

# VALEO VISIBILITY SYSTEMS

## DVN Shanghai



April 19-20th, 2021

**Valeo**  
法雷奥  
科技驱动智能出行

# Agenda

## Why HD Lighting ?

Valeo complete system  
proposal



# TOWARD HIGH DEFINITION AND AUTONOMOUS DRIVING



## GLARE-FREE HIGH BEAM

1 PIXEL



2014

## MATRIX BEAM

4 to 25 PIXELS



2016

## PIXEL LIGHTING

32 to 300 PIXELS



2019

## PICTURE BEAM™

2.5K-25K PIXELS



2022

## LIGHTING FOR SENSORS



2022

# 2 Main focus of HD Lighting

## FOCUS ON LIGHTING



## PERFORMANCE

DIGITAL BEAM

SUPPORT TO SENSORS

## FOCUS ON ROAD PROJECTION



## ASSISTANCE

ROAD MARKING

## COMMUNICATION

ROAD WRITING

20

**PIXEL 84**  
(+ FLAT)

22

**PICTURE BEAM™  
MONOLITHIC  
FOR LIGHTING**  
(+ FLAT)

24

**DMD**  
(+ MATRIX or PIXEL & FLAT)

**PICTURE BEAM™ MONOLITHIC  
FOR ROAD PROJECTION**  
(+ MATRIX or PIXEL & FLAT)

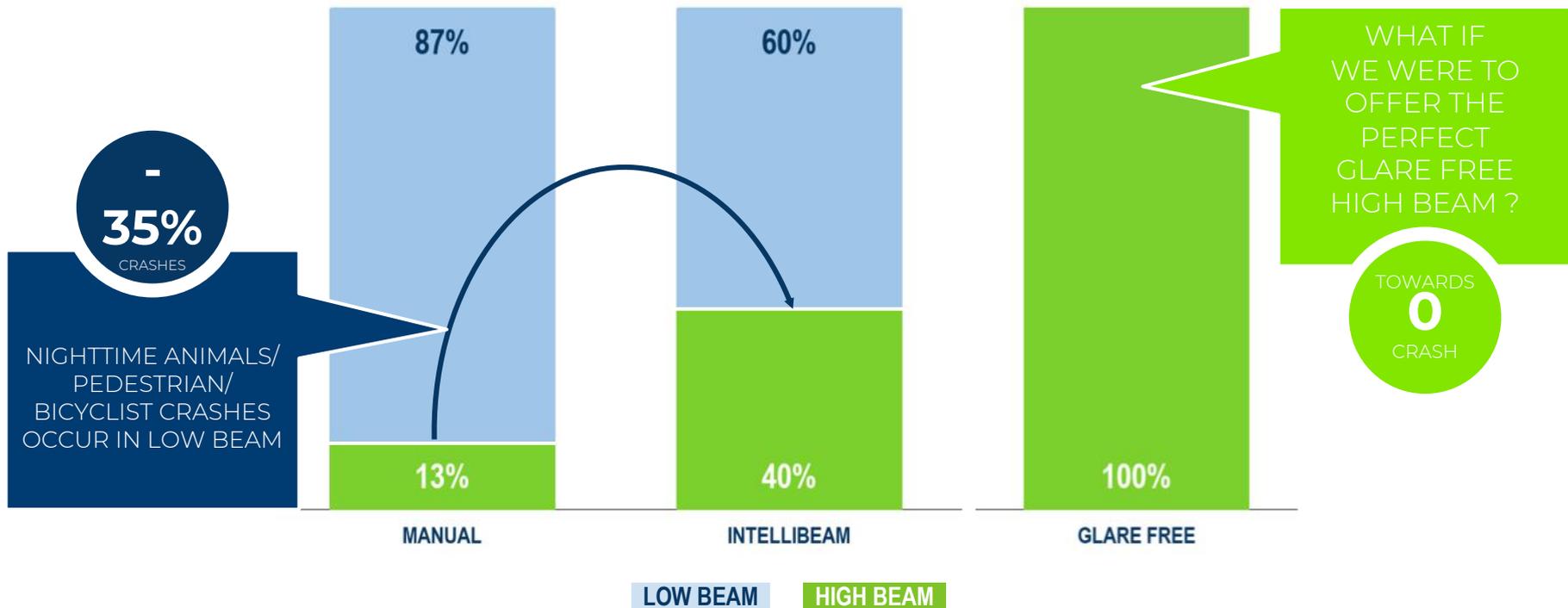
# SAFETY EFFECTIVENESS

GM/UMTRI | JUNE 2019 REPORT



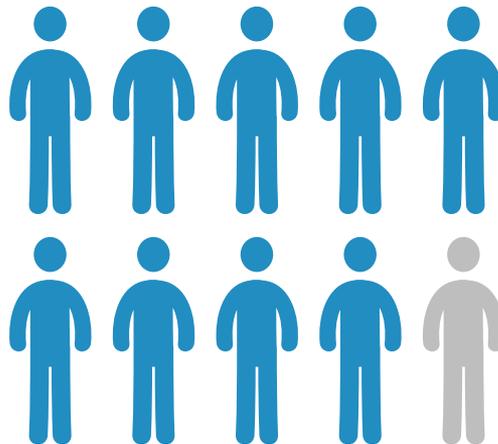
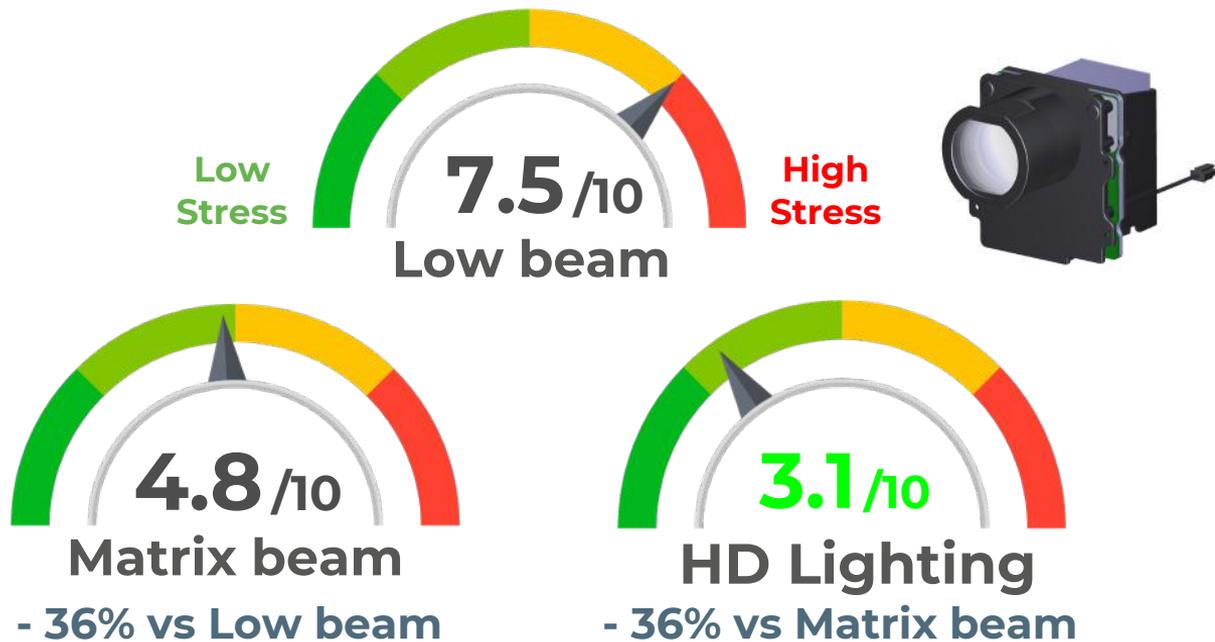
**HIGH BEAM AUTOMATIC ACTIVATION SAVES LIVES ! ▼ 35% NIGHTTIME CRASHES WITH VULNERABLES**

# SAFETY BENEFIT OF A PERFECT GLARE FREE HIGH BEAM



# STRESS REDUCTION WITH HD Lighting

## STRESS TEST RESULTS BY THE SCORE



**9 out of 10 drivers**  
give advantage to Monolithic  
compared to Matrix beam

The heart rate at rest was measured before driving to be referred as the low stress state.

\*Tests done w/ 120-150Lux total

HD LIGHTING

# HD LIGHTING FOR ADB

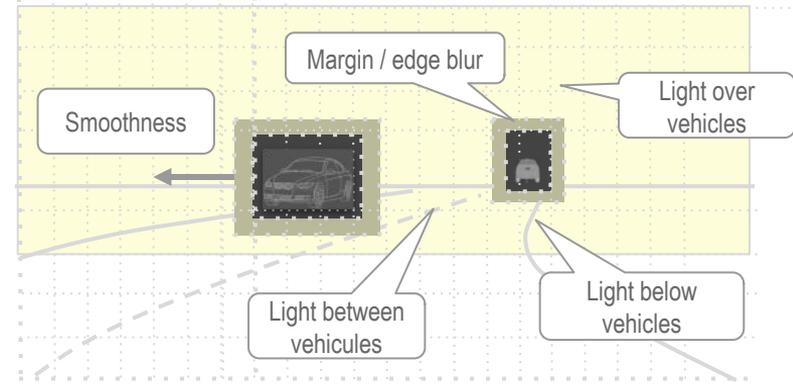


HD Lighting



Pixel 84

Pedestrian visibility in ADB mode with on top HD lighting system, compared to pixel 84 system at the bottom



**HD resolution offers a constant lighting flux with no blind zones around other cars**

# VULNERABLE ROAD USER SAFETY ENHANCEMENT



**5 X** higher risk  
of pedestrian fatality  
when driving **at night**



the detection rate of  
**camera** based systems  
can fall to

**<10%** at night

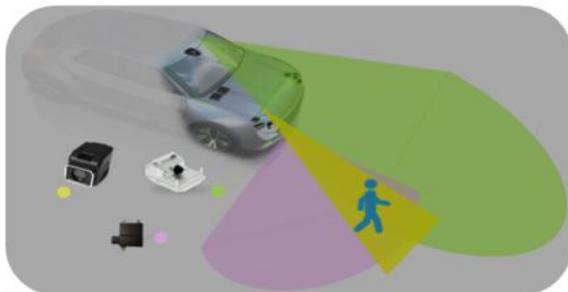
## Lighting for Camera

*By combination Fcam, Radar*

&

## VRU marking light

*With HD Lighting module*



### Time To Collision

 70 kph	 ↑ 	Low Beam	Combination W/ HD Lighting
		0.6 s	2.1 s

## Key OEM benefits

- Enhancement Fcam availability with more efficient AEB at night



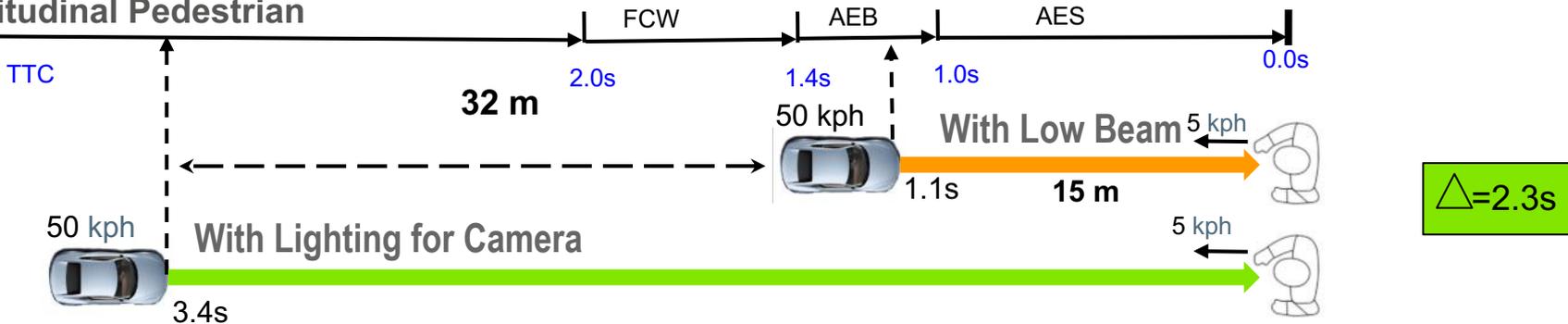
- Improved NCAP Rating at night

- Reduce pedestrian fatalities at night

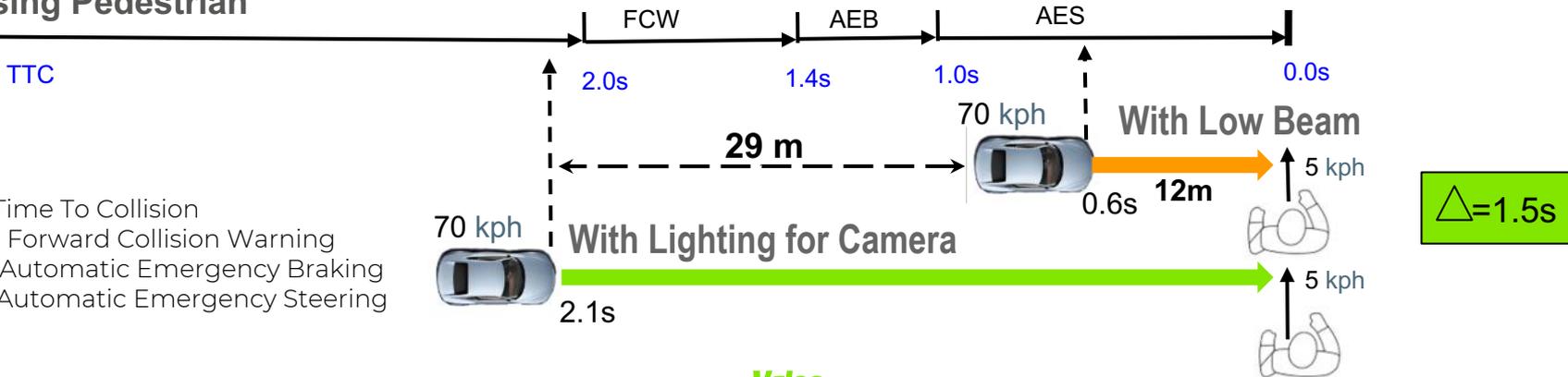
# Valeo solution for improvement of Pedestrian recognition

Time To Collision Front Camera (FC) Classification - Values below based on system latency assumptions that needs to be confirmed for each systems considered

## Longitudinal Pedestrian



## Crossing Pedestrian



TTC = Time To Collision  
FCW = Forward Collision Warning  
AEB = Automatic Emergency Braking  
AES = Automatic Emergency Steering

# VULNERABLE ROAD USER SAFETY ENHANCEMENT



Low Beam **w/o** Lighting for Camera

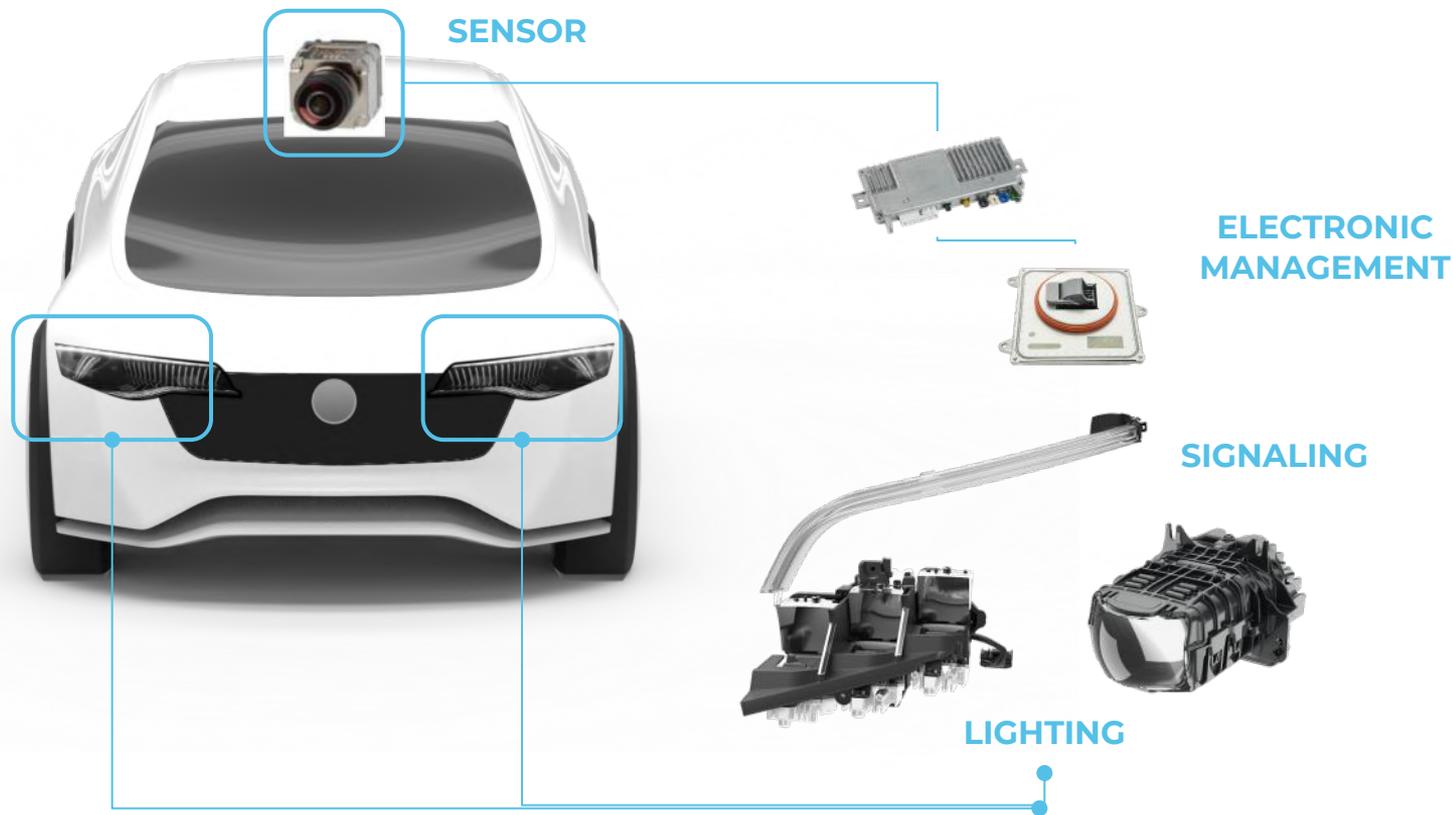


Low Beam **w/** lighting for Camera

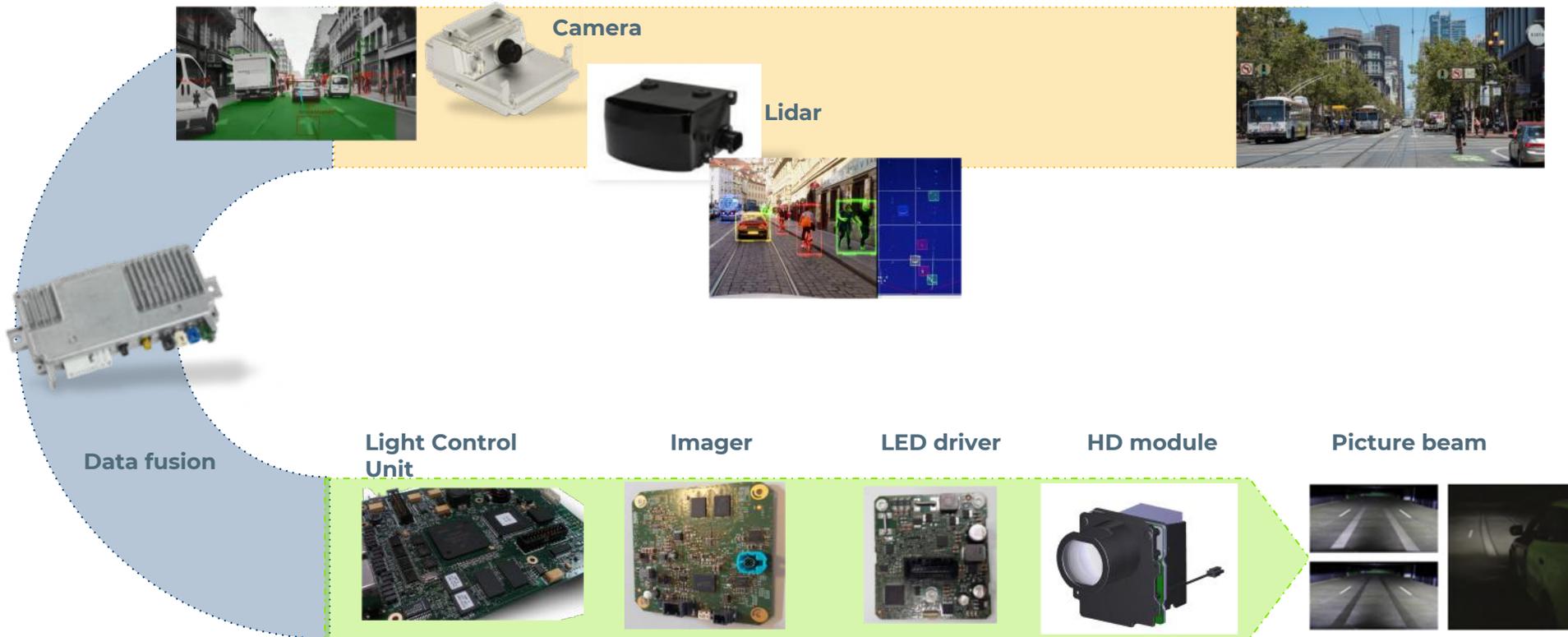
- Why HD Lighting ?
- **Valeo's complete system proposal**



# TODAY's LIGHTING SYSTEM



# MONOLITHIC PHOTON TO PHOTON VALEO SOLUTION



Complete Valeo system delivery from Camera to Lighting and through ECUs



# LIGHTING MODULE CHARACTERISTICS

## >20K Pixels Module

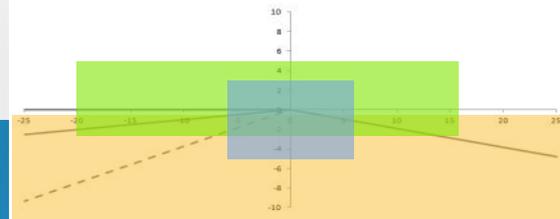
- **Flux on the road:** 500-700 lm
- **E<sub>max</sub>:** 100-110 lux
- **FOV:** H 24-30° x V 6-8°
- **Segment quantity:** >20 K
- **Resolution:** 0.1° in center
- **Consumption:** < 60W



# EXAMPLE OF INTEGRATION IN DEMONSTRATION VEHICLE



Valeo democar drive tests



PICTURE BEAM™ MONOLITHIC  
FIELD TEST RESULTS

DRIVER ASSISTANCE FUNCTIONS



SAFETY FEATURES



# EXPECTED APPLICATIONS TO COME

## FOCUS ON LIGHTING



## PERFORMANCE

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ROAD MARKING

## COMMUNICATION

ROAD WRITING



HD Lighting & roadprojection market interest is confirmed



Valeo invites you to come and discover the **latest Valeo Visibility innovations**,  
contributing to the **future of mobility**, at **Shanghai Motorshow**  
法雷奥诚邀您拔踵参观上海车展法雷奥展台，共同见证在未来移动出行领域视觉系统最新创新产品

Front, Rear, 360° and Interior Lighting Systems  
头灯，尾灯，360°近距离投射及内饰照明等系列车灯系统

Sensor Cleaning and Wiper Systems  
智能传感器清洗及雨刮系统

From **April 19 to 28**,  
Hall 2.2, Booth **6BE07**

SMART TECHNOLOGY  
FOR SMARTER MOBILITY



**Thank you for you attention!**

