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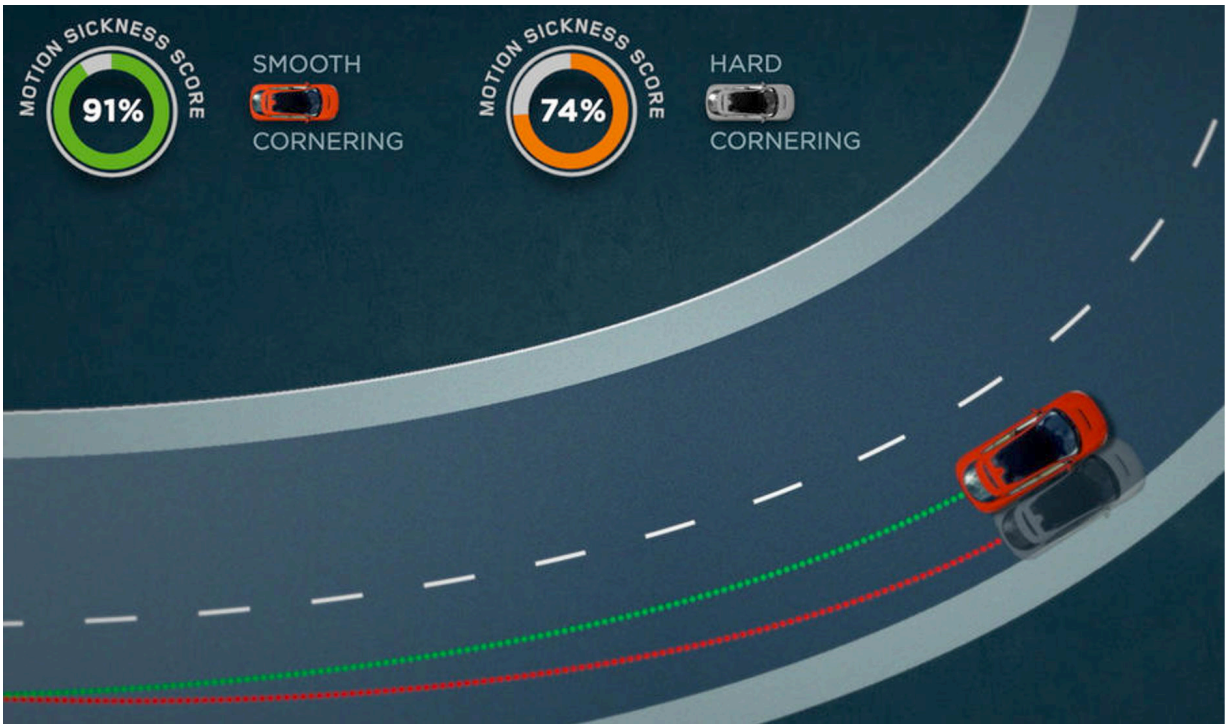
Weekly Newsletter

DVN Interior

NEWSLETTER #227

Editorial

Carsickness In Focus



JLR IMAGE

Automakers and suppliers have shown growing interest in motion sickness phenomenon in recent years. Their purpose is to better understand it to alleviate it effectively - not out of public interest but because it could compromise the successful launch of their future products.

To date, it remains a very complex topic, even if there's a lot of science being developed around it. Countermeasures are very multiple and still being researched, especially in the context or more automated, connected, and electrified vehicle. The latter include the use of visual, auditory, and tactile signals to help users better perceive and anticipate the vehicle's movements, but also the programming of a comfortable driving style that imitates that of a human being and limits sudden acceleration.

It is unfortunately an inevitable consequence of traveling. And it is not getting better with more automated, electrically driven, and digital mobility. Therefore, DVN Interior will continue to document any research happening in that direction, to publish about it in the weekly newsletter, and to organize a dedicated session, followed by a roundtable, at the next DVN Interior Workshop in April 2025. Stay tuned, your contribution is really appreciated, contact me here.

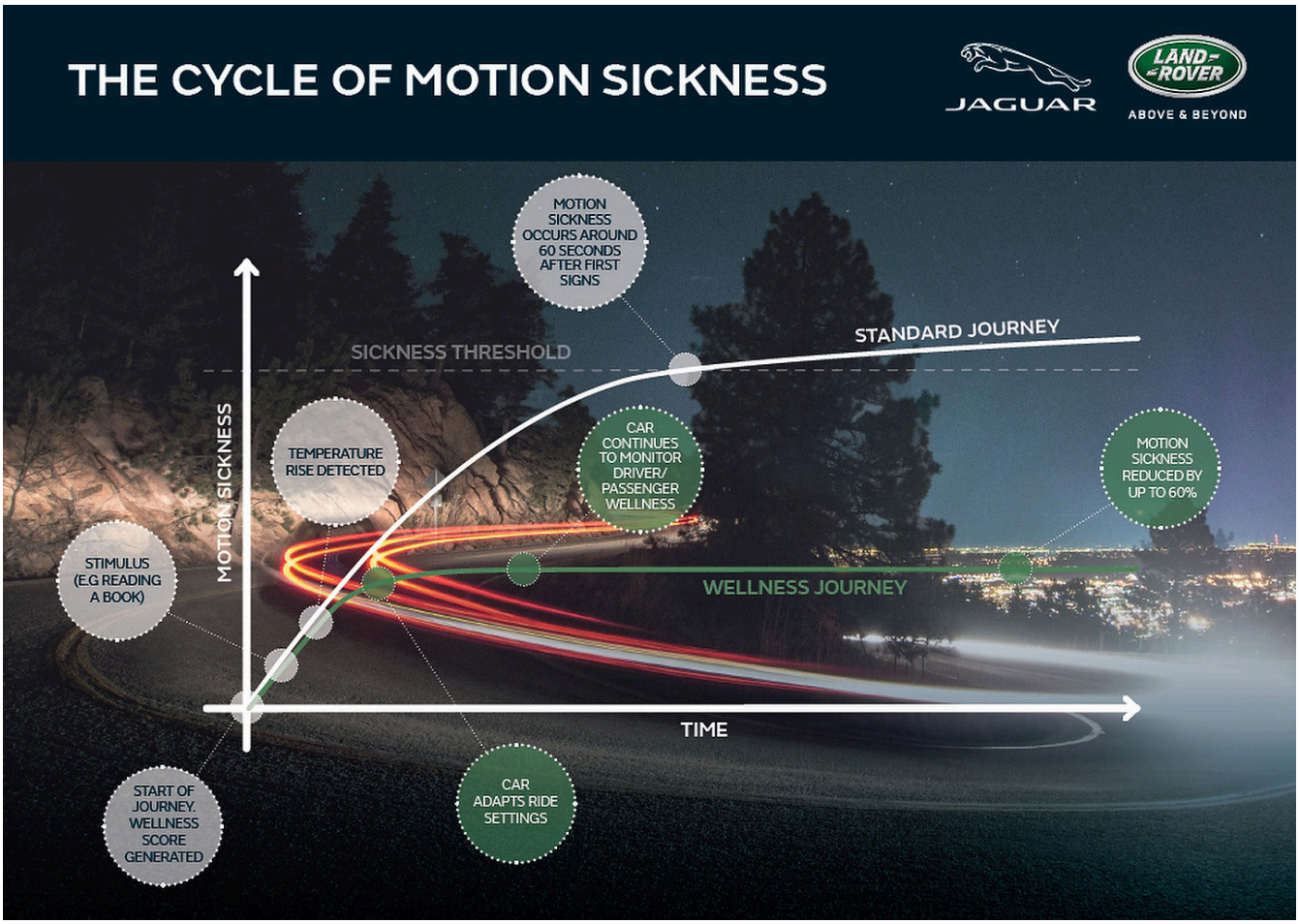
In the meantime, don't miss the DVN Interior Workshop in Torino next month on October 22-23, with the title: Mobility and Sustainable Interior Design. Leaflet and Registration here!

Sincerely yours,

Philippe Aumont
DVN-Interior General Editor

In Depth Interior Technology

Motion Sickness: Automaker Solutions, Call for Papers



CYCLE OF MOTION SICKNESS (JLR IMAGE)

Motion sickness occurs due to a difference between actual and perceived or expected motion. It is more likely to affect a passenger than a driver—with obvious implications for automated vehicles—because passengers are free to focus on something other than the view outside the car, like reading or scrolling through a phone. So, eliminating motion sickness is even more important in autonomous cars. Take a look at our **in-depth** **from last October** for a detailed description of the problem and some of its main factors.

Some 60 to 70 per cent of travellers experience some degree of motion sickness at some point; at least 25 per cent of the population—probably quite a bit more—regularly suffer from it. The deeply unpleasant symptoms include nausea and vomiting, sweating, chills, headache, and dizziness. Short of those, there's also drowsiness, apathy, disorientation, and decreased cognitive abilities, all of which are alarming in the driving context.

Motion sickness is experienced most in cars, hence the term carsickness. Passengers are especially prone because, unlike the driver operating the controls, they have only whatever view they might have of the outside world by which to perceive and anticipate trajectories. That outside view can be a tenuous one; modern high-tower head restraints block rear passengers' view out the front, and any passenger who looks at their phone or an old-fashioned manual book (or even just the interior of the car itself) cuts that one link, letting themselves in for a bad time.

It's thought to be down to a sensory conflict in the brain: the balance-and-equilibrium mechanisms of the inner ear, detecting the dynamics of a car moving over a road with curves and sags and bumps and surface imperfections, say "we're moving". But at the same time, the eyes looking at the stationary screen or page say "we're stationary". Just as seasickness sufferers are advised to look far away at the horizon, the carsick are encouraged to look outside the vehicle, if they can.

One might think that in over a century's worth of automobile development, the issue had been solved. But it hasn't; in fact, it's getting worse by dint of driving automation. Nevertheless, efforts are being made. Zero-gravity seats, optimized airflow, and interior air quality, and other suchlike are considered traditional solutions.

EV Specifics

There have been some interesting developments in addressing car motion sickness recently, and some new causes, as well.

Consider the differences between an EV and a combustion-engine car. An electric motor has maximum torque at zero RPM, and is quieter than a combustion engine. These are advantages in terms of accelerating and moving the car swiftly and smoothly, but they reduce the cues available for vehicle occupants to perceive the vehicle's movement. There is no engine-revving in electric cars, and no combustion-engine vibrations, which some perceive as soothing.

The use of regenerative braking, which captures kinetic energy from braking and converts it into the electrical power to charge the vehicle's battery, can also aggravate the matter; the decelerations induced by regenerative braking are usually low frequency, which is typical of a sickness-inducing motion force (again, like ocean waves causing seasickness).

Most of the major EV makers have adjustable regenerative braking options on at least some models. Reducing the regenerative braking effect gives a much smoother ride, but at the cost of some range.

Digital Interiors

Another technological advance inducing motion sickness is the proliferation of larger and more numerous screens inside vehicles. These overburden users with visual information, which discourages them looking outside. So, they lose even more access to visual signals to allow them to correctly perceive their position in space—the view outside the vehicle. That induces carsickness, even for drivers (or 'drivers', in the oncoming era of hands-off and hands-off/eyes-off autonomous mobility).

Studies suggest anticipatory audio cues can help mitigate motion sickness by allowing passengers to better predict vehicle movements (replacing engine-transmission sounds?). Apple introduced a feature in iOS 18 called Vehicle Motion Cues, designed to help users by providing better visual and auditory cues. Car manufacturers are also exploring ways to design electric vehicles to reduce motion sickness symptoms.

Car screenification is likely to increase in the coming years, including screens on glass or plastic surfaces and HUD or VR projections. It's all marketed in terms of being 'immersive', but from the wellness perspective, maybe *invasive* might be a more accurate word. Perhaps the idea isn't so hot after all of coccooning vehicle occupants in a tightly-controlled immersive virtual experience, sealed off from the real world.

Autonomous Driving

If autonomous driving ever really happens, it is also likely to worsen the problem. Carsickness is increasing even in today's partially-automated vehicles; if they will be fully able to pilot themselves, occupants will have even less possibility to anticipate trajectories, bumps, dips, and curbs.

CHESKY IMAGE

Moreover, the disappearance of the driving cockpit will make it possible to redesign vehicle interiors to become more welcoming, like a rolling living room. These new configurations will give passengers more freedom, allowing them for example to turn their seats round to chat with other occupants. Oops, but sitting backward, against the direction of travel, is popularly considered to increase the likeliness of becoming carsick. Although at least some research has found no difference between rearward- and forward-facing seat positions, the idea is prevalent enough to have a real possibility of manifesting as a sort of self-fulfilling prophesy, like the imaginary "Chinese restaurant syndrome".

Automakers' Ideas and Efforts

JLR IMAGE

JLR four years ago published ideas about the cycle of motion sickness, and how to interrupt it. The annotated image shown here is a good overall summary.

Mercedes-Benz's Airmatic system uses sensors to constantly monitor the vehicle's speed, load, and road conditions, to almost completely neutralize triggers of motion sickness. See video.

BMW recently filed for a patent focused on alleviating motion sickness in vehicles, particularly for rear-seat passengers. Their idea is to use a panoramic glass roof or large screen (such as their Theater Screen in the 7 Series) to simulate movement, but this may be compromised by ceiling-mounted displays. BMW proposes to create the illusion of a see-through ceiling, with images displayed on the screen or projected onto the ceiling. Eye-tracking technology would ensure alignment with the occupant's perspective. For multiple passengers experiencing motion sickness, virtual and augmented reality technologies could be employed. The complexity of this solution involves integrating sensors, cameras, GPS, weather data, and 'AI' to provide an accurate and dynamic portrayal of the surroundings on the ceiling-mounted display.

VOLVO IMAGE

Volvo engineers are reportedly developing a system that plays 'unobtrusive audio cues to passengers about a second before the vehicle makes a maneuver, such as a sharp turn or acceleration'. The cues would not be beeps or chimes, but rather 'reminiscent of car engine sounds'. Volvo worked with Swedish audio company Pole Position Production and Swedish research institute RISE, to compose these sounds. Volvo researchers say passengers have learned the meanings of these sounds over many years, so hearing them can prompt us to subtly brace our bodies against the motions. This, in turn, reduces motion sickness. Passengers who have tried the system are said to have reported feeling less sick when the audio cues were played.

NISSAN IMAGE

Nissan's e-4ORCE is new all-wheel-control technology that can precisely control vehicle momentum and handling—including suppressing pitch and dive. This creates a smoother ride during deceleration and in stop-and-go traffic, which in turn should help to reduce motion sickness.

HONDA PILOT (HONDA IMAGE)

Honda wants to quash carsickness by revising their power mapping for a smoother ride at low speeds. For example, their E model has an accelerator pedal response map to emulate the acceleration of a combustion-engine vehicle.

HYUNDAI IONIQ 5N (HYUNDAI IMAGE)

Hyundai's electric Ioniq 5N makes fake engine sounds linked to the accelerator pedal. And they've even added flappy paddles that mimic gear changes. While this is just a bit of fun for the owners, perhaps it could help combat some of the motion sickness felt in an EV, at least for the driver.

In sum, automakers and suppliers are showing increased interest in motion sickness recently. Their purpose is to better understand it to alleviate it effectively—perhaps not out of bighearted public spirit, but because a reputation for carsickness could compromise the success of their future products.

It remains a very complex topic. Countermeasures are many and still being researched, especially in the context of automated and electric vehicles. The solutions proposed include visual, auditory, and tactile signals to help users better perceive and anticipate the vehicle’s movements, as well as programming for a comfortable driving style that imitates that of a human being and limits sudden acceleration.

So, what are the next steps? Motion sickness is a consequence of technology evolving faster than physiology, so it will be with us for the foreseeable future. And it is getting worse with more automated and electrically-driven cars with increasingly digitally-infested interiors. For that reason, DVN Interior will continue to document research and innovation on this constellation of subjects. We'll publish about it in the weekly news, and we'll organize a dedicated session, followed by a panel discussion, at the next DVN Interior Workshop in April 2025. Stay tuned! And if you've got thoughts on the matter, or questions you'd like to see addressed, we'd love to hear from you.

Interior News

JDI's One Display-Two Screens Tech

INTERIOR NEWS

JDI IMAGE

Japan Display Inc. (JDI) has announced automotive-grade Dual Touch 2 Vision Display (2VD), a technology that allows a single screen to display different content simultaneously to the driver and passenger, while also enabling dual touch functionality.

The technology leverages JDI's low-temperature polycrystalline silicon (LTPS) and advanced optics to overcome previous challenges that prevented the commercial deployment of similar concepts. It also meets the high image quality standards required for in-car use.

The 2VD system is designed to have a single display functioning as two distinct touch-enabled screens, catering to both the driver and passenger. This capability aims to enhance the in-car experience by providing large displays for both parties, and addresses design challenges posed by the increasing number of displays in modern vehicles.

A key feature of the technology is its ability to distinguish between touch inputs from different users. Custom chips developed by JDI enable the screen to identify whether the input is from the driver or passenger, effectively splitting the screen's functionality.

JDI says they are in talks with several global automakers to integrate this technology into their next-generation vehicles, with potential market introduction as early as next year.

Mobis IDS Has Panoramic Multi-Display

INTERIOR NEWS

HYUNDAI MOBIS IMAGE

Hyundai Mobis has unveiled M.VICS 5.0, the latest version of their Integrated Driver's System. The system, first shown in 2021 and steadily upgraded since then, provides a digital cockpit technology suite and presents various driving information and media content while enabling external communication.

The 5.0 system, marketed under the motto 'All You Can See', focuses on merging diverse display technologies. The design integrates the entire front panel, spanning from the left A-pillar to the right one, turning it into a wide-screen cockpit. The system can adjust the size and angle of the display panel according to driving modes.

There are five display panels: a 27" main screen for dashboard, navigation and media content; a 12.3" high-definition screen for passengers; a 7" screen for vehicle status information; and button controls. These panels are interconnected to create an open and spacious driver's environment. Additionally, a projection display with touch and haptic feedback is included below the main screen for enhanced convenience.

Each display panel functions independently based on its purpose and use environment but can also integrate into a single screen when necessary. The display panels feature a variable system that moves vertically and adjusts tilt, optimizing the screen's size and position according to driving conditions. In 'Drive Mode,' part of the panel lowers below the dashboard, transforming into a smaller display. In 'Theater Mode' for media content or 'Relax Mode' for resting, the steering wheel lowers and the seat tilts, with the display's tilt and size adjusted automatically.

The large-screen display includes lighting technology on both sides to warn of potential rear-side collisions during boarding or alighting, with color scenarios designed to reduce motion sickness. Cameras mounted on the steering wheel and above the driver's seat monitor real-time drowsiness and inattentive driving, issuing emergency warnings as necessary. Safety features such as steering wheel, roof, and knee airbags are also integrated.

VW's New Hemp-Based Synthetic Leather

INTERIOR NEWS

VW IMAGE

Together with the startup Revoltech, founded in 2021 as a spinoff from TU Darmstadt, VW is working on a new type of synthetic leather for car interiors. The material is made from 100 per cent bio-based hemp; it uses otherwise-useless waste materials from the regional hemp industry.

The single-layer surface material, called LOVR, can be produced at existing industrial plants. The hemp fibers are bonded with a bio-based adhesive, and processed into a surface material. After its use in the car, the leather- and oil-free material can be recycled or composted.

The material is said to have already been very well received in customer surveys, and could be used in Volkswagen models starting from 2028.

Revoltech's LOVR material has been also used in the Kia EV4, as previously reported in DVN Interior.

Asahi Kasei's Materials for Better Connectivity and HMI

INTERIOR NEWS

ASAHI KASEI IMAGES

To meet the increasing demand for materials that boost the efficiency of 5G applications, Asahi Kasei is introducing new grades of their Xyron material to the European and North American markets. The combination of polyphenylene ether (PPE) with other polymers such as polyphenylene sulfide (PPS) and polystyrene (PS) allows this family of high-performance compounds to feature low dielectric properties and a high non-halogenic flame retardance. Together with the Tokyo Institute of Technology, the company has created a prototype resin antenna utilizing a new grade of Xyron. This new grade of the material offers high heat resistance and a stable, low linear expansion coefficient over a wide temperature range. This makes it ideal for plating-on-plastic applications and metal replacement in components that require precision, like slotted waveguide array antennas.

From HUDs to head-mounted displays and smart glasses, the requirements towards weight and design of optical devices have been steadily increasing in recent years. AK's transparent polymer AZP features an almost zero birefringence (this means a material has a refractive index that depends on the polarization and propagation-direction of light), and is overcoming the challenges of conventional transparent polymers in applications with polarizing light. Its superior processability compared to glass enables large-scale production of injection-molded optical components to fulfill demanding customer requirements.

Affordably achieving a good balance between sustainability and functionality is a major issue for car manufacturers. To meet this challenge, Asahi Kasei is developing a thermoplastic styrene block copolymer (SEBS) grade for automotive interior surfaces, which require good haptics and soft touch. Conventional approaches use different materials and production technologies for skin, foam and core layers in automotive instrument panels, door panels, armrests, or center consoles. The new SEBS material is suitable for both skin and foam layers, which can be molded in one step by using a core back injection molding process.

The connection to the polypropylene-based core layer is possible in the same or injection molding step, or in a different one. The strong chemical bond between all layers eliminates the need for additional adhesive layers. Asahi Kasei's new SEBS contributes to reducing the total number of materials, simplifying the manufacturing process, and improving the recyclability of interior components.

Asahi Kasei has also been developing a bio-based and biodegradable cellulose nano fiber (CNF). It is made from cotton linter, and features a high heat resistance and network-forming ability. CNF-reinforced polyamide shows thixotropic behavior (changes its viscosity and becomes more fluid when subjected to constant shear force), making it highly suitable for 3D printing applications for easy printing, dimensional accuracy, smooth appearance, and mechanical performance. Furthermore, CNF has superior material recyclability compared to glass fibers.

China vs. Germany: Same Car, Different Cockpit Expectations

INTERIOR NEWS

MERCEDES-BENZ IMAGE

Many drivers want clear cockpits with dials or buttons…in Germany. In China, customers want flashy audiovisual experiences. China is the most important single market for the German automakers Audi, BMW, Mercedes-Benz, Porsche, and VW, with almost 22 million units sold in 2023.

This brings with it a particular challenge: people in Asia have different expectations of technology and ideas of design than Europeans do, and the Chinese have different expectations than Germans. This is particularly evident in the design of car cockpits, which differ significantly in the target markets.

Things get really problematic when safety-relevant elements are controlled digitally via menu items. A prime example is the frequency of the windshield wipers. If it suddenly starts to rain, for example, the driver has to react quickly. Physical controls work very well, and are easy to use by muscle memory, without having to think about it or take attention off the driving task (which, let us remember, has just grown more challenging and dangerous on account of whatever has necessitated use of the wipers). A digital-menu control is a safety risk here.

Navigation or any other function that requires drilling down through sub-sub-sub-sub-submenus poses a real crash risk. In German vehicles, there is usually still a combination of software and hardware for control, which enables efficient, fast, muscle-memory control with precise feedback—not so in China, where they don't want any physical controls, just more and bigger screens crammed with as many functions and as much bling as possible.

In China, the focus is on the experience, not on driving; not the experience of operation, but the infotainment experience. The car is considered an extension of the smartphone with more and more and ever more functions on larger and larger and ever larger screens. Mercedes-Benz is following this trend with the Hyperscreen in the EQS, and is therefore certainly meeting the expectations of Chinese customers.

A look at China gives us an idea of what lies ahead. A great deal of attention is being paid to the development of screen technology there: OLED (Organic Light Emitting Diode) and AMOLED (Active Matrix OLED) screens impress with their high contrast ratio, vibrant colors and energy efficiency and are therefore increasingly being used in cars. Huawei has launched a light field display for cars that is designed to offer users a more realistic and intense visual experience. With light field technology, light beams are captured and projected from different angles. In contrast to conventional displays, which show the same image to both eyes, light field displays generate a slightly different image for each eye. This simulates depth perception in the real world and creates a three-dimensional effect without the need for special glasses.

Automated and autonomous driving will additionally strengthen the trend to large displays: when occupants no longer have to concentrate on driving, but have time for other things and need space for them—for meetings or movies, for working or simply relaxing—then the cards might be reshuffled.

New Audi A6 EV Interior

INTERIOR NEWS

AUDI IMAGES

The interior of the Audi A6 is consistently geared towards the users' needs.

The new A6 offers the most 'intelligent' assistance systems to date, the largest and best head-up display and brilliant AR graphics. The MMI panoramic display with OLED technology consists of the 11.9" Audi virtual cockpit and the 14.5" MMI touch display and, together with the 10.9" MMI front passenger display, forms a digital stage with visually clear design.

Active Privacy Mode allows the front seat passenger to enjoy entertainment content while traveling, such as watching movies or streaming series, without distracting the driver. Depending on speed and seat occupancy, the light is directed (privacy mode on) or diffused (content visible to all).

A new control system with ChatGPT, sensor fields on the steering wheel, and a new control island in the door provide additional convenience. The Audi assistant automatically recognizes whether to execute a vehicle function, search for a destination, or, for example, provide the weather forecast. The Audi system only forwards queries to ChatGPT when it cannot answer general knowledge questions. Drivers enjoy a seamless experience as all the functions are integrated into the Audi assistant.

Another new feature is the huge panoramic roof, which can be shaded at the touch of a button. In contrast to previous types, the panoramic roof's smart glass minimizes direct sunlight and becomes opaque at the touch of a button. This works with PDLC technology (polymer-dispersed liquid crystal), which can switch from transparent to opaque.

The Bang & Olufsen Premium Sound System with headrest loudspeakers ensures optimum sound. An efficient amplifier drives 20 loudspeakers with 830 watts of power. Four of these are integrated into the front seat headrests, enabling Audi to provide personal surround sound, personal navigation announcements, and one-on-one phone calls. Additional loudspeakers in the A-pillar and midrange speakers create a 3D surround sound.

The Design Lounge

Renault 17 Revived as EV Show Car

THE DESIGN LOUNGE

Since 2021, Renault has been collaborating with designers to pay tribute to some of their legendary models. A few weeks before the Paris Motor Show, Renault called on French design house Ora-Ïto to modernize the 1970s sports coupe, the R17, as an electric version.

This concept car will be exhibited on the Renault stand at the Paris Motor Show, from 14 to 20 October.

Renault enjoys creating new concepts that pay homage to the brand's heritage, without giving rise to a production vehicle. It is in this spirit that Renault presented the R17. While the R17 may not appear to be Renault's most important model, it nevertheless symbolizes the brand's arrival on the sports coupé market. Launched in 1971, it sold some 92,000 units before it was discontinued in 1979.

Designed on the monocoque structure of the original vehicle, it retains the cabin, doors, windows, glazing and seals, as well as the technical support surfaces.

On the outside, the show car is modernized, as shown by its headlights in four rectangular modules with rounded corners or its rear lights simplified into a single crossing strip. "We respected the most distinctive elements of the Renault 17, starting with its front face. Then, I brought fluidity and elegance, but without ever distorting it. The history of the Renault 17 and its sports coupe line are preserved", says Ora Ito.

As for its interior, this new version has modifications to the original dashboard and central console. The R17 is equipped with a central screen and four small geometric screens located behind the steering wheel, renewing the spirit of the period counters.

As for its interior, this new version has modifications to the original dashboard and central console. The R17 is equipped with a central screen and four small geometric screens located behind the steering wheel, renewing the spirit of the period counters.

The original R17 had all the interior features of a tourer, with its specific driving position, comfortable seats, full range of equipment, and meticulous finish. The show car maintains the original standards of comfort, while making a number of changes to the dashboard and centre console. The seats have been redesigned around the original 'petal' structure, with new upholstery inspired by the world of interior design: a heathered satin in fine Merino wool for the brown fabric and a delicate lightweight wool bouclé that is both long and thick, for the beige fabric. There's a central screen with the current Renault graphic environment and four small geometric screens behind the steering wheel, inspired by the dials of the original model

For contrast, here's a driver's-eye look at the R17 TL of 1971:

News Mobility

IM Prototype Car Parks Sideways

NEWS MOBILITY

IM PROTOTYPE CAR PARKS SIDEWAYS

IM Motors is an EV joint venture between Chinese automaker SAIC and Chinese technology companies Zhangjiang Hi-Tech and Alibaba Group. They've posted a short video of a prototype car, based on the L6, showing an impressive parallel parking maneuver: the car rolls sideways to easily fit into the tightest parking spot.

There's not much explanation of how the tech works, but it has something to do with IM's four-wheel steering system on the L6 model. It can pivot the rear wheels along with the front ones, allowing the car to turn in place. The system then applies precise torque control to move the car smoothly sideways. See video. This type of innovation could touch off a revolution in the infrastructure of parking, and even of cities entire.

Will Robotaxis Change Economy and Society?

NEWS MOBILITY

WAYMO ROBOTAXI AT PHOENIX AIRPORT (WAYMO IMAGE)

With advancements in autonomous driving technology and expanding regulatory approval, the once-distant dream of robotaxis increasingly looks to be within reach (Elon Musk's perpetual, fatuous any-minute-now promises notwithstanding). Take a look at the recent approval of robotaxi services at Phoenix airport, where autonomous vehicles can now do curbside pickups and dropoffs.

However, the road to full autonomy is still an uphill one, for a big bunch of reasons. One of the main challenges is to do with the economics of personal transport. As robotaxis become prevalent, people may find it more economical to use them routinely rather than owning a car. This could lead to a significant reduction in vehicle sales—and, as a knock-on effect, a corresponding decrease in the demand for parking spaces, garages, and other infrastructure associated with car ownership. If people spend 50 or 150 dollars a month for robotaxis instead of 600 to 1,500 dollars a month on car payments, it's difficult to imagine car sales doing anything but fizzling out.

Widespread adoption of robotaxis could open transport to broader audiences, and accelerate the transition to sustainability and catalyze other societal changes for the better. If autonomous vehicles become more prevalent, we can reasonably expect to see shifts in everything from personal transport habits to urban planning, economic structures, and environmental policies. Each and all of these individual changes will have ripple effects, creating more and more change throughout society.

Looking at it from an opposite angle, the automotive industry is one of the major industrial and economic forces across the world. It produces nearly 80 million cars and trucks annually, and they are consuming almost half of the world’s oil. The automotive ecosystem provides employment to 50 million people globally.

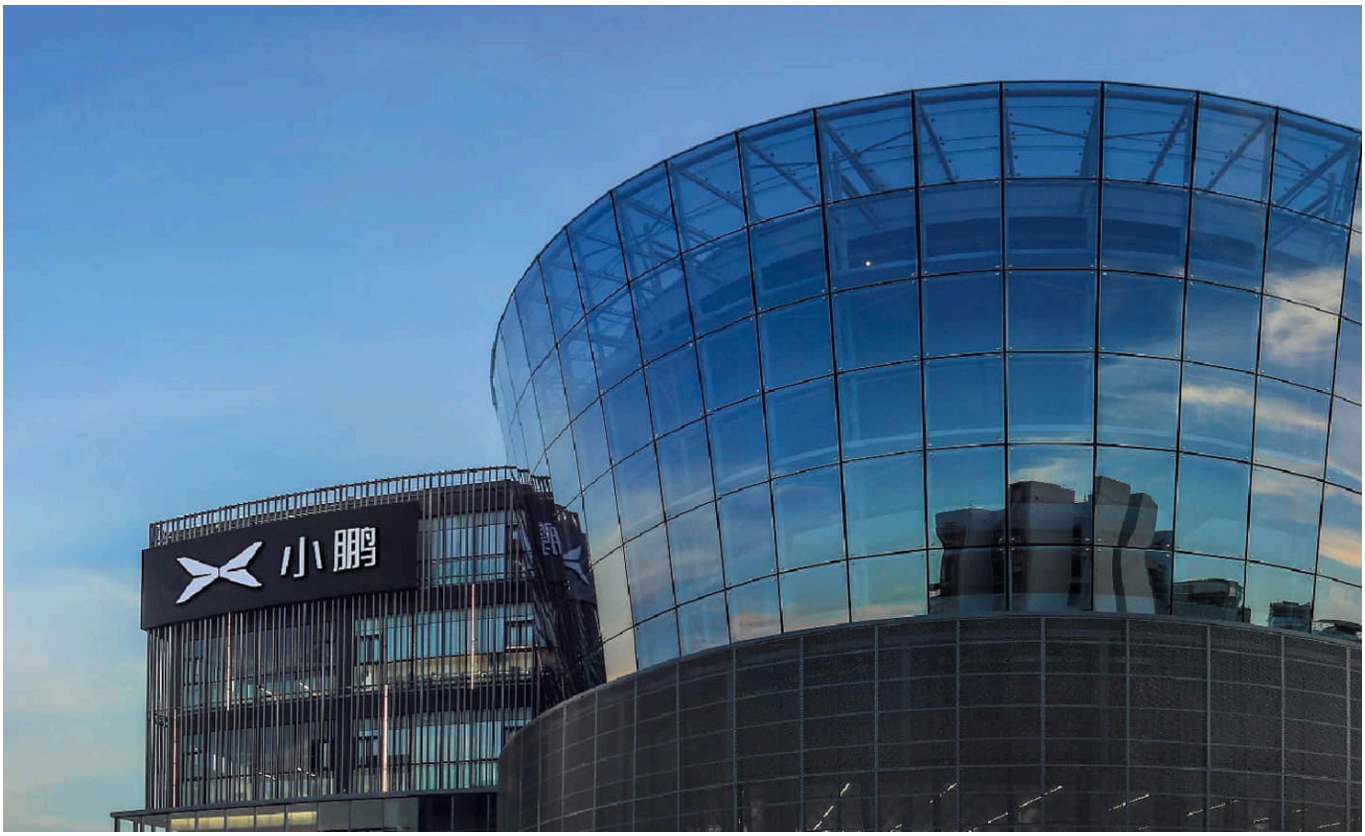
The financial rewards of EVs are presented as substantial to the economy even considering high up-front costs because EVs, from two-wheelers to buses, are less expensive to run and maintain.

…but what if these EVs are mainly robotaxis, rather than privately-owned cars?

General News

Xpeng Seeks Production Site in Europe

GENERAL NEWS



XPENG IMAGE

Chinese EV maker Xpeng, keen to avoid impending EU tariffs on Chinese-made EVs, is looking around Europe for a place to put a plant.

Two other Chinese car companies, Chery and Leapmotor, already have started producing cars in the EU; Chery took over a former Nissan plant near Barcelona, in Spain, and Leapmotor will soon commercialize cars built in a Polish plant belonging to their joint-venture partner Stellantis. BYD is not far behind; they're building a plant in Hungary and will soon break ground for one in Turkiye. SAIC, Chinese owners of the MG and Maxus brands, also is planning a factory in Europe.

Even without the tariffs, European factories would still allow for faster, cheaper transport of vehicles from the production line to dealers. And the delivered model range could be adapted more quickly and flexibly to customer requirements and market developments.

In addition to a factory, Xpeng also wants to build a data center in Europe to support connected-car technologies.

Xpeng launched two models on the German market in May, the G9 SUV and P7 sedan; a third model, the G6 SUV, is following close on. In addition to Germany, Xpeng is currently offering cars in Scandinavia and the Netherlands.

Car Owners Fed Up With Excessive In-Car Tech: J.D. Power

GENERAL NEWS

JD POWER IMAGE

J.D. Power's newly-published 2024 U.S. Tech Experience Index ("TXI") study finds that vehicle owners are sick and tired of tech features that don't solve an actual problem, don't work well enough to be trusted or worthwhile (or don't work at all), and are user-hostile.

Features such as facial recognition, fingerprint readers, and interior gesture controls are not living up to the hype; owners say they unsuccessfully try to solve problems that don't actually exist. For example, owners say interior gesture controls are problematic (43.4 PP100, problems per 100 vehicles), and 21 per cent of these owners also say this technology lacks functionality. J.D. Power says these poor performance metrics, including the lack of perceived utility, represent enormous amounts of lost investment by automakers.

The 2024 TXI looked at 40 automotive technologies, classed as convenience; emerging automation; energy and sustainability; and infotainment and connectivity. The conclusions are based on responses from 81,926 owners surveyed between July 2023 and May 2024 after 90 days of ownership of new 2024-model vehicles registered from April 2023 through February 2024. Here are some key findings:

- Features like 'smart' climate control, said to be based on 'AI', get favorable responses from owners who have used it, but overall drivers still strongly prefer hands-on controls. Despite proliferation of ADAS features, many owners don't see the point. Most owners do appreciate features that directly address specific issues, such as visual blind spots while reversing. But other ADAS features register with owners as unnecessary; drivers feel capable of handling, all by themselves, the tasks those systems purport to assist with. This, says J.D. Power, is particularly evident with active driving assistance. Hands-on-the-wheel features (L2, L2+) are among the lowest-rated ADAS technologies, with low perceived utility. More advanced hands-free versions aren't rated significantly better.
- Automakers are increasingly putting in passenger display screens, but they get negative reviews from owners who consider them unnecessary and difficult to use. J.D. Power think maybe these screens might find better favor if the front passenger seat weren't usually vacant; only one in 10 vehicles in America carries a front passenger daily. Meanwhile, the addition of a second screen adds to the vehicle's cost and complexity right from the start, with additional costs and hassles accruing as soon as the sales contract is signed; it is difficult for dealers to teach new owners how to use the primary infotainment screen, let alone a second one.

- Cracks are appearing in Tesla's carefully-cultivated façade of technological superiority. Historically, Tesla owners have expressed zealous enthusiasm for the brand and everything associated with it, and rated their vehicles highly despite poor build quality, seemingly unfixable problems, and spectacular safety recalls all over the world. However, owners who aren't in the hardcore fanbase are answering surveys perhaps more realistically, and Tesla's satisfaction scores are dropping in technology such as direct driver monitoring.
- Genesis ranks highest overall and highest among premium brands for innovation for a fourth consecutive year; in that brand's premium segment, Lexus ranks second and BMW ranks third.
- Hyundai ranks highest among mass-market brands for innovation for a fifth consecutive year; Kia ranks second, and GMC ranks third.