

## Editorial

# Autonomous Driving And V2X Communication



I was last week in Shenzhen, Anne Hometown (Anne is our DVN representative in China. To visit some DVN members (and possible members) to exchange about lighting, automotive market and understand the Chinese way of working, including Chinese vehicle development speed.

During my first taxi trip, my somnolence was brutally interrupted by these small yellow vehicles, riding at an estimated speed 40 kph, with 2 side lidars, 1 roof lidar and a lot of other sensors. No driver.

These cars are food delivery cars. You order your food on your phone, and they deliver to you the food. In a 5-minutes drive, you can meet around 50 vehicles like these ones. All of them have front and rear displays with clear messages. English translation on front means “be careful”, and on rear “keep distance”. They are driving smoothly in the traffic, no accident, no risks. You feel safe.

This week I publish a long article from Eric Blusseau about the history of the AD signaling lamp in Geneva (the famous turquoise lamp). 7 years that this topic is on the table to decide if we want (or not) a specific lamp to signal if a vehicle is in AD mode or not. Next step will be if we want to interact with other cars (the famous V2X communication).

This is a real example of the Chinese speed. They have V2X with lighting on these vehicles. They do it. Is it good or not ? I am not able to judge, but they do. They simply move forward.

Sometimes in Europe it may be good to move forward. Hope GRE will take a decision during April session (and then GRVA and WP29).

Sincerely yours,

**Paul-Henri Matha**  
DVN Chief Executive Officer and Lighting General Editor

A handwritten signature in blue ink, appearing to read 'pammuuu'.

# In Depth Lighting Technology

## 7 years of discussion about AD-Signaling lamp



**By Eric Blusseau, Legal expert DVN**

For several years, the automotive industry has worked on driver assistance systems which perform some driving tasks (eg: Adaptive Cruise control system, lane keeping assist). As research continues, the performance of driver assistance systems is increasingly advanced and can partially or completely replace the human driver. In such conditions, the vehicle can complete travel autonomously not requiring driver oversight.

WP29 at UNECE decided to create a new working party, the target of which is to define the specific regulations for this kind of vehicles (GRVA: Working Party on Automated/Autonomous and Connected Vehicles). The first session occurred in Geneva in 2018.

In Parallel, GRE (Working Party on Lighting and Light-Signaling) addressed the question of a specific need of Autonomous vehicle marker lamp.

The lighting signaling Experts of GRE worked on this topic and were wondering about the safe interaction between an Autonomous vehicle and the other road users. GTB submitted two informal documents addressing these questions to GRE Experts during the 79<sup>th</sup> session in April 2018. GRE during the following session in October 2018, concluded that a new task Force should be created to address this topic. This new task force was created (TF AVSR: Autonomous Vehicles Signaling Requirements). WP 29 should manage the relationship between GRVA and GRE.

Please find herewith below the table which describes the more relevant steps of the actions.

Dates	Meetings	Take away
April-18	GRE79	Presentation by GTB of a document dealing with studies dealing with interaction of an autonomous vehicles with the other road users. Basic signal for autonomous vehicles is needed.
October-18	GRE80	<b>Creation of a new Task Force : Autonomous Vehicle Signaling Requirements (AVSR)</b>
November-18	AVSR 1	Kick Off Meeting. Chair: K Manz. Secretary : L. Schwenkschuster. Question about the safety benefit of a dedicated signal for automated vehicles?
December-18	AVSR 2	Analysis of existing studies dealing with interaction ADAS/ other road users.
January-19	AVSR 3	Review of studies: (Light Sight Safety, ISO, ...) and literature about ADAS road users interaction. Analysis of SAE J3134 (Automated Driving System (ADS) Marker Lamp). Drafting of a document "arguments".
February-19	AVSR 4	Drafting of arguments to consolidate the received information since the previous meeting
March-19	AVSR 5	Preparation of the progress report for GRE 81.
April-19	GRE81	Progress report of AVSR TF: Safety benefit of a signal for ADAS? No conclusion. If yes, it should be visible. GRE decided to request WP.29 for guidance on this matter.
October-19	GRE82	Stand by
October-20	GRE83	Stand by
April-21	GRE84	The question of relevance of a signal for ADS address to the Working Party on Automated/Autonomous and Connected Vehicles (GRVA). GRE contacts the GRVA and FRAV Chairs for guidance on light-signaling requirements for autonomous vehicles. GRE agreed that the activities of TF AVSR are put on hold until such guidance was received.
October-21	GRE85	GRE to contact again the GRVA Chair with the aim to obtain guidance on potential light-signaling requirements for autonomous vehicles.
April-22	GRE86	No feedback from GRVA and no AC.2 guidance on the issue, <b>GRE asks to screen UN Regulation No. 48 to identify which amendments</b> would be necessary to cater for ADS level 3 and below. TF AVSR shall convene a kick-off meeting on this topic.
June-22	AVSR 6	Fitting of R48 for ADS No feedback from GRVA about ADS marker lamp.
September-22	AVSR 7	Fitting of R48 for ADS. Status report and draft proposal R48 to GRE.
September-22	GRVA 14	Discussion on the need of a ADS marker lamp.
October-22	AVSR 8	Status report and draft proposal R48 to GRE.
October-22	GRE87	Feed back GRVA: no mandatory requirements for additional light-signalling devices beyond those requirements established for manually driven vehicles. • establishment of uniform provisions for a light signal to communicate the ADS operational status under certain conditions, should it be required or permitted by an individual contracting party. • continued monitoring of research into the ADS signalling and safety. TF AVSR to continue liaising with GRVA. 1st draft proposal of fitted R48 considering specific requirements for ADS.
November-22	WP29	WP 29 recommends that GRE conducts analysis of research and establishes high level principles related to light-signalling for ADS operational status,
January-23	GRVA 15	An external <b>light signal would not be the preferred option</b> , at this stage, to identify the status of a vehicle with ADS.
March-23	AVSR 9	Questions about ADS marker lamp. Different position for some contracting parties. ADS marker lamp introduced in R148 (lamp) and in R48 (Installation)?
March-23	AVSR 10	<b>GRVA: No lamp needed but the Contracting parties have to decide. -&gt; ADS marker lamp optional?</b> Question addressed at the next GRE Session.
April-23	GRE88	TF AVSR introduce Automated Driving System in UN Regulation No. 48. TF AVSR reports that there are different positions of contracting parties on the need of an automated driving system (ADS) Lamp.
May-23	GRVA 16	Comments on the proposal of AVSR
June-23	AVSR 11	New definitions in R48 for ADAS : Manual Driven vehicle, Automated Driven vehicle, Driven system control. Contact GRVA/FRAV for comments.
July-23	AVSR 12	Comments from GRVA/FRAV considered. Modification of the draft R48. Proposal sent to GRE/

October-23	<b>AVSR 13</b>	Revised definitions and fitting of R48 for ADAS . -> GRE
October-23	<b>GRE89</b>	New draft proposal from TF AVSR: revised amendment of R48 A set of new definitions and vehicle & (sub)categories to be introduced.  TF AVSR proposes to submit to the next GRE session an informal document addressing the colour and intensity of the ADS marker lamps.
November-23	<b>AVSR 14</b>	Revised definitions and fitting of R48 for ADAS . -> GRE ADS Marker lamp: Stand by. Waiting for WP29 and GRVA guidance.
January-24	<b>AVSR 15</b>	Fitting R48 for ADAS. Progress report to GRE.
March-24	<b>AVSR 16</b>	Fitting R48 for ADAS. GTB Proposal: ADS Lamp definition General requirements of the lamp.
April-24	<b>GRE90</b>	TF AVSR: revised amendment proposal for UN Regulation No. 48 to cater for ADS. GRE: several points require further consideration and expects an updated proposal for the next session. TF AVSR presented a draft concept for a separate UN Regulation on ADS marker lamps. The Chair invited TF AVSR to consider this issue highlighted by some contracting parties.
July-24	<b>AVSR 17</b>	Fitting R48 for ADAS taking into account remarks of GRE 90: Definition of Dynamic Driving task, Automated Driving system, driver,... Editorial modifications of R45 for ADAS.
July-24	<b>AVSR 18</b>	Mercedes proposal ADS marking Lamp: Installation, Photometry (Front, side and rear). Color, Fitting R48 for ADAS
October-24	<b>AVSR 19</b>	Progress report for GRE91. Fitting of R48 for ADAS to be submitted at GRE 91. To consider new vehicle categories X & Y introduced by TASK FORCE ON AUTOMATED VEHICLE CATEGORISATION (TF-AVC) (GRSG) . Definition of Automated Driving Systems proposed par TF-AVC/GRSG Presentation by GTB : ADS Marker lamp to be presented to GRE 91
October-24	<b>GRE91</b>	TF AVSR submits a revised amendment proposal for UN Regulation No. 48 to cater for automated driving systems(ADS). update the proposal for the next session. Draft amendments to UN Regulation No. 45 to make it suitable for ADS vehicles to be submitted as a working document to the next session. TF AVSR presents the first draft technical specifications for ADS marker lamps. GRE supports the work on ADS marker lamps. Review of this issue at the next session.
November-24	<b>AVSR 20</b>	Fitting R48 for ADAS taking into account the remarks of GRE91
November-24	<b>AVSR 21</b>	European Commission (EC) comments on R48 Fitting. EC proposal of editorial modifications in R148 and R149. Fitting of R48 for ADAS
January-25	<b>AVSR 22</b>	Fitting of R48 for ADAS. Comments from Canada. Next meeting in March 2025

Since June 2022, the main target of the Task Force TF-AVSR has been to fit the Regulation R48 (Installation ) with the vehicles equipped with an Automated Driving System.

For that purpose, new definitions were introduced in R48: Dynamic Driving Task (DDT), Automated Driving System (ADS), Driver, Operational Design Domain (ODD),etc. Some definitions were modified to consider the vehicle driven by an Automated Driving System: Switch On/Off,...

Some general specific requirements were added in the case of a vehicle equipped with an ADS. The tests procedure for approval of the vehicle were modified accordingly.

You can find the current document which will be reviewed during the up-coming meeting of TF-AVSR on March 11<sup>th</sup> on the UNECE Website [here](#) , document: AVSR-21-02\_Rev.2 - (AVSR) Proposal to amend UN-R48 (based on AVSR-20-02\_Rev.1) after AVSR-22.docx. After the next meeting, an informal document should be submitted to GRE during the 92<sup>nd</sup> session as an informal document.

The latest draft technical specifications for ADS marker lamps were submitted by TF-AVSR during the 91<sup>st</sup> GRE Session. (informal GRE91-12 available [here](#)).

The main proposed characteristics are:

<b>Photometry</b>	Daytime (min/max)	Front: 50 / 300 cd Rear: [20 / 120 cd] Side: 20 / 120 cd
	Nighttime (min/max)	Front: 10 / 125 cd Rear: 4 / 42 cd Side: 4 / 25 cd
<b>Color</b>		"blue-green" / "turquoise" x=0.012, y=0.495; x=0.200, y=0.400; x=0.200, y=0.320; x=0.040, y=0.320.

GRE Supports the work and shall be addressed during the upcoming session in April 2025.



However, There is no agreement between the CPs on the relevance of such a signal for autonomous vehicles:

- France is **in favour** of such a signal to clearly identify autonomous vehicles in autonomous state.
- Japan is **in favour** of having an external light signal and also of the policy proposed by GRVA. Japan believes that further discussion is needed on detailed regulatory requirements.
- UK is **not in favour** of such a signal and wants to come to a common understanding as expressed by GRVA. UK clearly wants to have a provision to ban such signals on their roads
- Korea is recently doing a study if and how to implement an ADS signal, however, no specifications available yet.
- Australia's general view is that, in the initial stages of deployment and while there is a mixed fleet of ADS and Non-ADS vehicles, **there may be benefit in communicating** to Other Road Users that a vehicle's ADS is operating.
- China **does allow such a signal**; however, it is yet not required by GB-standards and defined inside the new, draft GB standard for light-signalling devices
- SAE has established a recommended practice (SAE J3134) about ADS marker lamps.

This should lead to lengthy discussions during the next GRE sessions before an agreement can be reached. This topic is at the agenda of the upcoming GRE Session in April 2025. (See point 13-a of the agenda [here](#))

In a nutshell, we try to resume all the discussion from 7 years about AD-Signaling lamp. Different groups are involved in this topic that is certainly adding complexity for final decision

## Lighting News

# EOI Breaks Ground on New Plant in Mexico, Set to Begin Mass Production in 2026

### LIGHTING NEWS



The President of EOI, Fanny Huang (third from left), and the Global Marketing Director, Allan Kuo (third from right), participated in the groundbreaking ceremony for EOI's new plant in Mexico.

On February 11 EOI held a groundbreaking ceremony for its new plant in the newly established industrial zone in Queretaro, Mexico. This marks a significant milestone in the company's global supply chain strategy. The plant is expected to be completed by September this year and will begin mass production in 2026, further enhancing EOI's supply and service capabilities in Mexico, Central and South America, as well as European markets.

EOI President Fanny Huang shared that in response to the rapidly evolving global landscape, EOI remains agile in overcoming market challenges while maintaining a strong commitment to sustainable operations. We are also focused on strengthening its strategic alliances with leading global automotive lighting manufacturers. The new plant in Mexico has already secured several long-term contracts for LED automotive lighting modules, with agreements spanning six to seven years, and continues to expand its collaborations with clients.

Strategically located near numerous international automotive lighting manufacturers, the plant offers notable logistical advantages, helping to reduce inventory, transportation, and packaging costs, while also minimizing carbon emissions and enhancing supply chain efficiency. Importantly, the products from this plant will not be exported to the U.S. market, keeping them unaffected by the U.S. government's proposed 25% tariff on Mexican imports.

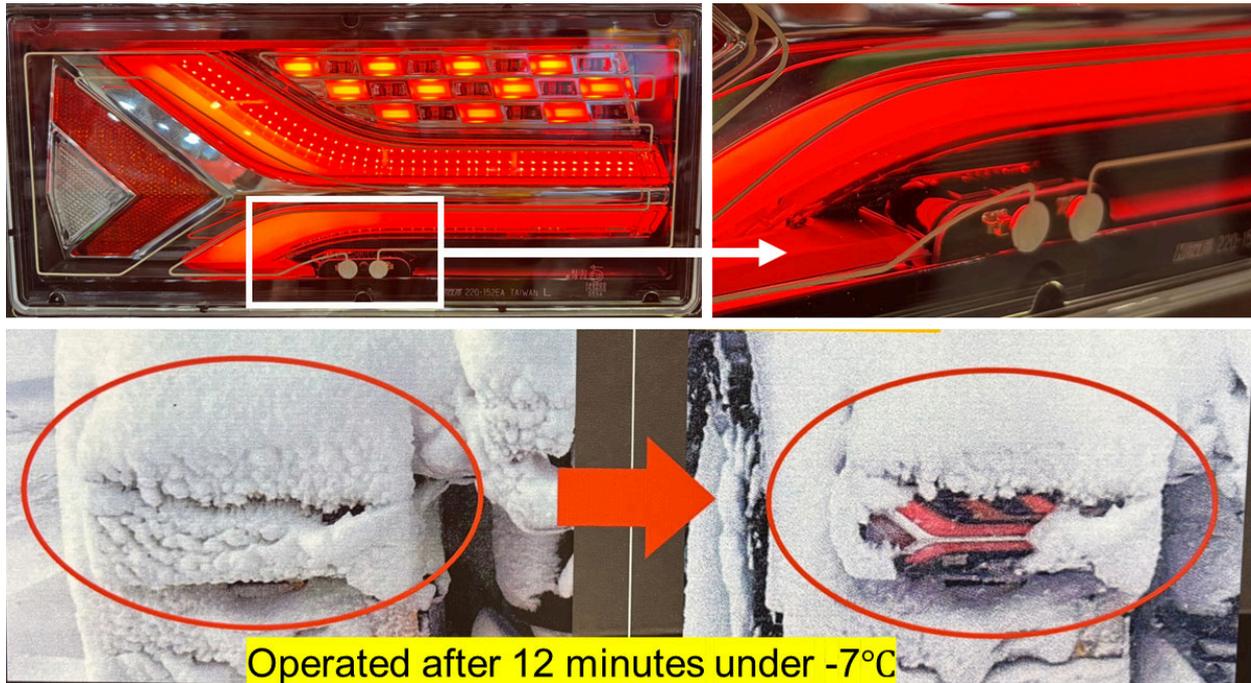
EOI Global Marketing Director Allan Kuo highlighted that approximately two million new vehicles in North America are equipped with EOI's LED automotive lighting

modules each year. This year, the company plans to ship over 300 containers to the North American market from its overseas manufacturing bases. As the business continues to grow, the Mexico plant is expected to become EOI Group's largest production base within five to seven years, generating around 800 jobs across management, engineering, manufacturing, and quality control sectors, thus contributing significantly to the local economy.

At the ceremony, Marco Antonio Del Prete Tercero, Secretary of Sustainable Development of Queretaro, and Carlos, Chairman of Frisa Construction Group, both underscored the importance of EOI's entry into the region. They pledged full support through a variety of assistance and incentive services to ensure the successful operation of the plant in the future. In addition, key executives from major international automotive lighting manufacturers attended the event, recognizing EOI's establishment in Mexico as a strategic move to better serve clients, strengthen customer relationships, and position itself as a key global partner and a rising force in the industry.

# Snow melting lamp by Koito

## LIGHTING NEWS



Koito exhibited the new Rear combi lamp for Truck at IAAE 2025. This Rear combination lamp has a snow melting device. It's the principle that a heat source is attached to the inside of the lens. There is already snow melting device today but it is a film type, but there was a problem that the film was peeled off when the car was washed. Koito's new technology uses a heat source attached to the inside of the lens to prevent from peeling problem.

A temperature sensor is installed inside the lens. Automatically turns the heater on condition that the temperature drops below 5°C and off at 15°C. The temperature reaches about 50°C on the lens surface. There is only one type of the lamp at present, which is for medium-sized trucks. SOP was last year. Koito is also considering adopting this technology for large Heavy Duty trucks.

When there is a heavy snow, especially with the recent LED lamp, the snow on the lens surface does not melt easily. In a result, the following vehicles do not notice that a truck is driving in front, which can lead to accidents. Koito believes this technology leads to safety and reduces accidents.

# Valeo, TactoTek in Lighting Pact

LIGHTING NEWS



Valeo have got a licence for TactoTek's In-Mould Structural Electronics (IMSE) technology to offer advanced interior and exterior lighting components and systems.

Valeo will apply their expertise in over-moulding processes and optical systems alongside TactoTek's IMSE technology. For safety purposes, this technology can offer functions such as a warning or visual feedback for ADAS, alerting drivers when a vehicle is detected in a blind spot, or during emergency braking. It will also enable automakers to meet the growing demand for dynamic displays that include colour management and animation, as well as customization elements such as logos.

Valeo Light CEO Maurizio Martinelli says, "Around the world, OEMs are redefining their use of lighting as their clients ask for more ADAS, differentiation and communication. To meet these new needs, our lighting solutions evolve from lines to surface, with a higher number of LED sources. With Valeo expertise and In-Mold Structural Electronics (IMSE) lighting platforms, we have the tools to transform lighting design to offer new personalisation experience and more safety on the roads".

And TactoTek CEO Jussi Harvela says automakers "find In-Mould Structural Electronics (IMSE) lighting solutions appealing for design, packaging, and power efficiency. We are excited to collaborate with Valeo — their expertise in lighting design combined with our pioneering IMSE technology will set new standards for the industry."

Lighting functions are becoming increasingly important to consumers, particularly in terms of dynamic displays and vehicle personalization options. This trend presents significant challenges: materials must satisfy various criteria regarding brightness for daytime visibility, fit behind decorative elements in terms of thickness, allow for shape flexibility, and optimize efficiency in consumption and performance.

In-Mould Structural Electronics (IMSE) technology is suited to meeting these requirements. By integrating electronic components into lightweight, 3D injection-moulded polymer structures, it offers designers freedom in creating versatile lighting elements. Additionally, it requires fewer parts and less plastic than parts manufactured using conventional methods, which reduces its impact on the environment.

The collaboration between TactoTek and Valeo is in line with the Group's ambition to guarantee a smooth and intuitive Human-to-Machine interaction by offering innovative solutions tailored to customer expectations.

# Volvo ES90 Revealed

## LIGHTING NEWS



Volvo Cars just revealed their new EV ES90 Sedan that will be produced in China, based on similar architecture to the EX90.

The maker's website hints at the car's lighting technology: "Our signature Thor's Hammer LED headlights come standard. They cast a wide light pattern for excellent visibility, and automatically switch between high and low beams as other cars approach. Upgrade to high-definition pixel headlights for even sharper night driving. 20,000-pixel modules can instantly rearrange the light pattern to reduce glare and avoid dazzling oncoming drivers. They adapt for up to five vehicles and three objects at once. As you steer into curves, they swivel to light the way. Look for the light sequence as you approach or leave the car—a sparkling display to mark every trip."



The picture just above confirms a HD microLED system just below the Thor's hammer. After DLP on Volvo EX90, Volvo is now proposing microLED HD solutions. The rear lamps seem to combine a new rendition of the trim C-shaped familial theme of recent Volvo taillights, plus a fascinating pair of high-level taillights just inboard of the rear pillars.

On the Volvo website you can also see a really [nice welcome sequence](#).

# Audi A6 Avant Revealed

## LIGHTING NEWS



Audi just revealed their newest A6 Avant (with PHED, HEV and ICE powertrains, versus the EV e-tron model). As you can see, the rear design is totally different. Audi is still using digital OLED 2.0, and a full-width light stripe, but the logo is unlit. The arrangement of the OLED tiles looks different, too.



Audi A6 e-tron Avant

Up front, we can see also similar design between A6 Avant and A6 e-tron Avant, but low and high beam are placed in the same housing with signalling function on the

Avant, and the grille is also open for thermal engine cooling.



Audi A6 Avant versus A6 e-tron Avant

A big job has been done on interior lighting, with different ambient light on cockpit, doors and central console.



# VW's New ID.every1 Concept

## LIGHTING NEWS



VW have unveiled their latest show car, offering a preview of an electric entry-level VW priced around €20,000. The ID.every1 is the final piece of the puzzle on VW journey towards the broadest model range in the volume segment. By 2027, VW will have introduced nine new models in Europe.

The lighting signature will change compared to current front and rear designs. We're looking forward to discovering the final car!



# Aito M8 Revealed

## LIGHTING NEWS



The Aito M8 has just been revealed. The extended-range crossover from Huawei and Seres got 21,000 orders six hours after presales kicked off in China. It is a three-row SUV with 526 hp and a mixed range of 1,526 km. Its starting price is C¥ 368,000 (about USD \$50,650). At the same time, the updated M9 SUV, with its starting price of C¥ 478,000 (\$65,790) got 11,000 orders. The M8 will be equipped with the new generation of XPixel lamps; watch for more detail soon in DVN.

# Vivek Jindal is New Uno Minda Lighting CEO

## LIGHTING NEWS



Vivek Jindal, who gave the introduction speech at DVN Pune in September 2024, has taken on the role of CEO for Uno Minda's newly consolidated Lighting and Alternate Fuel Systems (LAS) Domain. Previously serving as CEO of LAS-1 and a Whole-time Director, he now leads the restructured domain, bringing extensive industry expertise and leadership capabilities. With a strong track record, he has been instrumental in driving growth and innovation across various business segments. His elevation aligns with Uno Minda's strategic vision to enhance operational efficiency and decision-making while focusing on sustainable mobility solutions.

The consolidation of the LAS-1 and LAS-2 domains into a single entity is aimed at strengthening Uno Minda's position in lighting and alternate fuel technologies. This restructuring is expected to optimize resources, foster innovation, and accelerate the company's expansion in the evolving automotive sector. Vivek Jindal's prior leadership roles at Minda Westport Technologies Limited, Clarton Horn, and ACMA India have equipped him with deep industry insights, making him well-suited to drive Uno Minda's future growth in this dynamic landscape.

# VueReal Line Up Funds to Grow, Ramp Production

LIGHTING NEWS



[VueReal](#), a pioneer in MicroSolid Printing™, just announced it has secured access to USD \$40.5 million in Series C funding. The round was led by Export Development Canada (EDC) and included participation from existing VueReal investors, including Cycle Capital, BDC Capital’s Cleantech Practice, and TDK Ventures. This significant investment will enable VueReal to scale its production capabilities and enhance its ecosystem to support partners in achieving their goals of integrating microLEDs in commercial production.

The funding positions VueReal to bring transformative microLED and other micro semiconductor solutions to market at scale. With its award-winning Microsolid Printing™ technology, VueReal has redefined the industry standard, creating a clear path for cost-effective, high-volume microLED production while addressing the critical [transfer challenge](#) and enabling unprecedented efficiency, scalability, performance, and affordability. This technology is set to transform industries, including [consumer electronics](#), [automotive](#), and [healthcare](#).

“VueReal has always been committed to delivering and scaling its breakthrough MicroSolid Printing™ platform to redefine the display and sensing landscape. This latest funding round is a testament to our partners’ confidence in our technology and vision,” said Dr. Reza Chaji, CEO of VueReal. “This new capital infusion will enable us to scale the mass production of microLED lighting and displays while empowering our partners to enhance their production capabilities. By expanding the ecosystem, we aim to ensure the seamless integration of Microsolid Printing™ technology into production lines worldwide.”

“As a lead investor, EDC recognizes VueReal as a pioneer shaping the future of the global microLED market,” said Lissa Bjerkelund, Vice-President, Investments and Mid-Market Lending at EDC. “VueReal’s cutting-edge technology and commitment to

establishing a world-class production platform are pivotal in unlocking the vast potential of microLED and other micro semiconductor innovations across industries. EDC is pleased to support VueReal's global ambitions and help the company realize its bold vision for the future."

"VueReal is transforming the lighting and display industry and creating a scalable, sustainable pathway for advanced manufacturing," said Andrée-Lise Méthot, Founder & Managing Partner of Cycle Capital. "We value VueReal's ability to drive innovation and commercialize the technology through innovative business plans. We're excited to be part of this journey and look forward to seeing the impact of their technology on a global scale."

This funding milestone follows several recent breakthroughs for VueReal, including its partnership with [microLED suppliers and foundries](#) for cartridge scale-up production and significant patent portfolio growth. VueReal continues solidifying its position as a global leader in microLED and micro semiconductor innovation, driving the industry forward with its commitment to sustainability, performance, and scalability.

# Driver Assistance News

## Shenzhen's First Public Road Test for Driverless Delivery Car

DRIVER ASSISTANCE NEWS



An autonomous delivery vehicle from on-demand retail platform Meituan began a road test in Shenzhen's Longhua District on 5 February

After arriving at the destination, the car parked precisely by the roadside. After a staff member entered the verification code on the vehicle's display screen, the car door opened, and several newly ordered Chinese New Year dolls were retrieved from the compartment.



It is the city's first public road test for such a vehicle. Meituan, a leading food delivery provider, will officially provide automatic vehicle delivery services to the residents of nearby communities in Dalang Subdistrict once the testing is successfully completed.