Driverless technology & implications for transit

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Presentation outline

• Definition & timelines
• Why the interest in driverless technology?
• The change in business model
• Driverless technology in transit today
• Implications for transit
Driverless vehicles

Source: Bosch
Driverless vehicles

- **Phase 1 (now to 2016):** 'Passive' autonomous driving
- **Phase 2 (2015 to 2019):** Limited driver substitution
- **Phase 3 (2018 to 2022):** Complete autonomous capability
- **Phase 4 (two decades):** 100% autonomous penetration, utopian society

Source: Morgan Stanley Research
So why the interest?
Safety
Urbanization

Urban Boom

Can Earth Sustain >2 Billion Vehicles?


Congestion

COUNTING THE FUTURE COST OF GRIDLOCK

The Economic Impact of Congestion in Europe and the US: 2013-2030

‘Cumulative’ cost of congestion between 2013 and 2030:
- France: $469B
- UK: $480B
- Germany: $691B
- US: $2.8T

‘Annual’ cost of congestion for each country in 2030:
- France: $30B (+31%)
- UK: $33B (+63%)
- Germany: $44B (+31%)
- US: $186B (+50%)

Cost per household:
- France: $3,163 (+23%)
- UK: $3,217 (+44%)
- Germany: $2,927 (+34%)
- US: $2,301 (+33%)

Source: INRIX
Congestion

‘Annual’ cost for the most gridlocked cities in 2030

<table>
<thead>
<tr>
<th>City</th>
<th>Cost to City</th>
<th>Cost per Household</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paris</td>
<td>$18.7B (+60%)</td>
<td>$5,525 (+51%)</td>
</tr>
<tr>
<td>London</td>
<td>$14.5B (+71%)</td>
<td>$6,259 (+45%)</td>
</tr>
<tr>
<td>Stuttgart</td>
<td>$4.2B (+34%)</td>
<td>$5,552 (+35%)</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>$38.4B (+65%)</td>
<td>$8,555 (+49%)</td>
</tr>
</tbody>
</table>

The ‘cumulative’ cost to each city by 2030

- Paris: $267B
- London: $204B
- Stuttgart: $65B
- Los Angeles: $559B

Cost of congestion in LA in 2013

- $23.2B
  - more than 10x the estimated value of the LA Clippers

Cost of congestion in London in 2030

- $14.5B
  - equivalent to the cost of the 2012 London Olympic Games

Source: INRIX
Pollution

Paris

Prague

London
Demographics: the booming elderly

The world's ageing population

% of the population 65 years or over

- 2012
- 2050

Japan, Ireland and Cyprus face the largest jump in ageing costs over the next decade

In 2050 one person in three will be over 65 and one person in ten will be over 80

2012 - 11% of the world's 6.9bn people are over 60

2050 - 22% of the world's 9bn people will be over 60

Between now and 2050 the fiscal burden of the crisis will be 10% of the ageing-related costs. The other 90% will be extra spending on pensions, health and long-term care

http://visual.ly/ageing-population
Young adult relative “disinterest” in driving
The driverless "promise"

- Safety
- Circulation
- Environment
- Productivity
- Extra €
Change in urban transport model
SEAMless Mobility

Shared, Electric, Autonomous, Multimodal
A multitude of alternatives to vehicle ownership

Increasingly connected through technology
A multitude of alternatives to vehicle ownership

Increasingly connected through technology
Viele Wege führen zum Ziel.

Qixxit findet deinen.
Multimodal mobility

Helsinki, Finland
Driverless “transit” solutions today
1st commercially available driverless vehicle
Several applications

- Numerous Automation level 4 train & metro systems worldwide

Heathrow, UK

Barcelona metro line 9
“Public transport” pilots (examples)

Milton Keynes, UK

Google SDC, California

Singapore

Wageningen, Holland

Oristano, Italy, CityMobil2
Driverless buses on the way

Claire Perry reveals one major company has already held talks about introducing computer-controlled buses in UK
Implications for transit
Controlling the data
Business model implications: a new mobility ecosystem

- How does transit remain relevant?
- How does transit become profitable?
Transit planning implications
Human implications
Infrastructure implications
The time to act is NOW
Thank you / Děkuji
Questions? / Nějaké otázky?

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