



Transformation Shifts Shaping Future of Mobility



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F R O S T & S U L L I V A N

Top Transformational Shifts Reshaping the Future of Mobility



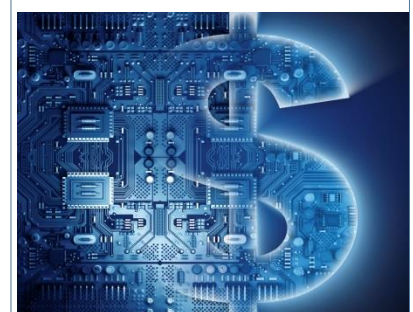
Connectivity



**Cognitive Era
and Autonomous
Mobility**



**Digitization of
Retail**



**Start-Ups
Disrupting the
Industry**



**New Business
Models**



**Health Wellness
and Wellbeing in
Cars**



**VW Digitalgate &
growth of
electrification**



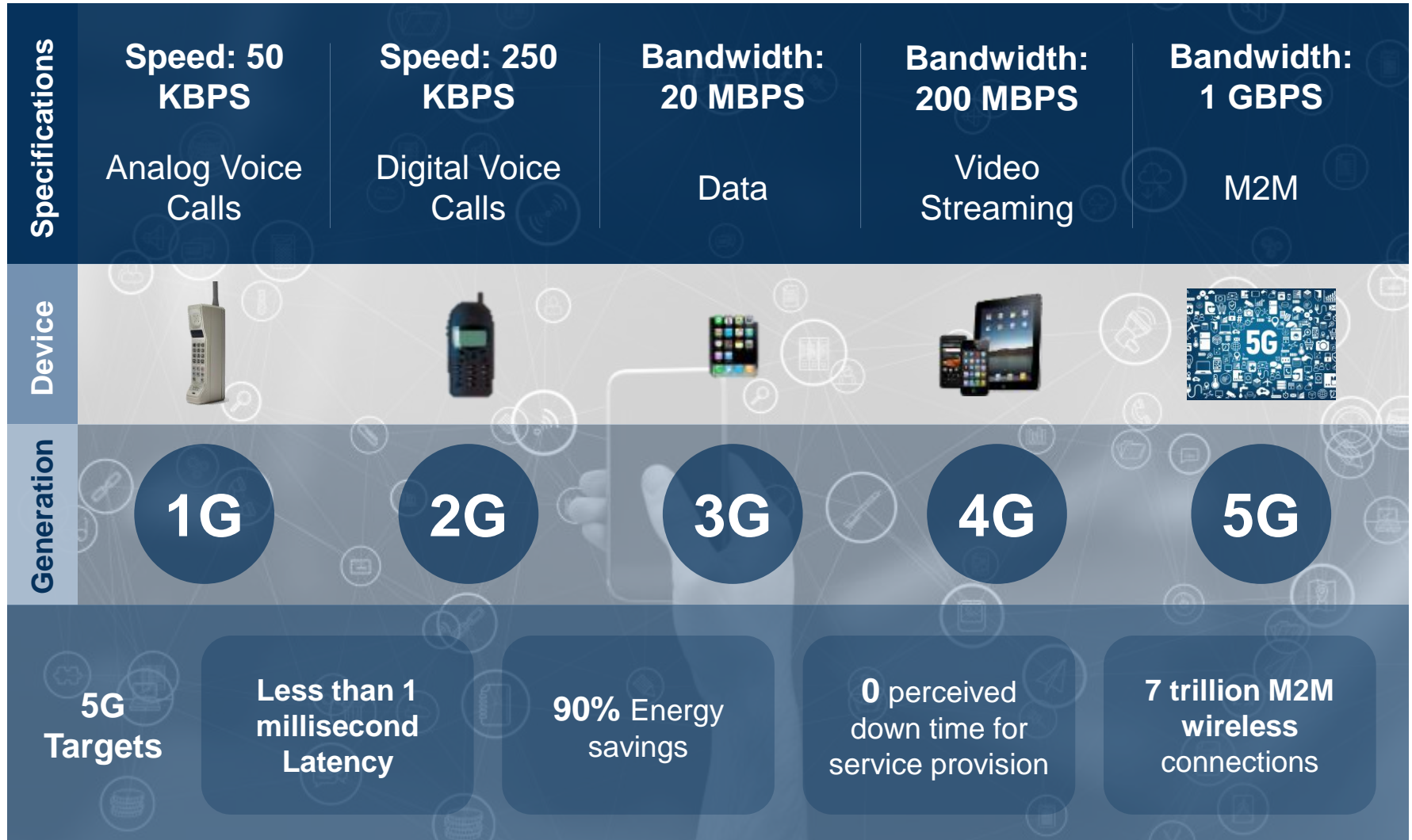
**Mobility as a
Service**

Connectivity and Convergence



5G Rollout in Europe: Road Map and Vision

5G technology will enable zero latency applications such as V2V or V2I communications and signaling for high-speed systems.



Sub Trend : What Can Big Data Do For Us?

Meaningful data sets is expected to grow from 10MB to 5GB in an average connected car by 2017/2018 providing saving of \$800 per car to OEM



The 3 “Bs” of Data Monetization Business Models

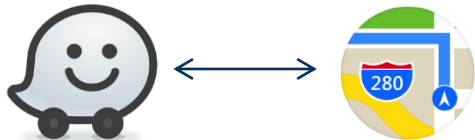
Bartering, Brokering and Building Services are the Three Models of Monetisation

DATA MONETIZATION MODELS

1

Bartering Model – Information based exchanges

Create new service
offerings
Share and win data
Provide contextual
relevance

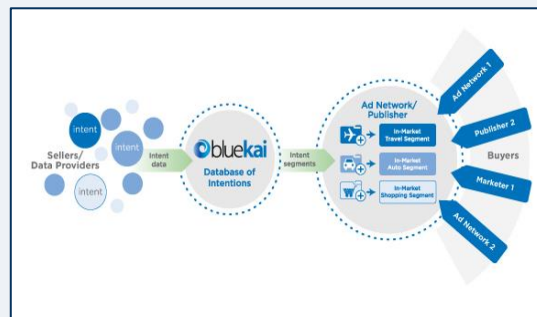


E.g. Apple Maps & Waze

2

Brokering Model – Information based brokering

Sell raw information
Provide benchmarking
Deliver processed data



E.g. BlueKai, Acxiom

3

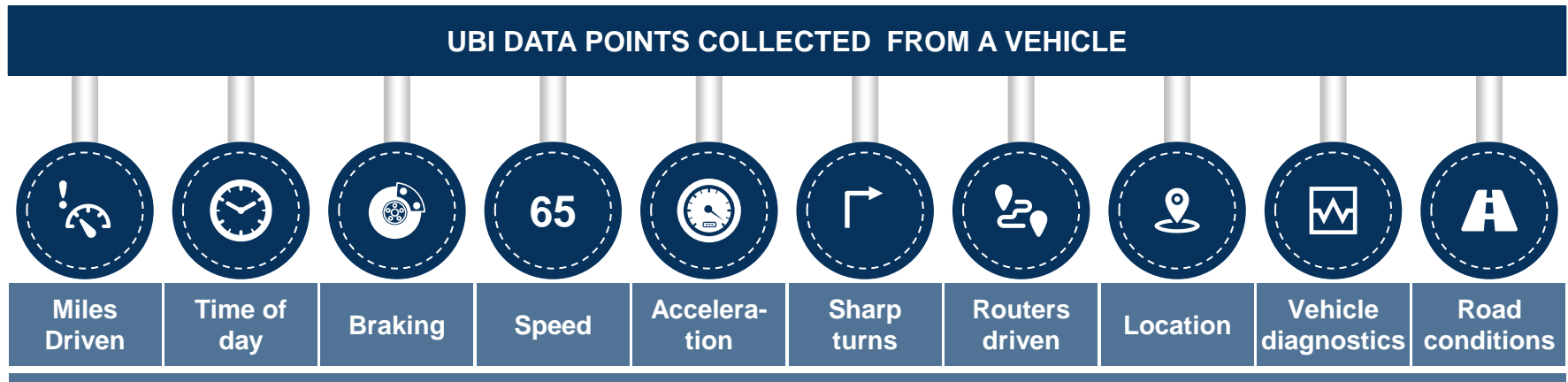
Business Intelligence Model – Information based services

Provide business
intelligence and insights
Drive deal making
Enable advertising

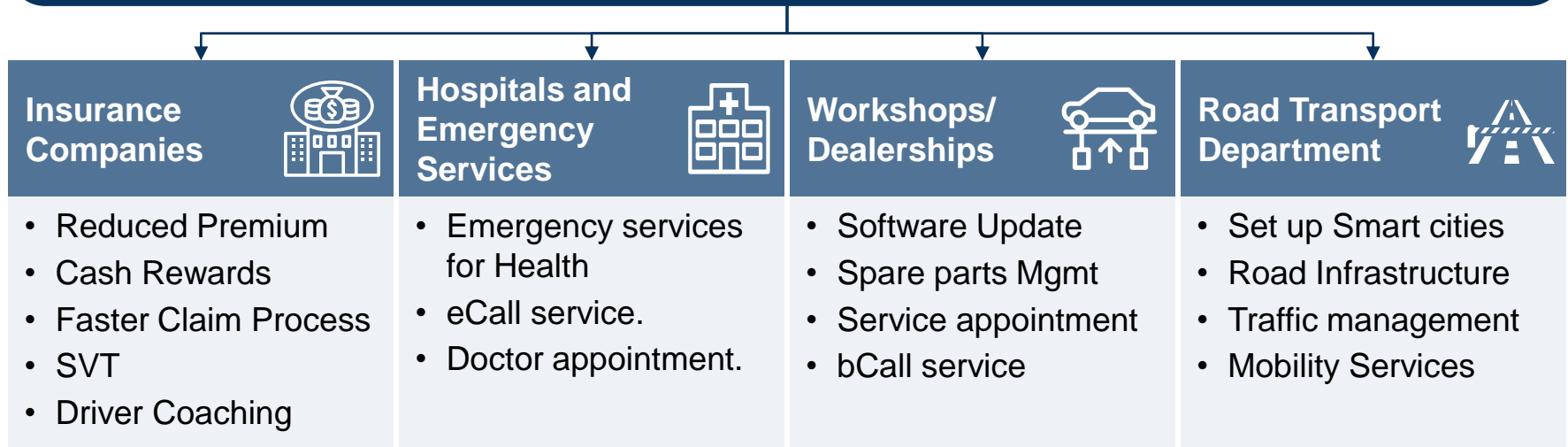


E.g. - Dunnhumby

Case Study : User Based Insurance (UBI)



DATA MONETIZATION AVENUES



Case Study : Future of Car Insurance

Big Data Will Transform the Car Insurance Industry in Future



drive like a girl

<http://www.drivelikeagirl.com/>

CAR INSURANCE
DESIGNED FOR GIRLS*

17 - 25 year olds
save the most

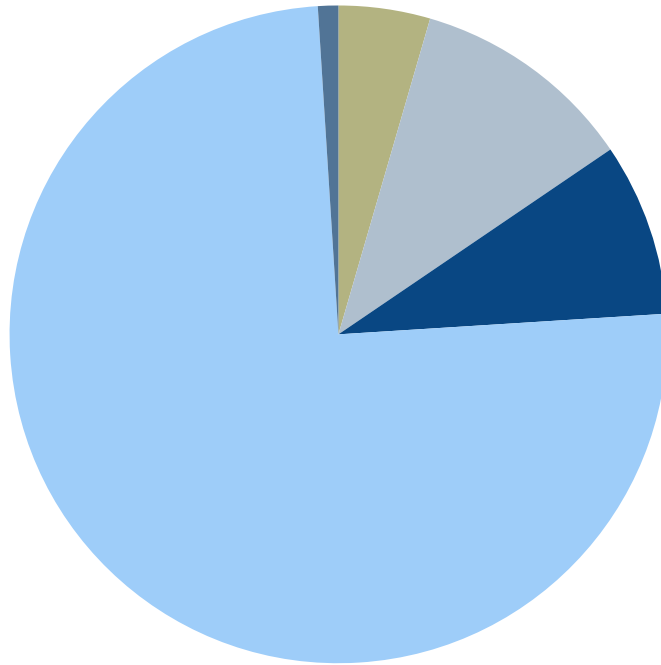
Automotive Data Monetization Market in 2017 – Total Addressable Market

Market If all the connected vehicles with the ability to capture certain data types were monetized at the current value per car per year rates, the overall opportunity sums up to ~\$2.0 billion.

Automotive Data Monetization Market : Available Opportunity based on Data Type, Global, 2017 - 2025

Available Opportunity based on Data Type in 2017

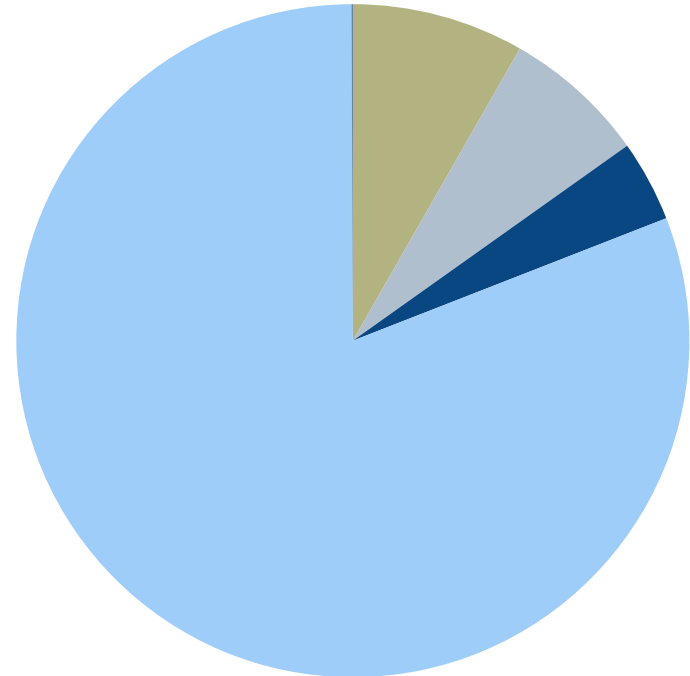
is ~\$1.8- 2.0Billion



■ Location Data
■ HD Map Data
■ Environmental Data
■ Driver Behavior
■ Vehicle Usage Data

Available Opportunity based on Data Type in 2025

is ~\$32.0 Billion

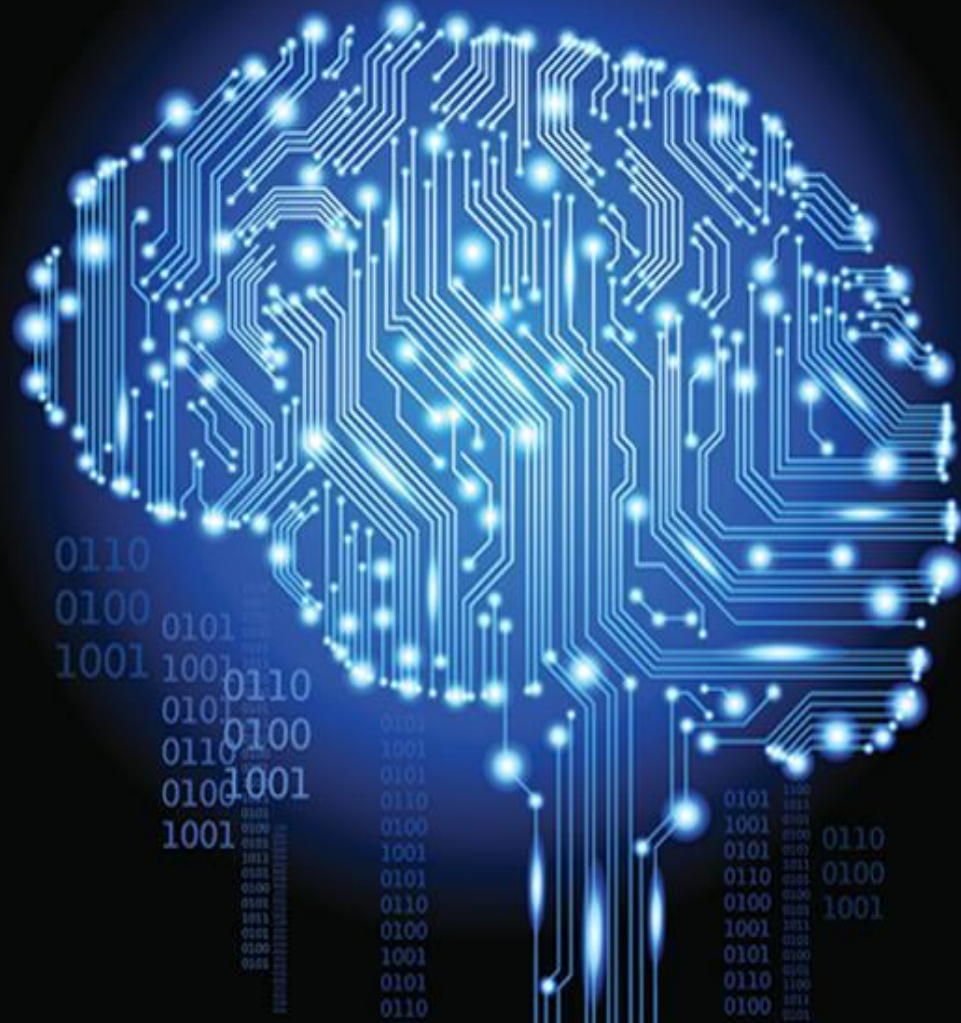


■ Location Data
■ HD Map Data
■ Environmental Data
■ Driver Behavior
■ Vehicle Usage Data

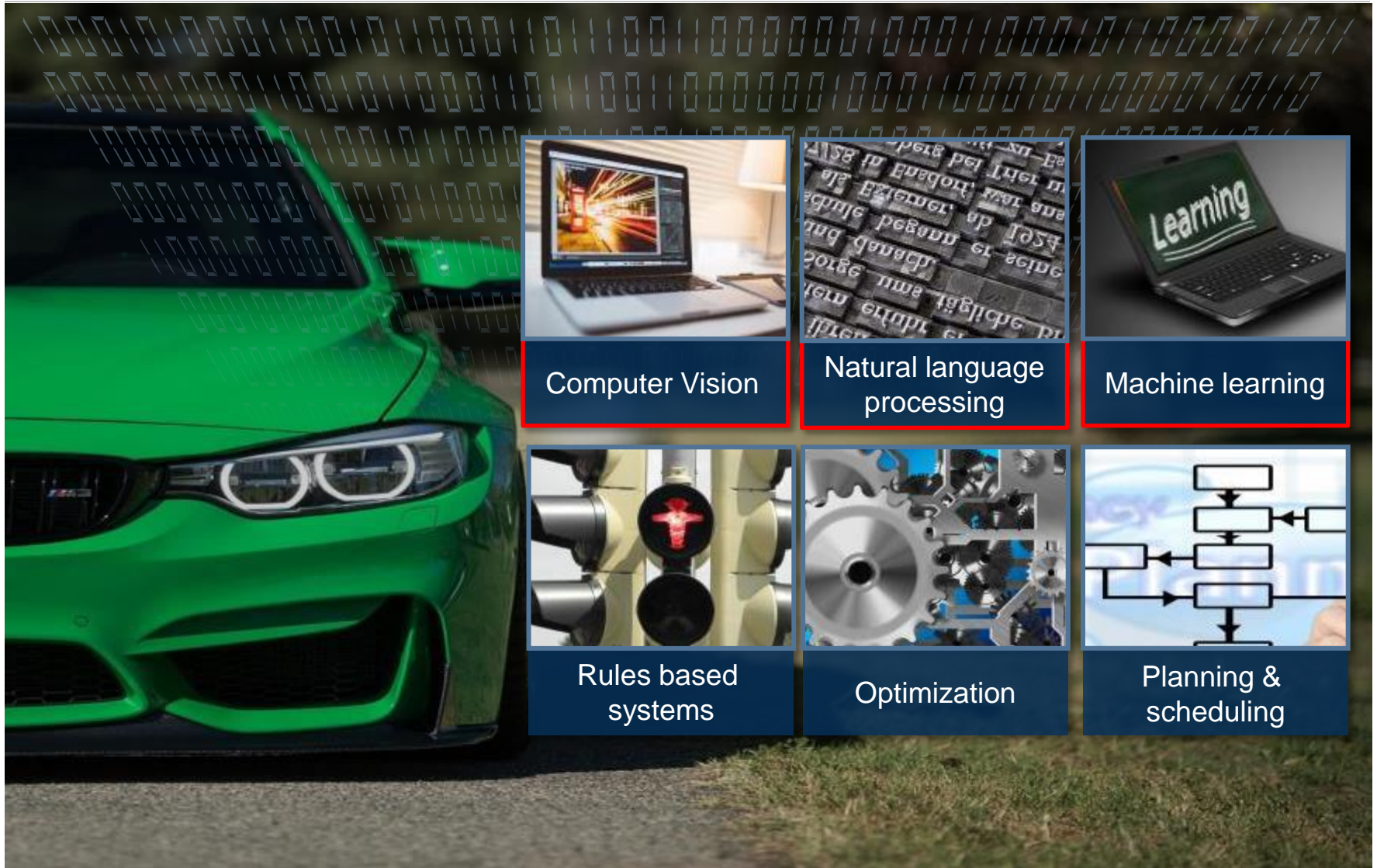
Note :The definition of each data type is mentioned in the previous slide

Source :Frost & Sullivan

Advent of the Cognitive Era



Cars Will Need These 6 Cognitive Technologies For AI

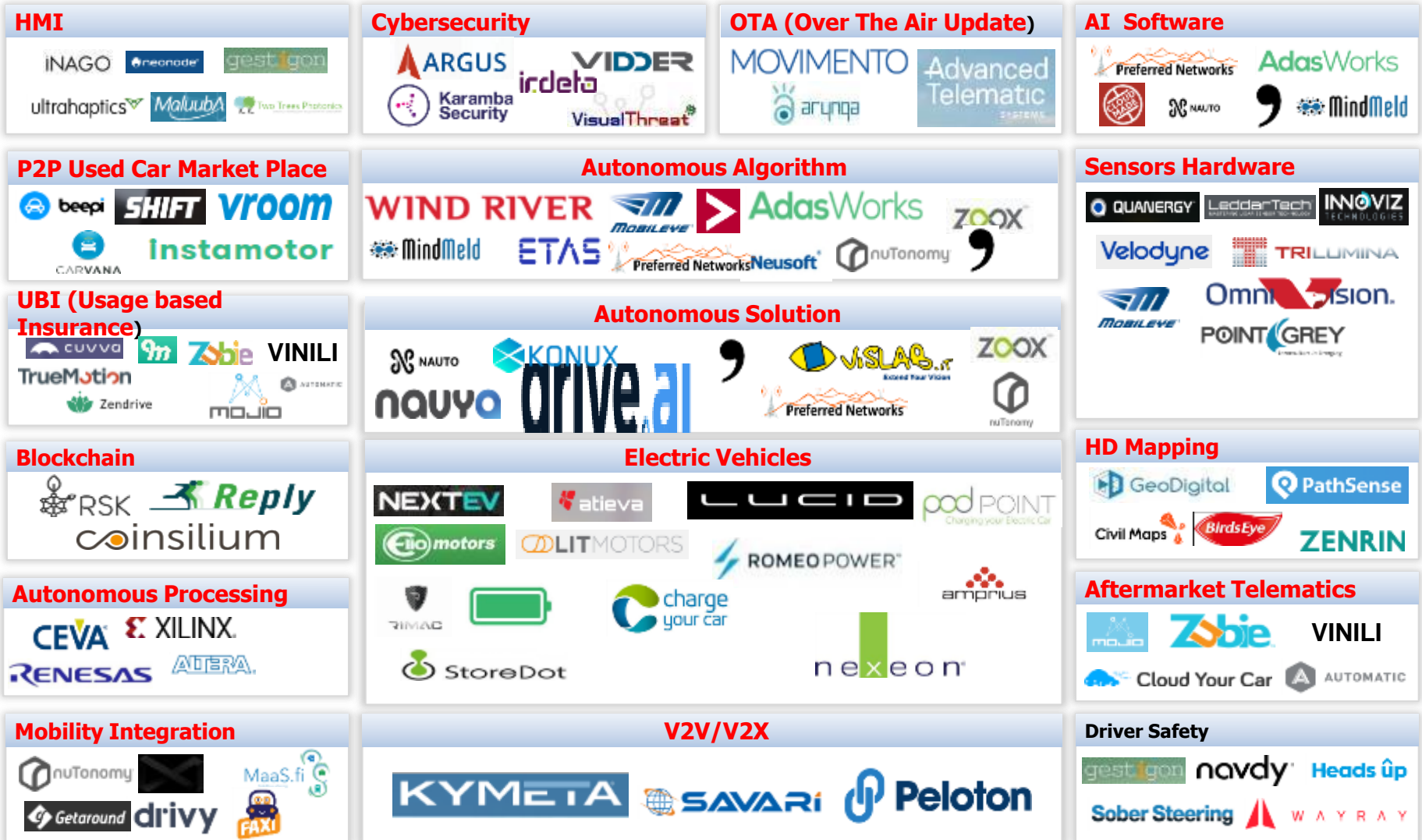


Sub Trend: Autonomous Cars - \$60bn per annum market opportunity in 2030, 50% of which will be in Software



Over 1700+ Start Ups Disrupting the Automotive Landscape

Auto Suppliers are building Innovation Hubs and Accelerator programs to use open innovation to leverage this trend



Future of F1 Racing is Autonomous














Select Flying Car Specifications, 2017

From Roadable Aircrafts, Gyroplane's, Quadcopters, Multicopters to Manned Drones, the flying cars sector at present is comprised of products which are highly differentiated from each other

Flying Cars : Flying Car Specifications- Comparison, Global , 2017

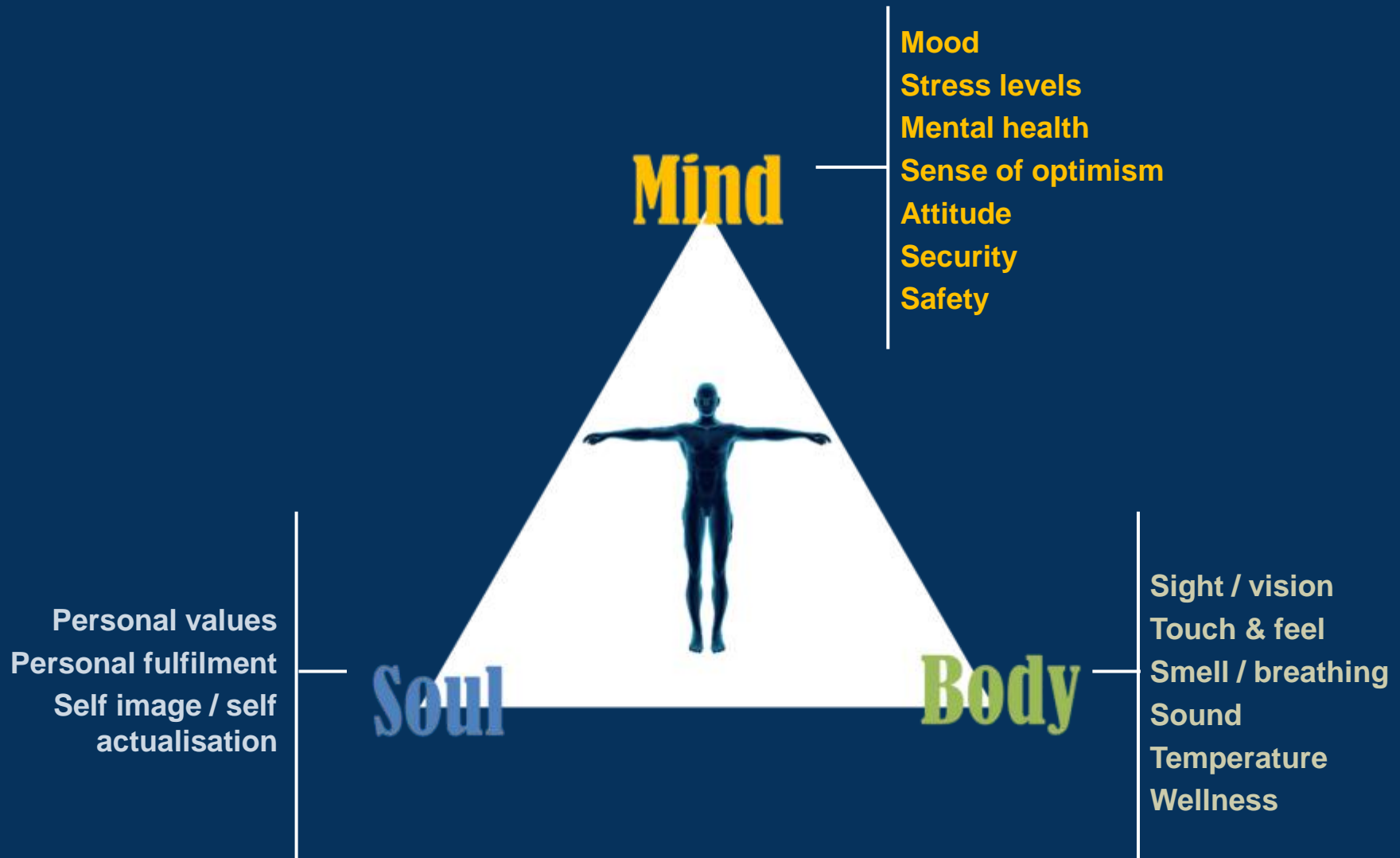
Specification	Terrafugia Transition	Aeromobil 3.0	PAL-V Liberty	Ehang 184	Volocopter VC 200	Cormorant
Type 	Roadable Aircraft	Roadable Aircraft	Gyroplane	Quadcopter	Multicopter	Manned Drone
Fuel 	Gasoline	Hybrid	Gasoline	Electric	Electric	Gasoline
Fuel Efficiency 	5 US Gal/hour	4 US Gal/Hour	7 US Gal/Hour	5 miles/hr charge	NA	NA
Range (Km) 	400 km	700 km	500	NA	NA	50 (carrying 500kg)
Maximum Altitude (Feet) 	10,000	9800	11, 480	11, 840	6500	12, 000
Cruise Speed 	100 mph	124 mph	112 mph	62 mph	100 Kmh	115 mph
Propeller 	3 Bladed	NA	2-bladed	2 bladed	2-bladed	Internal Rotors
Engine 	Rotax 912is	Rotax 912S	160kW	NA	16 motor	NA
Useful Load (Kg) 	210	NA	246	119	120	500

Source: Frost & Sullivan

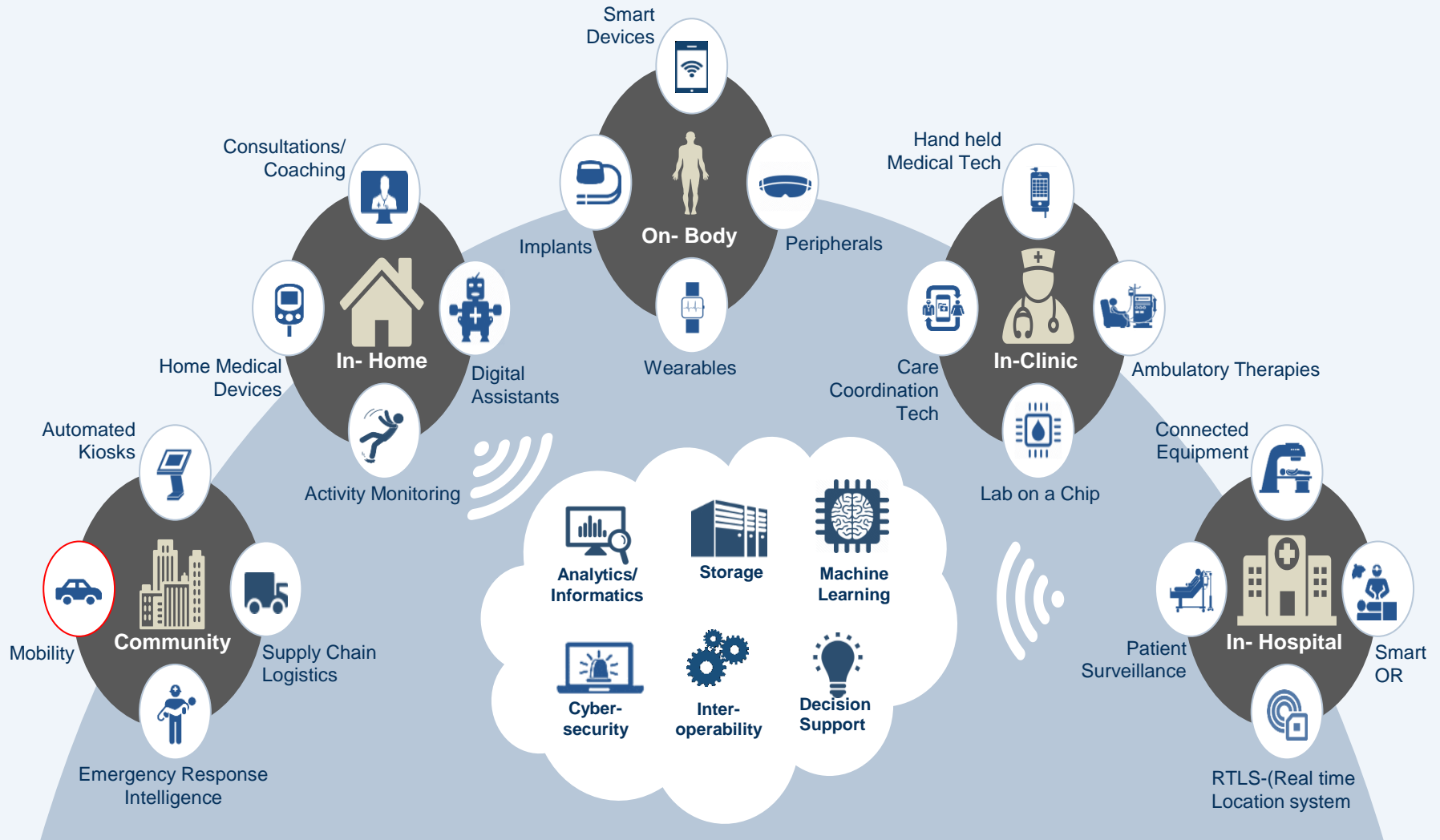
Mega Trend : Health, Wellness and Wellbeing



The 3 Cornerstones - The Body, Mind and Soul - Contribute To Humans Definition of Health, Wellness and Well Being



Transformational Shift : Anytime Care - Internet of Medical Things



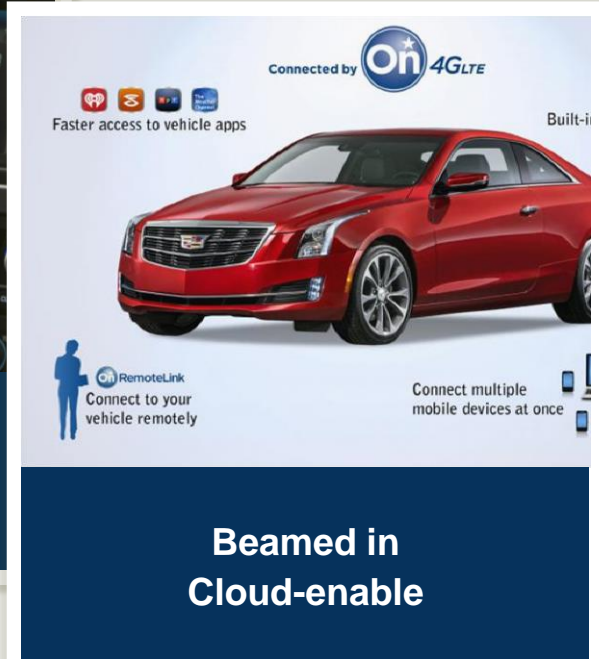
Health, Wellness and Wellbeing the Next Big Differentiation Factor for OEMs As they Develop Built-in, Brought-in, and Cloud-enabled Features



**Built-in
(Embedded)**



**Brought-in
(Peripheral Integration)**

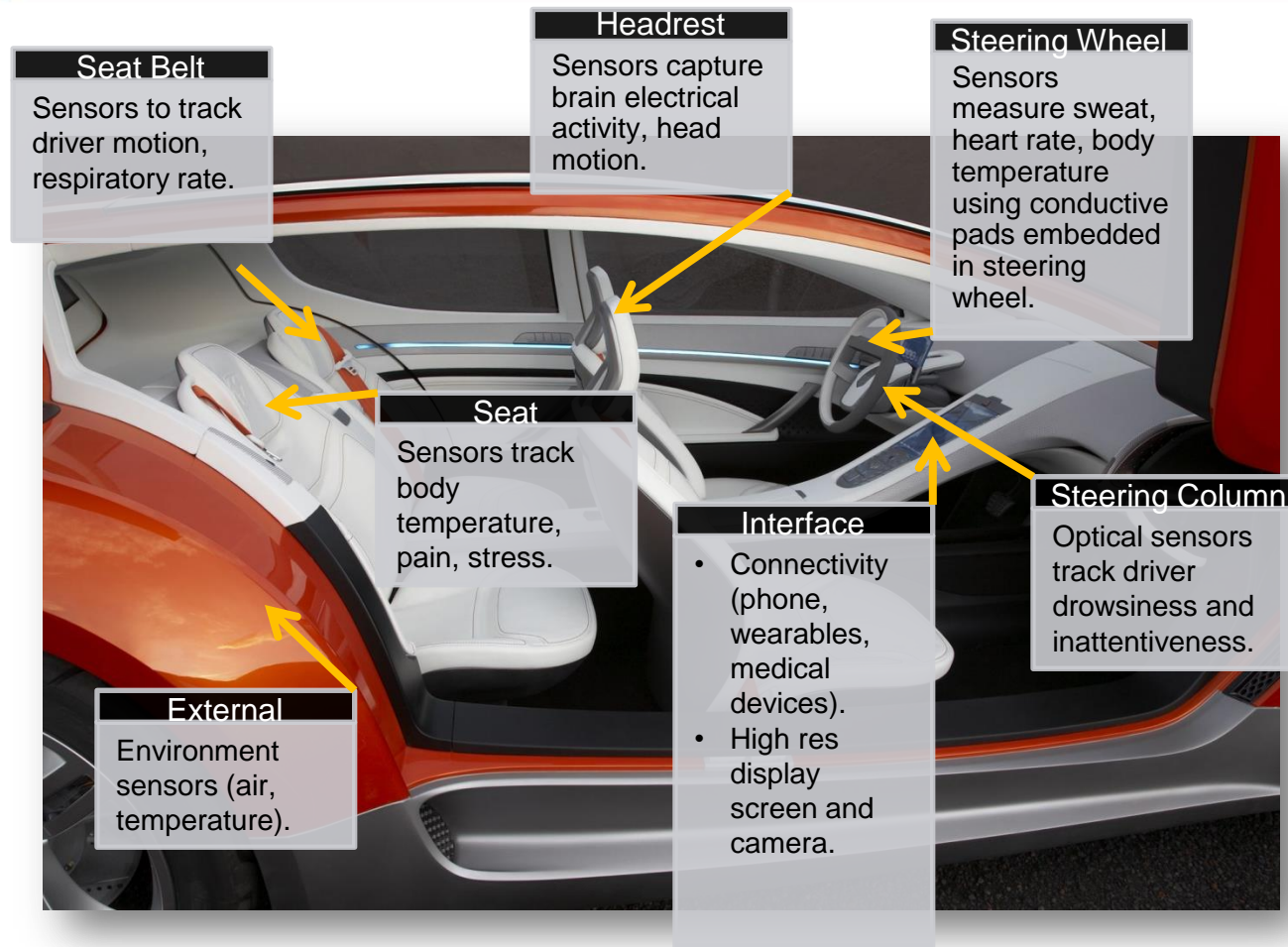


**Beamed in
Cloud-enable**

Source: Frost & Sullivan

Example of Built-In Health Wellness and Well-being Technologies

PSA should consider Wellness features tailored to specific markets like Diabetes Sensor, Air Purifiers, BP Monitor, Alcohol – locks/Driver Drowsiness (for chauffeur's) in India



Developer Spotlight*:



In vehicle sensors:

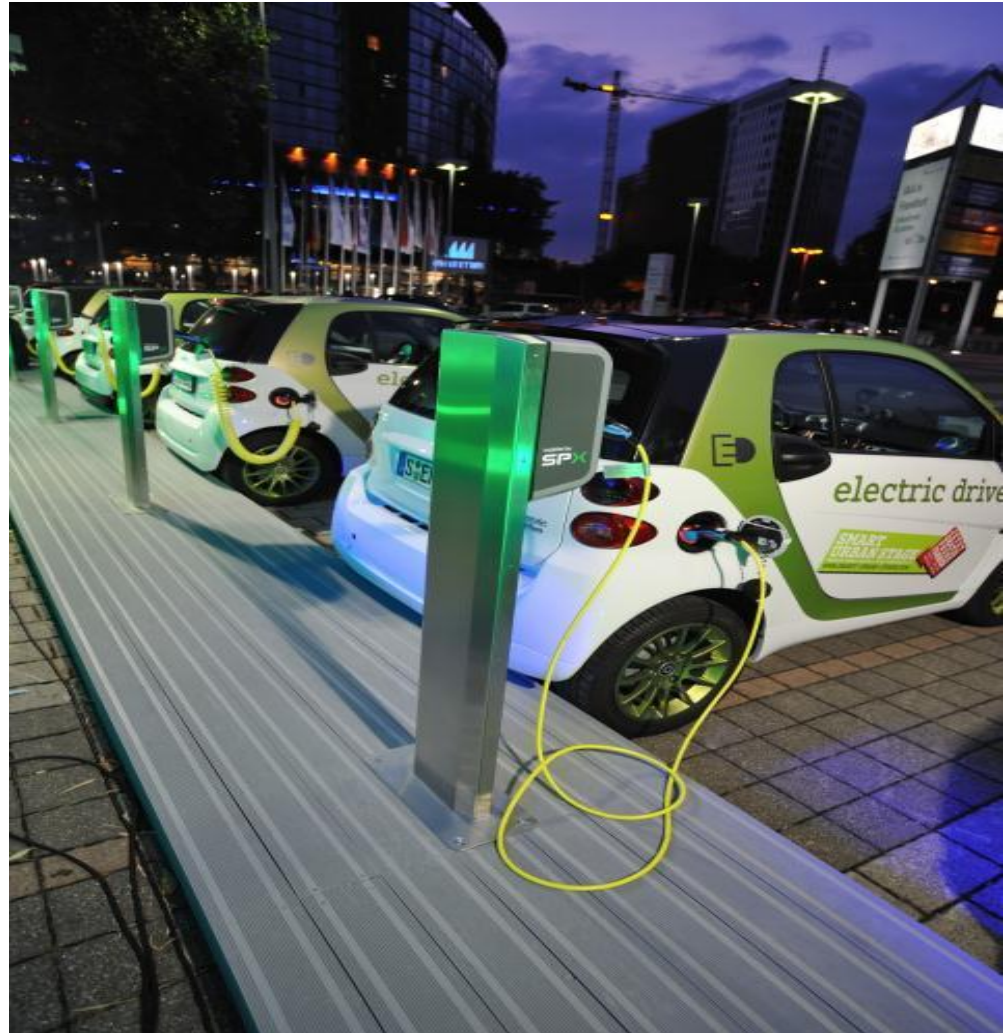


Dashboards/ Analytics:



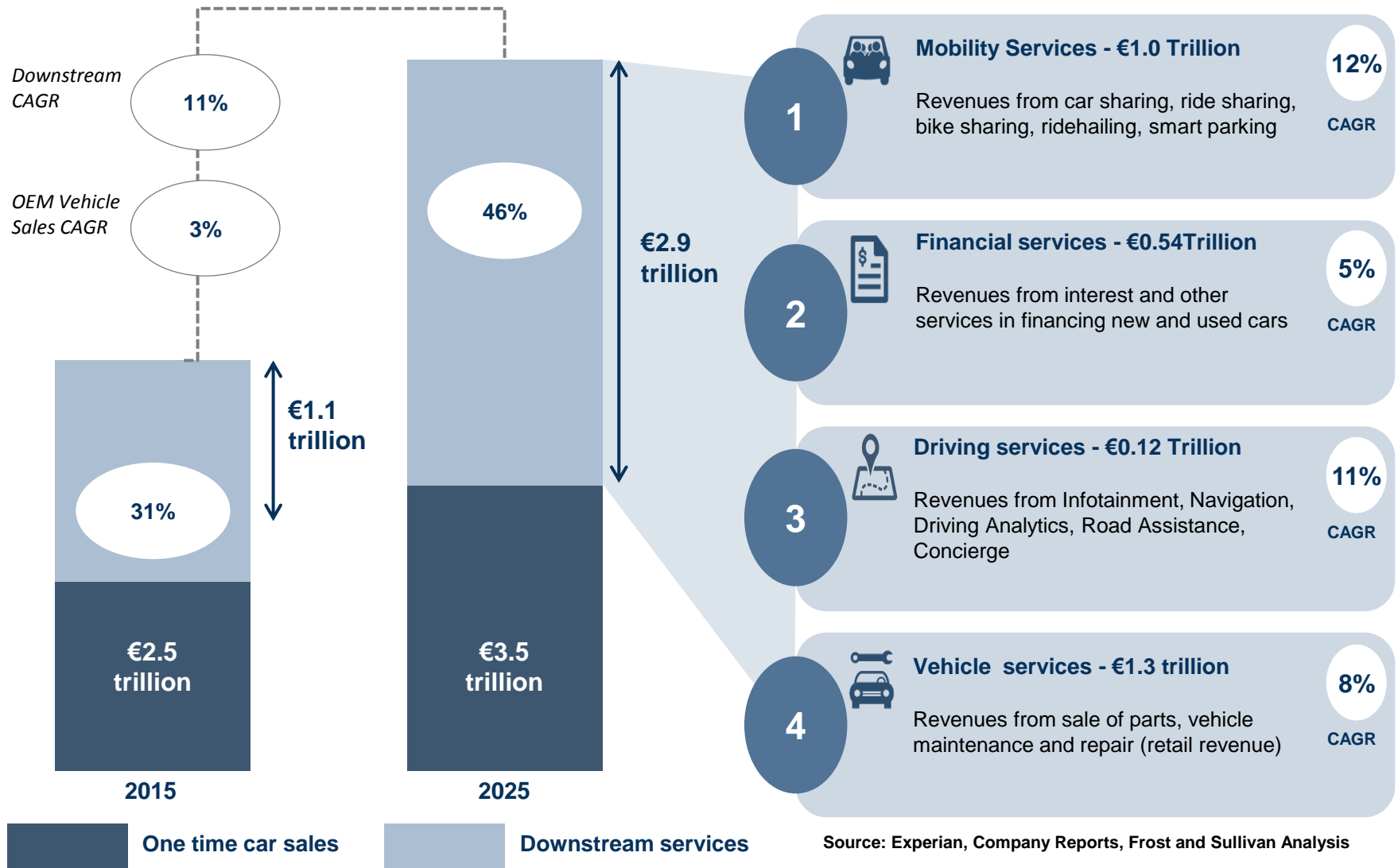
* See appendix for select sensor, wearable, and mobile health tool developers.

Future of Mobility



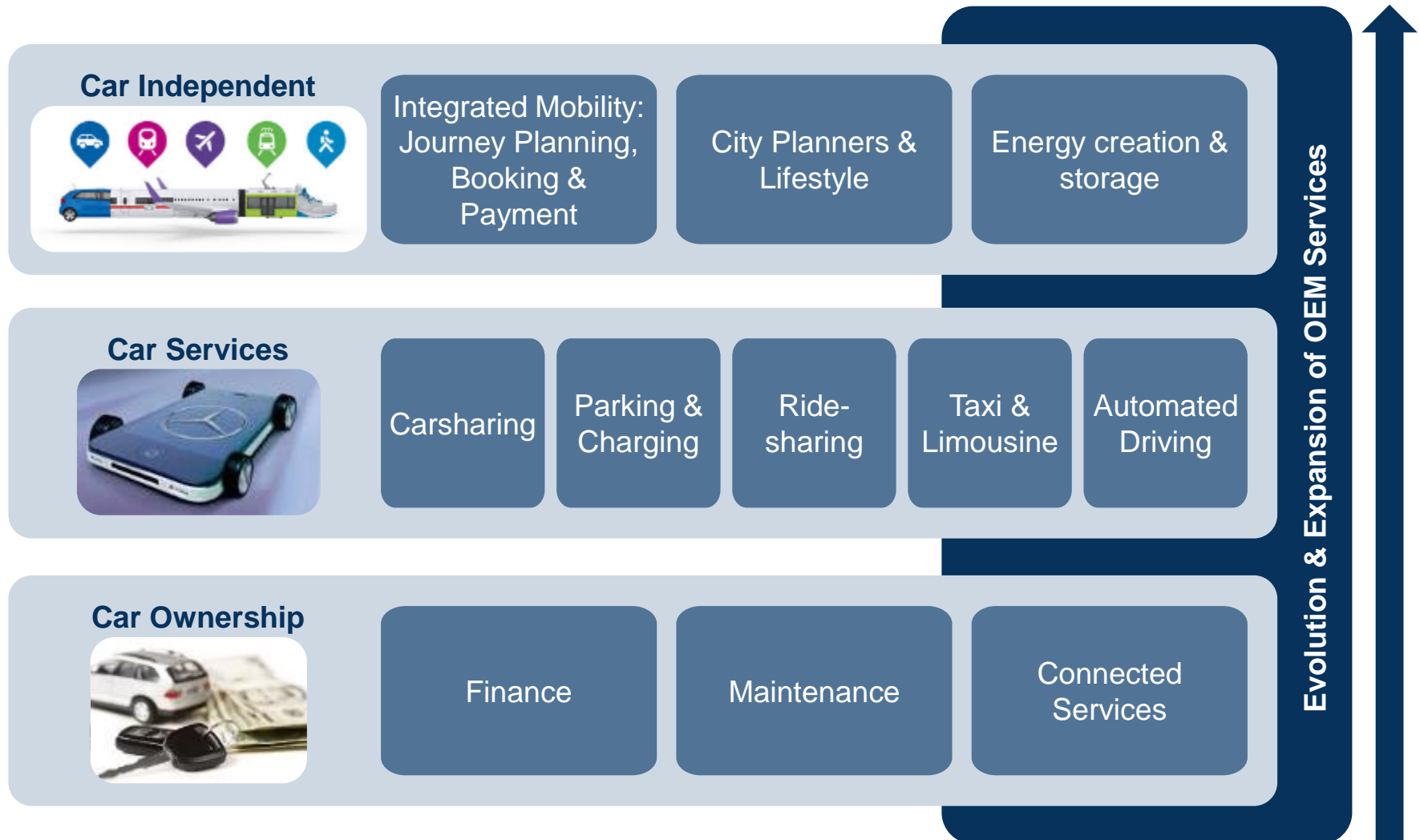
Automotive Revenue growth in Future Will Come From Downstream Services

New revenue streams from Financial, Driving, Vehicle and Mobility services is expected to grow into a trillion dollar market by 2025

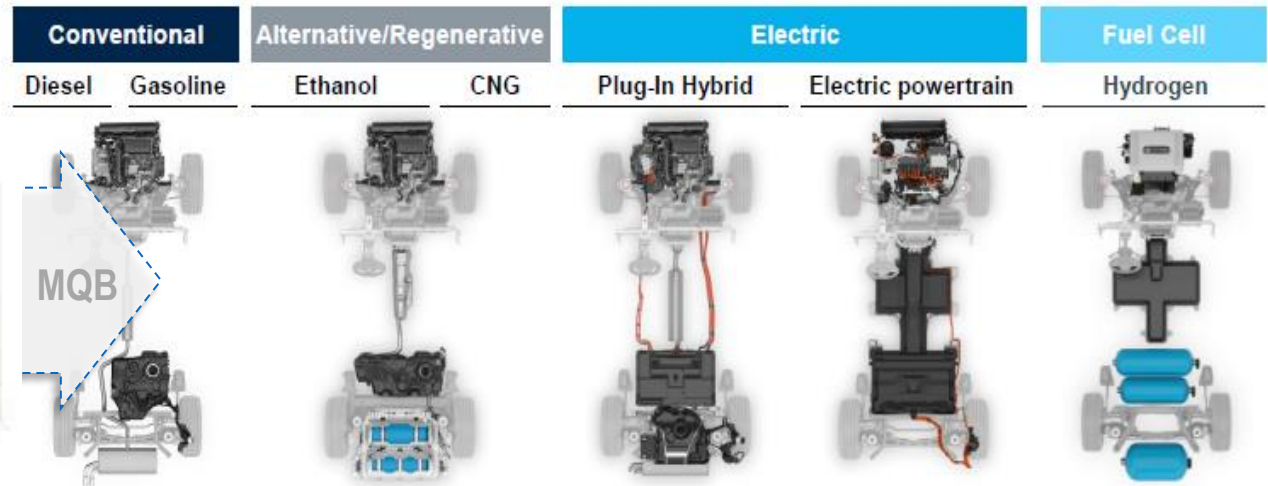


Sub Trend: Evolution of OEMs Mobility Services

Car companies are evolving from the business of manufacturing & selling just cars, to providing Mobility as a Service Offerings



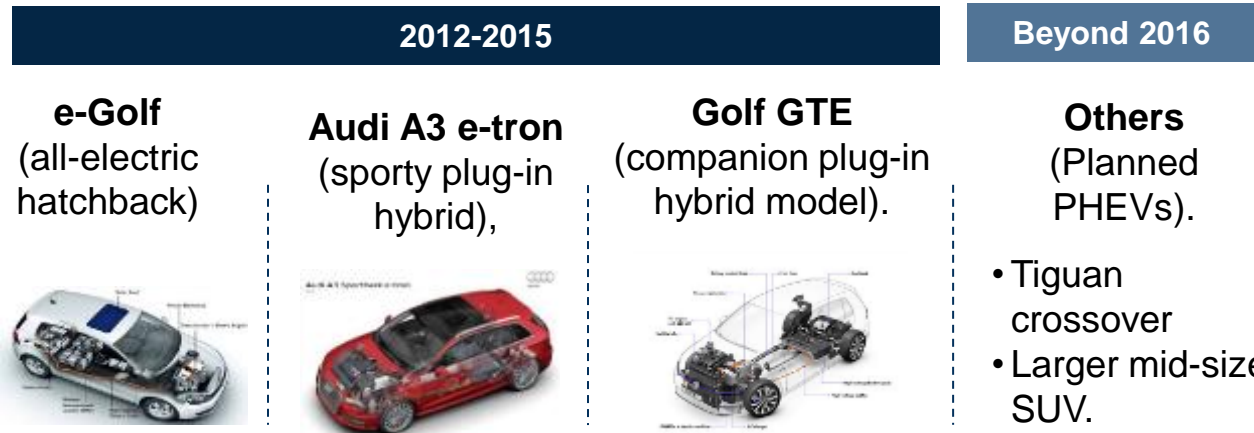
VW Dieselgate reshaping the auto landscape with push to Electrification.



←---- Battery pack of varying capacity, an 85-kW electric motor system, and/or a motor-integrated version of its DSG. ----→

Flexibility in packaging afforded by:

- MQB platform
- Vehicle-electrification toolkit



Conclusions



How OEMs Will Differentiate Their Brand In Future

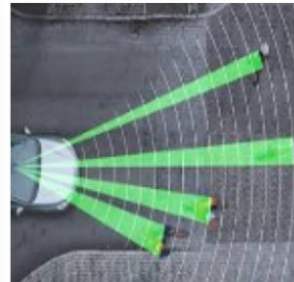
DESIGN & STYLING



DRIVING DYNAMICS



SAFETY



SUSTAINABILITY & ENVIRONMENT



AUTOMATED MOBILITY



QUALITY & RELIABILITY



COMFORT & CONVENIENCE



COST OF OWNERSHIP



CONNECTED MOBILITY



HEALTH, WELLNESS & WELLBEING

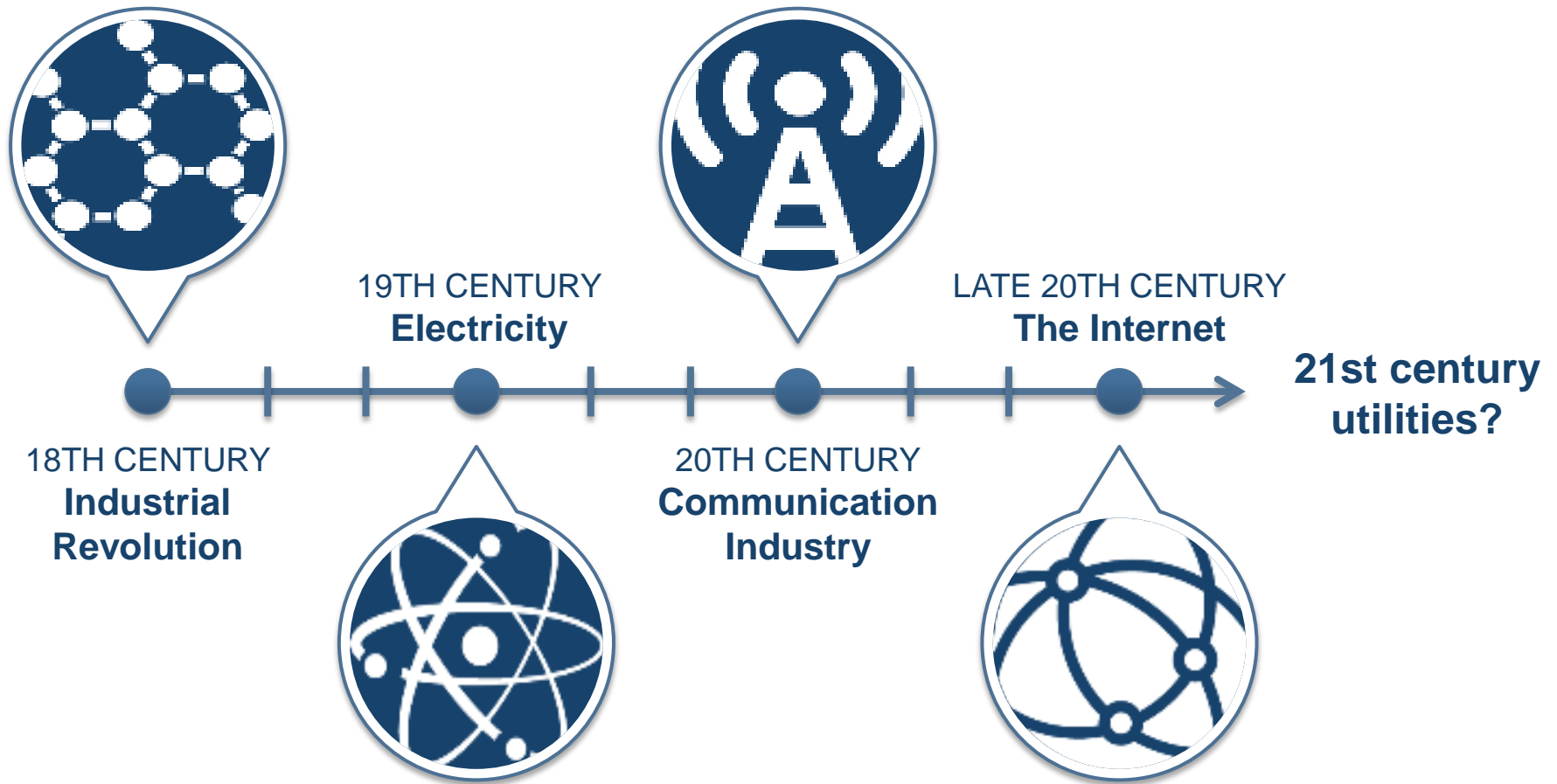


PRE 2000

TODAY

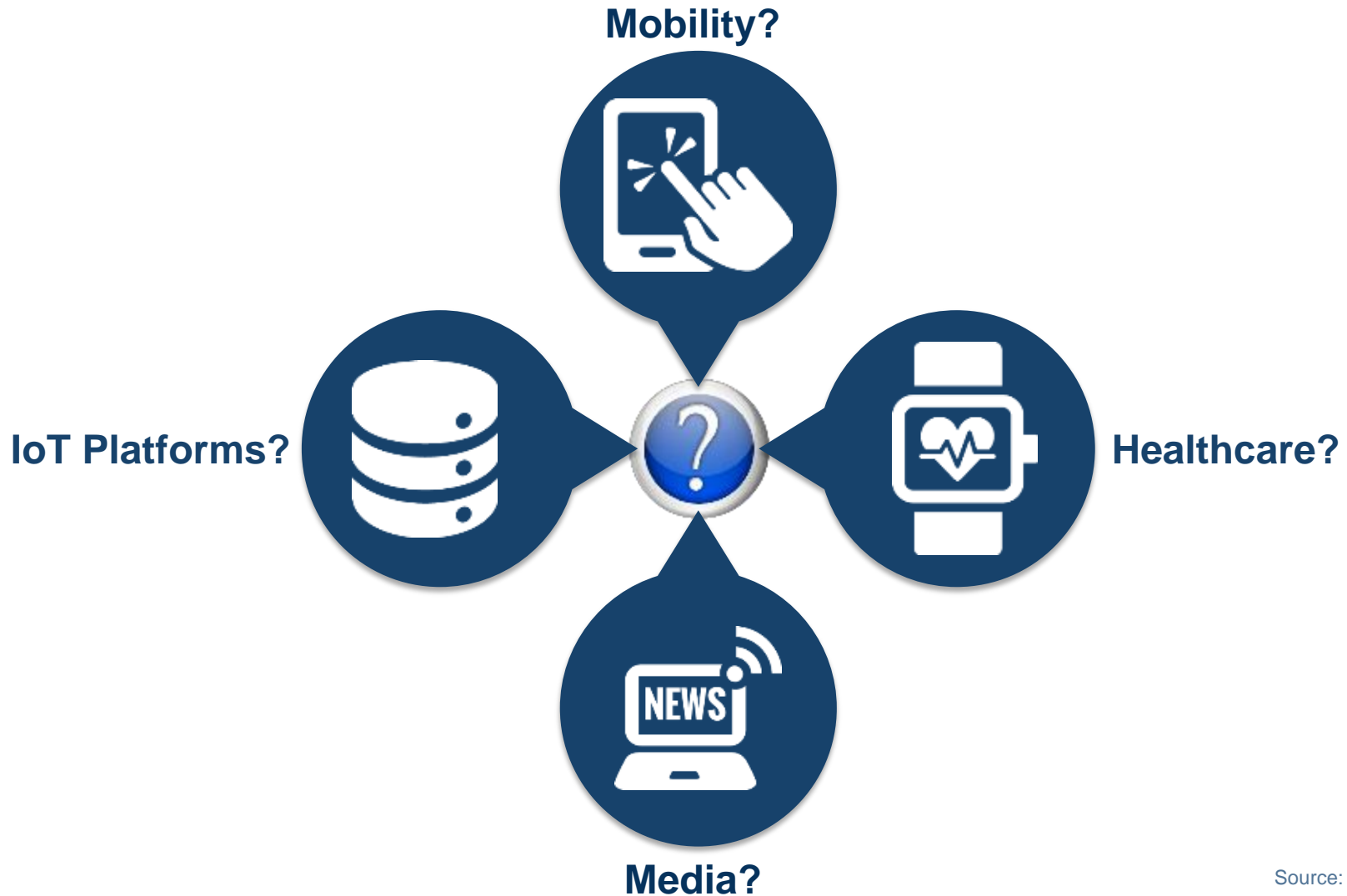
FUTURE

Utilities and commodities of The Past



Source: Frost & Sullivan

21st Century Utilities: What is the Future ?



Source: Frost & Sullivan

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