DVN-I
Automotive Interior

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Editorial

Frankfurt Motor Show: The EV Future Is Now!

The Frankfurt Motor Show as it has been known is being challenged by participants, protesters, and media. Many major automakers and suppliers were absent, and several exhibitors reduced their investment.

But there's a lot of real estate between absence and excess; BMW and Opel, for example, showed that a more frugal display gets the job done. IAA is still a great opportunity to see new cars and to meet colleagues; social media coverage extends the reach to an unprecedented 250 million sets of eyes, while traditional media coverage is no longer as enthusiastic as it once was—this year, there was a lot of "this was the last IAA" messaging. All traditional motor shows must reinvent themselves, at least as professional events, not forgetting that to create buzz and media coverage, you need events!

In any event, IAA confirmed that EVs aren't a curiosity or an emerging trend any more—they are the central mainstay of the market. Every exhibitor presented EVs or components and systems for EVs. From an interior perspective, electric vehicle power is not (yet?) a key discriminant, except as whole-vehicle reconfiguration for electric motivation (battery and motor instead of fuel tank, engine, exhaust system, etc) alters the spaces available for the interior. New open body architecture on modular platforms could create much more opportunities for interior architecture, along with the tunnel-free underbody.

As usual, show cars are sketching the future, and that's where we see a lot of potential for new interior concepts: much roomier, slimmer seats, interior lighting is everywhere, B-pillars are absent. As the new automotive reality takes shape, there are always traditional elements kept for their enduring value—see the VW ID.3 and Honda e, as good examples.

The centrality of the interior to today's vehicle topography is confirmed by prominent interior demonstrators presented by many exhibitors. It's obviously a way to emphasize HMI without being encapsulated into a body. Our in-depth article this week reviews the most interesting ones we saw,

and the Design Lounge more extensively covers concept cars and new vehicle introductions. And we're not done, either; watch for more coverage coming in the next Newsletter.

For those who have not yet subscribed, you'll continue to receive headlines every two weeks, but to carry on receiving the whole Newsletter as well as the growing list of other benefits of DVN-I membership, please contact us today.

Enjoy your reading!

Sincerely yours,

Philippe Aumont
General Editor, DVN-Interior

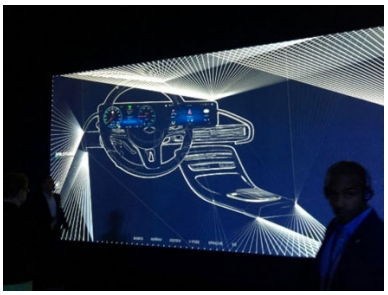
In Depth Automotive Interior

Interior Demonstrator Showcases at IAA

User experience, human-machine interaction, vigilance, cognitive science, and automotive autonomy are among today's interior buzzwords. But it's much more, and automakers and suppliers strove to break out of the auto show's static, passive experience by engaging attendees in a big array of interior bucks.

Mercedes Benz, for example, the MBUX, for Mercedes-Benz User Experience. This system can learn your preferences using artificial intelligence, but you can also communicate through a voice activated system, or even through a script pad. Architecture and HMI remains the same in any equipped model, with consistent screen and air duct design and position.

MBUX was shown with a front interior buck, as well in a virtual dark room.



Porsche introduced their first EV, the Taycan—even in a "turbo" version, presumably to keep performance branding continuity with fuel-burning cars, though applying that word to an electric car strikes as a bit odd. It certainly sticks in mind; perhaps that's the point.

The cockpit has a clear structure and a completely new architecture; compared to a traditional Porsche, all interfaces have been redesigned. The curved instrument cluster forms the highest point on the dashboard. A central, 10.9-inch infotainment display and an optional passenger display are combined to form a continuous wide screen with a black-panel effect. Classic hardware controls such as switches and buttons are greatly reduced in number. Instead, control is carried out using touch screen operation or voice control, which responds to the command "Hey Porsche". Development has been done in partnership with Croatia-based technology and sports car company Rimac, specialized in electric drive and HMI. Porsche has recently increased its stake in Rimac to 15.5 percent, after a first investment of 10% in June 2018.

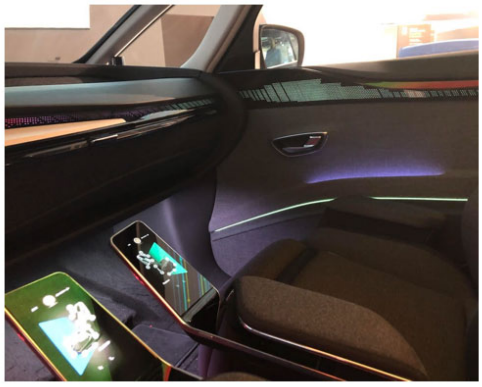
Wey, a luxury SUV brand of China's Great Wall Motors, had their AI Experiential Cockpit on display. Daily mobility scenes in Germany were simulated to give participants a taste of Chinese-style high-tech motoring.

Lüdensheid-based automotive supplier Kostal presented a level-2 driving simulator giving a pretty spectacular driving experience. It is focused on transfer of control from the steering wheel to a pad on the center console and back again.

When Kostal's system detects appropriate and safe conditions, car controls can be operated directly from the pad—to adjust the throttle, to change lanes, or to brake. Driver vigilance is monitored

through an eye tracker, steering wheel contact, and pad control, and emergency braking is activated whenever driver is detected not to be in proper control. Kostal puts a strong focus in their product strategy on smart surfaces, light signals, and interactive control panels in the interior—steering wheel, console, seats, doors, and elsewhere.

Hella showed a demonstration vehicle in the New Mobility World building. In the completely redesigned interior, various lighting arrangements support diverse scenarios of automated driving.



For example, when passengers—including a DVN passenger, as seen here—enter the vehicle they are greeted by name with interior lighting on the instrument and door panels as well as the seats. Incoming calls, for example, can be indicated by lighting signals without disturbing other passengers.

Hella management board member Dr. Frank Huber, responsible for global lighting activities, says "In the course of automated driving, the driver is increasingly becoming a passenger. Together with our partner Faurecia, we are therefore working intensively on the integration of innovative lighting solutions into the vehicle interior, which can be adapted, for example, to the respective needs of the occupants or the driving situation."

Faurecia and Hella have also jointly worked on functionalities improving communication and safety in automated driving situations. This includes the division of tasks between driver and vehicle at the end of an autonomous driving situation. The seat then brings the driver back into the appropriate driving position and a dynamic lighting scenario is used to increase concentration and attention.

ZF, meanwhile, showed their SHI Cockpit (for "Safe Human Interaction") made in partnership with Faurecia. In it, advanced assistance systems and automated driving functions communicate with the driver as simply and efficiently as possible.

The seat can adjust automatically to suit all kinds of drivers across a wide variety of situations. The vehicle provides feedback on control interventions in a clear, unambiguous way, and intelligent electronic assistance makes for easy adjustments and configurations. Uwe Class, Director of Safe Mobility Systems in ZF's Advanced Engineering department, says the system "really does simplify the handover scenarios between humans and machines. Furthermore, drivers are kept [informed] about which driving mode is active at any given time. This increases the acceptance level for these important functions".

The SHI Cockpit advises when road traffic conditions permit automated driving. The vehicle can take over as soon as the driver lets go of the steering wheel. This is sensed by a hands-on detection function in the steering wheel system and the wheel also rises and retracts forward, but remains within range. At the same time, the seat moves backward and downward, and inclines to a steeper angle.

The SHI Cockpit uses a variety of modes to convey information to riders: haptic (e.g., vibrating seat belt), visual (e.g., circulating strip of cockpit lights that vary in color), and acoustic (sounds, voice). When the driver needs to take back control, the SHI Cockpit gives the driver advance notice. If the driver fails to respond, the vehicle can be programmed to go to a safe position and stop.

A 3D interior camera measures the seated driver's height and individually adjusts the seat and the steering wheel to match that person when driving manually. To allow the driver to leave the vehicle, the seat moves back to provide easy egress and subsequent ingress.

Joyson Group, a supplier based in Ningbo, China, presented themselves as a complete system supplier. Their no-design interior demonstrator featured operating systems and HMI developed by the Preh Group, as well as innovative backlit surfaces and a linear air duct from Joysonquin Automotive Systems and active and passive safety systems from Joyson Safety Systems (formerly Key Safety Systems).

It's presented as an "adaptive" interior, meaning adapted to autonomous driving, including folding steering wheel enabled by steer-by-wire technology, and a driving touchscreen.

To manage safe transfer of vehicle control, the system recognizes the driver's attention state during the handover with three technologies: "DMS", the Driver Monitoring System which uses a camera to sense the head's tilt and direction of view; hands-on detection with sensors in the steering wheel to detect the position of the hands and evaluate vital functions such as pulse and skin conductivity, and a light bar positioned in the driver's field of view provides visual feedback in critical driving situations or information about the degree of autonomous driving.

The center console integrates a linear air duct with invisible slats, a backlit surface decor, and touch module. The seat has a motorized seat belt, a belt-integrated airbag, and illuminated belt lock and the belt carrier to maintain safety in various occupant positions—including lying down—and can replace the conventional front airbag. A sensor for seat identification, which is required for the interaction between seatbelt tensioning and airbag deployment, is just as much a part of the seat as a pre-crash side airbag. Watch for more information about Preh products in the next Newsletter.

THE DESIGN LOUNGE

IAA: Concepts & New Vehicles walk through

As we discussed last week, there were quite a few points of interest at the IAA this year in three categories—concept vehicles, new vehicle launches, and model refreshes—hat will be detailed in this and upcoming issues of DVN-I.

Although many major automakers were not at the show this year (a trend that seems to be growing) a few vehicles that stood out in each of the categories will be discussed at some length this week. Today we focus on some concept vehicles and new vehicle launches.

Concept Vehicles

Two vehicles stood out for heralding a new direction for their maker: the Audi Ai:Trail and the Hyundai 45, both focusing on the potential of autonomous driving and using an electric powertrain.

Audi AI:Trail

This is the latest in Audi's AI series of concept vehicles showing their progress toward tomorrow's autonomous world. Specifically, the potential of how an off-road or adventure vehicle could be redefined using an electric and autonomous platform that included drones to assist while driving. AI here stands for Audi Intelligence, and the AI:Trail has three siblings so far: the AI:Con autonomous luxury sedan shown at IAA 2017, the AI:Me compact AV shown at the Shanghai motor show this year, and the AI:Race sports car shown at Pebble Beach this year.

The interior of the AI:Trail was specifically designed for outdoor and adventure usage to show a vision of an Audi future. With an expansive glass area extending far down nto the doors and includeingthe front 'grille' area, a very open mono-volume interior space is very open and airy, with a spectacular view of the outdoors from the interior perspective—defining the overall theme and character of this vehicle.

From the drivers view, contrary to the current direction of more screens and displays, all the screens were removed except for digital mirrors. Instead, the driver's smart phone is used as the primary digital interface. The dramatically minified instrument panel affords a completely unobstructed forward view, especially notable in comparison to Audi's production models with their high beltline.

As we look to the rear and specifically the seating solutions, there are fabric rear jump seats that echo camping chairs. These stand (or sit) in stark contrast to the pedestal front seats, which are strapped down using ratchets, allowing for them to be removed and adjusted based on the user needs.

Also, many outdoor accessories, such as flashlights, are attached to the doors and seats. Real wood and durable fabrics covered the many surfaces.

Hyundai 45

Hyundai looked to their first vehicle, the Pony, for inspiration with their future autonomous vehicles. Bold, crisp and dynamic surfaces described a fresh proportion for their autonomous 5 door vehicle.

Large angular surfaces move the vehicle's dynamic gesture forward to create a unique 5 door profile that is both fresh and grounded in Hyundai's past.

By using a friendly, U-shaped surface theme with standalone objects such as the seating and IP, the 45's interior contrasts sharply with the exterior by keeping with an architectural style interior that seems to be the trend in autonomous vehicles.

There are interesting laminated and bent seatbacks and clean and simple door panels.

There's a U-shaped floating IP with no visible ducts. Like the seatbacks, it's made of laminated wood. And there's a ¾-width display and interface panel.

The passenger gets their own specific interface projected on the wood portion of the IP.

New Vehicle Launches

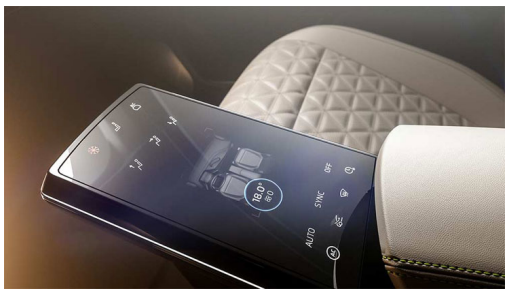
This year's IAA was also the launch venue for production versions of a few concept vehicles shown around the world in previous years. The highly anticipated 'real' versions of the Byton M-Byte and Honda "e" EVs were introduced along with Great Wall's Wey Hybrid SUV the P8 GT.

Byton M-Byte

The M-Byte has a rather traditional yet sporty CUV exterior profile.

The IP and display, developed in partnership with Faurecia, are anything but traditional and define this new brand. The 48” curved display is seamless and set forward and deep within the IP creating a uniquely configurable panoramic view. The IP itself is very low and thin, keeping in theme with the curved display.

The interface for the 48” display is a mix of a large touch screen with a gloss piano black display along with physical buttons mounted on a fixed hub for the driver.



The passenger also has a control display, but without any physical buttons. It protrudes from the center console/armrest. Two large displays are attached to the back of the front seats for rear occupants, bringing the total number of large format displays to five.

Honda e

Concept versions of Honda's e have been shown around the world for a few years, and we finally got to see the production version. True to the original concept, the basic and friendly proportions

and form have translated well. Quality features like frameless glass doors, side view cameras, and a glossy piano black front and rear fascia highlight this modern interpretation of a classic Honda design.

There's a full-width display inside. Although not a curved or seamless unit, it comprises the side view camera displays. It is placed close to the driver and passenger so the touchscreen can be used without stretching to reach, even with hands on the wheel.

The display band sits atop a matte-finished real wood horizontal surface with a strong raw-wood feel. Traditional buttons and knobs are integrated into the horizontal IP but without a forward center console.

The seats, both front and rear, are of a very simple and straightforward design. Honda has again chosen to use a fabric material that has a very furniture-like feel for large expanses of both the seating and doors.

Wey P8 GT Hybrid

Although not a fully electric vehicle, Great Wall Motors' Wey premium SUV is a hybrid, and boasts enough technology to be worth a look in an exposition like this.

The large, bold front grille and traditional CUV proportion combine for a cautious, conservative approach.

Inside, there seems to be some inspiration drawn from Mercedes' design language, finished with real wood and metal. The perceived quality is quite high, and there are large displays for both the cluster and center UX/HMI.

Ford Puma

The new Puma has a 1.0-litre, three-cylinder 48V mild hybrid powertrain. Based on a Fiesta platform, it's no longer a sports car, as it was between 1997 and 2001 in Europe. Exterior body and design are along the SUV line.
The interior looks very similar to a Fiesta, but there's a higher driving position with a 12.3" digital dashboard display, SYNC 3, and FordPass Connect. The interior can be trimmed in genuine leather, and the front seats have lumbar support and a massage function

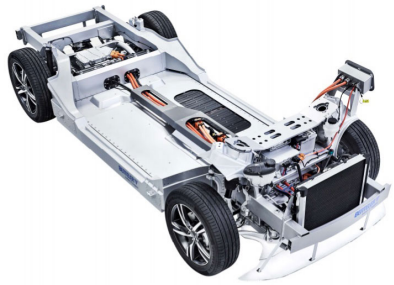
There're also a full complement of safety systems on offer, including adaptive cruise control with stop & go traffic jam assist, plus something called "local hazard warning" which notifies drivers of road works, broken-down vehicles, or even animals on the road using crowdsourced data.

The cargo compartment is notable for its total volume—probably a record in its segment—of 456 liters (16.1 cu ft). There's a lower compartment 30 cm deep under the floor. By positioning this floor at the back of the rear seat, the total available height can transport plants or two golf bags in

a vertical position. In addition, this lower volume of 80 liters (2.8 cu ft), with a drain plug for easy cleaning.

NEWS MOBILITY

Pininfarina Bites First on Bosch-Benteler EV Platform



In the future, mobility service providers such as such as Lift, Didi, and Uber will increasingly use shuttles to offer customized on-demand mobility. By 2025, it is expected that more than 2.5 million shuttles will be driving on the world's roads. Bosch entered an alliance with chassis and automotive specialist Benteler early this year. With solutions for electrification, automation, connectivity, and personalization, Bosch wants to help these providers offer ride-hailing services featuring maximum comfort and security. The undercarriage of such shuttles could be a rolling chassis—a ready-to-drive, modular platform that serves as a flexible basis for various bodywork designs. In addition to the floor structure, it includes suspensions, steering and electric motors.

Digital Giants: Relevant in Auto Industry

Microsoft's and BlackBerry's latest announcements are just two examples of new efforts of digital giants to become relevant in the auto industry, through either user experience and infotainment software, cybersecurity and data protection products as vehicles become more connected and automated. Both are lagging behind the

Googles and Apples of the world.

Microsoft used this year's Frankfurt auto show's future-of-mobility focus to highlight the software company's approach to working with the auto industry: targeting all nodes in the ecosystem—automakers, suppliers, and startups.

Microsoft's Connected Vehicle Platform was highlighted in their IAA announcement. Automakers such as Volkswagen and the Renault-Nissan-Mitsubishi Alliance use the platform, which Microsoft says "combines advanced cloud and edge computing services with a strong partner network so automotive companies can build connected driving solutions."

Microsoft for Startups: Autonomous Driving is an application-based program intended to speed the growth of startups working on self-driving vehicles. It supports startups in advancing automated driving technology, especially in delivery, ride-sharing and long-haul transit. Once accepted to the program, eligible startups will receive access to Microsoft engineers working in the AV field.

BlackBerry's announcement last week on its expanded partnership with Jaguar Land Rover illustrates the Canadian company's renewed interest in the auto industry. It includes predictive software maintenance and cybersecurity threat protection through BlackBerry QNX and its newly acquired cybersecurity unit, BlackBerry Cylance.

Software products from BlackBerry's automotive unit, BlackBerry QNX, range from infotainment to wireless frameworks. They can be found in vehicles from automakers including Audi, BMW, Daimler, Ford, General Motors, Honda, Hyundai, Jaguar Land Rover, Kia, Maserati, Porsche, Toyota, and Volkswagen, and suppliers including Aptiv, Bosch, Denso and more.

Amazon's Giant Rivian Order

EV startup Rivian Automotive has an agreement to fill the largest order of fully electric vehicles in automotive history.

Rivian, which has been described as a legitimate competitor to Tesla, will build 100,000 electric vans for e-commerce giant Amazon over the next decade. The first batch of vans is expected to hit U.S. roadways by 2021, with 10,000 on the road by late 2022. All 100,000 are to be operating in Amazon's fleet by 2030.

Even though Amazon led a $700m round of funding for Rivian earlier this year, the vans were negotiated outside that partnership, a Rivian representative said; the vans will not be sold to other customers. They're to be built at Rivian's plant in Normal, Illinois, alongside the SUVs and pickups Rivian plans to build in a former Mitsubishi plant. There's also an as-yet-unnamed vehicle that Rivian and Ford plan to partner on that might run on the line, which could add up to the plant capacity of 250,000 vehicles annually

It is consistent with Amazon's strategy to become carbon-neutral by 2040, and confirms EVs have a great future in delivery services.

The Amazon order is the largest order of a fully electric fleet to date. Waymo has contracts to buy up to 62,000 Chrysler Pacifica hybrid minivans from FCA, as well as 20,000 fully electric Jaguar I-Pace SUVs.

UMV at IAA: the Urban Modular Vehicle


The German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) exhibited their prototype of an Urban Modular Vehicle (UMV) for the first time. This intelligent, modular, electric city car brings together DLR's research in the fields of automated and networked driving, propulsion technology, vehicle design and structure, energy management and chassis mechatronics.

DLR Executive Board Member for Energy and Transport Karsten Lemmer says the UMV "will enable people to reach their destinations more comfortably while simultaneously saving resources such as space, time and energy. The ideas being presented at our stand are both an inspiration and a challenge to shape the mobility of the future today".

UMV needs to be automated and electrically powered, meet high safety standards, be comfortable, and at the same time flexible and efficient to manufacture. The keyword of the UMV concept is modularisation, to go from small city runaround to larger, autonomous versions—the People Mover and Cargo Mover. All of the eight different variants of the UMV family are built on a common basis. The length of the floor module can be adjusted, and the front and rear modules are common to all variants.

The use of multi-material construction and function integration ensures that the body structure of all variants is optimally adapted to electric propulsion and offers a high level of crash safety. A sophisticated overall energy management system coordinates and directs the energy flows of the interior, battery and electric motor for an optimum operating strategy.

DLR transport researchers have implemented the UMV People Mover 2+2 variant as the first drivable prototype. This vehicle offers space for four people and is intended for use as an autonomous shuttle in urban areas, for example to provide on-demand mobility services. The user summons the vehicle via an app and activates it using an interface in the side window so that the sliding doors open. The interior has a simple design and offers two central monitors with information on travel time, route and vehicle status.

New Mobility App from German Transport Ministry


The Federal Ministry of Transport is examining the possibility of a cross-service mobility app for Germany, and reviewing the legal basis for the introduction of cross-border mobility apps.

With such an app, for example, consumers could buy train tickets, book rental cars, or rent bicycles, said Parliamentary State Secretary Steffen Bilger.

According to the idea, the different transport companies would have to share their data "if it has a benefit for the consumer", and therefore they would need to be more committed to working together.

In countries such as Finland, this data exchange is already required by law. "We are considering creating a similar legal obligation as is the case in Finland," Bilger says.

Although there are already regional model projects, they still lack breakthrough. Bus companies would have their bouts and delays, car sharing providers share their locations and prices. By 2021, the initial goal is to offer nationwide fast Internet, so that apps can be used anywhere.

SAFETY

EuroNCAP, IIHS Safety Ratings Praise Interior Designs

The latest vehicles evaluated by EuroNCAP and the US Insurance Institute for Highway Safety have

all achieved maximum ratings, a sign that vehicle design overall is improving—and that it's probably time for the NCAP standards to be raised again.

Ssangyong korando

Škoda Kamiq

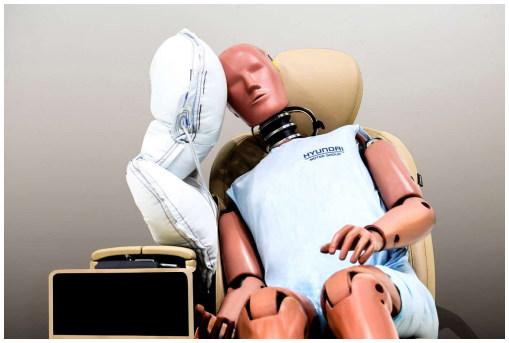
The tests involved Mercedes' first electric off-road vehicle, the EQC, and their second-generation CLA; Škoda's Kamiq SUV, the fourth-generation SsangYong Korando, BMW's latest Z4, the new Audi A1, and the Ford Focus.

The test reports noted interior factors: "Ford has improved the design of the seats and head restraints and the car now demonstrates good whiplash protection in rear-end collisions and is rewarded for its excellent AEB city performance", according to a EuroNCAP official.

In the US, the Tesla Model 3 and Audi e-tron EVs and Hyundai Nexo fuel cell vehicle achieved the IIHS Top Safety Pick Plus award. "Vehicles with alternative powertrains have come into their own," an IIHS official said in a statement. "There's no need to trade away safety for a lower carbon footprint when choosing a vehicle".

Hyundai's Coming Advanced Airbags

Hyundai plans to install newly developed center-side airbags in their vehicles, but the maker hasn't yet specified the timeframe or any model names.



The new bags, developed by in-house engineers, prevent drivers and passengers from colliding during a crash and also protect a lone driver from the impact of glass fragments. They will be installed on the right side of the driver's seat, and will inflate in 0.03 second once triggered by a relevant crash.

According to the European Automobile Manufacturers' Association, 45 percent of car crashes cause secondary injury from collisions between passengers or from flying glass splinters. Hyundai's new airbag can reduce the chance of head injuries by 80 percent, the company said, citing internal tests.

Nissan Juke: More Connectivity, Better Safety


Nissan says connectivity features are increasingly informing the consumer's thoughts when thinking of buying a new car. They're working to address this new demand with the second generation of the Juke compact coupe-styled urban crossover.

In an interview, Gareth Dunsmore—in charge of marketing communications about connected car services and customer experience—said connectivity creates a two-way communication for Nissan and their customers: "Here there is a big opportunity to learn what the customers are doing with their cars and get their feedback to develop more features for them and improve their relationship with the car".

That's particularly true for systems like the ProPilot ADAS to help drivers plan trips on their phones, setting destinations which are passed seamlessly to the car's nav system once they get in the car. Upon arrival, if there's a need to walk to the destination, that info is bounced to the phone for ready guidance. This strategy reduces the potential for distraction and maximizes driver safety and convenience.

One of the top connected-car attributes of the new Juke is its ability to keep pace with future digital innovations thanks to an infotainment system that is fully OTA compliant. Dunsmore says "Iit's a car that can now always update itself. Since the beginning of this year we have been trying to introduce a new connectivity system first with the Leaf, then the Navara and now the Juke which gets more features than even the other two vehicles."

The system uses an on-board SIM with Nissan partnering with network provider Orange in Europe to provide Wi-Fi access for passenger access to data through a monthly service plan.

GENERAL NEWS

Great Wall Consider European Car Builds...Again

Chinese automaker Great Wall presented two Wey-branded SUVs at the Frankfurt auto show, including their "S" (not to be confused with Tesla's).

Great Wall Chairman Wey Jianjun says the maker might again consider building a plant somewhere in the European Union if their sales there hit 50,000 units a year, as part of a push to seek growth in overseas markets.

Great Wall are the № 1 SUV and pickup manufacturer in China, and are now exploring sales and production in overseas markets to expand their global influence and seek higher profit, as growth slows in the Chinese domestic market—the world's largest auto market. They plan to start selling Wey-branded SUVs in Europe in two years, and maybe more of their mass-market brand Haval as well; they already sell some pickup trucks in Italy, at least according to their website. In June Great Wall started production at a plant in the Tula region of central Russia with a manufacturing capacity of 80,000 cars a year. The company sold 624,000 units in the first eight months this year, 5.7% higher than the figure in the same period last year. "We hope to take market share from foreign brands, we are vigorously investing in R&D. The technology we're focused on developing now is technology that will be suitable for use in the 2030s," Wey told Reuters.

European Suppliers' Visions of the Future

CLEPA
European Association of Automotive Suppliers

While IAA was under way, CLEPA—the European Association of Automotive Suppliers—put forth the sector's vision on the future of transport and industry, to support and inspire the dialogue with all stakeholders in pursuit of new mobility.

The vision paper describes four main pillars of transformation in the coming years and decades, demonstrating that mobility will be:

- Safe, to ensure zero casualties on the road by 2050
- Sustainable, with increased electrification and a minimized environmental impact
- Smart, enabling connectivity and autonomous driving
- Powered by a competitive industry, strengthening European technology leadership

The common goals of more automation and, eventually, autonomous driving is having a huge impact on the development of new safety technology. Active and passive safety technologies must be part of an integrated approach. Sensors can warn of accidents about to occur, thereby setting off new exterior airbags that help to significantly reduce crash impact and accident rates. In-cabin monitoring technologies enable safer trips by making sure the driver is in good condition. Once partial or fully autonomous driving becomes a reality, new passenger seating positions will be enabled, which will require a reinvention of airbag and seatbelt technology.

The big mobility trends now transforming the industry are set to boost safety on the road. Highly automated and full autonomous cars will be designed to be safer than those driven by human drivers today. Machine learning, more sophisticated algorithms, improved sensor systems and active safety technologies in cars will see to that.

Light-weight technology should be considered a full part of the integral low emission mobility strategy, and many automotive suppliers innovate and invest substantially in this field. Light-weighting has the potential to significantly reduce CO2 emissions. Each 10% reduction in vehicle weight brings a 6-8% improvement in fuel economy and energy efficiency.

There's also new attention being paid to seeking ways to improve resource efficiencies and better methods to reuse and recycle materials.