Comfortable, eco-friendly driving experience: over 60GB of global testing data has verified the automatic climate control, ensuring the most stable and comfortable interior temperature for passengers. NICT control algorithm reduces costs from internal temperature sensors, while satisfying the requirements of driver's comfort. A newly developed new energy vehicle thermal management system will guarantee the safety of vehicle batteries and a comfortable cabin condition for the driver.

Audi's New Q5 Has New Look, New Functions

INTERIOR NEWS

AUDI IMAGES

The newly developed interior concept of the Audi Q5 offers networking with integrated displays and voice control with AI support. The dashboard with up to three displays spans the entire width of the vehicle like a stage.

The MMI panoramic display has a curved design and OLED technology. It consists of the 11.9" 'Virtual Cockpit' and the 14.5" 'MMI Touch Display'; the 10.9" 'MMI Passenger Display', and a configurable head-up display (HUD) are available options. The 'dynamic interaction light' extends across the entire cockpit and serves as an additional display.

Vehicle and infotainment functions can be controlled via the HUD. In entertainment mode, for example, the favorite radio station or podcast can be selected via the list control. Incoming calls can be shown in the head-up display and answered using the steering wheel button.

Audi uses Android Automotive from Google as the operating system. Content is updated via over-the-air updates. The learning voice assistant is also on board. Additional apps can be downloaded directly, i.e. without a smartphone in between. Good sound is provided by the Bang & Olufsen premium sound system, which can be further upgraded via Functions on Demand.

The driver assistance systems include rear parking assistance with distance display, cruise control and a speed limiter, lane departure warning, an efficiency assistant and an attention and drowsiness assistant as standard. Adaptive cruise assist and active front assist are available as options.

The rear seat is now fully adjustable, both lengthways and in terms of inclination. Depending on the model, the cargo compartment holds up to 1,473 litres. The center armrest cubby is bigger than before, and there are four USB-C ports; the rear ones can charge at up to 100 watts.

The Design Lounge

Cupra Terramar: Emotional E-SUV

THE DESIGN LOUNGE

COFFEE CORNER
DVN
Interior

The new Cupra Terramar embraces the brand’s new design language, with an expressive familial face also on the new Cupra Leon and Formentor, and in line with the electric Tavascan SUV.

Designed and developed in Spain, the Terramar will be produced at Audi’s Györ plant in Hungary. It is built on VW MQB Evo platform, with dimensions which are 4.52 m long, 1.59 m high and 1.86 m wide, with a standard wheelbase of 2.68 m

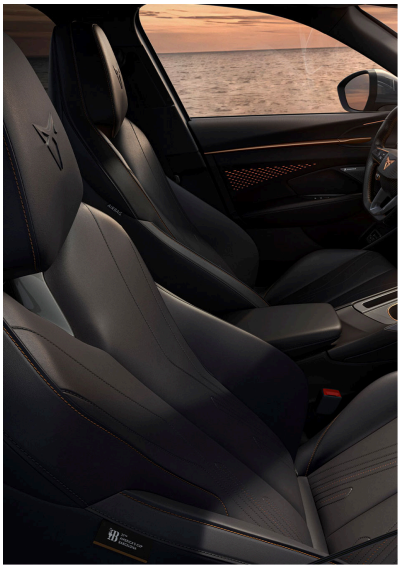
The interior has digital instrumentation in front of the driver on a 10.5" panel, complemented by a 12.9" touchscreen at the top of the center console. It's modern, including backlighting. A HUD completes the range.

As in all Cupra's, it is a driver-centric cockpit, with center console and dashboard oriented towards the driver, progressive connectivity, and design. It is streamlined, dynamic, and highly emotive. The dashboard includes parametric moldings and copper detailing throughout.

The cabin also aims to be sustainable with the use of recycled materials, particularly for textiles. On the upper part of the dashboard, the materials are flattering with a beautiful foamed plastic that is pleasant to the eye and to the touch.

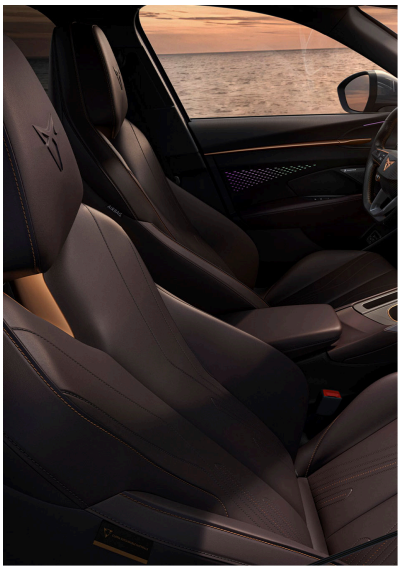
The Terramar also aims to be premium with a new HMI system integrated into the digital instrumentation behind the steering wheel and into the 12.9" infotainment system in the center of the dashboard. The interface is more modern, more responsive, and more intuitive.

The sound system is a collaboration with Sennheiser Mobility, with 12 speakers and 390 W.

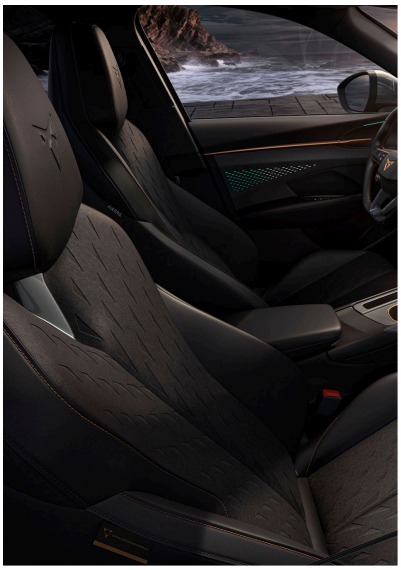


Different interesting trim are available; all seat options feature an embossed Cupra logo and copper stitching.

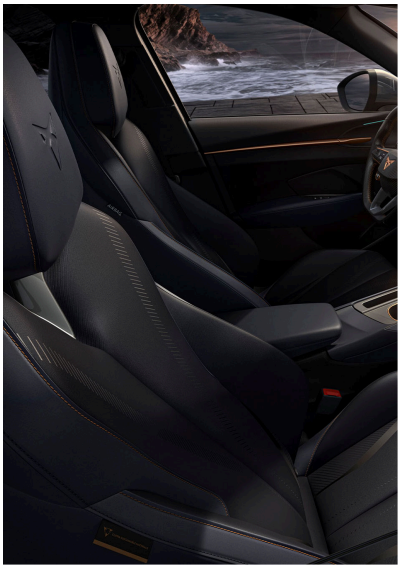
The 'America's Cup' trim features a 'Moonslate' color scheme, combining dark grey and black, with copper-accent cup holders and air vents and parametric boomerang moldings.



The 'High Canyon' trim has dark burgundy leather seats with a copper-accent soft-touch dashboard, with memory driving seat and advanced ambient lighting.



The 'Moon Light' trim has a soft-touch dashboard with copper accents, and highly adjustable seats upholstered in recycled black-and-grey Dinamica microfibre, with memory function, lumbar support, power folding, and more.



The 'Deep Ocean' trim includes Seaqual-upholstered seats made from recycled marine plastic, a deep blue dashboard with copper accents, and adjustable sport seats.

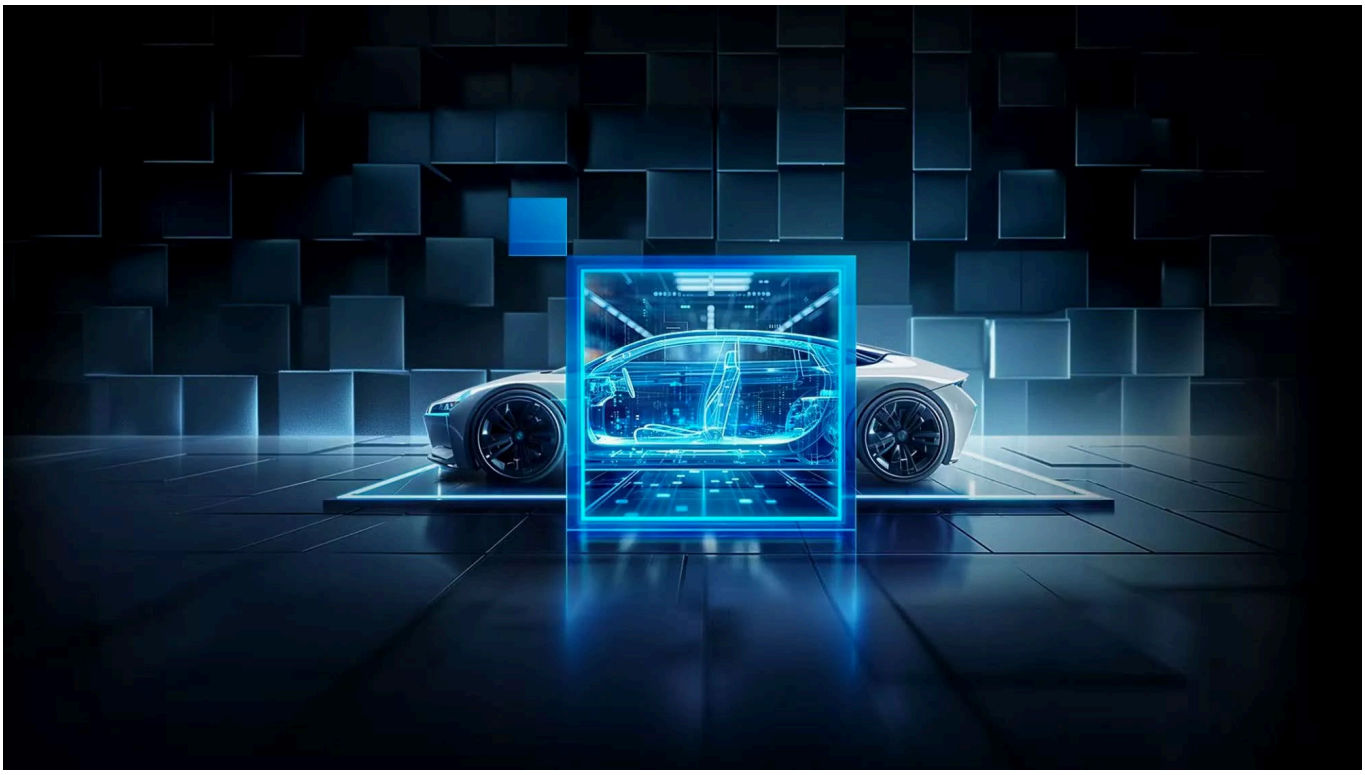
Thanks to the wheelbase dimension, rear seats provide good habitability for large sizes. The bench rear seat can be moved forward and backward.

The backlighting, along with the instrument panel and headliner substrate, is made by Antolin.

News Mobility

Toyota: AI Tech is Driver Support, Not Replacement

NEWS MOBILITY



INTEL IMAGE

'Artificial intelligence' uses mathematical algorithms, for example to categorize images. Avinash Balachandran, Head of Human Interactive Driving at the Toyota Research Institute in Silicon Valley, talked about the benefits and challenges of 'AI' in the automotive sector:

“When we think about how we can build safer and smarter cars that are also fun to drive, 'AI' is an incredibly useful tool. For example, 'AI' can support the driver in difficult situations.

A good example is driving on icy roads. When a vehicle hits a patch of ice and starts skidding, it is difficult for an average driver to handle this sudden situation safely. Our research integrates the skills of an expert into our 'AI' and enables it to steer a vehicle when it skids.

In the future, we envision that this technology will be able to help the driver cope with difficult situations through passive interactions such as lights or sounds and ensure the safety of the vehicle through active steering, accelerator and brake interventions. Our goal is always to support the driver.

We are exploring various ways in which 'AI' can help drivers. These include working on fully automated systems where they make sense, and supplementing traditional systems such as stability control. The “Driving Sensei” project at the Toyota Research Institute is a kind of driving school with 'AI'-based driver assistance, that the driver improves and masters his driving skills through meaningful interactions with the 'AI'.

The aim is to work both safely and economically soon. That is why we are developing technology that supports human drivers, not just replaces them. As 'AI' becomes more powerful, we can expect the interaction between drivers and 'AI'-controlled vehicles to increase. Since the perception of driving enjoyment varies from person to person, our goal is to provide customized 'AI' solutions for individual drivers so that everyone can get the most out of their driving experience.”

Will Autonomous Driving Really Relieve the Roads?

NEWS MOBILITY

MICROCHIP IMAGE

As described in Jevons' paradox, self-driving cars may minimize energy consumption while driving. However, behind the virtual wheel there is a lot of computer power in the form of sensors and other hardware, software and servers on which the next driving steps are calculated.

This alone requires a huge amount of additional energy, which—if the entire system is not produced and operated exclusively with renewable energy—generates further harmful emissions. Added to this is the forecast mentioned above in the context of the Jevons paradox regarding the increasing use of more efficient systems.

Anyone who can attend meetings, play games, read or sleep while driving in the future might have less reason to get out of the car. In 2014, historian Peter Norton from the University of Virginia warned that autonomous driving is more likely to encourage people to spend more time in their vehicles and use them for even more tasks.

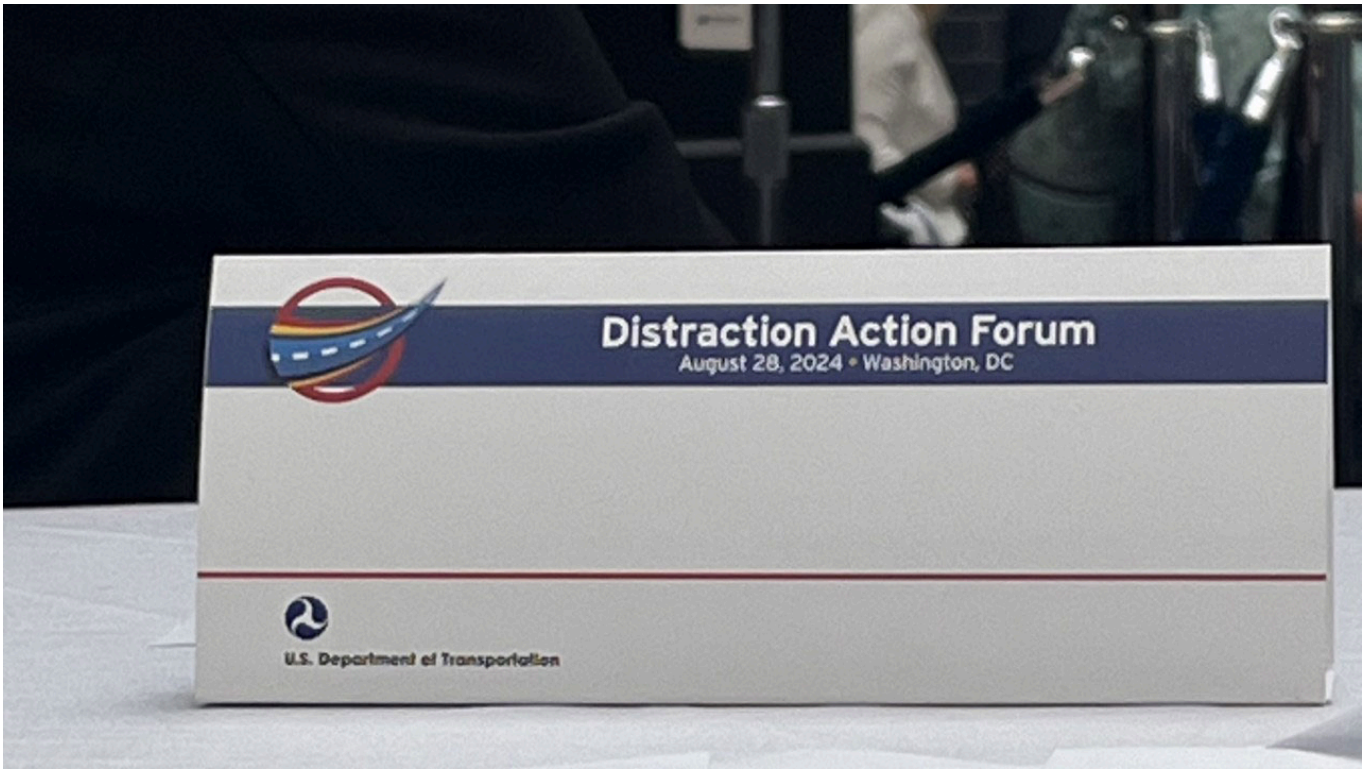
Norton had wondered why the proponents of autonomous driving only spoke of benefits and savings, but did not consider the expected contrary developments. According to a US study, the increasing availability of self-driving cars will make journeys more frequent and longer. It is also possible that commuters will feel encouraged to move even further into the surrounding area because of less strenuous journeys—with a corresponding impact on traffic.

Ultimately, of course, it is not clear where the development of autonomous driving, which is being funded with many billions of US dollars, will lead us in the future. What is certain is that the advantages talked up by the providers have corresponding—and countervailing—drawbacks.

General News

NHTSA's Distraction Action Forum to Prevent Impaired Driving

GENERAL NEWS



US DOT IMAGE

The U.S. Department of Transportation including NHTSA (the National Highway Safety Traffic Administration), convened stakeholders to provide input to a research roadmap to address new distracted driving challenges. Distraction is a known contributing factor to the national roadway safety crisis, and the Distraction Action Forum hosted by NHTSA is part of the National Roadway Safety Strategy, the Department's comprehensive initiative to bring the number of roadway deaths to the only acceptable number: zero.

The forum also included panel discussions, fireside chats, and breakout discussions with USDOT leadership and experts and invited stakeholders to consider vehicle and behavior research and industry perspectives on distraction.

The event happened in the context of increasing fatalities on US roads.

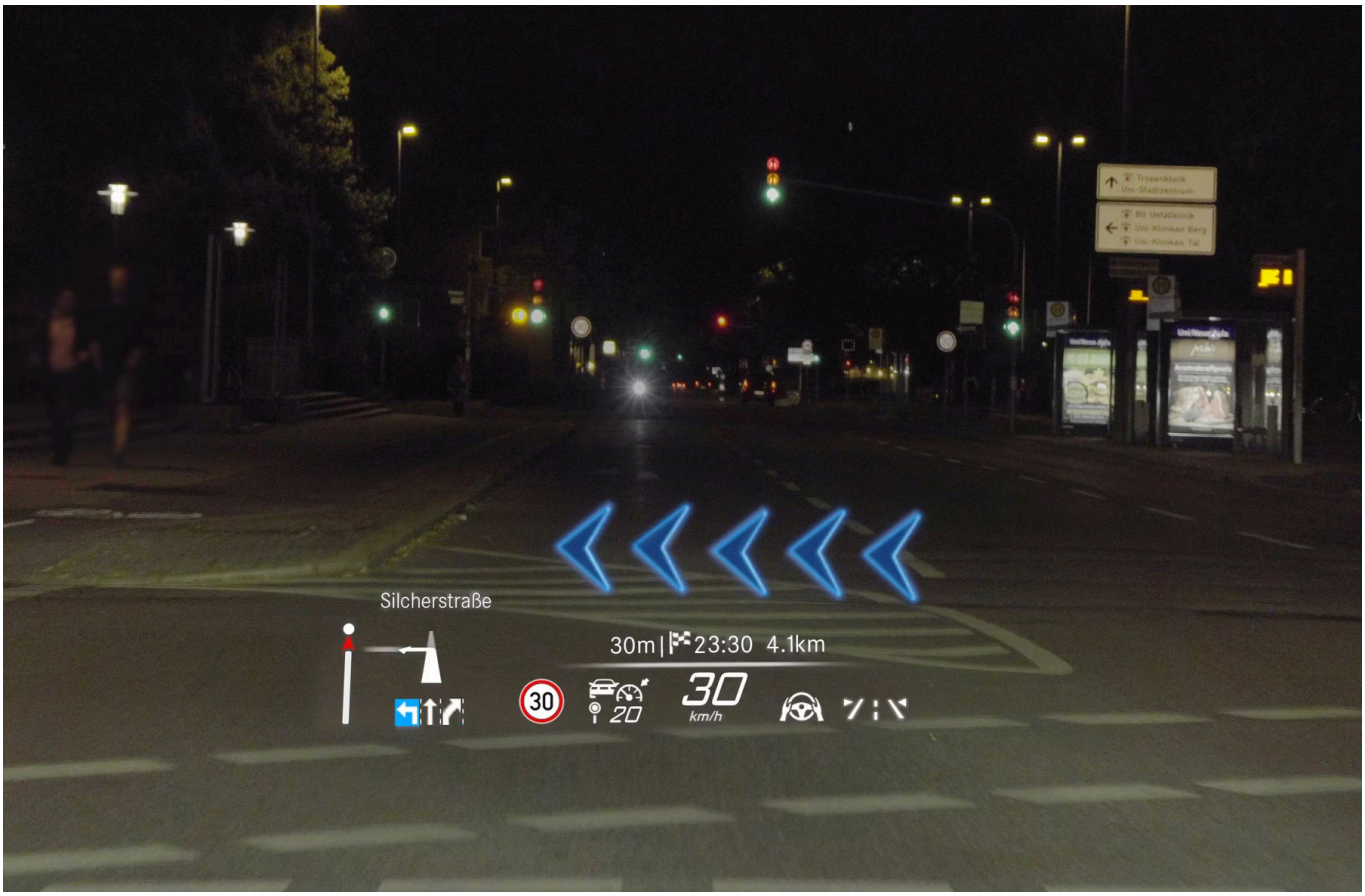
Attendees included automakers, tier-1 suppliers (including Seeing Machines, see DVN Interior coverage), road safety advocates, and researchers all committed to stopping distracted driving.

The event concluded with breakout sessions where attendees had the opportunity to share thoughtful and candid comments on solutions, both short term and long term, to stop driver distraction. Driver monitoring systems are a proven solution for distracted driving and complement advanced technological solutions for traffic deaths and injuries which are a core component of the safe systems approach.

NHTSA is broadening the definition of impairment to include distraction, drowsiness, and alcohol as part of an Advanced Notice of Proposed Rulemaking (ANPRM) for Impairment Detection issued earlier this year. The rulemaking was required by Congress as part of the Infrastructure Improvement and Jobs Act which became law in 2021. The ANPRM is the first step toward a formal rulemaking for technology to help prevent impaired driving.

HUD Market to 2030

GENERAL NEWS



MERCEDES-BENZ IMAGE

A report by MarketsandMarkets forecasts the automotive HUD market will grow from USD $1.2bn in 2024 to $2.4bn by 2030, at a CAGR of 12.3 per cent. With the increase in awareness of the safety of vehicles and passengers demand for better in-vehicle experience, growing preference towards connected vehicles steady increase in the market for premium and luxury vehicles, primarily in emerging markets, are expected to increase the demand for automotive HUD solutions all over the world. Increasing adoption of electric vehicles along with growing demand for semi-autonomous vehicles are also expected to create lucrative opportunities for the automotive HUD market in the coming years globally.

During the forecast period, the 3D HUD category is expected to present considerable growth prospects. Customers will have a more engaging driving experience because of the ease with which 3D HUD may incorporate AR features. To give drivers a thorough awareness of their surroundings, augmented reality features can include dynamic navigation overlays, virtual lane assistance, and the ability to indicate potential hazards on the road. AR technology is a major emphasis for several automotive HUD suppliers. 3D HUDs are being developed by many HUD manufacturers, such as WayRay, Continental, Panasonic, and Visteon, as well as component suppliers such as Nvidia and Zecotek. Advanced technologies like ADAS are becoming more widely used and AR technology is receiving more attention.

The HUD market in Europe is rapidly evolving, driven by a strong focus on vehicle safety, technological innovation, and consumer demand for premium automotive experiences. As European automakers continue to innovate, they are increasingly integrating HUD technology to provide a safer, more intuitive driving environment. These systems, which project essential driving information like speed, navigation, and safety warnings directly onto the windshield, allow drivers to stay focused on the road, enhancing both safety and convenience. With the European Union's stringent safety regulations and the growing adoption of ADAS, the market for HUDs is set to expand significantly.