Intelligent Mobility

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The emerging digital disruption in Transport

"We think our business and personal mobility will change more in the next five years than the last 50" GM President Dan Ammann on making \$0.5bn investment in Lyft



"In the next 10 to 20 years, transportation will be one of the biggest areas for electronic and software investments" Xavier Mosquet, US Auto Practice Lead, Boston Consulting Group

"We strongly believe that autonomous vehicle go-to-market strategy is through a network, not through individual car ownership" John Zimmer, President of Lyft





Intelligent Mobility



An Introduction to Intelligent Mobility

The transportation market is undergoing radical whole-scale transition from old heavy industrial networks to light, agile, networked, optimized and autonomous fleets. Intelligent mobility describes technologies that facilitate this change and move us towards transportation that is far more efficient, effortless for consumers and digitally-connected by design.

- Urbanisation is a global trend creating negative externalities of congestion and pollution
- Current approach to transporting people and goods is inefficient, costly and not meeting the needs of the customer
- Digital technology is enabling new "shared" / multi-modal mobility services within existing infrastructure
- Rise of global aggregators (Uber, Lyft etc) offers a glimpse towards future integrated transport solutions

Existing Inefficiency

Existing Customer Spend:

- Average expenditure on mobility is ~€300 per month in Europe compared to ~€30 per month on telephony.
- This is comparable to ONS UK weekly estimates for transport spend: £50.10-£74.80 (~€285 pm to €424 pm respectively).

Capital / Operational Efficiency:

- The average car spends 96.5% of its life parked. Improved capital utilisation through shared-models could significantly reduce the costs to consumers.
- Route optimization / predictive maintenance can enhance capital and operational efficiency.
- Removal of drivers (e.g. via Platooning) can reduce costs in supply chains.

Land:

 It is estimated that up to 20% of city centre land is used for parking. New business models offer capital release potential for large land owners.







Why is this happening now?

Intelligent Mobility - driven by clear mega-trends:

Many sectors have seen whole-scale disruption due to digital and internet technologies – for example Retail, Media and Banking. Transport has hitherto been relatively untouched.

This is now changing. Demand for intelligent mobility is being driven by four global mega-trends that show no signs of slowing:

- 1. Proliferation of smart, connected devices
- 2. Urban population growing faster than capacity
- 3. Falling car ownership / shared economy
- 4. Growing level of autonomy within vehicles



Transport faces incresing innovation and disruption





Mercedes: F015 Autonomous Concept Car

Mega-trend 1 – Proliferation of Smart Devices

- 46% of US smartphone users say their smartphone is something "they couldn't live without"
- Young consumers active users of smart devices e.g. in China 50% of the 15-25 year demographic check their mobile phone every 15 minutes (Credit Suisse)
- Increasing share of travel bookings of all types are made digitally
- Mobile accounts for most of the overall growth in travel bookings since 2014, as the share of mobile bookings has almost doubled.
- Data shows that smart phones increasingly occupy instant transactions. 65% of same-day hotel reservations were made via a smartphone.



Source: Credit Suisse Chinese Consumer Market Insights



Source: Statista



Mega-trend 1 – Proliferation of Smart Devices

- As well as on the consumer side, increasing numbers of connected devices are bringing digitisation direct to the vehicles themselves.
- 22bn sensors will be sold in cars worldwide by 2020 (Deloitte).
- Growth in predictive maintenance across many industries.
- Outside of private vehicles there is increased digitisation of ticketing and payments and tracking of fleets/cargo.



Source: ABI Research







Source: UNECE

Mega-trend 2 – Urban population growth



Source: UN trends in urbanization



- 54% of the world's population resided in urban areas in 2014.
- In North America, 82% of the population is Urban. In Europe 73% reside in cities.
- Africa and Asia are urbanizing fast, projected to reach 56% and 64% urbanisation by 2050.
- Continuing population growth and urbanisation are projected to add 2.5bn to the world's urban population by 2050. By this time 2/3 of the world population will live in cities.
- At the same time, investment in Inland Transport Infrastructure at Record Low (OECD).
- Proportion of global population living in urban areas continues to rise faster than capacity on roads, rail and other types of transport



Source: UN trends in urbanization

Mega-trend 2 – Urban population growth



- Road users spend, on average, 36 hours in gridlock every year in metropolitan areas.
- Annual hours wasted are anticipated to increase by 6.8 hrs by 2030 due to increased population growth within cities.
- The economic cost of congestion is anticipated to be \$293bn by 2030.
- Health impact of known pollutants is driving tightening regulation globally. Many Chinese mega-cities have pollution levels well over WHO guidelines.
- EU has had ambient air quality limits for member states since 11 June 2008. However, many cities remain over target.

UK faces £300m fine over failure to meet air pollution targets by 2010

European Commission to take legal action against Britain over high levels of dangerous gas

Ian Johnston | Thursday 20 February 2014 | 🖵 128 comments

Source: Ministry of Environmental Protection

Mega-trend 3 – "Peak Car" / Sharing Economy

- US: Number of miles driven per person peaked in 2005
- Miles driven de-coupling from traditional link to GDP (between 1969 and 1995, GDP explains more than 95% of the annual variation in VMT.)
- US highly urban (82%). Similar private transport declines being witness in major cities e.g. London







Source: FHWA and Bureau of Economic Analysis



Source: TfL

Mega-trend 3 – "Peak Car" / Sharing Economy

- Car and bike sharing schemes globally have ٠ increased significantly since 2000 but are still at a low base.
- Improvements to responsiveness of schemes . could drive significant uptake if they can be as dynamic and responsive as Uber-style services.
- Car club membership has a demonstrable impact ٠ on subsequent ownership of vehicles.





Source: Statista



Impact of car clubs on car ownership

Source: Carplus

Source: Frost & Sullivan

Mega-trend 4 – Autonomous Vehicles

Global battle for ADAS and Vehicle Autonomy – By no means a comprehensive list

Company	Project	Expected Launch	Company	Project	Expected Launch
Ú	Project Titan	Fully autonomous by 2020	Google	Project X	Finished product 2020
Bai db 百度	JV with BMW	Semi-autonomous prototype by 2016	DELPHI	Autonomous road trip	First autonomous road trip across US
DAIMLER	Autonomous trucks	Road testing trucks since May 2015	НУППОНІ	Genesis	Semi-autonomous features available.
Ŷ TESLA	Autopilot	ADAS available now. Fully autonomous expected 2020	VOLVO	"Intellisafe"	Planned 100 customer trial of autonomous XC90 SUV in 2017

Source: Various

Mega-trend 4 – Autonomous Vehicles





Source: BI Intelligence



Examples of semi-autonomous technology



Ligier/Robosoft: Easymile CityMobil2 - Fixed route autonomy



Scania: "Platooning" technology



Mercedes: ACAS

Source: KPMG / SMMT

Market Development Phases



New Consumer Interfaces

Company	Post-Money	Latest Raise	Company	Post-Money	Latest Raise
UBER	\$51bn	\$1.2bn, September 2015	yongche .com 用 本 新 生 活	\$1.7bn	\$700m, October 2015
いけて	\$17.4bn	\$1bn, September 2015	GRABTAXI	\$1.5bn	\$350m, August 2015
lyA	\$5.5bn	\$1bn, January 2016	Bla <mark>Bla Car</mark>	\$1.2bn	\$200m, September 2015
	\$5bn	\$500m, November 2015	HAIL	\$170m	\$50m, January 2014

Digital Disruption = Opportunity



