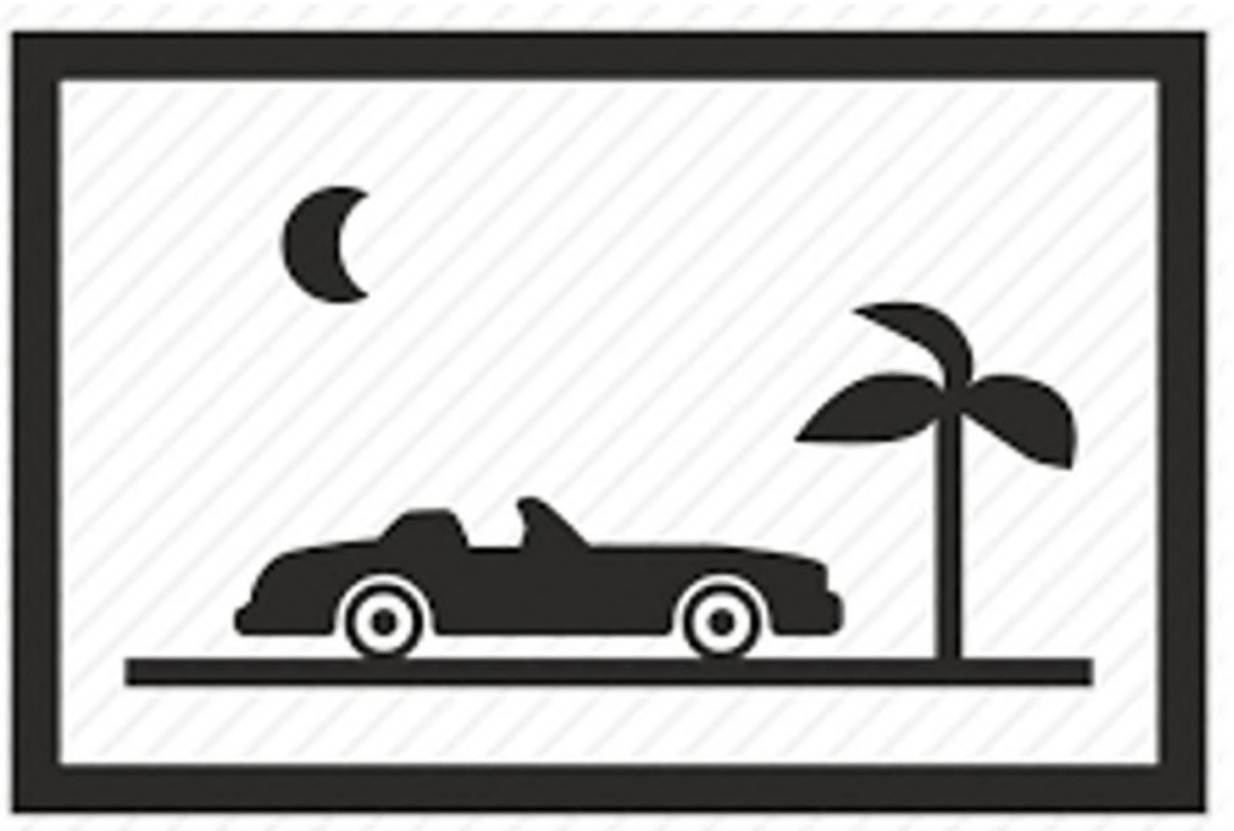
DVN-I
Automotive Interior

Thu, 13 August 2020 Weekly Newsletter NEWSLETTER #34

Editorial

Sun, Beach, Holiday: La Dolce Vita With A Roof!



The sun, the beach, and a droptop car traditionally fit well together for summer leisure in sunny tourist resorts—See Pininfarina's fresh interpretation of the idea in this week's Newsletter. And even though this year has been rough and rocky in a lot of ways, take heart: today's convertibles are as safe as closed models; a recent report from the Insurance Institute for Highway Safety confirms it!

Unfortunately for sun-worshippers (and those who appreciate car design), cabriolet market share continues to drop; it's now at 0.8% according to LMC. Even less than that for SUV-based convertibles like the VW T-Roc Cabriolet, a real niche within a niche. Why? Well, automotive climate control has gotten better and better, while climate change is bringing us hotter and hotter summers, plus there's the security factor, and automakers like BMW are offering high-versatility remote-start systems capable of pre-cooling the interior. Convertibles are harder for buyers to justify, and so whether it be a sedan or a crossover or an SUV, most buyers choose to have a cabin and a roof.

And a roof is a surface ready for design and content upgrades. Luminous headliners are making a lot of sense to provide the feeling of space, reinforcing a vehicle's premium lineage and signature with thoughtfully designed and coordinated interior celling lights. And that's just one example; take a look at this week's in-depth article on interior lighting, confirming BMW's prediction of a tenfold car interior market growth in the near future.

Interior lighting is one of the numerous topic we'll address at the inaugural DVN-I Smart Interior Conference and Expo to be held online this coming 24 September, providing an ideal opportunity to go deeper into these topics. **Sign up here**, see the docket **here**, and find a video teaser **here**.

This week's Newsletter also brings you new chapters in our onrunning series: lighting integration, trajectories, mobile signature.

We hope you find this Newsletter interesting and informative. Have you not yet subscribed? **Here's your link**!

Sincerely yours,

Philippe Aumont
General Editor, DVN-Interior

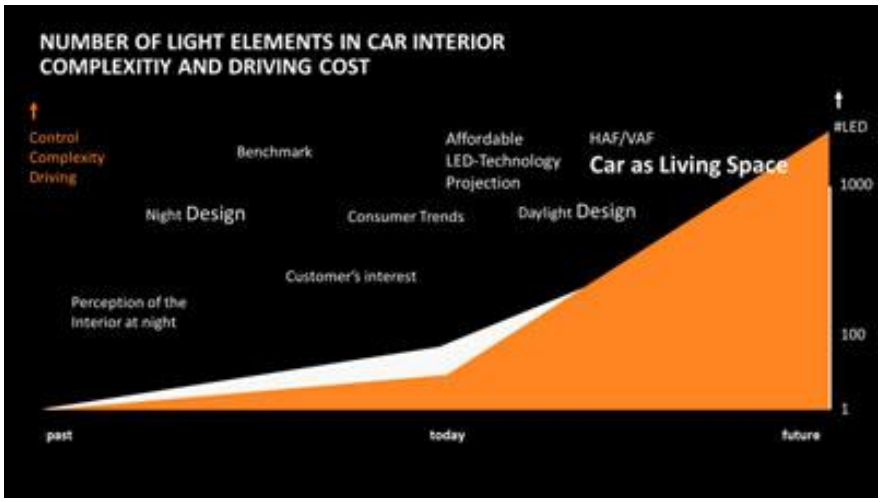
In Depth Interior Technology

Vision of Future Car Interior Lighting

Carmakers are running with lighting as a key factor for the future car interior. Today we have different functional lamps for reading and bright illumination of the car interior and its exterior surroundings, supplemented by displays and ambient lighting of the floor, cabin space, interior components, and on surfaces of textiles and smart decor trims.

EXTENSIVE INTERIOR LIGHTING FUNCTIONS (BMW)

Interior lighting has an wide array of functional and ambient lighting functions as series equipment in the higher car segments, and increasingly available as extras in the lower segments.



ESTIMATED INCREASE OF LIGHT ELEMENTS IN THE FUTURE, BEFORE PANDEMIC (BMW)

Before the Corona pandemic, BMW predicted a tenfold increase in light elements in the car interior in the near future. Despite the pandemic this trend could continue because interior lighting has a high perception, acceptance, and demand by customers in all car segments. For that matter, the pandemic could wind up accelerating lighting uptake—think of cabin sanitization by UV light, for example. Interior lighting will become more and more complex and multifunctional with an increasing number of new light elements and functions in night and day design, driven by affordable and package-minimized LED technology, consumer interest and trends, and the perception of the car interior as living space.

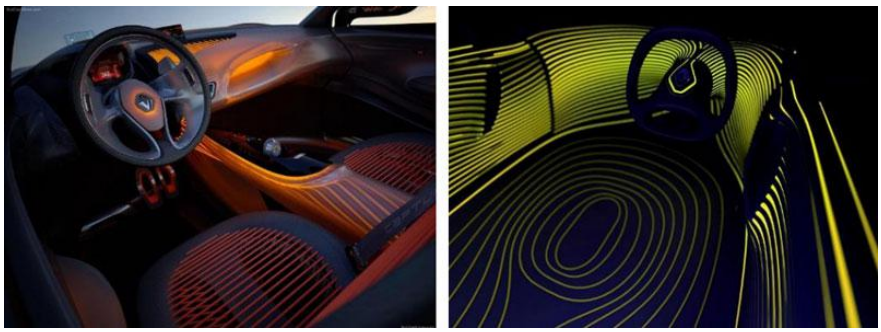
DISPLAYS AND INTERIOR LIGHTING GROW TOGETHER (DAIMLER)

Displays and lights will carry on growing more and more reciprocally integrated in new, ever-more-seamless ways as styling elements and for dynamic and adaptive functions including ambient lighting and welcome/farewell animations. Software combines interior lighting with matching interior component functions. Comfort use cases and assistance enrich the functionalities of today. The future interior lighting follows the megatrends of increasing connectivity and digitalization for infotainment and enhanced interaction with the environment, individualization and personal lighting solutions, efficiency for electric vehicles and new use cases in autonomous driving vehicles.

Static indirect and contour lighting will be replaced by dynamic lighting functions for signaling, safety and communication aspects. Dynamic matrix reading lamps, zone lighting for each passenger, adaptive lighting for different seat positions and activities, light beams for hand guidance, anti-fatigue and anti-motion-sickness lighting, and individualized lighting for wellbeing, relaxing, and alertness are only some examples for future interior lighting functions.

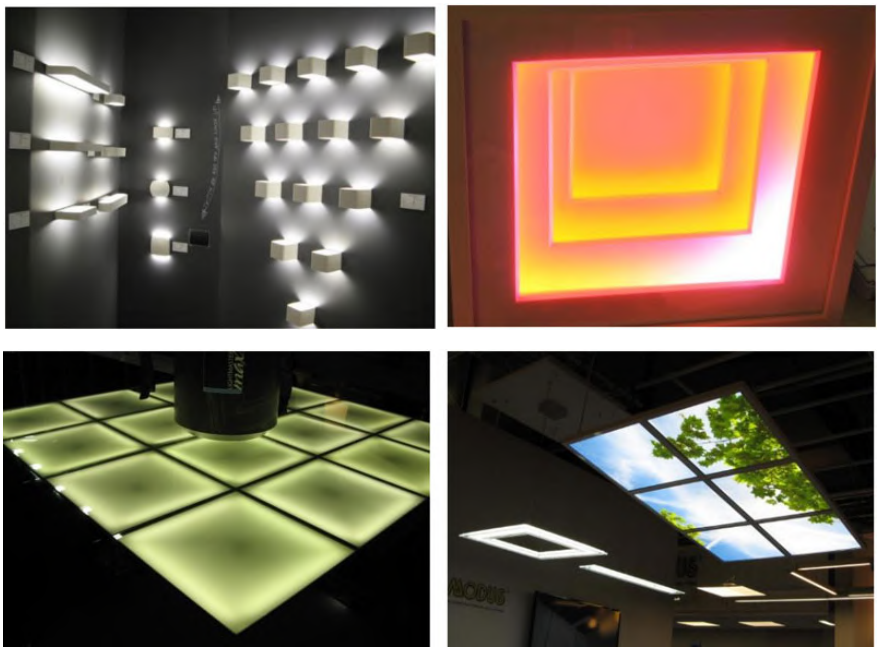
"Experience modes" deliver orchestrations of interior lighting and functionalities matched to a variety of situations and scenarios. The functionalities are addressed to different senses to form a coherent experience. The complete interior experience can be changed with just one click or voice command. With this kind of modal adjustability, passengers can experience different moods and æsthetic orchestrations in the car interior for wellness, vitalization, and relaxation achieved by a combination of light, climate control, massage, scents, music, and otherwise like that.

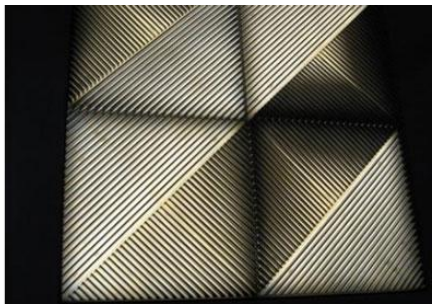
Future interior lighting developments will be driven by safety, communication, comfort, and styling demands; examples include the aforementioned welcome/farewell animations, brand identification, and new lighting functions and technologies. Light projections, smart LEDs, microLEDs, smart functional surfaces, laser-based lighting, guiding materials for 3D light patterns on demand, and area backlighting with hidden-until-lit effects are some of the new lighting technologies being researched and developed for future lighting applications.



EXAMPLES FOR BACKLIGHTING AND LIGHT PROJECTION (RENAULT)

Tomorrow's automotive interior lighting will also borrow and share reciprocally with general lighting, with its much longer history and experience in developing lighting for all imaginable use cases. Now that technology and technique exist to do so, many general lighting solutions and effects can be transferred into the car interior, especially for autonomous driving vehicles.



EXAMPLES FOR 3D SIDE PANEL, FLOOR, AND ROOF LIGHTING EFFECTS FROM GENERAL LIGHTING

ISELED (Intelligent Smart Embedded LED) is an innovative technology based on highly integrated, smart LED modules enabling dynamic ambient and functional lighting solutions.

A widespread group of companies are working together as an ISELED Alliance to promote and further develop this technology. The alliance will be presented at the DVN Interior conference and expo on 24 September, and will be holding **their own workshop** as well, on 3 September.

Interior News

Lighting Integration in Automotive Interior Components (part 3)

INTERIOR NEWS

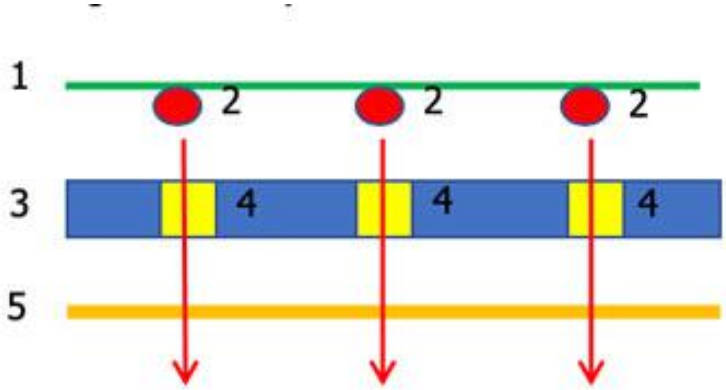
This third piece of our interior lighting integration story looks at luminous headliners.

Rolls Royce:

The starry sky inside a Rolls Royce is an extensive assembly of single light guides. The light guide ends are fixed in holes of the headliner and illuminated by central light sources.

Opel Adam:

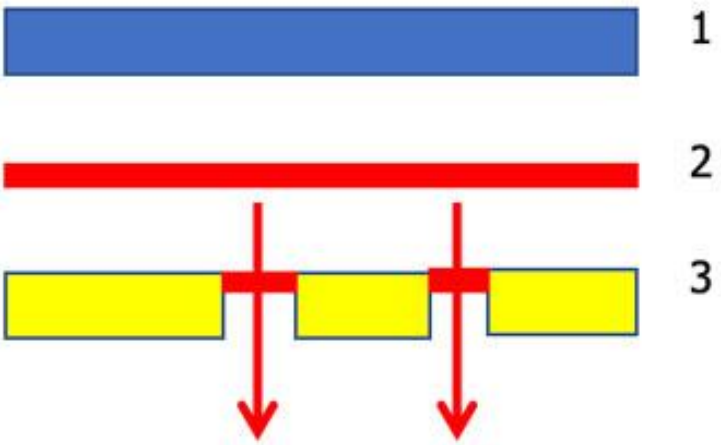
Technological Principle :



- FLEXIBLE PRINTED CIRCUIT FOIL (FPC) (1) WITH INTEGRATED LEDS (2)
- SUBSTRATE (3) HAS PERFORATIONS (4) DIRECTLY BELOW THE LEDS (2)
- TEXTILE (5) IS LAMINATED ON THE SUBSTRATE
- LEDS (2) EMIT LIGHT THROUGH THE PERFORATIONS OF THE SUBSTRATE

Peugeot 2008:

Technological Principle:



THE FABRIC (3) ON THE CARRIER (1) HAS TRANSPARENT LINES WITH LESS TEXTILE
THE LUMINOUS AREA (2) BETWEEN CARRIER AND FABRIC CAN BE REALIZED BY:

- A BROAD RIGID PLASTIC LIGHT GUIDE WITH COUPLED LEDS
- ONE OR MORE BROAD FLEXIBLE LIGHT GUIDES WITH COUPLED LEDS
- A ELECTROLUMINESCENCE FOIL WITH CONVERTER FOR THE NECESSARY HIGH VOLTAGE
- A LARGE OLED FOIL

BMW 7 Series:

Panoramic roofs can be illuminated by incoupling LEDs positioned in the sides of the roof, and by "activation" of the glass or plastic surface with screen prints or microstructures on the surface of the transparent material. New technology allows lasers to burn defined, nearly invisible light-scattering microstructures into the volume of the panoramic roof material. The volume-lasered microstructures are visible only when the light is switched on. 3D light patterns can be created in this manner, according to the whims and demands of stylists.

Pininfarina Spiaggina Holiday Concept Car

INTERIOR NEWS

The Spiaggina (Beach in Italian) is a concept car put together by Pininfarina and Fiat with nimble craftwork by Garage Italia, a Milan-based outfit who bill themselves as a "concept-to-product trendmaker at the crossroads of the fashion, design, and automotive industries".

To celebrate the 60th anniversary of the original Fiat 500, Garage Italia chairman and creative director Lapo Elkann reinterpreted La Dolce Vita to bring forth a car designed for summer leisure at sunny tourist resorts.

Pininfarina shaped the Spiaggina, initially adapting the car body and the original chassis from the Fiat 500C, later by crafting the specific elements created by Lapo Elkann and his team. The low windshield clearly refers to a motorboat windscreen; likewise, the seat's bench form and the design of a structural roll bar evokes the boat arches for antennas and radars. There's a folding trunk which, when open, looks like the small stern bridge of a yacht. The attention to detail—long a specialty of Pininfarina—stands out as the car fairly bristles with innovative design ideas: the rear cockpit that can be opened, the removable road shower, and more.

The interior, made of water-resistant materials, has white and light-blue Foglizzo leather upholstery with a waterproof treatment. There are retro-chic wide-whitewall tires, and chrome touches on the door handles, the sideview mirrors, and the hubcaps.

Convertibles Are Just as Safe as Roofed Cars: IIHS

INTERIOR NEWS

2020 FORD MUSTANG CONVERTIBLE

Unlike in the past, a convertible car's lack of a roof does not mean a lack of safety. That's according to a recent study by IIHS, the U.S. Insurance Institute for Highway Safety—a nonprofit organization funded by auto insurance companies.

Even with cloth tops, modern convertibles don't pose a greater crash and fatality risk than sedans or coupes; in fact, convertibles show a lower crash rate. An analysis of crash fatality data of convertibles that were up to five years old during 2014-2018 showed that convertibles were involved in 6% fewer crashes per miles traveled and death rates were 11% lower than in conventional cars.

"There's no statistical basis for concerns that the lack of a permanent roof makes them more dangerous," said Eric Teoh, IIHS director of statistical services and author of the study.

Other studies echo this point. Convertibles had fewer insurance claims and lower injury rates when compared to closed-cabin versions of the same car, according to a study released this year by the U.S. Highway Loss Data Institute.

Convertibles aren't generally put through certain kinds of crash test; they can't be tested for roof strength. Nevertheless, automakers have enhanced convertible safety by strengthening the A-pillars and installing roll bars. As an example, the 2020 Ford Mustang is the only convertible tested recently, and it earned top "Good" ratings in side, front overlap, and head restraint tests.

All is not completely rosy, however; occupants still get ejected from convertibles at a higher rate than from closed cars. The IIHS found that 21% of convertible drivers killed in crashes were ejected from the vehicle, compared to 17% for regular cars.

JLR's Predictive Touchscreen for Safety, Hygiene

INTERIOR NEWS

Jaguar Land Rover (JLR), working with Cambridge University, has developed a contactless touchscreen interface to reduce the need for drivers to take their eyes off the road and reduce the spread of viruses and bacteria.

The automaker says the patented technology, which they call "Predictive Touch", uses artificial intelligence and sensors to predict a user's intended target on the touchscreen—navigation, climate controls entertainment settings, or whatever else—before any button has been touched.

The system is aimed at furthing JLR's Destination Zero long-term plan to make their vehicles safer and the environment cleaner and healthier. JLR's view is that technologies such as predictive touch represent a step along the road to addressing the wider mobility landscape, encompassing how customers connect with mobility services and the infrastructure required to enable fully integrated, autonomous vehicles in cities.

According to JLR, lab tests and on-road trials show the predictive touch technology can halve a driver's touchscreen interaction effort and time. Road vibrations and the need to split attention make it difficult to select and correctly tap a touchscreen button, so drivers must take their attention away from the road to use the interface, increasing the risk of a crash. They say the AI allows the system to determine the item the user intends to select on the screen early in the pointing task, speeding up the interaction. A gesture tracker uses vision-based or radio frequency-based sensors, to combine contextual information such as user profile, interface design, and environmental conditions with data available from other sensors, such as an eye-gaze tracker, to predict the user's intent in real time.

The software-based solution for contactless interactions is described as having reached high technology readiness levels and can be seamlessly integrated into existing touchscreens and interactive displays, assuming the correct sensory data is available to support the machine learning algorithm.

iPhone Digital Car Keys Can Be Shared OTA

INTERIOR NEWS

Apple's newest iOS, version 13.6, brings digital car keys to iPhones as far back as the SE-2. It uses Near-Field Communication (NFC) protocols technology for now, though digital car keys based on UWB (Ultra-wideband) technology are on the horizon with the Apple U1 chip.

Either way, an iPhone or Apple Watch can be used to unlock and start a vehicle with the addition of virtual keys to the Wallet application. They can be shared with iMessage or disabled in iCloud.

The key has been an essential part of the car owning experience almost forever. It is the physical symbol connecting an owner with their car, even when the two are separated. In recent decades, the traditional car key has been in transition; first from a physical key to a fob that sends a signal allowing pushbutton door locking and unlocking (and vehicle starting by proximity); next, the key will go away altogether, replaced by a smartphone.

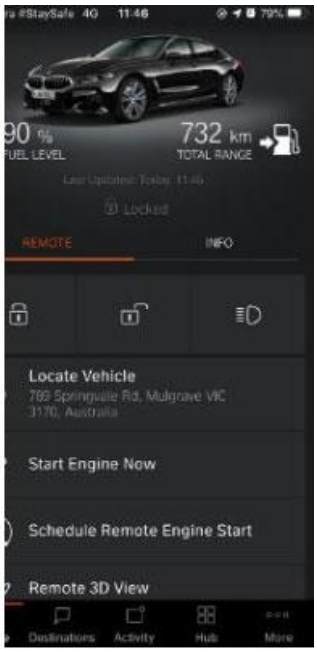
If the phone is lost or stolen, the owner can log in to iCloud from another device and disable the digital key, like disabling a credit card.

The technology is flexible; digital keys can be shared via iMessage (Apple's secure SMS protocol and server network), and there are options to restrict the utility of a shared key for teens and valets. Another layer of security can be added with an option to require Face ID facial recognition or Touch ID fingerprint identification authentication before unlocking the doors.

For the moment, it is a partnership with BMW and their BMW Digital Key system for compatible recent vehicles. Many automakers already offer similar system, but Apple's implementation of the feature natively into the iDevice ecosystem along with Apple's notoriously good security boosts the potential for this to become a universal car-key experience.

BMW's Remote Engine Start Pre-Conditions Car's Interior

INTERIOR NEWS



Certain BMW models with the iDrive 7.0 operating system and remote software upgrade capability now offer a special remote engine start feature. The system allows the vehicle owner to start the engine for up to 15 minutes at a time from any location through the BMW ConnectedDrive App. From there, it allows for the cabin conditions to be optimized before the driver and occupants enter the car.

The function can also be enabled via the car's key at a range of between 30-70 meters. If the vehicle has features like seat heating, seat ventilation and steering wheel heating, they can be activated remotely. This cluster of features is expected to be particularly useful in hot and cold climates, where the owner may want to pre-heat or pre-cool the interior before stepping inside.

Yanfeng CHyM Lightweight Interior Parts

INTERIOR NEWS

Natural fiber has been applied in several fields of automotive interior design, such as damping material, in seats, and to strengthen or replace plastic trim parts. It is a challenge to use fibers in positions with tough requirements for strength, durability, and humidity tolerance. For application in an interior door panel, for example, the panel must be protected against condensation and rainwater which might flow between the outer door sheet and the inner panel. There are several applications of natural fiber in combination with glass fiber and with synthetic resin for protection. Eligible natural fibers include kenaf, hemp, flax, jute, and sisal, among many others.

On the road to CO_2 neutrality, Yanfeng (Yanfeng Automotive Interiors - YFAI) has recently communicated on their CHyM fiber process technology. CHyM stands for Compression Hybrid Molding, existing since 2013 for lightweighting. It uses a natural fiber mat, put into a tool and back injected with polypropylene with a honeycomb structure to provide needed performance. It also is available as a glass fiber mat. On its own, CHyM parts offer up to 40 percent weight savings, depending on the part and the customers' demands.

Door panels are typically covered with PVC or leather. CHyM panels could be used without any skin, though few automakers are interested in showing the natural material. As an option, Yanfeng is showing a new decorative cover with a thermoplastic polyolefin film. The film could even be transparent, allowing natural fiber to be seen beneath the surface in a tight mesh, producing a 3D effect.

Audi Opens Interior in New Q4 e-tron

INTERIOR NEWS

With the recent launch of their Q4 Sportback e-tron concept, Audi confirmed that without the need for a transmission tunnel, the vehicle will offer much more front and rear leg room.

Audi has emphasized the sense of interior space via the color scheme, which combines light, warm colors for the upper section of the cabin with contrasting dark carpet in the floor area. The headlining, the window pillars and the upper section of the door rail and dash panel are finished with white and beige microfiber textiles.

Sustainability was a key consideration in the design of the décor; the floor covering is made of recycled materials, and instead of chrome-plated metal decor frames, the surfaces are covered with a high-quality multilayer paint finish.

Audi chose to keep the LED-display dashboard relatively simple: speed, charge level, and navigation information are provided, while a large head-up display with augmented reality is a first for this class by Audi.

Above the Q4's center console, there's a 12.3” touchscreen tilted toward the driver which provides access to the infotainment and vehicle functions. A strip of HVAC control buttons is located below it, while frequently used functions can also be selected via control panels designed as touch elements on the steering wheel spokes.

As the center console does not need to hold functional elements such as gearshift or handbrake levers, that space is repurposed as a storage compartment that includes a cellphone charging cradle.

News Mobility

_Trajectories, Our Mobile Signature

NEWS MOBILITY

TIRE MARKS, FORMULA 1

(a designer’s look at our mobility-centric culture)

4. Early automotive trajectories

(this story is part of an ongoing series on mobile trajectories as defining element of our cities)

With a wide spectrum of social changes, massive urbanization, high levels of productivity, profit and prosperity, the 19th century set some of the most amazing achievements. Talented urbanists and visionary leaders embedded the new standards into our surroundings and established the corridors of progress and social growth. A new urban mindset took over, and mobility branded modern urban spaces. From Paris to Berlin and Chicago and other major cities, wide metropolitan avenues, large urban parks, squares, roundabouts became the landmarks of new mobility and soon enough a distinct, state of the art commodity would be crossing all boundaries.

In less than 20 years after Haussmann's death, the automobile took over and a bothering thought came to mind. Did the Baron know that a novel form of mobility would soon

conquer his urban masterpiece and thus he rushed to put in place, early on, its spatial expression? Perhaps. However, it is obvious that Paris was built before the automobile, like most European cities, but strangely enough was designed for it.

All technical progress made on carriages associated with the internal combustion engine gave an astonishing engineering composition. The automobile, inseparable of its production method and the organization of a new manufacturing approach, implicated societal changes. Henry Ford recommended increasing wages regularly to widen the pools of consumption. The market opened to the vast middle-class populations and mobile trajectories became a form of personal expression. Now all territories were up for grabs, including external factors of cognitive intuition such as mud, bumps, steep slopes, sharp turns, and all unpredictable factors that may occur and alter the traveling path of the pioneer motorists. Road gravel, with frequent automobile passage, soon disintegrated into dust. Four-wheelers slid and dust becomes the visual atmosphere of this unexpected mechanical episode. Side sliding is an irregularity and a new type of trajectory that for the decades to come will constitute a strong and symbolic imaginary. Inherited sliding trajectories are now dialed into car mythology and graphically drawn in black burned tire traces on tarmac. They reveal the unique signature of the pilot in drift culture championships, set in a similar foggy atmosphere; dust is replaced by smoking tires and trajectories are drawn with artistic precision around interfering obstacles (*e.g., Ken Block gymkhana series)*.

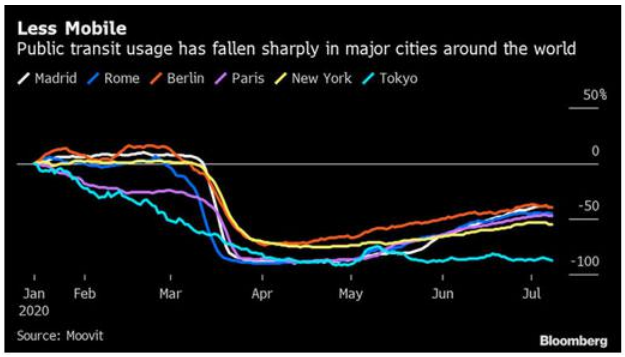
Tires have reassured traction and simultaneously became the drawing media on driving grounds, tracing some of the sharpest lines along the most exotic race circuits and doodling domesticated trajectories in every populated or not territory. At the end of that fascinating decade, automobile was established as the dictate mobile reality in heavily decorated environments by direction signs that drew the theater-set of the automotive toe-dance.

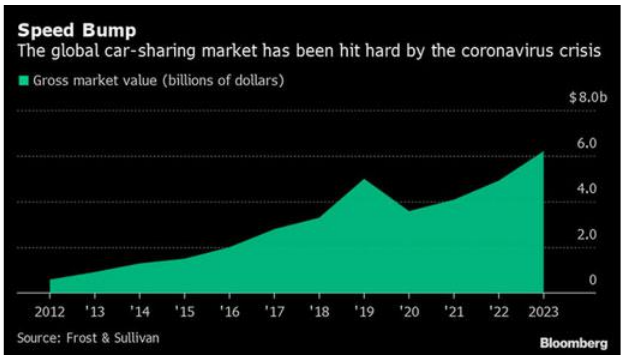
to be continued…

*INDUSTRIOUS*_____

Does Coronavirus Threaten the Model of Urban Mobility?

NEWS MOBILITY





Mobility services are suffering from the fallout of the pandemic, with Frost & Sullivan predicting a 25 per cent drop in the market this year. Concerns about contagion and city dwellers who are less mobile because they are more working from home are combining to push customers away from mobility services.

Europe is particularly competitive because of its compact cities and an array of public transport options. "Car-sharing as a business model is a tough one to achieve profitability in," says Shwetha Surender, head of new mobility at Frost & Sullivan. "It is not going back to pre-COVID levels immediately. We expect a slow recovery." Globally, more than 15 operators already shut down last year.

In Madrid, 50% of people plan to use short-term rental services "less" or "much less" than before, and 8% say they will never again use them, according to a report by consultancy EY-Parthenon.

In Rome, just 1.3 percent of people plan to use share-cars or other mobility services as contagion risk impacts consumer behavior, according to a survey by Moovit, a mobility company recently acquired by Intel. There, people favor traveling by foot, using their car, or their Vespa.

Of course, short-term rental companies are adapting by upgrading health procedures and offering a wider array of rental options, including advanced reservations, hourly packages, and multi-day bookings. Will it be enough?

Paris is an exception. The market there got a boost at the end of 2019 because of a major transit strike, and has since bounced back after the lockdown. Driving a car, even a rented one, is considered safer than public transport.

And on the whole Frost & Sullivan still forecast a market rebound, as fleet cars are probably easier to sanitize compared to public transport vehicles.

Lyft 100% EV by 2030

NEWS MOBILITY

Ride-hailing company Lyft whose vehicle fleet is currently over 99% combustion-engine cars, put out an announcement recently that every Lyft vehicle will be electric by 2030. But the company will not provide financial support to drivers for switching from ICE cars. Instead, the company will privatize the profits and socialize the debts by pushing competitors, lawmakers and automakers to offer financial incentives for buying, leasing, and driving electric vehicles.

John Zimmer, Lyft's co-founder and president, says the company has reached a scale to impact policy change. "If policymakers do their part in the next few years, EVs should reach cost parity with gasoline vehicles by mid-decade," the company said.

A February study found ride-hail services create around 50 percent more carbon emissions than private car trips.

Short-term rental could be hit anyway by upcoming new regulations, so Lyft chose to communicate ahead to benefit from the announcement.

General News

Renault Strengthens Design Team

GENERAL NEWS

There are new leaders in the Renault design team, by Laurens van den Acker as Corporate Design EVP and member of Groupe Renault's Executive Committee.

GILLES VIDAL

Gilles Vidal, formerly chief designer at the Peugeot brand, will start at Renault in November. He is the Renault Group's second major hire from PSA this year, following Gilles Le Borge, who led PSA's engineering before joining Renault in January.

Vidal graduated from the Art Center College of Design in Switzerland and has spent his entire career with PSA. He joined Citroën in 1996, working in interior and exterior design,

then as manager of the C4 and C4 Picasso models. He worked in advanced design and concept vehicles for Citroën before joining Peugeot in 2009, and was named design director at Peugeot in 2010.

In addition to his role at Peugeot, Vidal was responsible for user experience and user interface at PSA Group, and created the Peugeot Design Lab. Under his tenure, Peugeot moved toward a more dynamic style for recent models such as the 508 midsize fastback sedan and station wagon and the 3008 and 5008 SUVs, which were formerly positioned as minivans.

ALEJANDRO MESONERO-ROMANOS

Alejandro Mesonero-Romanos, formerly Seat's design director, will join as well.

Mesonero-Romanos was born in Madrid, Spain, and graduated in industrial design from the Elisava Barcelona School of Design. He also holds a master’s degree in automotive design from the London Royal College of Art.

He held several positions at different marques in the VW Group before joining Renault in 2007 to work in the advanced design department. He was then appointed design director of Renault Samsung Motors in South Korea.

His last position was design director of Seat, which he started in 2011. He was responsible for the fifth generation Ibiza, as well as the latest versions of the Leon range and the Cupra Formentor and el-Born.

Bosch Software, Electronics Merged Into One Division

GENERAL NEWS

Bosch will establish a new Cross-Domain Computing Solutions division. From the start of 2021, the new division with about 17,000 employees will provide Bosch customers with electronics systems and the requisite software.

A modern vehicle contains some 100 million lines of software code (one million lines equals 18,000 printed pages). The market is still growing at a pace of more than 15%, and the software of automated vehicles will include between 300 and 500 million lines of code. The new Bosch division will help to reduce this complexity through cross-domain software and electronics solutions. In addition, it will aim to get new vehicle functions on the road significantly faster.

To achieve this, Bosch software, electrical, and electronics engineers from the areas of driver assistance, automated driving, car multimedia, powertrain, and body electronics are being shifted to the new unit. Harald Kroeger, member of the Bosch board of management in Bosch's Mobility Solutions business sector, will be responsible for the new division.

This division will also be in charge of development of vehicle computers, control units, and sensors to have more reliable system through smoother interaction. Bosch's yearly automotive software expertise represents €3bn.

Waymo, FCA Partner for L4 Light Commercial Vehicle

GENERAL NEWS

2020 RAM PROMASTER (US MODEL, SOLD ELSEWHERE UNDER CITROËN, PEUGEOT, FIAT BRANDS)

Waymo is now FCA's exclusive, strategic technology partner for L^4fully self-driving technology. Waymo will work exclusively with FCA as preferred partner on the development and testing of L^4autonomous light commercial vehicle for goods movement, including in Waymo Via. The initial project will be integration of the Waymo Driver into the Ram ProMaster van.

The expansion of this partnership with FCA is the latest step towards scaling and deploying what Waymo calls "The World’s Most Experienced Driver" across ride-hailing, trucking, local delivery, and personal car ownership.

The move upgrades a relationship that started four years ago when Waymo began buying hundreds of Chrysler Pacifica hybrid minivans for road tests and to serve as the main vehicle for its early-stage robotaxi service in suburban Phoenix, Arizona. FCA now will integrate Waymo software, computers and sensors into Ram commercial vans for use by the new Waymo Via autonomous logistics service. The companies aren't sharing financial details related to the partnership and haven't said if it involves PSA Group, with whom FCA will soon merge.

This is Waymo's biggest partnership yet, as alliances reshape the autonomous tech race. Other Waymo partnerships include Volvo, Renault and Jaguar.