



DVN San Francisco 2023

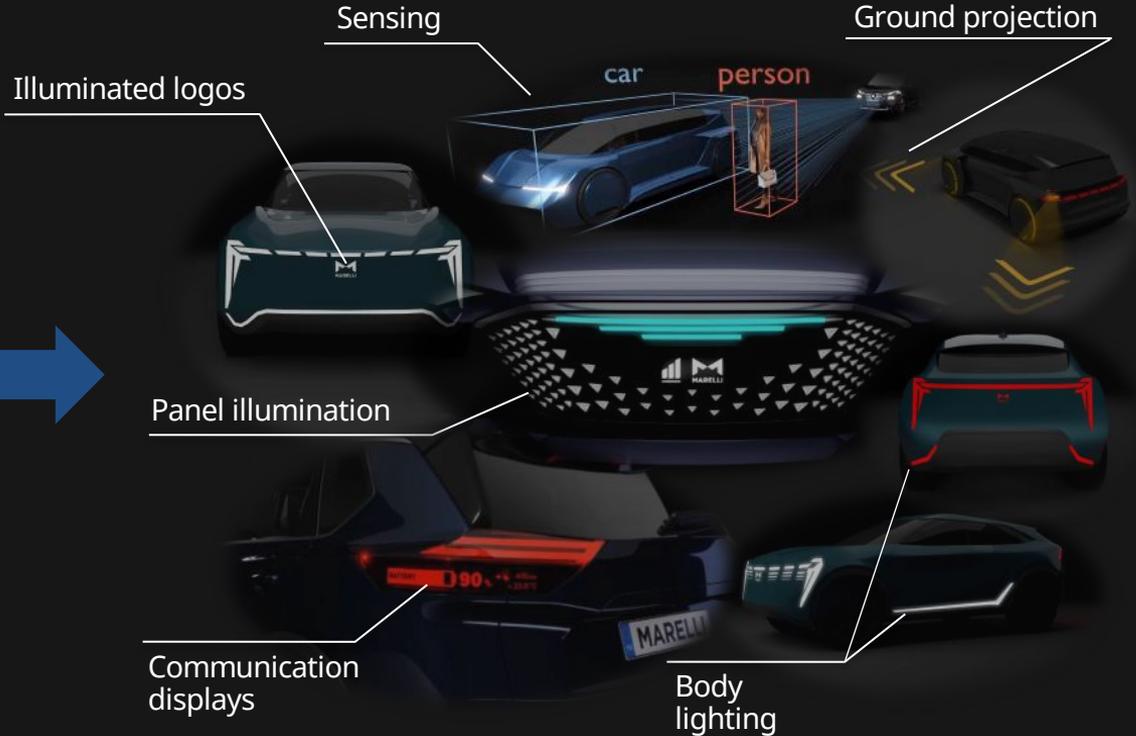
Lighting Communication and Assistance by Projectors and Displays

Coradazzi Francesco

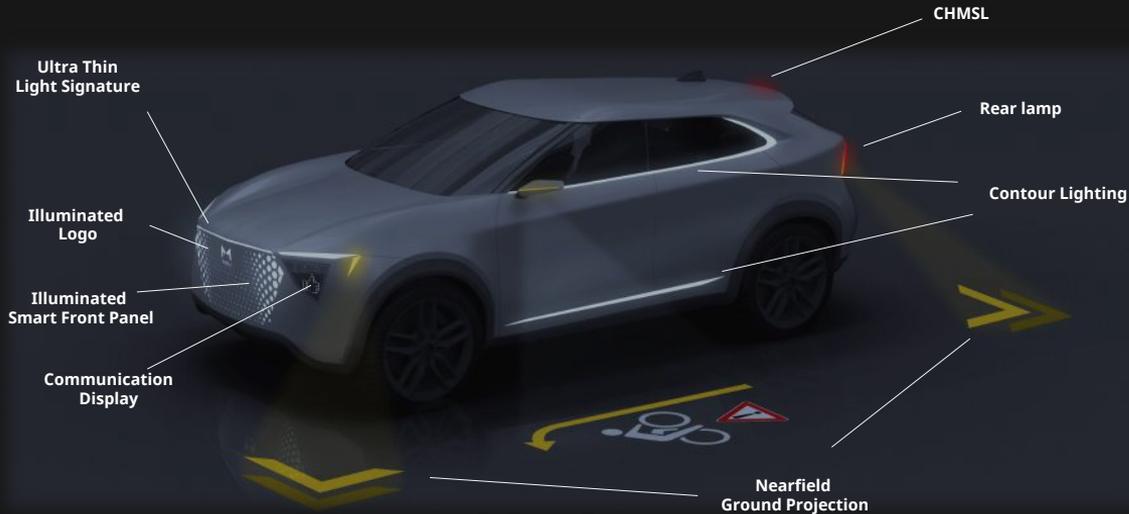
The past



The future



Central intelligence as key enabler for the future



Personalization for end customers

Features on demand / as a product (via OTA)

OEM branding & differentiation

Scalability of vehicle variants

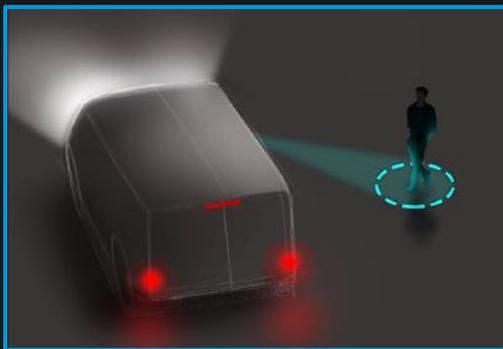
Regional and OEM-related differences (caused by culture & legislation) **will evolve**

Static and semi-dynamic ground projection

Ground Projection – 360° Use Cases



Welcome



Safety

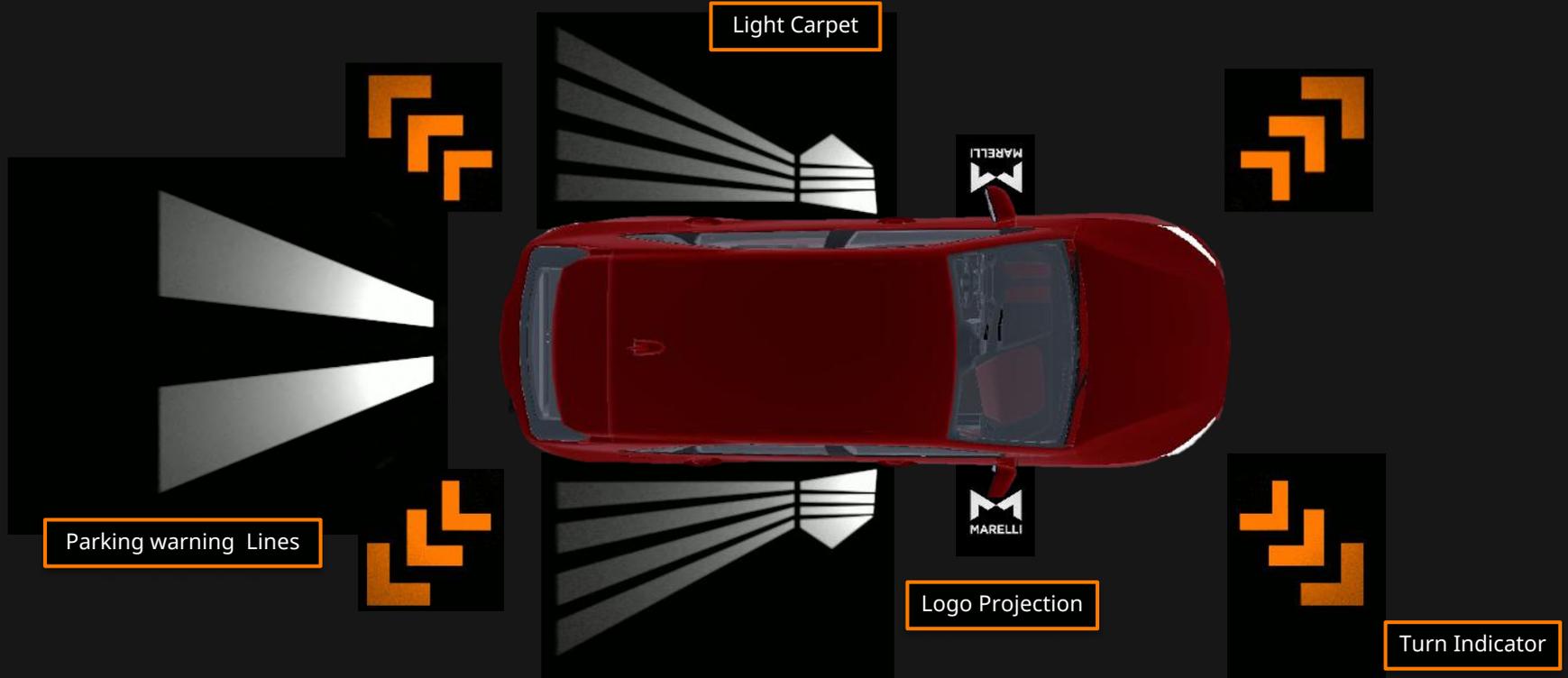


Communication



© Selected Pictures: Riccardo Anzaldi

Ground Projection - Overview



Near Field Ground Projection

Static & Semi-Dynamic Applications



Applications:

- Semi-Dynamic Turn Indicator
- Logo Projection
- Parking Assist Lines
- Light Carpets
- ...

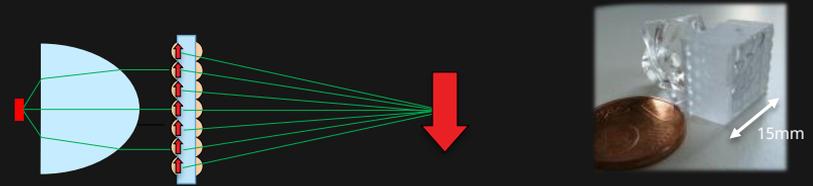
Various mounting positions:

headlamp, front panel, rear lamp, rocker panel, trunk, side mirror

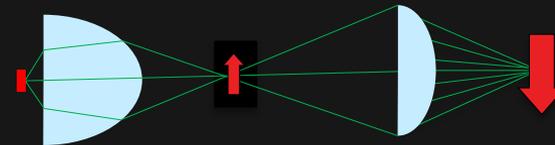


Technologies

1. MLA (Micro Lens Array)



1. Gobo projector (graphical optical blackout)



Illuminated front panels

From Lightbars

to

Smart Illuminated Front

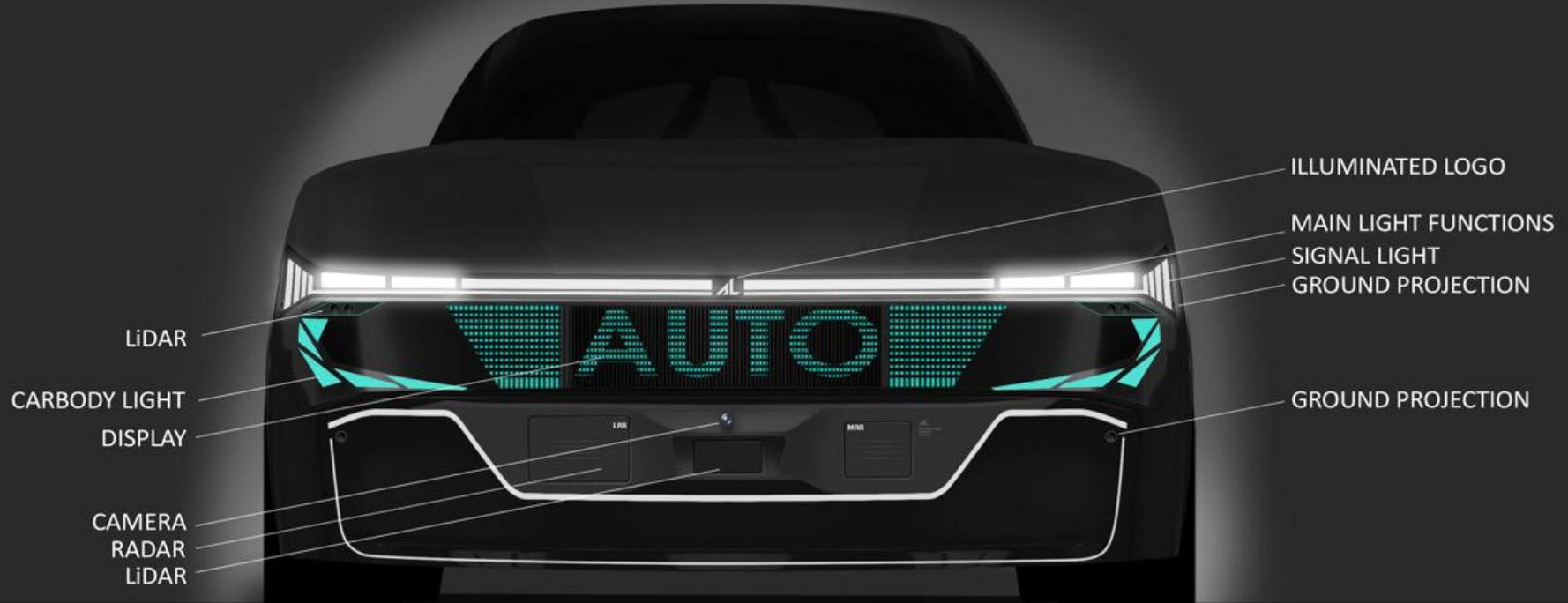


- One Lightbar
- Position Light
- underlining Car Signature
- Standard Technologies



- Illuminated Panel
- Integration with Main Light Functions
- Supporting ADAS with Sensor Integration
- To be used for communication, V2X

The Evolution of Signature Lighting:



Improving the User Experience with Illuminated Body Panels

The Evolution of Signature Lighting



Matrix displays

Displays : advanced communication & differentiation



Being different as new identity

Communication for safety and comfort

Display used for signaling, symbols and advanced communication



Personalization & customization for end users

Programmable Light functions , increased LED segmentation and OLED technology will enable customized signatures in combination with OTA personalization.



Differentiation and branding for the OEM

New features capable to underline and emphasize brand signatures and vehicle personality.



Displays : advanced communication & differentiation



The first steps...

Welcoming scenarios and emotion

Low resolution display used for symbols and animated welcome scenarios

Signaling and communication

Displays as part of signal functions and enabling basic communication.
Multicolor LEDs enabling full signaling compatibility

Differentiation and branding

Specific display stylings and OEM-individualized animations lead to strong brand identification through "WOW"-effects.



Displays : advanced communication & differentiation



Marelli supports with ...

First steps and the track beyond

Experience and know how - First products on the road

Support & guidance for user experience and use cases 360° around the car

Human Horizons
Hiphly Y



https://www.human-horizons.com/main/smart_car/

Next generation front lighting microLED

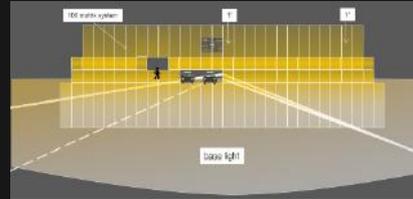
Main light function : HD democratization



μLED enables High Definition for everyone

- Dynamic light distributions – the Wow
- Adaptive to regional regulations – simply switch
- Highest performance – boost the IIHS rating

- Road projections – raise attention



Differentiation will also be needed for **μLED** based ADB in the next generation :

D&E Segment (100k)

B&C segment cars (4k ... 20k)

Speed Limit
Warning



Guide Surface
Lines



Lane Keeping
Left / Right



Speed Limit



Ice
Warning



Snow
Warning

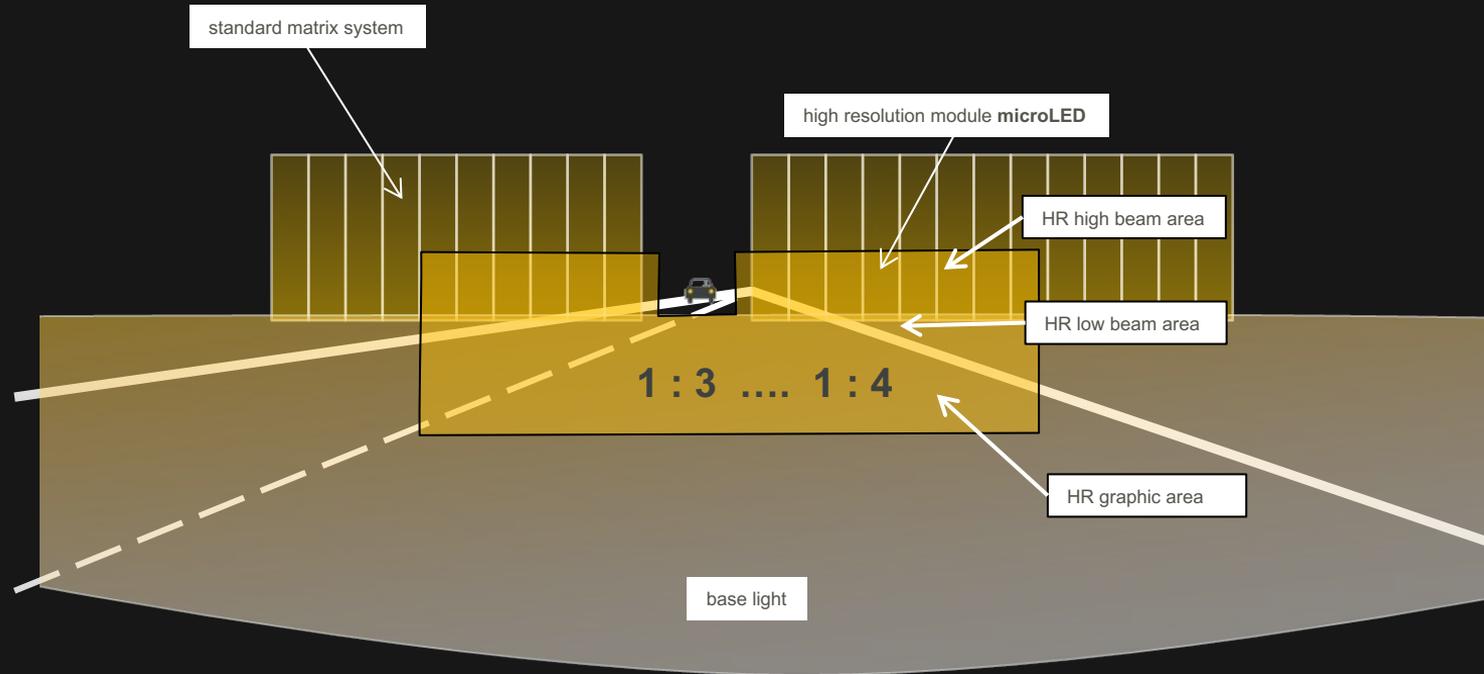


Road
Works



High resolution micro-LED Technology

Glarefree High Beam

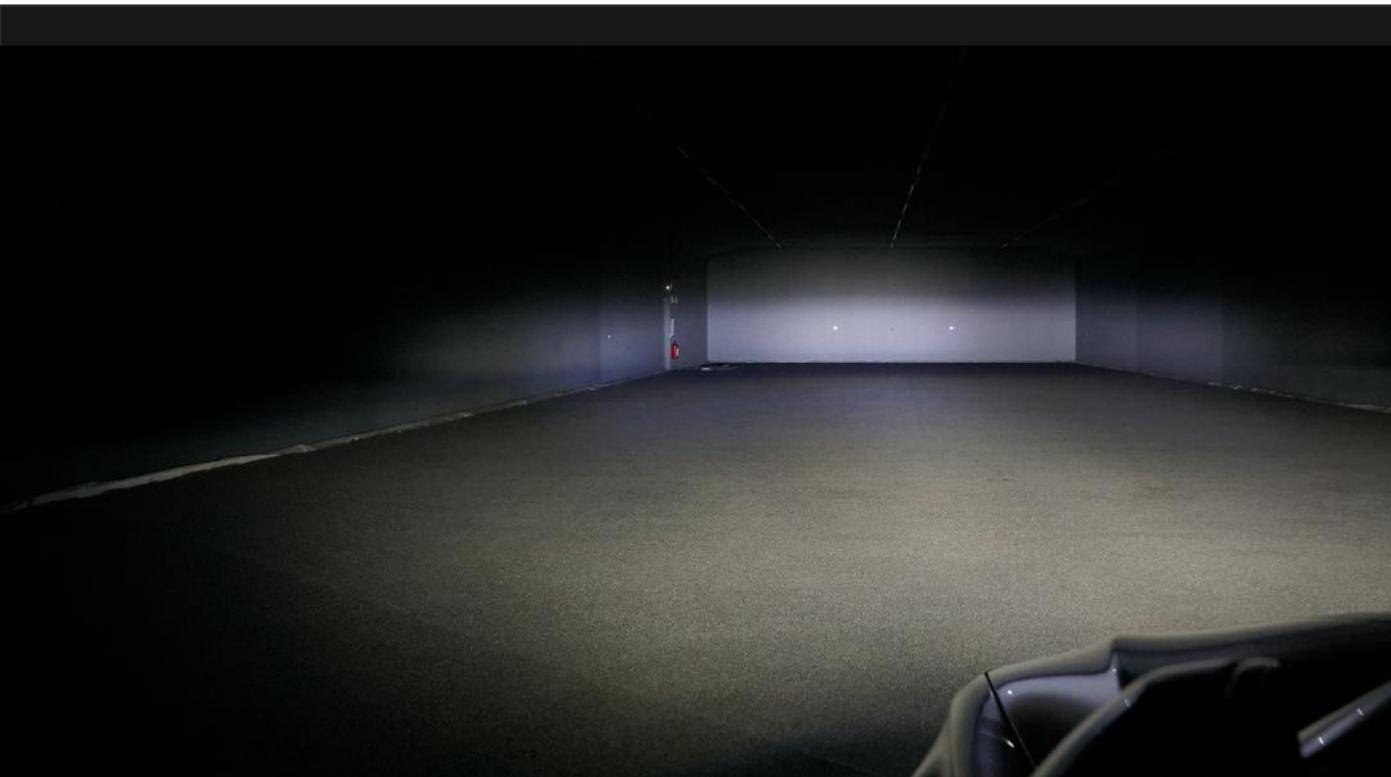


Low Beam



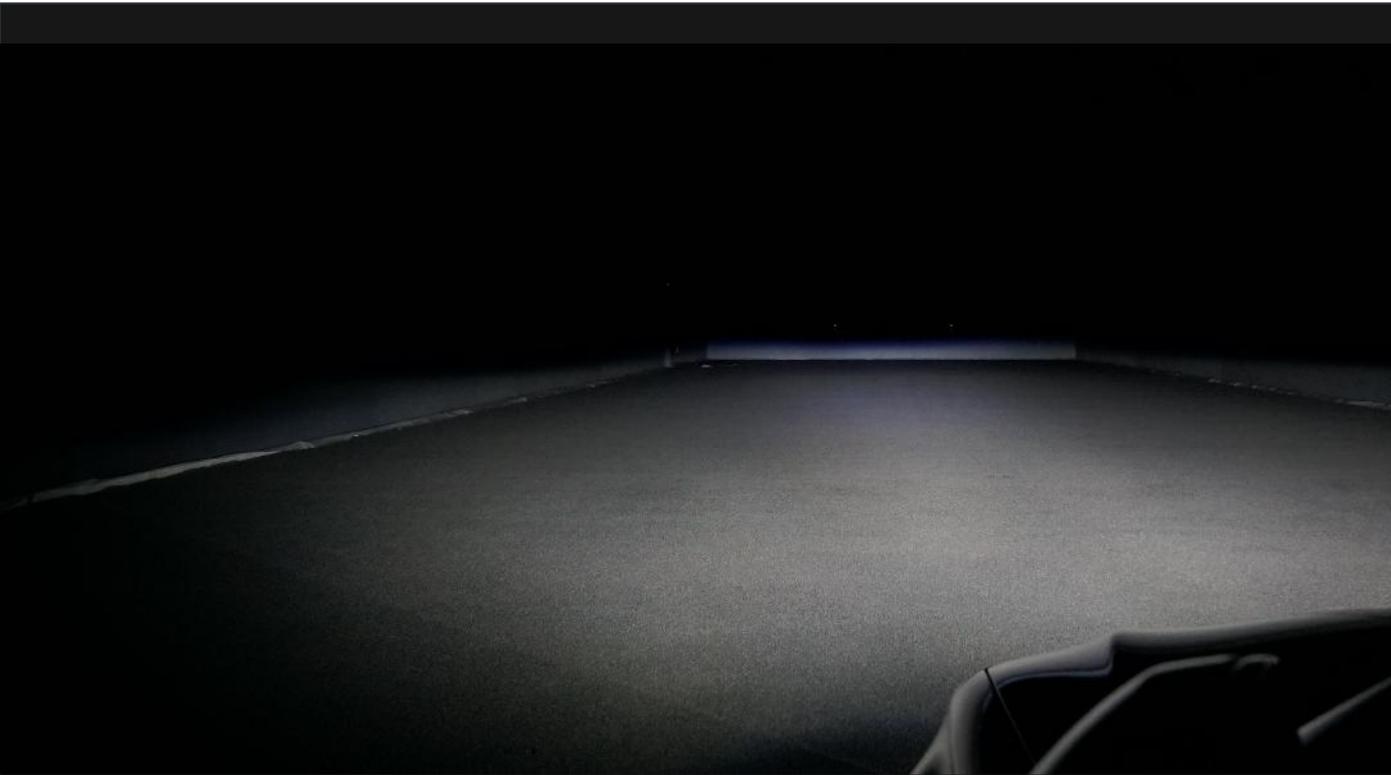
AL-test car prototype headlamp with micro-LED module prototype

Full High Beam



AL-test car prototype headlamp with micro-LED module prototype

Town Light



AL-test car prototype headlamp with micro-LED module prototype

Distance Warning



AL-test car prototype headlamp with micro-LED module prototype

Distance warning



AL-test car prototype headlamp with micro-LED module prototype

Lane Keeping Assist



AL-test car prototype headlamp with micro-LED module prototype

Lane Keeping Assist



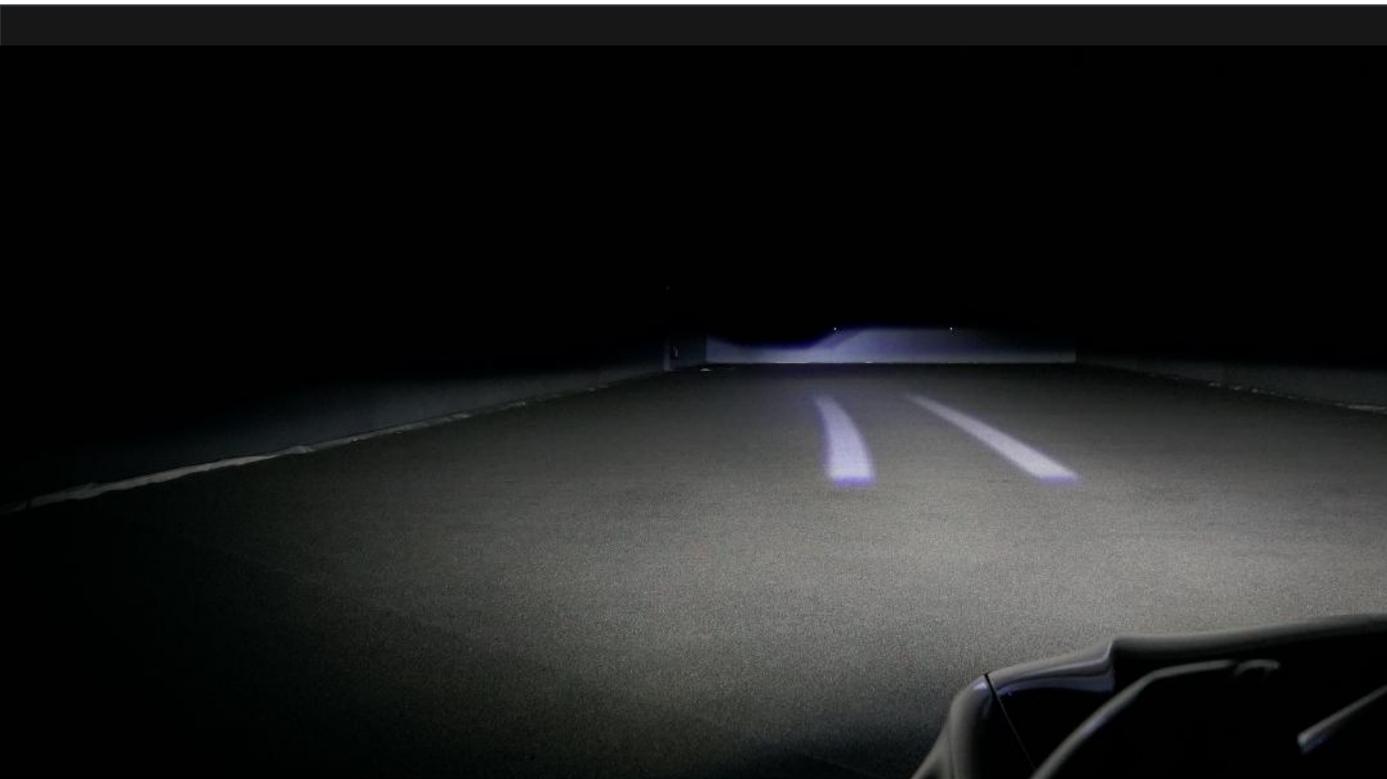
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MicroLED SOPs

VW Press-Release



(Source: VW, <https://www.volkswagen-newsroom.com/de/der-neue-touareg-15441>)



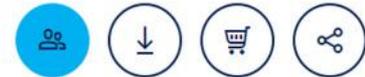
Volkswagen are upgrading their third-generation Touareg, not least in lighting. There are new HD LED matrix headlamps with more than 38,000 interactive LEDs to project a light carpet exactly onto the driving lane and illuminate the road more precisely than ever before.



The camouflaged Tiguan during final test drives

06/15/23 | Wolfsburg | Models | Press Release

Final set-up drives: New Tiguan⁰¹ with premium class technologies and a long electric range



> MQB evo – the latest evolutionary stage of the modular transverse matrix platform brings a variety of modern technologies on board the Tiguan

> In future, the successful model will be launched with premium features such as HD matrix headlights and new adaptive chassis control



Thanks!