WRC 2019 Abu Dhabi (Oct. 2019)

Collaborative research and smart roads mobility challenges: a global automotive tier1 supplier perspective

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VALEO IN SHORT

KEY FIGURES 2018

€

19.3 BN
TOTAL SALES
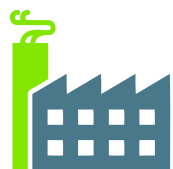
113,600
EMPLOYEES

33
COUNTRIES

186
PRODUCTION SITES
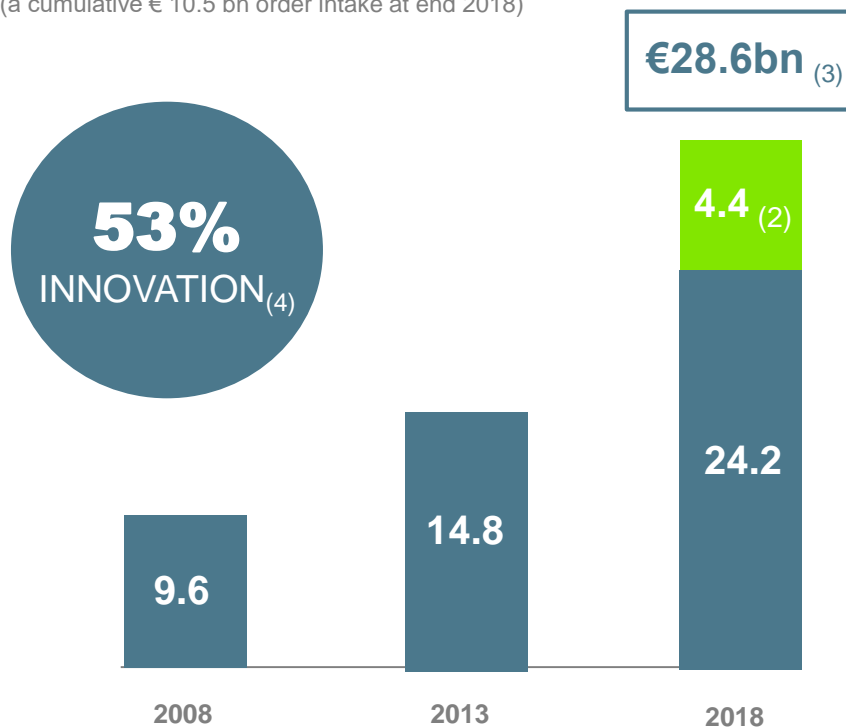
59
**RESEARCH &
DEVELOPMENT CENTERS**

15
**DISTRIBUTION
PLATFORMS**

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OUR MAIN CUSTOMERS

October 2019

ORDER INTAKE AT END 2018 FUELED BY INNOVATIONS[1]

- ● **Valeo Group order intake**
- ● **Valeo Siemens eAutomotive**
  (a cumulative € 10.5 bn order intake at end 2018)

€28.6bn [3]

53%
INNOVATION[4]

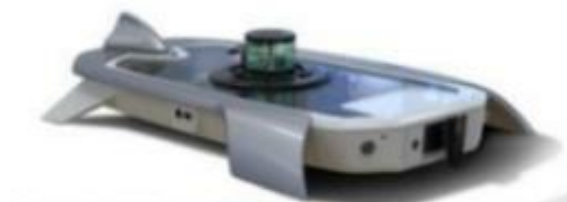|	2008	2013	2018
green			4.4 [2]
blue	9.6	14.8	24.2

[1] Products and technologies in series production for less than 3 years

[2] Valeo Siemens eAutomotive order intake at end 2018
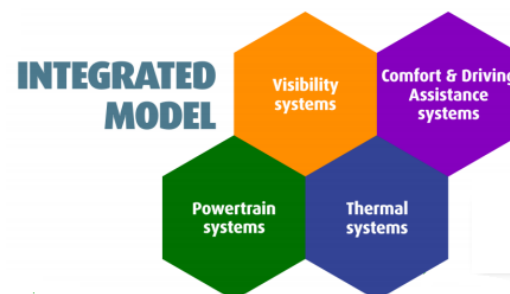
[3] Valeo & Valeo Siemens eAutomotive order intake

[4] Excluding Valeo Siemens eAutomotive

Artificial Intelligence by Valeo

> €1bn order intake: AI-enriched surround view & automated parking systems with object and pedestrian detection features

€1bn order intake for robotaxis

INTEGRATED MODEL
- Visibility systems
- Comfort & Driving Assistance systems
- Powertrain systems
- Thermal systems

Increasing order intake for cross-Business Group systems

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PRODUCT PORTFOLIO:
ELECTRIFICATION SOLUTIONS FOR ALL MOBILITY MODES

100% electric

Low-voltage
48V full propulsion systems

Valeo SIEMENS eAutomotive

High voltage
full propulsion
systems up to 347kW

Hybrid

Low-voltage
Mild hybrid & Plug-in hybrid

Valeo SIEMENS eAutomotive **High voltage**
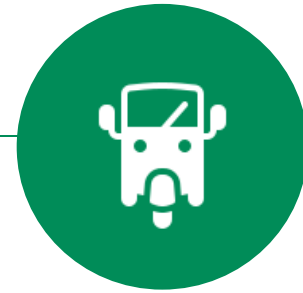Plug-in hybrid

Engine optimization
Integration of transmission
Reduction of CO2 emissions and
fuel consumption on combustion
engines

Light urban mobility

Low-voltage
48V full propulsion systems for any
type of electric urban mobility
objects

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PRODUCT PORTFOLIO:
DIGITAL MOBILITY SOLUTIONS

CAR SHARING SOLUTIONS
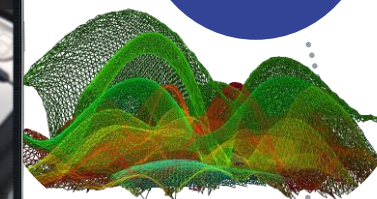
CYBER VALET & PARKING SERVICES

with **CISCO**

DYNAMIC REAL-TIME AIR QUALITY MAP

FLEET MANAGEMENT SERVICES

CONNECTED CAR SOLUTIONS

with **NTT docomo**

KUANTIC M2M & TELEMATICS

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VALEO, A KEY PLAYER IN THE EU COLLABORATIVE RESEARCH ECOSYSTEM

▶ **ERTRAC (European Road Transport Advisory Council)**

▶ **EGVI (European Green Vehicle Initiative)**

▶ **ECSEL JU (EU funding scheme on electronics & IA) – Artemis IA Presidence (the Embedded Intelligent Systems Association within Europe)**

Technology shapes mobility and cities

Transform infrastructure to foster mobility

How to better collaborate

TECHNOLOGY SHAPES MOBILITY AND CITIES

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TECHNOLOGY IS ON TRACK

Autonomous driving is accelerating

Connectivity is the catalyst

Mobility experience is the award

Electrification as a new paradigm

About 35% of new cars worldwide will be automated by 2025

Nearly 600 million connected vehicles on the roads by 2025

Interior sensing will equip about 20% of the vehicles by 2025

Electrified vehicles will represent 44% of the worldwide cars in 2025 and 74% of the worldwide cars in 2030

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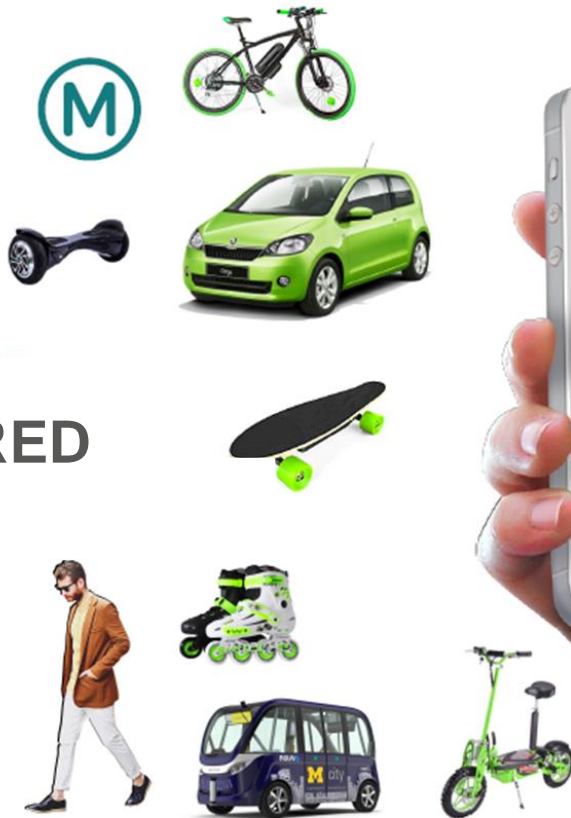
Mobility:
a darwinian world...

BUSINESS MODELS ARE EVOLVING

FROM SHARED MOBILITY
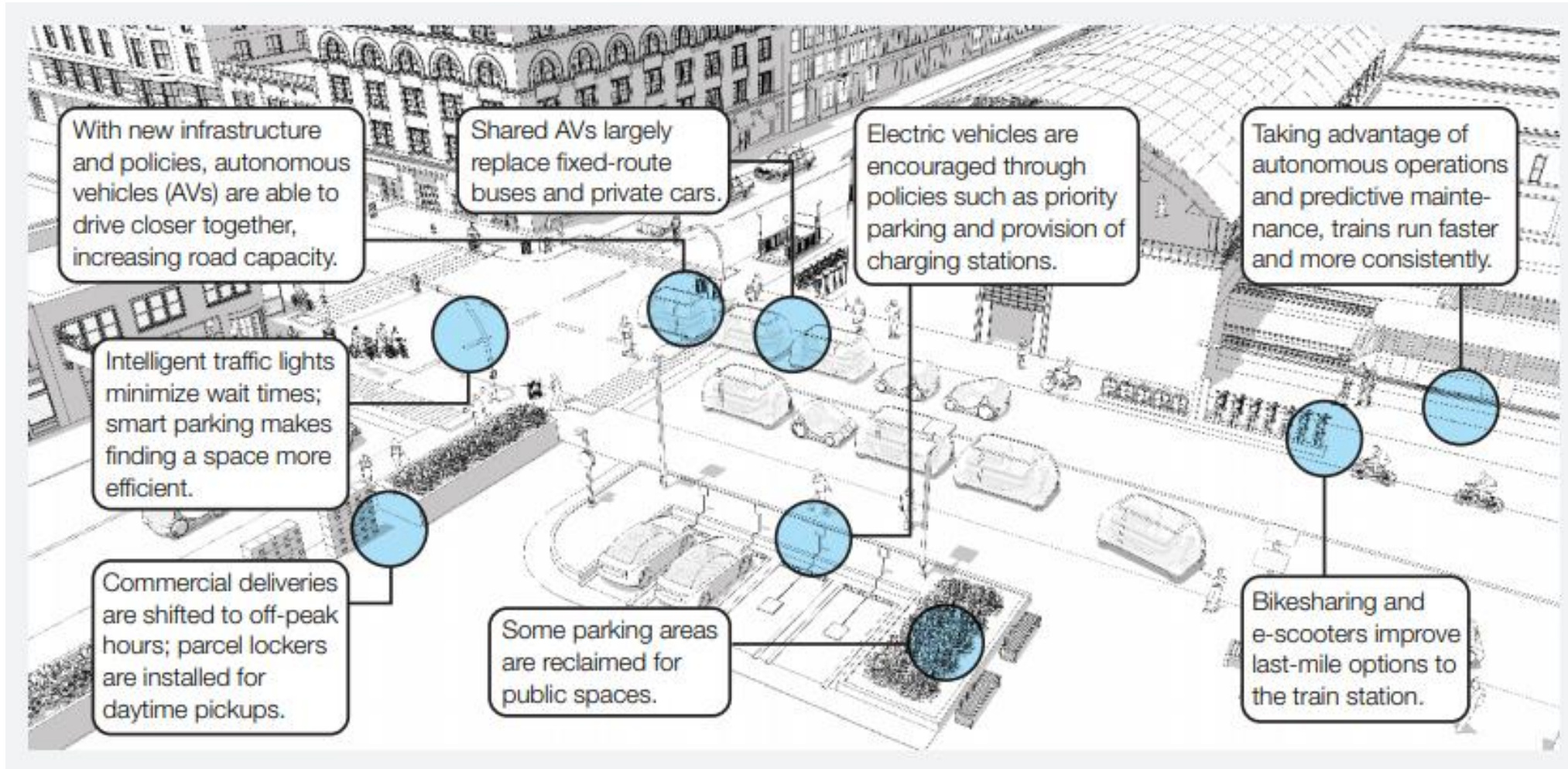
TO MOBILITY- AS-A SERVICE

SMART CITY IN 2030: MULTIPLE MOBILITY SCENARIOS

With new infrastructure and policies, autonomous vehicles (AVs) are able to drive closer together, increasing road capacity.

Shared AVs largely replace fixed-route buses and private cars.

Electric vehicles are encouraged through policies such as priority parking and provision of charging stations.

Taking advantage of autonomous operations and predictive mainte-nance, trains run faster and more consistently.

Intelligent traffic lights minimize wait times; smart parking makes finding a space more efficient.

Commercial deliveries are shifted to off-peak hours; parcel lockers are installed for daytime pickups.

Some parking areas are reclaimed for public spaces.

Bikesharing and e-scooters improve last-mile options to the train station.

McKinsey 2019

SMART CITY IN 2030: A SHIFT IN INFRASTRUCTURE USAGE

Passenger-kilometers traveled per year, index: current demand = 100

Less private cars, more shuttles in cities by 2030
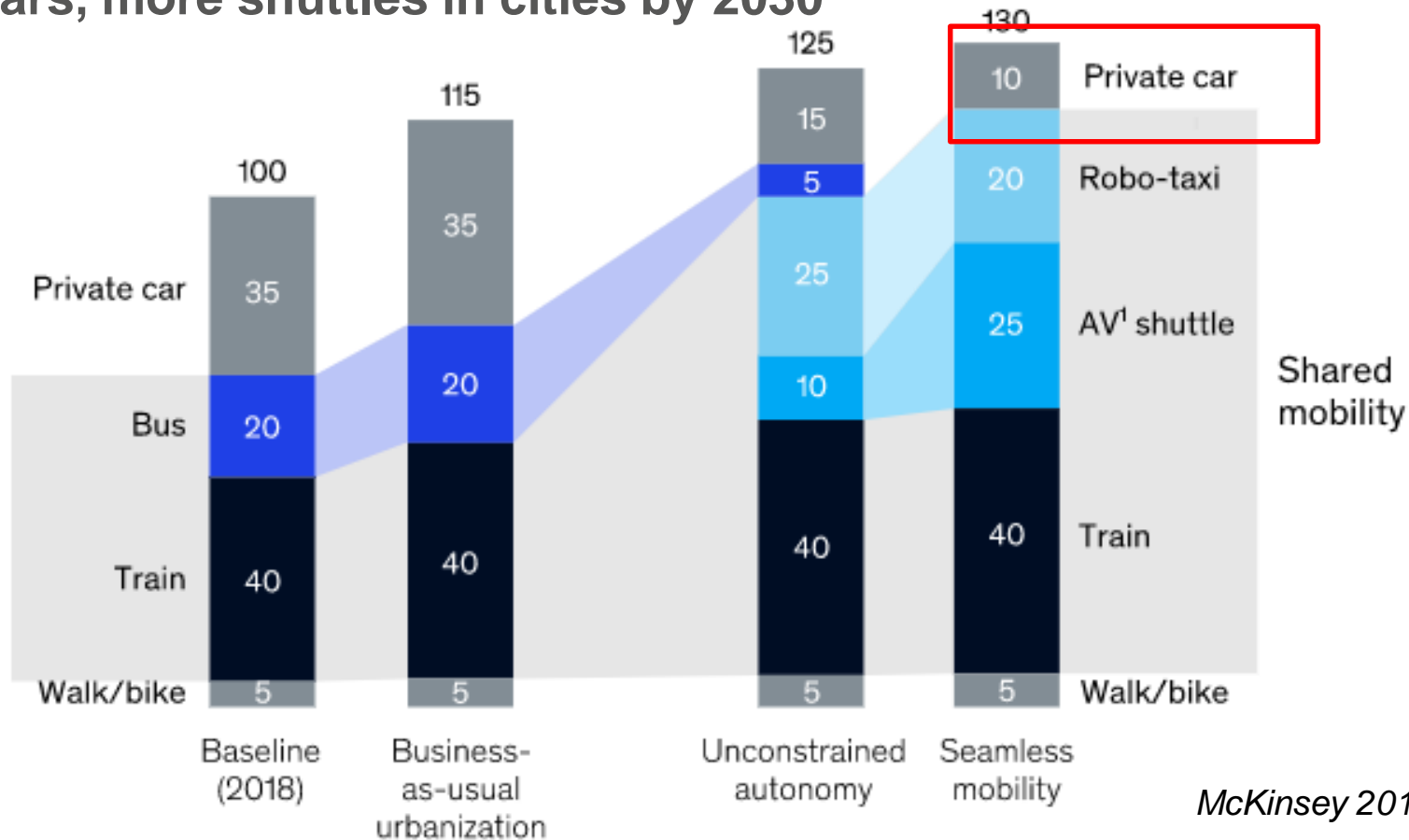
▶ **In 2030, traditional vehicles using conventional roads will represent 10% of trips/year**

McKinsey 2019

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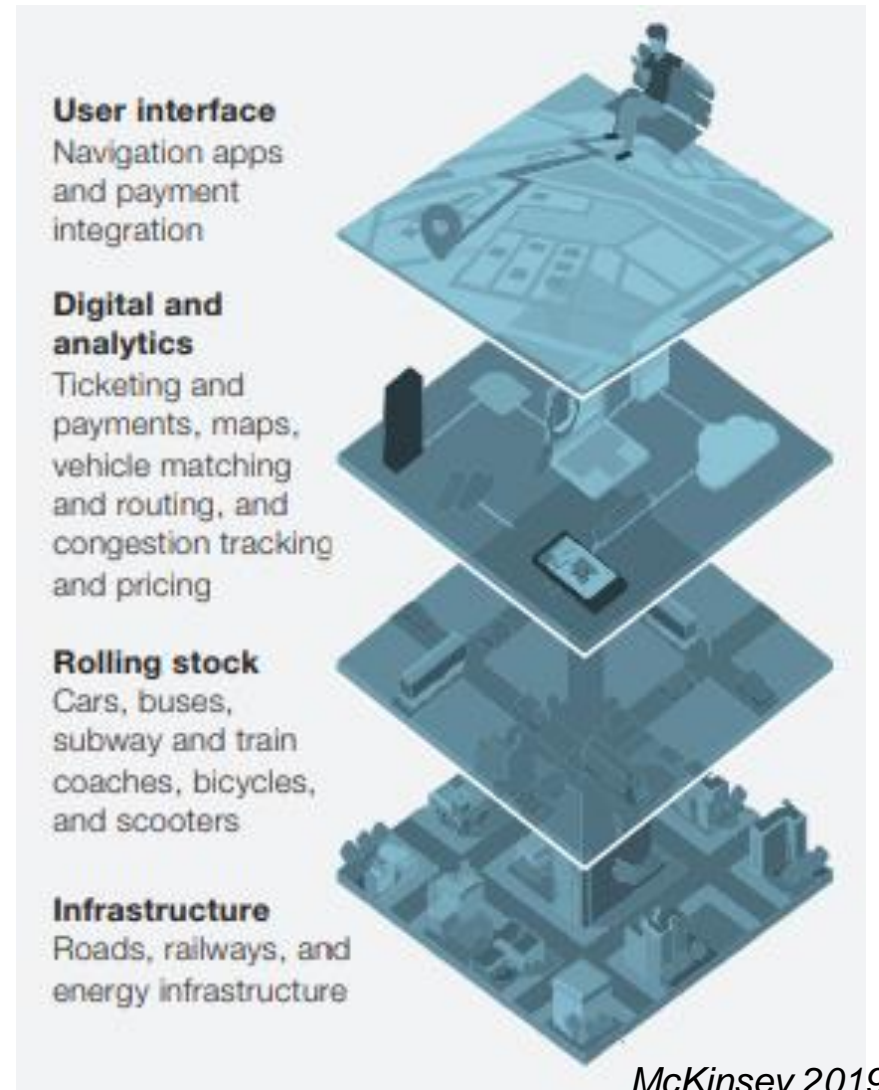# TRANSFORM INFRASTRUCTURE TO FOSTER MOBILITY

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TRANSFORM INFRASTRUCTURE FOR SMART MOBILITY

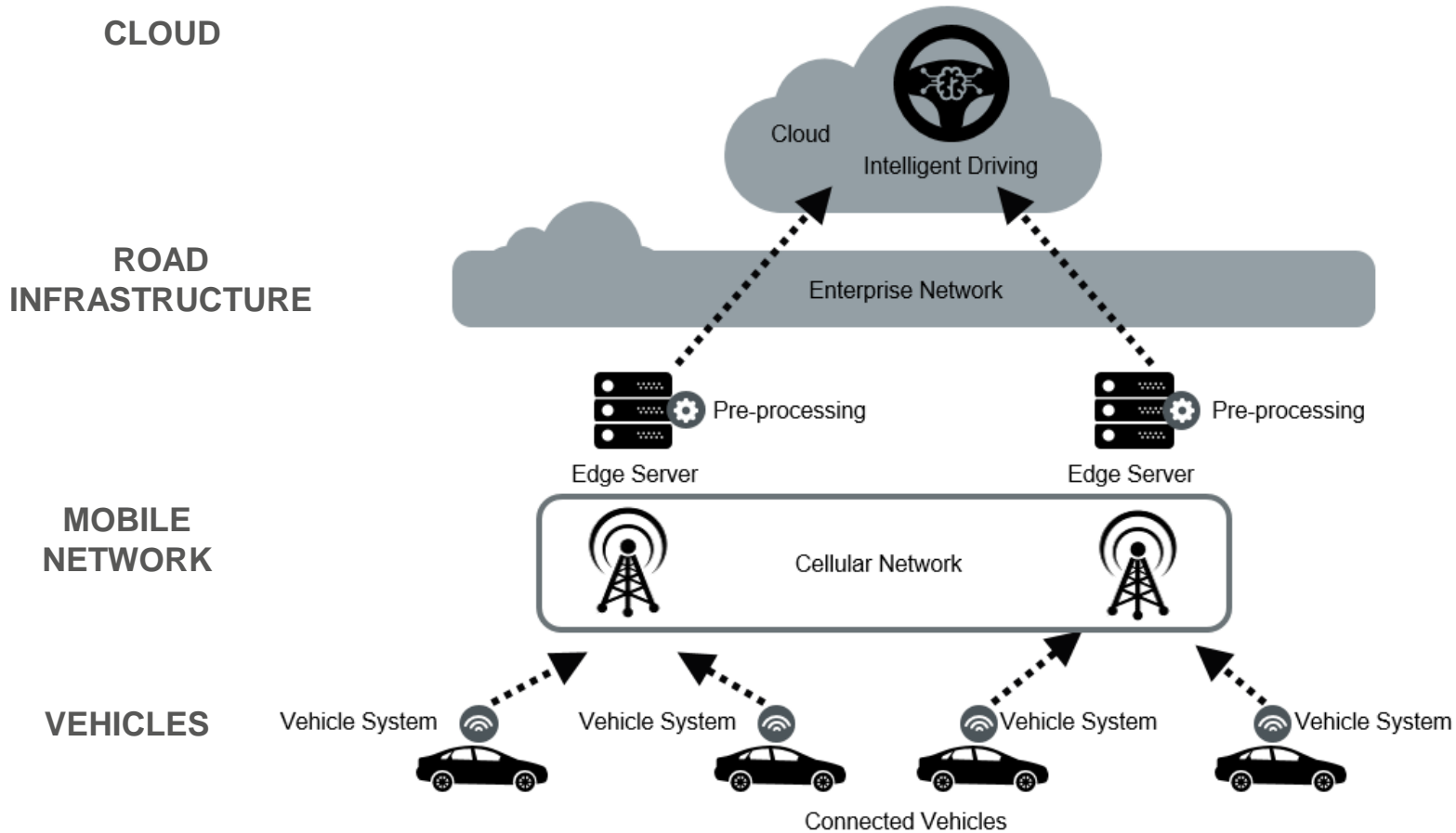**Urban mobility : backbone of urban mobility system**

Road & infrastructure re-design to support the new mobility use cases:

▶ **Intelligent road infrastructure to support higher connectivity needs**

▶ **Road infrastructure and renewed space allocation in cities**

User interface
Navigation apps and payment integration

Digital and analytics
Ticketing and payments, maps, vehicle matching and routing, and congestion tracking and pricing

Rolling stock
Cars, buses, subway and train coaches, bicycles, and scooters

Infrastructure
Roads, railways, and energy infrastructure

McKinsey 2019

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MORE DATA, MORE CONNECTIVITY: NEED FOR INTELLIGENT PHYSICAL INFRASTRUCTURE

CLOUD

Cloud
Intelligent Driving

ROAD INFRASTRUCTURE

Enterprise Network

Pre-processing
Edge Server

Pre-processing
Edge Server

MOBILE NETWORK

Cellular Network

VEHICLES

Vehicle System
Vehicle System
Vehicle System
Vehicle System

Connected Vehicles

Risks

Risk of central cloud saturation

Risk of cellular networks saturation
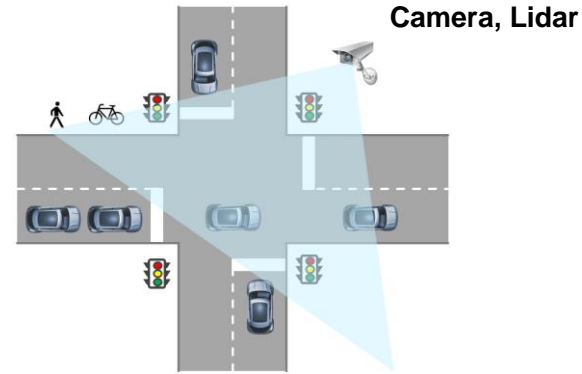
X100 Millions connected cars

Opportunities

Local data processing

Challenges: business models

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DISTRIBUTED INTELLIGENCE IN THE INFRASTRUCTURE: SEVERAL USE CASES FOR SMART MOBILITY

Camera, Lidar

Smart intersection
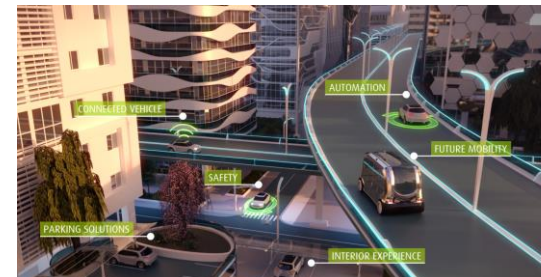
Pedestrian detection
collision avoidance

Smart infrastructure for

Tele-operation
Road information
Platooning

Smart cities

Vehicles connected with Cities infrastructure for reducing pollution, congestion, multi modal traffic management and energy efficiency

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RETHINK SPACE ALLOCATION AND INFRASTRUCTURE

Road and infrastructure redesign

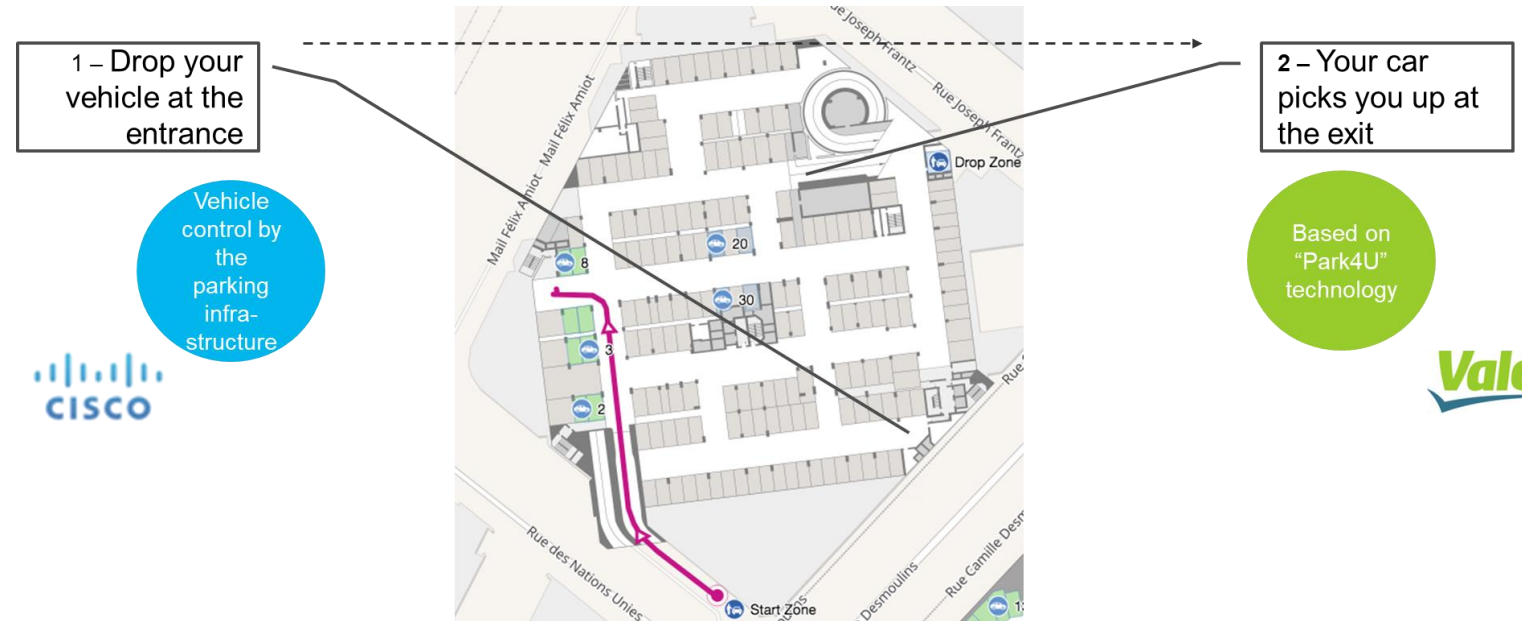Foster inter-modality
Facilitate commuting
collision avoidance

Car pooling faciliting areas

Commuter parkings

Rethink parking

Intelligent roads (sensors) and buildings
Re-allocate space in cities
Additional services in parking units
(maintenance, etc.)

1 – Drop your vehicle at the entrance

2 – Your car picks you up at the exit

Vehicle control by the parking infra-structure

Based on "Park4U" technology

HOW TO
BETTER COLLABORATE ?

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REINFORCE MOBILITY & INFRASTRUCTURE PLAYER COOPERATION

▶ **Speak the same langage**

▶ **Build ecosystems**

▶ **Test use cases**

▶ **Find hybrid forms of financing**

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SPEAK THE SAME LANGAGE:
ALIGN ON INFRASTRUCTURE READINESS FOR THE FUTURE OF MOBILITY

Connected Automated Driving Roadmap

Status: final for publication

Version: 8
Date: 08.03.2019

ERTRAC Working Group
"Connectivity and Automated Driving"

	Level	. Name	Description	Digital map with static road signs	VMS, warnings, incidents, weather	Microscopic traffic situation	Guidance: speed, gap, lane advice
Digital infrastructure	A	Cooperative driving	Based on the real-time information on vehicle movements, the infrastructure is able to guide AVs (groups of vehicles or single vehicles) in order to optimize the overall traffic flow.	X	X	X	X
	B	Cooperative perception	Infrastructure is capable of perceiving microscopic traffic situations and providing this data to AVs in real-time	X	X	X	
	C	Dynamic digital information	All dynamic and static infrastructure information is available in digital form and can be provided to AVs.	X	X		
Conventional infrastructure	D	Static digital information / Map support	Digital map data is available with static road signs. Map data could be complemented by physical reference points (landmarks signs). Traffic lights, short term road works and VMS need to be recognized by AVs.	X			
	E	Conventional infrastructure / no AV support	Conventional infrastructure without digital information. AVs need to recognise road geometry and road signs.				

▶ **EU Project INFRAMIX (2018-2021): define the infrastructure readiness for automation & connectivity level**

▶ **ERTRAC to make recommandations in CAD Roadmap in 2019**

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BUILD ECOSYSTEMS AND TRY USE CASES

CITIES / URBAN PLANERS

CITY AUTHORITIES

ROAD OPERATORS

AUTOMOTIVE SECTOR & SUPPLIERS

Integrating AVs with existing transit

Optimizing and redefining curb

Rethinking road construction and maintenance

Capital planning for an uncertain future

Redeveloping off-street parking

MOBILITY PLAYERS

CITIZENS

TELECOM PLAYERS

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FIND HYBRID FINANCING MODELS

▶ **Finance the evolution of the road infrastructure from a global perspective:**

- *Telecommunication infrastructure: how to finance 5G deployment ?*

- *AV uptake: who and how to finance road readiness for AVs ?*

- *EV penetration and infrastructure: how to finance charging stations ? Road adaptations.*

▶ **Explore new options to finance road evolution and its environmental impact through road charging:**

- *Road charging as a mixed mechanism to better optimize road usage and its impact: environmental impact as part of the taxation formula*

- *Environmental criteria as an anti-market distortion mechanism between all stakeholders (grantors, concessionaires, financers, customers, regulators, etc.)*

➔ *Mechanism that can combine price, elasticity of the demand, existing CO_2 taxes and cross boarders difference*

▶ **Attract new investors:**

- *Insurance and pension funds could be more attracted as investors*

- *Urgent need to overcome "cash rich" situation and "liquidity poor" economic context*

➔ *Prevent and prepare the road maintenance and adjustments of tomorrow*

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TAKE AWAY

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TAKE AWAY

▶ **Technology is shifting and mobility patterns are evolving**

▶ **Infrastructure needs to adapt**

▶ **Smart infrastructure will enable new mobility**

▶ **Maturity of solutions & financing of road infrastructure should be approached on a use case mode**

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SMART TECHNOLOGY
FOR SMARTER CARS