AUTOMOTIVE

The changing face of mobility

Reinventing the wheel

26 January 2017 | Frankfurt

Tom De Vleeschauwer, Director, Transport & Mobility Practice Leader
tom.devleeschauwer@ihsmarkit.com
@tdv_auto

© 2017 IHS Markit. All Rights Reserved.
Overview

• Introduction
• Future challenges & uncertainties
• New alternatives
• New insight required
• Wider world of mobility
• Summary
Uncertain (but exciting) times ahead... #autonomousdisruption

“Data is the new oil”

Brian Krzanich, Intel CEO

“The transformation into e-mobility will have to be financed by selling ICE for many more years to come...”

Bernd Osterloh, Chairman Group Works Councils, VW

“The current modal split in many cities around the world is not sufficient to meet the Paris Agreement”

Alain Flausch, UITP Secretary General

“The next revolution in the auto industry”

Mary Barra, Chairman & CEO, GM

“With the present state of the automotive industry, the present state of our product, with all the technologies coming, it’s going to be very, very difficult to make forecasts for five years or six years down the road”

Carlos Ghosn, Renault-Nissan CEO

“No one company owns all the expertise necessary to build an autonomous vehicle”

Phil Magney, Former Senior Director, IHS

Source: IHS Markit
Questions about future challenges are being asked...

- What will be the car of the future?
- Will cars be owned or shared on-demand?
- What energy source will drive our cars in 2040?
- Will cars drive themselves?
We are heading for a different era

Car as a Product

Mobility as a Service

#autonomousdisruption
New mobility alternatives are gaining popularity
Perceived as a threat to conventional vehicle manufacturers

Internet companies looking to become mobility service providers
Car-Sharing & Ride-Hailing: The Success

User Criteria Attractiveness

- Cost
- Connectivity
- Service
- Privacy

Market cap and estimated valuation comparison between automakers and new mobility entrants

- Automaker
- Ride-Hailer
- Car-Sharing
- Ride-Sharing

Source: IHS Markit Research

Notes: Uber Technologies, BaMo, Grab, Lyft, Ola, and Didi Chuxing are estimated market valuations. Source: NYSE/NASDAQ, Bloomberg, TechCrunch.
Ride-Hailing: The Funding
Mobility on-demand leaders becoming ‘equal’ to OEMs?

Selected funding of leading ride-hailers

**$13.8B** UBER FUNDING
Morgan Stanley • Saudi Arabia’s Public Investment Fund • Baidu • TATA Capital • Goldman Sachs • Fidelity Investments • Glade Brook Capital Partners

**$10.2B** DIDI FUNDING
Apple • Alibaba • Tencent • Foxconn • China Merchants Bank • China Life Insurance • Temasek Holdings

**$1.23B** OLA FUNDING
Softbank • DST Global • Vanguard • Baillie Gifford • Sequoia Capital • Steadview Capital • Tiger Global Management

Note: Selected investments only; not an exhaustive listing

Source: IHS Markit
New Mobility: The OEM Response
Visionary manufacturers prepare for life beyond “car-as-a-product”

Ford Motor Co selected investments in future mobility <$500 million

- **$75M**: VELODYNE - Lidar Sensors • Silicon Valley-based autonomous driving enabling technology provider
- **$65M**: CHARIOT - Dynamic Routing/Pooled Ride-Share • San Francisco app-based commuter shuttle startup
- **$6M**: CIVIL MAPS - Mapping • California based provider of 3D mapping technology for fully autonomous vehicles
- **$10sM**: SAIPS - Artificial Intelligence • Israeli company focusing on machine learning and computer vision
- **$182M**: PIVOTAL - Software/Analytics • San Francisco cloud-based advanced software development/analytics
- **$24M**: ZOOMCAR - Ride-Sharing • India based car-sharing start-up

Note: Selected investments only; not an exhaustive listing

Source: IHS Markit
Addressing future challenges requires a new insight

In order to become a Mobility provider/facilitator, it is critical to understand all the aspects associated with New Mobility...

- Car-Share
- Ride-Hailing
- Autonomous
- Vehicle
- Forecast & Data
- Research Community & Workshops
- Strategic Implication Opportunity

Source: IHS Markit
Ride-Hailing regional success difference

*Implies that the regional market impact could vary significantly*

Mature markets feature lower usage rates

Ride-Hailing so far has made a bigger impact in emerging markets

Active Users

<10%

>35%

Note: % of users who actively use ride-hailing apps.
Active users are defined as users who use ride-hailing more than twice per month

Source: IHS Markit Research
What could be the effect of autonomous cars?

Potential Energy Consumption Impact

- Mobility Services
- New User Groups
- Travel Cost Reduction
- Increased Features
- Higher Speeds
- Vehicle Right-Sizing
- De-emphasized Performance
- Congestion Mitigation
- Eco-Driving

Note: Energy consumption impact ranges; the impact is highly dependent upon research input assumptions
Source: Wadud Z, MacKenzie D and Leiby P (Help or hindrance? The travel, energy and carbon impacts of highly automated vehicles)
Automotive industry structural change ahead?
Supply chain upheaval expected

Traditional Automotive Supply Value Chain

Future Automotive Supply Value Chain Absorbed By A New Ecosystem?

SW=Software ; HW = Hardware

Source : IHS Markit
New mobility options will both impact size and structure of the market – *new modelling is needed*

![Pie chart showing the transition from personal car to ride-hailing and car-sharing](image)

**Today**  
#autonomousdisruption  

**Future**  

Source: IHS Markit
Complex Systems Model

• Currently working on a “complex system modelling”

  • Where people live?
  • How much mobility is needed?
  • Relative cost of modes?
  • Do people really want it?
  • Change resistance

• New future mobility outlook

Source: IHS Markit
US ride-hailing economics favor urban markets

Indicative cost comparison: Personal Vehicle Ownership

Cost per Year

<table>
<thead>
<tr>
<th>US City Avg</th>
<th>US Avg</th>
<th>Autonomous Ride Pool</th>
<th>Private Car</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0</td>
<td>$5,000</td>
<td>$10,000</td>
<td>$15,000</td>
</tr>
<tr>
<td>$5,000</td>
<td>$10,000</td>
<td>$15,000</td>
<td>$20,000</td>
</tr>
<tr>
<td>$10,000</td>
<td>$15,000</td>
<td>$20,000</td>
<td>$25,000</td>
</tr>
<tr>
<td>$15,000</td>
<td>$20,000</td>
<td>$25,000</td>
<td>$30,000</td>
</tr>
<tr>
<td>$20,000</td>
<td>$25,000</td>
<td>$30,000</td>
<td>$35,000</td>
</tr>
</tbody>
</table>

Notes: For illustration purposes only
Source: IHS Markit

© 2016 IHS Markit
Macroeconomics & the wider world of mobility

Global consumer spending on mobility

2015 spending:
USD1.3 trillion new vehicle purchases
USD1.5 trillion operation costs
USD1.2 trillion transport services
USD3.9 trillion total mobility spending

New Shared Mobility
(2015 FY status)
Ride-Hailing & Car-share
USD $7.4 billion
0.7% of total transport services
(up from just under $4 billion in 2014, so it is growing quickly)

Source: IHS Markit, IHS Global Consumer Markets Service

Note: Transportation services account for public transport: buses, trains, taxis

© 2017 IHS Markit
In summary...

• The automotive industry is transitioning to a multi-stakeholder mobility sector... *structural change ahead*

• The long-term outlook is clouded with uncertainty... *no one company has all the required capabilities*

• Complexity will be enormous... *as will be the consumer mobility spending*
IHS Markit Customer Care:

CustomerCare@ihsmarkit.com
Americas: +1 800 IHS CARE (+1 800 447 2273)
Europe, Middle East, and Africa: +44 (0) 1344 328 300
Asia and the Pacific Rim: +604 291 3600

IHS Markit™ COPYRIGHT NOTICE AND DISCLAIMER © 2017 IHS Markit.
No portion of this presentation may be reproduced, reused, or otherwise distributed in any form without prior written consent of IHS Markit. Content reproduced or redistributed with IHS Markit permission must display IHS Markit legal notices and attributions of authorship. The information contained herein is from sources considered reliable, but its accuracy and completeness are not warranted, nor are the opinions and analyses that are based upon it, and to the extent permitted by law, IHS Markit shall not be liable for any errors or omissions or any loss, damage, or expense incurred by reliance on information or any statement contained herein. In particular, please note that no representation or warranty is given as to the achievement or reasonableness of, and no reliance should be placed on, any projections, forecasts, estimates, or assumptions, and, due to various risks and uncertainties, actual events and results may differ materially from forecasts and statements of belief noted herein. This presentation is not to be construed as legal or financial advice, and use of or reliance on any information in this publication is entirely at your own risk. IHS Markit and the IHS Markit logo are trademarks of IHS Markit.