# EXECUTIVES PANEL

**Panel Discussion - Smart mobility & Supply Chain Digitization in Africa.**

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# KEY TRENDS IN MOBILITY

# Technology enables new mobility business models

**Growth of Downstream Services**

**New Mobility Business models**

**Subscription Services**

**Digital Transformation & Data Monetisation**

**Rise of Autonomous Taxis and Shuttles**

**Growth in Autonomous in Commercial vehicles**

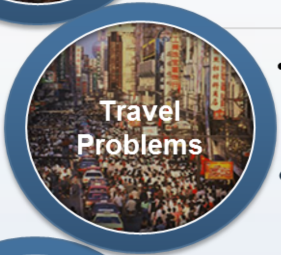
**Beyond Cars – Drones, Delivery Bots and Flying Urban Vehicles**

**Future Scenarios of Mobility**


- *Technology as key enabler – smartphone and connectivity, not only embedded tech*
- *Customer real-time feedback and service offerings*
- *Change in thinking on ownership – rise of subscription services*
- *New trend with significant revenue potential – data monetisation – what to do with data?*
- *Autonomous enabled by new tech and startups, cost saving and insurance*
- *Smart city solutions for last mile – drones and FUVs*
- *Cost of ownership and affordability in Africa*

# Changing urban demographics are leading to travel problems that past mobility services aren't solving


| Factors | Impact To Mobility |
|---|---|
| • Over **54%** of the World's population lives in cities, expected to rise to **67%** by 2050; urbanisation exceeds **80%** in OECD countries | • More concentrated density<br>• Limited space<br>• Increased mobility demand<br>• ***Unbalanced Supply & Demand*** |
| • Drivers spend **50** hours per year in congestion which stifles the economy of **1%** of GDP<br>• **7** million lives are lost prematurely each year due to air quality; mobility is the largest sector contributor | • Unproductive time spend<br>• Inconvenience & high costs<br>• ***Opportunity for innovation in new mobility services*** |
| • Private cars are utilised **4%** of the time and account for **29%** of transport trips on average, but account for **85%** of our mobility expenditure | • Inconsistent Transport Provisions<br>• Multiple apps & fragmented markets with several providers<br>• Fixed, inflexible routes<br>• ***Lack of information,*** |





**Global mobility market needs new type of mobility services.**

- *Urbanisation*
- *Congestion time and cost*
- *Change in preferences*
- *Change in ownership perceptions – inefficient use of private vehicle*
- *Efficiency and pay-per-use*
- *Digital technology platforms open new possibilities and business models*



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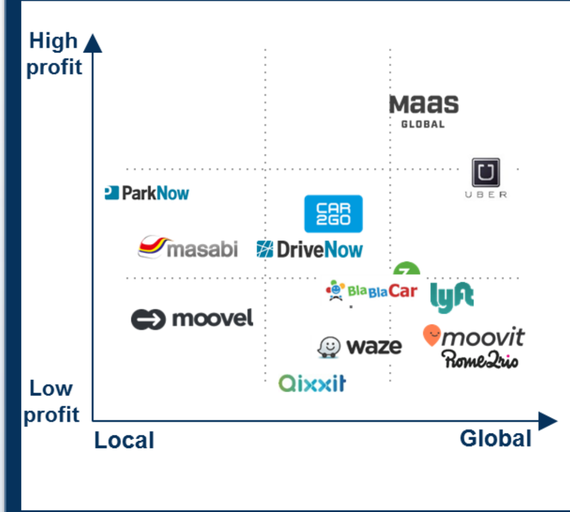
# New players are disrupting the market

**Individual players ability to provide quality services is stifled by the price competition, few single mode / sector offer large coverage as well as high profitability**




| Key Competitor | Business Model | Investments Raised | Regional Presence |
|---|---|---|---|
| CAR2GO | Carsharing | - | 8 Cities in EU, 13 in US and 1 in China |
| DriveNow | Carsharing | - | 11 Cities in Europe |
| UBER | eHailing | €14.13 Bn | 400 cities Globally |
| lyft | eHailing | €1.98Bn | 65 cities globally |
| BlaBlaCar | Carpooling | €291.96 Mn | 22 Countries Globally |
| Qixxit | Integrated Mobility | - | Germany |
| moovit | Integrated Mobility | €76.73 Mn | 1200 cities Globally |
| moovel | Integrated Mobility | | 3 Cities in Germany and 2 cities in US |
| masabi | Ticketing App | € 19.58 Mn | 4 cities in US and 1in UK and 1 in Greece |
| ParkNow | Smart Parking | - | >200 cities in EU and US |

- *Simple technology enabler is the smartphone – direct access from user to provider in real time*
- *Rise of e-hailing, carpooling, carsharing, ticketing and smart parking apps*
- *Business model - Asset light vs. asset heavy*
- *Examples*
- *Local: CarTrip , uGoMyWay - carpooling, GoMetro – integrating solution*
- *Affordability and convenience*
- *Challenges to overcome: competition and regional differentiation*



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# Autonomous Trends in Mobility

*"We Accelerate Growth"*

# Development of Autonomous Driving will Outpace Uptake


Current Level

| | 2011 | 2016 | 2018 | 2025 | 2030 |
|---|---|---|---|---|---|
| No Assist | Early Warning Systems | Traffic Control | Awareness for Takeover | General Awareness | Full Autonomous Driving |
| Level 0 | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| New Vehicles | 40 million | 15 million | 5 million | 2 million | 1 million |

- *What is autonomous driving and development roadmap*
- *Enablers of AD:*
  - *Infrastructure*
  - *Connectivity*
  - *Insurance industry (safety)*
  - *Processing power and artificial intelligence*
- *Threats to uptake*
  - *Jobs*
  - *Popular vote*



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# Social Pushback on Autonomous Technology

GM self-driving car gets PULLED OVER by police and slapped with a ticket in San Francisco after getting 'too close' to a pedestrian

Uber in fatal crash detected pedestrian but had emergency braking disabled

The driver who died in a Tesla crash using Autopilot ignored at least 7 safety warnings

UK kicks off driverless car law review to get tech on the road by 2021

UK takes first step towards criminalising driverless car hackers

Self-driving cars attacked by angry San Francisco residents

Human attacks have accounted for a third of accidents this year



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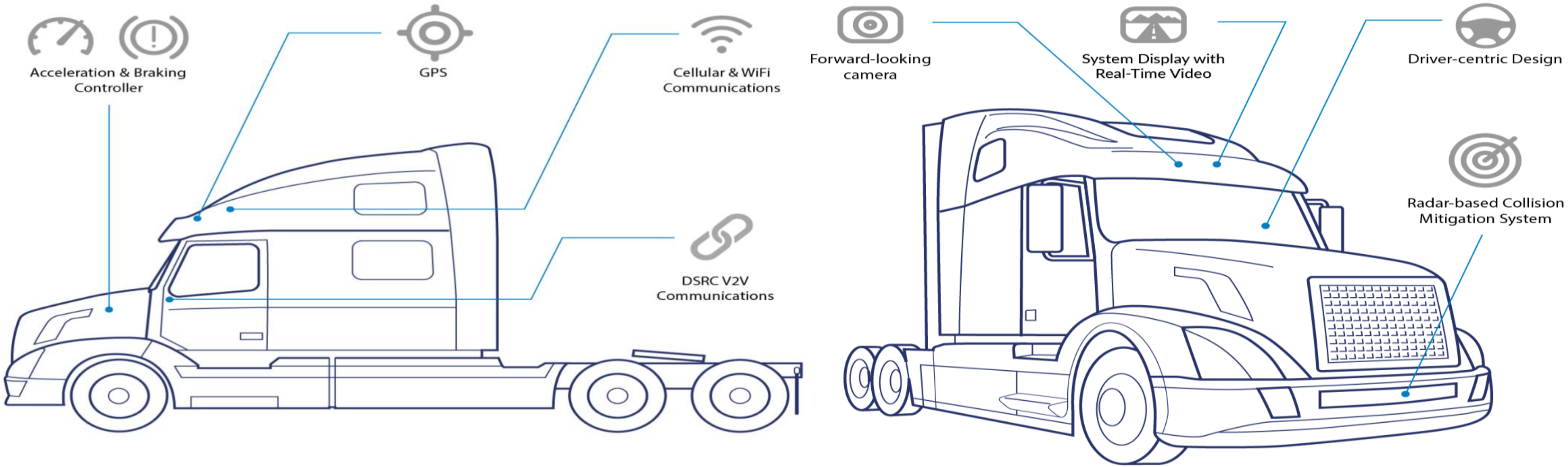
# V2V Communication Between Commercial Vehicles

*Peloton Technology, US*



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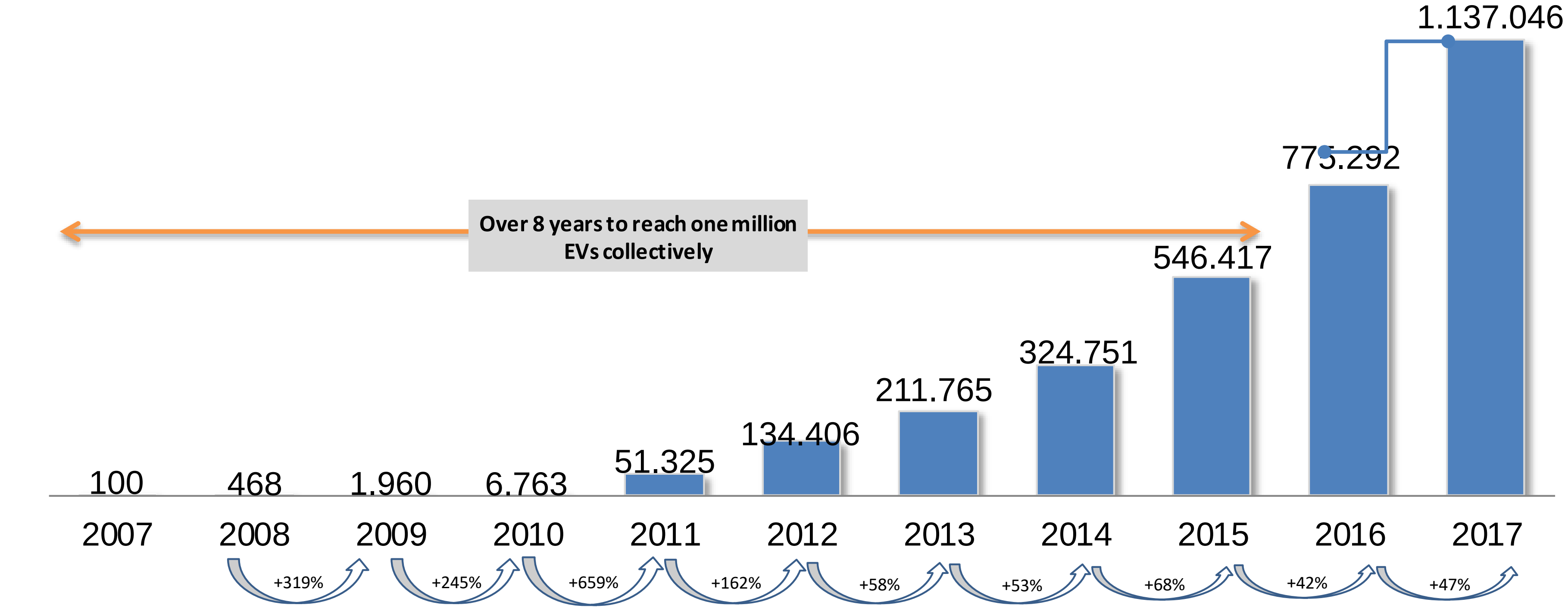
# ELECTRO-MOBILITY TRANSFORMING THE MOBILITY ROADMAP

# Electric Vehicles Sold in the last decade

**EV sales have doubled since 2015 – currently EVs account for a penetration of 1.2% of the total passenger car market. In comparison, hybrid cars took 15 years since launch to reach the 1M mark.**

**GLOBAL ELECTRIC VEHICLE OUTLOOK: HISTORIC EV SALES, GLOBAL, 2007-2017**




Note – December numbers have been estimated based on average sales per month



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# EV targets announced by OEMs in 2017

**The last 6 months 11 OEMs have announced EV milestones and targets. If all the announcements made so far were to come true, there will be about 25M EVs sold by 2025 or 20% of all cars sold to be EVs**

## OEM ANNOUNCEMENTS AND MILESTONES

**Jun**

- **Porsche** plans 50% of cars to be electric by 2023.
- Mission E to be its first all-electric vehicle that is planned for 2019-2020

**Jul**

- All cars produced from 2019 onwards will be electric or hybrid; first one produced will be in China.
- 5 BEVs likely to be launched between 2019-2020.
- Aims to have 1 million EV sales by 2025

**Aug**

- By 2030, Aston Martin expects that EVs will account for 25% of its sales, with the rest of the lineup expected to be hybrids

**Sep**

- VW Group as a whole will deliver more than 80 new models by 2025. 50 BEVs and 30 PHEVs
- Aim to sell 2-3 million EVs by 2025

- Renault Nissan & Mitsubishi alliance announce 12 new electric vehicles by 2022.

- GM Announces all electric future with 2 fully electric vehicles by 2020 and another 18 models by 2023
- Plans to sells 1 million EVs by 2026

- By 2025, BMW will offer 25 electrified vehicles 12 will be fully-electric.
- Aims to have 25% (.8 million) of its vehicles to be electric.

- JLR announced 100% shift towards electric and hybrid vehicles by 2020

**Oct**

- Ford and Zotye formed a joint venture. A new 50:50 joint venture that will offer EVs

**Nov**

- Daimler announced to invest 5 billion yuan ($755 million) in China, with BAIC (JV partner), to produce electric cars and the batteries.
- Aims 25% (0.7 million) of its vehicles produced to be electric by

**Dec**

- Toyota plans to offer more than 10 EVs by 2020.
- Aim to sell over 1 million EVs by 2025

| BY 2025 AS PER ANNOUNEMENTS | ~25M EVs | 20% WILL BE EVs | ~400 EV MODELS |
|---|---|---|---|



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# Supply chains will face disruption

- *Conversion vs. purpose design*
- *Elimination of traditional powertrain value chains*
- *New battery value chain*
- *OEMs are not battery manufacturers – risk and R&D*
- *Rise of tech and IoT companies in automotive manufacturing*
- *New materials will disrupt supply chains*
- *Aftermarket and end-of-life disruption – reverse logistics costs for recycling*



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# Boom in the automotive startup ecosystem

## There has been a shift in the automotive value chain; over 1700 new startups are unbundling the mobility industry

### HMI
iNAGO, neonode, ultrahaptics, Maluuba

### Cybersecurity
ARGUS, VIDDER, Karamba Security, VisualThreat

### OTA (Over The Air Update)
MOVIMENTO, Advanced Telematic Systems, arynga

### AI Software
Preferred Networks, Cloud Made, AdasWorks

### P2P Used Car Market Place
beepi, SHIFT, vroom, CARVANA, Instamotor

### Autonomous Algorithm
WIND RIVER, MOBILEYE, Neusoft, AdasWorks, MITSUBISHI ELECTRIC, Elektrobit, NVIDIA, ETAS, LUXOFT

### Sensors Hardware
QUANERGY, LeddarTech, INNOVIZ TECHNOLOGIES, Velodyne, TRILUMINA

### UBI (Usage based Insurance)
cuvva, TrueMotion

### Autonomous Solution
NAUTO, Google, VisLab.it Extend Your Vision, ZOOX, navya, drive.ai, Baidu 百度, nuTonomy

### HD Mapping
GeoDigital, PathSense, BirdsEye, ZENRIN, MOBILEYE

### Blockchain
RSK, Reply, coinsilium

### Aftermarket Telematics
mojio, Zubie, VINILI, Cloud Your Car, AUTOMATIC

### Autonomous Sensors
Velodyne, QUANERGY, ON Semiconductor, LeddarTech, OmniVision, TRILUMINA, Neusoft, POINT GREY Innovation in Imaging

### Autonomous Processing
CEVA, XILINX, RENESAS, ALTERA

### Driver Safety
gestigon, navdy, Heads up, Sober Steering, WAYRAY

### Mobility Integration
nuTonomy, Getaround, drivy

### V2V/V2X
KYMETA, SAVARI, Peloton

### Electric Vehicles
NEXTEV, atieva, Elio motors, LIT MOTORS



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