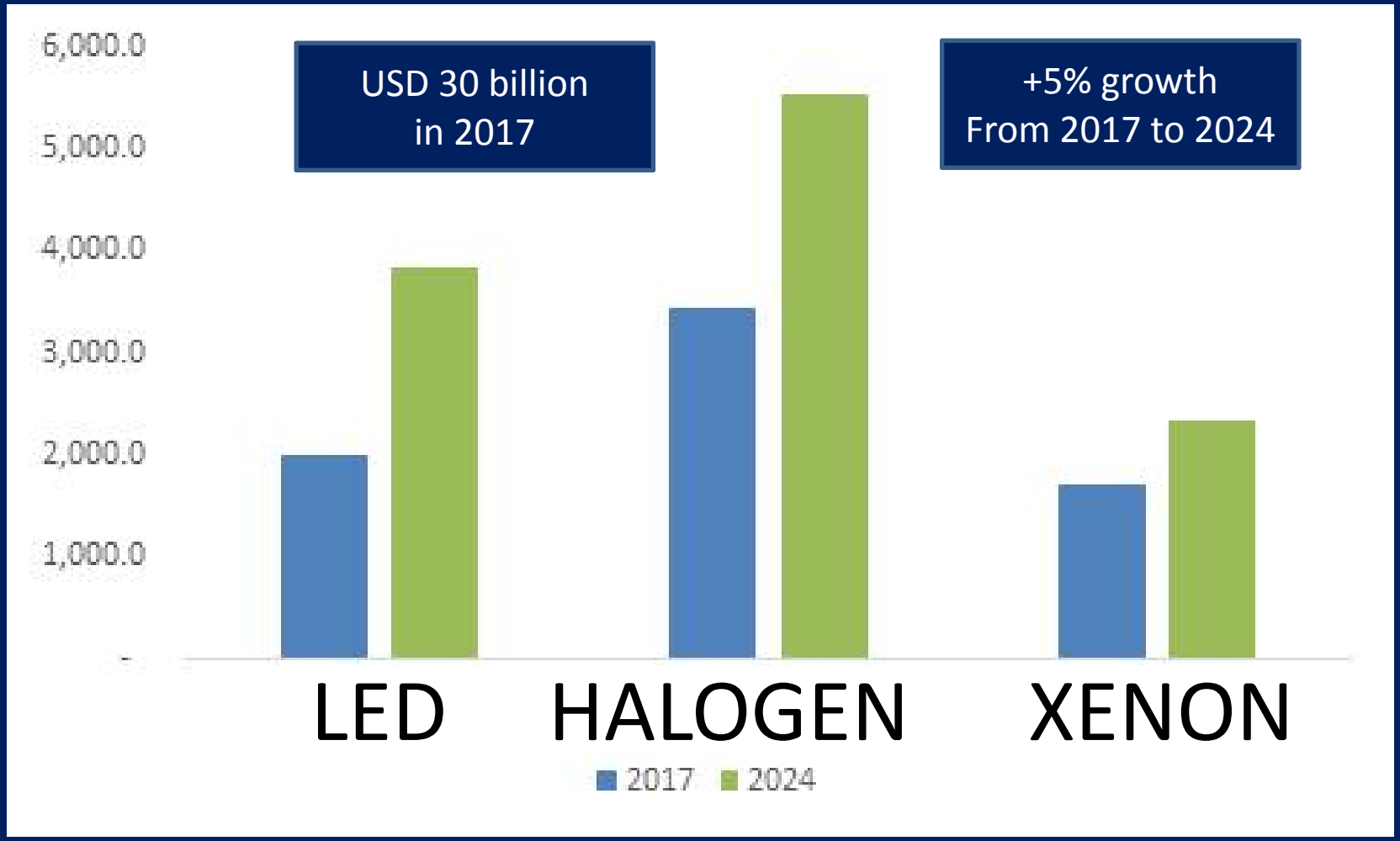
Light & design for automotive industry

By Agnes Kubiak and Sherman Chu
Style-vision

Automotive lighting is an international mega-trend. Increasing technical advances in lighting inspire motorists to seek out the latest innovations.
Enhanced performance, improved security, and a memorable design and emotions are the key points of automotive lighting trends and research.

MAGIC LIGHTING

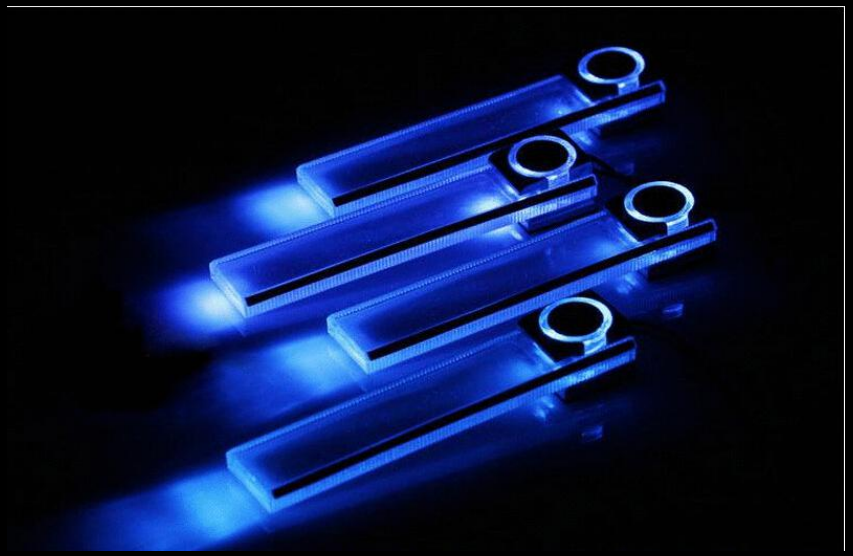
CHINA AUTOMOTIVE LIGHTING MARKET, BY TECHNOLOGY



Industry Trends

Automotive Lighting Market size was valued at around USD 30 billion in 2017 and will grow at a CAGR of over 5% from 2018 to 2024.

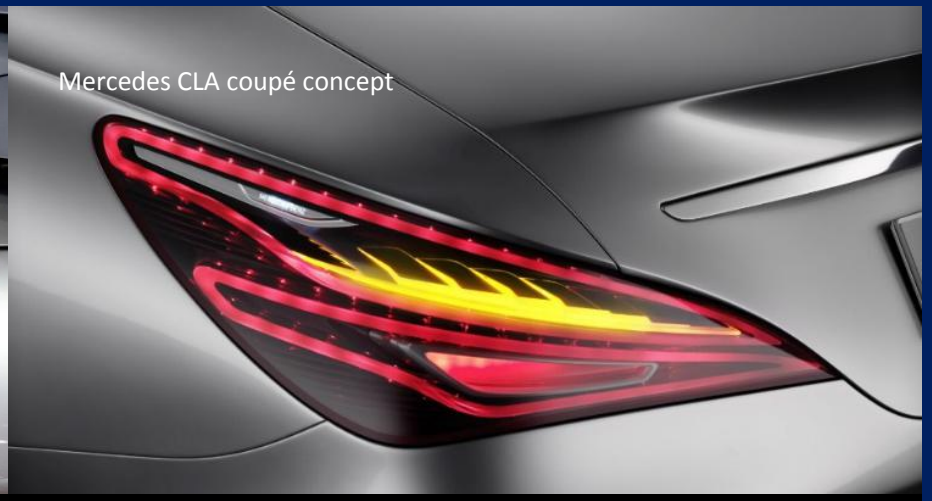
LIGHT CAN CONVEY NEW EMOTIONS & MOODS WITHIN SECONDS



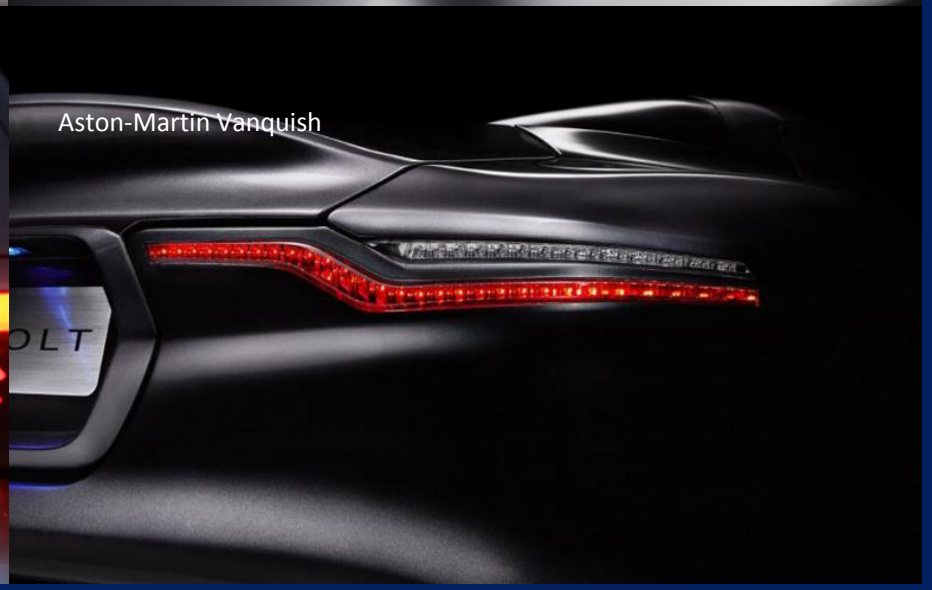
Light offers a wide range of emotional possibilities, and for car manufacturers a real added value to align their driving concepts with the driver‘s emotions and moods.
For, example, an illumination concept for a sports car can either facilitate an adrenaline rush or provide comfort – appropriate for the luxury driving mode in an automatic transmission – with soft lighting tones.

LIGHTING FOR EMOTIONAL DESIGN


Devine DS concept


Mercedes CLA coupé concept


Faraday FUTURE FF-91


Aston-Martin Vanquish

Led diamond lightings to see and be seen - Led珠宝灯

LIGHTING FOR SAFETY AND ATTENTION

Laser or led?

LASER LIGHT: NEW HEADLIGHT TECHNOLOGY

The BMW i8 and the Audi R8 LMX were launched at the same time as the first series production vehicles with laser headlights. OSRAM was heavily involved in the development of the innovative laser light technology.

This lighting trend opens up completely new horizons in the design and performance of headlights.

The brightness is four times that of an LED.
This means that headlights can be made even smaller in the future – without compromising on light intensity.

NEXT GENERATION LASER-LIGHT

- The new LASER light source is significantly smaller – with unchanged performance and power consumption saving.
- For the first time, the LASER beam is used in mid-range vehicles.

- Controlled by camera-information, this laser solution can be used in partial high beam mode.
- This means a significantly increased operating time of the LASER source with improved driving safety under various traffic conditions during night time driving.

BEND LIGHTING HEADLAMPS WITH LED TECHNOLOGY

Dynamic bend lighting headlights is a new technology. Up to now, mechanical assemblies were required to move parts of the headlight or the complete headlight. Thanks to LED technology, such innovations as Advanced Forward Lighting Systems (AFS) now can be implemented much more simply.

AFS LED HEADLIGHTS

AFS LED headlights

Is a smart, adaptive high resolution headlight.

Lighting can be adapted electronically according driving and weather conditions continuously.

Benefits of the innovation

At high speeds, the range of the light beam is increased automatically.

In city traffic, wider light distribution improves safety. The road, the sidewalk and peripheral areas are better illuminated.

SECURITY AND INFORMATION > windshield is a screen to communicate

ELECTRO LOOK > OUTSIDE DESIGN

Mercedes Benz concept EQ electric car > Design with new electro-look.
“Concept EQ is hot and cool,” says Gorden Wagener, Head of Design at Daimler AG. “It’s a reflect of our design philosophy of sensual purity, the aim being to create an avant-garde, contemporary and distinctive electro-look.
At the same time, the design of the visionary show car, which has been reduced to the essentials, reveals an alluring progressivity.”
The monolithic basic form of “Concept EQ” unites the genes of an SUV with the dynamic character of a coupé and a dash of shooting brake at the rear end.

ELECTRO LOOK > INSIDE DESIGN

Fibrance technology by Corning is a glass optical fiber that unleashes colorful lighting. It differs from optical fiber for the telecommunications industry which is designed to have very low losses of data signals in form of light.

ELECTRO LOOK > PROGRESSIVE LIGHTING

The new SCHOTT MultiLight is a mix of uniformly illuminating contour light guides and spots. Contour and spotlighting can be adjusted to door panels and map pockets easily, creating an individual and comfortable atmosphere.

ELECTRO LOOK > informative LIGHTING

The interiors of the Vision Mercedes-Maybach (electric coupe concept car) is designed like a cockpit or a “360° open-air luxury lounge” wrapping the driver. The transparent center tunnel uses blue fiber optics.

ELECTRO LOOK > informative LIGHTING

Mercedes Benz
concept car

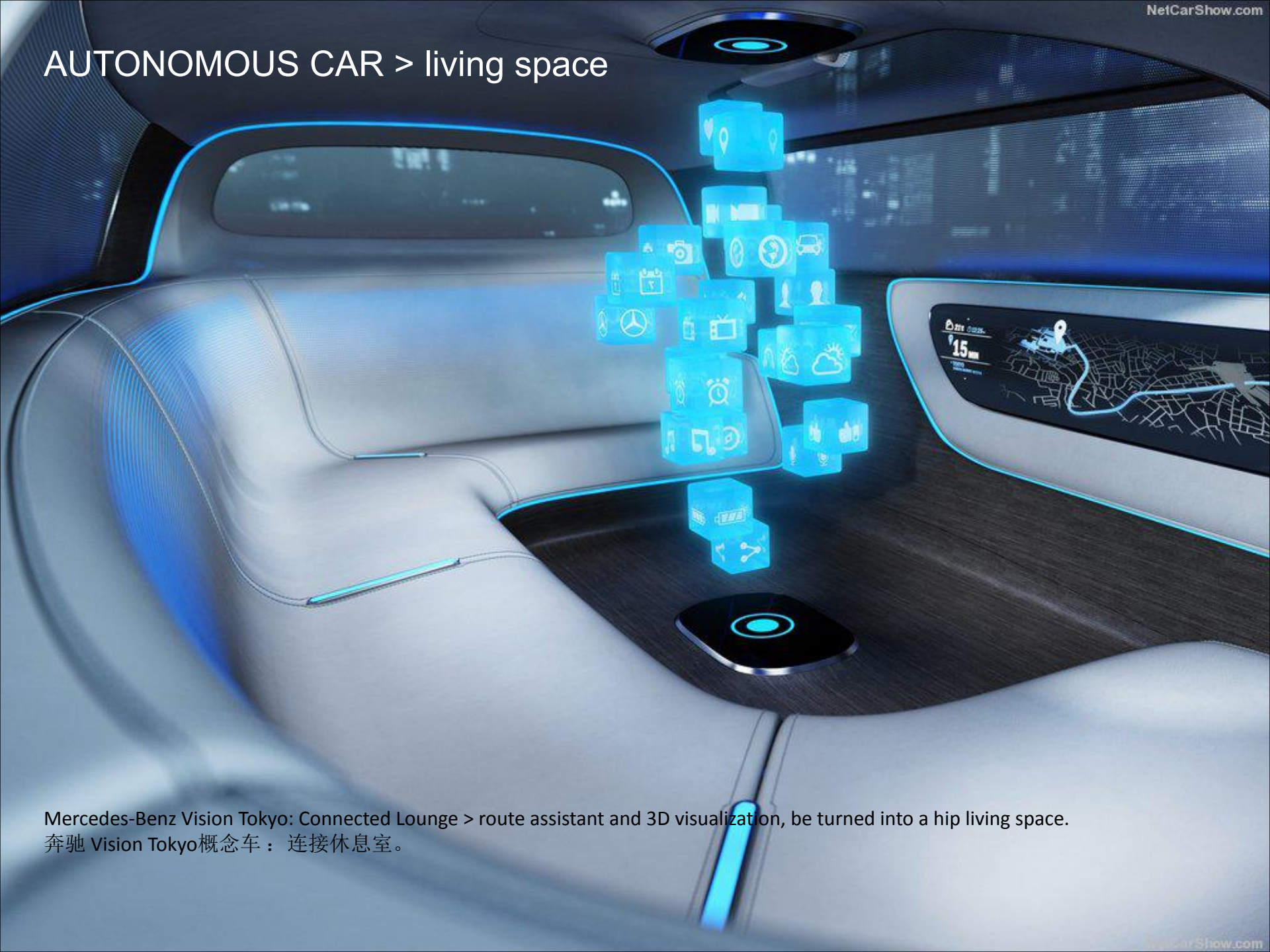
AUTONOMOUS CAR > living space

Enhance comfort in rear seats -
Most rear seat comfort / convenience in North American cars are targeted for children or kids in early teen years. That is why sitting in rear seats for journeys greater that 60 minutes is not comfortable with two adults in the front seats.
Issue of comfort / convenience in all seats is critical for autonomous cars.

AUTONOMOUS CAR > living space

XiM17 from Yangfeng Automotive Interiors is an electric vehicle concept car.
By selecting one of the four modes (driving, family, meeting, lounge), the seating and floor console are automatically powered into specific positions.

AUTONOMOUS CAR > living space



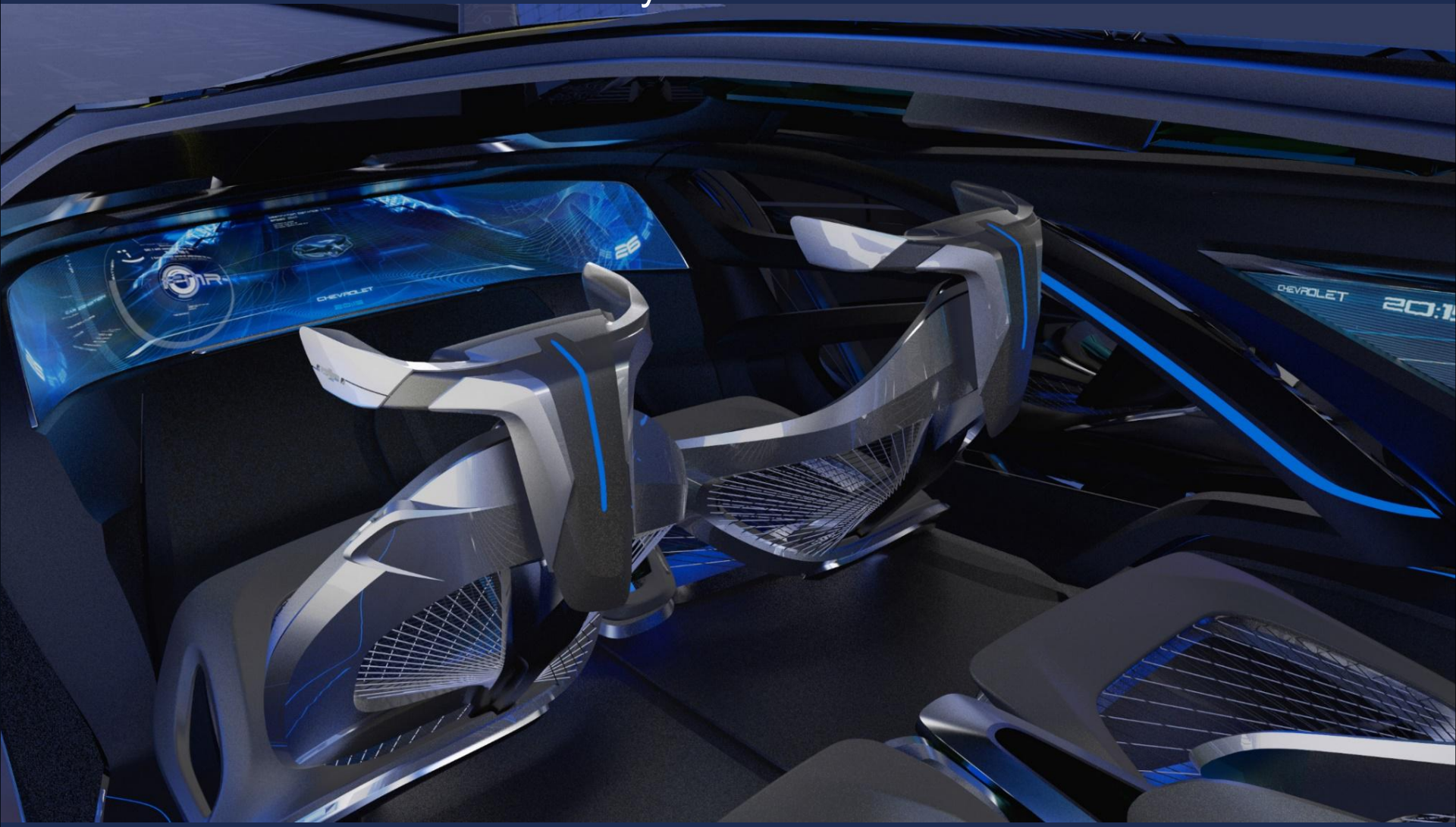
Mercedes-Benz Vision Tokyo: Connected Lounge > route assistant and 3D visualization, be turned into a hip living space.
奔驰 Vision Tokyo概念车：连接休息室。

SCREENS & HOLOGRAMS > luminous dashboard

Corning's "Connected Concept Car" has a dashboard that's made entirely of Gorilla Glass (same as Apple's iPhone screens). The car's glass center console is covered by a thin and flexible layer of Gorilla Glass. Displays are bright and clear enough to see even in bright daylight. The most obvious automotive application for Gorilla Glass is in windows and windshields.

康宁的“连接概念车”拥有完全由Gorilla玻璃制成的仪表盘（与苹果的iPhone屏幕相同）。 该车的玻璃中央控制台被一层薄薄而有弹性的Gorilla玻璃所覆盖。 即使在明亮的日光下，显示屏也足够明亮清晰。 Gorilla玻璃最明显的应用是在汽车窗户和挡风玻璃上。

SCREENS & HOLOGRAMS > crystal laser



Chevrolet self-driving concept car > is an autonomous electric vehicle concept designed in Shanghai by the company's Pan Asia Technical Automotive Center (PATAC).
Futuristic design of course, with crystal laser headlights and taillights.

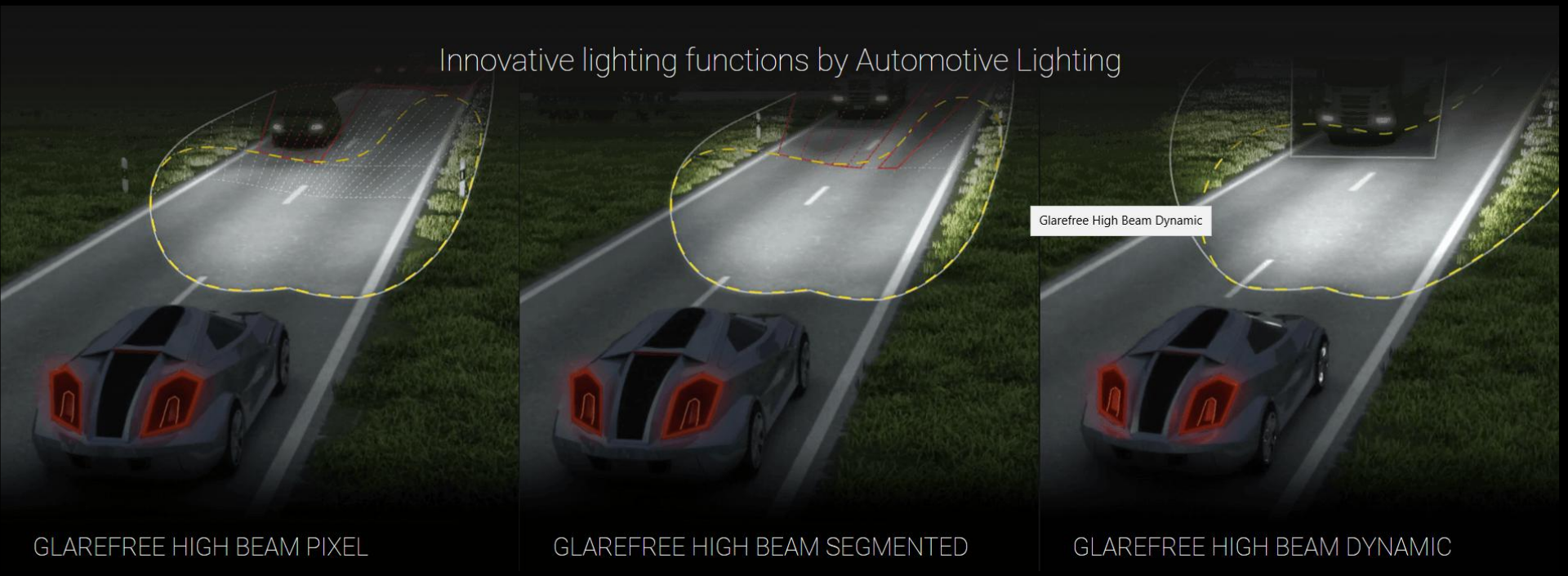
SCREENS & HOLOGRAMS > interconnection

Self-driving concept car > interconnection of information between the driver and surroundings

SCREENS & HOLOGRAMS > route assistant

BMW Hologram Dashboard > route assistant to help determine the best route to your destination

SMART LIGHTING > selective beam



Adaptive Driving Beam (or Glare-Free High Beam) technology is a safer and more comfortable driving at night.

It is a dynamic lighting systems that will *see, sense, adapt and react* to rapidly changing driving conditions.

It involves a computer controlled, using a camera and sensors to detect objects and selectively disable portions of the light.

This prevents glare for the other drivers on the road while still giving the driver the best visibility.

SMART LIGHTING > selective beam

SMART LIGHTING > digital light by Daimler

Picture: Presentation of the DMD technology in a headlamp at Mercedes Tech-Night. Source: Daimler AG

The light becomes digital: 1.3 million pixels on the street

Digital Light" is the name of this project developed for 5 years by Daimler and Automotive Lighting and Texas Instruments.

This new technology makes the light distribution more flexibly.
The light distribution is controlled fully automatically in a wide variety of traffic situations.

The first series vehicle with this system is the Mercedes-Maybach, which has been on the roads since mid-2018.

SMART LIGHTING > digital light by Daimler

The most interesting feature of Daimler's headlights, however, is what they could do for other people sharing the road with you. The ability to selectively switch off headlights could help drivers avoid blinding oncoming vehicles or pedestrians, as on-board sensors detect faces and windshields and automatically dim the brightness in those areas.

SMART LIGHTING > digital light by Daimler

Better illumination and additional guidance information for the driver are the tasks of the new lighting system.
To keep drivers informed while their eyes stay on the road ahead, "million-pixel" headlights that project warning symbols and driving tips on the road itself.

SMART HIGHWAY IS NOW A REALITY

The smart highway has been tested on 500 meters of road in the Netherlands last week.

The roads will make driving at night safer, while also reducing the need for streetlights.

The road markings are made with paint containing photo-luminescent powder that charges in the daytime and then releases a green

glow at nighttime…

Thank you for your attention

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