THE REVOLUTION OF URBAN MOBILITY

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Study on Urban Mobility
1,6 TN EURO
MARKET FOR AUTONOMOUS BUSINESS MODELS 2035.

CUSTOMERS AND MUNICIPALITIES ARE WINNERS.

Comprehensive consideration of the current mobility study, valid for cities with over 100,000 inhabitants, relevant for 70 percent of the urban world population.

New mobility offerings have the potential to replace the production of 23 million private passenger cars by 2035.

Mobility platforms such as Uber, Didi and Lyft will lose their dominant position of power and will have to share the profits with fleet operators.

Cross-subsidization of deficient public transport offerings can be largely eliminated with improved service offerings. This benefits customers and communes.
The UNO has forecast that the world population will rise from its current 7.4 to almost 8.4 billion people by 2035. At the same time, the mobility requirement will rapidly increase. The logical consequences are higher traffic impact and environmental burdens, as well as rapidly rising mobility costs.

In 2015, the global mobility budget was still EUR 3.6 trillion, and will more than double by 2035. Berylls's mobility study details the challenges and opportunities that this entails. The analysis is based on data from 200 major cities.
The analysis shows that, by 2035, autonomous driving cars will be able to shoulder up to 28 percent of inner-city trips in various sharing models. However, they do not have the potential to replace the entire personal transportation. As a business model, however, they still offer tremendous potential and thereby have a large influence on municipalities, current mobility operators, car manufacturers and the current mobility platforms.

With mobility platforms such as Uber and Lyft, the first digitalization wave of personal transportation has overtaken the municipalities and car manufacturers. The latter are now actively driving the transformation with their carsharing and ride-hailing service such as Car2Go, DriveNow, Moia or Maven.

On the way to the fully automated transportation, various suppliers of platforms will allow users to share their cars when they are not being used. The technical term is peer-to-peer sharing (P2P), the Croove platform (which has now been fused with TURO) is an example of this. Pooling-on-demand is another variation on sharing. The term describes a bus service that is no longer bound to rigid timetables and routes, and can be operated either with conventional minibuses or autonomous vehicles.

The individual configuration in a particular situation of routes and stops, which responds dynamically to customer demand, or anticipates it, in conjunction with autonomous driving: this is the formula for the new era of urban mobility.
The mobility study demonstrates that the large differences between the cities and regions will develop. Those cities that adapt at an early stage to the electrification of mobility and the digital operator model, and open up their transport area to autonomous fleets will increasingly outpace the latecomers in the “transformation of transportation.” Without alternative solution concepts, a further increase of the traffic jam problem will be unavoidable in these cities, with all the negative consequences for the population and environment.

Customers benefit from significantly lower costs compared to the present passenger car. Fully automated shuttle services can be provided more economically to customers than current bus trips. The municipalities can therefore probably operate autonomous mobility concepts without cross-subsidization, and thereby significantly reduce the burden on the public purse. In Germany alone, about EUR 5.8 billion per year is required for public transportation as cross-subsidization.

**INTRODUCTION OF AUTONOMOUS VEHICLE FLEETS INTO THE URBAN MOBILITY SYSTEM**

- Autonomous “shared vehicle fleets offer a superior combination of cost and flexibility / comfort.
- Creation of new urban transportation class “individual public transport” in an urban environment.
- The growth of this segment leads to a differentiation of the offering - Car2Come - Robo-taxi - Robo-shuttle
- Autonomous operator models are clearly more economical to operate than manned models; in the long term, the price level is comparable with that of the current public transportation system, with an improved service level and higher availability.
At the same time, business models of current so-called “pure” sharing platform suppliers, such as Uber, Didi or Lyft come increasingly under pressure. “The present market dominance and negotiating power of the pure platform supplier in some parts of the world will decline strongly due to the introduction of autonomous vehicles - particularly when a model becomes established that is targeted at the deployment of “special purpose vehicles,” says Matthias Kempf, partner at Berylls. It is also conceivable that the cities will regulate the sharing platforms, at least in Europe, in order to prevent monopolies and maximize the fleet utilization.

“At the same time, car manufacturers gain the opportunity to maintain their own fleets and to cover new business fields. The automobile manufacturers thus obtain additional business potential, which can offset an expected net decline in vehicle demand.”
Robert Ziffling, Consultant at Berylls and co-author of the study adds: “For the automotive industry, the development is both a threat and an opportunity. On one hand, sales of passenger cars and light goods vehicles will be reduced by 13 percent by the new offerings, on the other hand, the operation of autonomous fleets will create a new attractive billion-dollar market, in particular for the service network in the Operations area. And we should not overlook that fact that, despite all this, the global car sales market is still rising - because of the extremely low rates of car ownership in many world regions, where a speedy introduction of autonomous vehicles still appears very unlikely.

In addition, about 40 million special purpose vehicles are necessary to serve the newly emerging demand -with roughly eight to ten times higher utilization than a private passenger car today. Each of these vehicles achieves average revenue of about €60,000 per year. In addition, the study allows conclusions to be drawn about the need for change in traditional public transportation companies. They must also continue to develop structurally if they want to retain their leading position in the cities in future. Matthias Kempf adds: “The traditional control, pricing and financing models must be called into question if autonomous offerings show high potential for profitable self-sustaining operation, cannibalizing other transportation models. Public service and economic interest no longer need to stand in mutual contradiction.”
Without political support, the advantages of digital mobility cannot be realized in full, perhaps not at all. Integrated planning and financing concepts must be worked out, involving not only the cities themselves but also the surrounding municipalities. Other industrial sectors such as energy and supply must also be included. The mobility study performed by Berylls Strategy Advisors now provides a solid decision-making basis for political decision makers, as well as for everyone who wants to shape tomorrow's mobility.

INTEGRATED CONCEPTS ARE NECESSARY.

FLEET SIZE SHARED MOBILITY 2035 (BASE CASE)

6.050 BN
3.668 BN
43.6m Vehicles
43.6m Vehicles

5.675
2.783
34.791
32.9

375
885
8,848
6,9

Persons-km 2035
Vehicle-km 2035
Fleet 2035
SPV Fleet 2035

Utilization
1.3 - 2.5
Persons / Vehicle
20-30%
unproductive Mileage
Reduction „shared“ Private Passenger Cars: 3.8 Mio

AUTONOMOUS
NON AUTONOMOUS

This study is based on data from 200 metropolises and official statistical agencies on the expected population growth, the number of journeys per capita, the distances covered and the costs per kilometer per transportation carrier. It also draws on numerous market studies, business reports by the companies affected, data and estimates by traffic authorities such as the NHTSA (National Highway Traffic Safety Administration), Berylls’s own robo-taxi study or the study on mobility in Germany (MID).
IMPACT ON THE PRODUCTION VOLUME.

**"STEADY STATE SZENARIO"**
CAGR: 2.4%

- Mio: 51,7
- Mio: 91,5
- Mio: 143,3

**"NEW MOBILITY"**
CAGR: 1.5%

- Mio: 23,0
- Mio: 0,5
- Mio: 4,0
- Mio: 124,7

**VEHICLE PRODUCTION**
- 2015
- 2015 - 2035
- 2035

**GROWTH**
- Reduction due to new mobility offerings
- Higher utilization of partly shared private vehicles
- New SPV fleet
- NEW "BASE CASE" 2035

Within a specific urban area, users can conveniently order a car-sharing vehicle or robo-taxi per smartphone, which travels driverless to them for the continued journey. Picture: Daimler AG
Autonomous business models are classified for regulatory purposes as part of the public service and a new form of public transportation.

The winners of the “shared autonomy” are customers and municipalities - thanks to lower costs due to an improved mobility offering.

With the elimination of the driver, new business models arise - current platform providers lose their dominance.

For the suppliers, it depends on having a presence in the right cities at the right time - this offers latecomers the opportunity to enter the market: vehicle manufacturers get a “second chance.”

The competition in shared autonomy becomes intensive, high profits are only possible during a transition phase for “first movers.”

Public transportation companies face the challenge of defending their current sources of profit, adjusting their positioning and building up new skills.

Politics and regulators should prepare new integrated mobility concepts - the current fragmented mode of planning of the transportation carrier silo should be reconsidered in favor of an integrated eco-system of industry, politics and science.

Automotive manufacturers are required to develop TCO-optimized vehicles for the new mobility models, and extensively orient their sales and after-sales structures and processes to the new requirements without diminishing their current core business.
Berylls Strategy Advisors is a top management consulting firm with offices in Munich, Berlin, Baar / Switzerland, Detroit / USA, Leamington Spa / Great Britain, Seoul / South Korea and Shanghai / China. Together with automotive manufacturers, automotive suppliers, engineering and mobility service providers, equipment suppliers and investors, its strategy advisors and associated network of experts work to deliver answers to the central challenges of the automotive industry.

The focus is on highly innovative and high growth strategies, assisting in mergers & acquisitions, organization development and transformation, and measures to improve performance along the entire value chain.

In addition, the experts at Berylls Digital Ventures work with clients on solutions for digitizing and transforming the business models of OEMs, suppliers and automotive service providers.

Berylls’ consulting teams are known for their extensive and relevant experience, solid knowledge, innovative creativity and entrepreneurial outlook.

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