



Shaping the impacts of new technologies:

A Call for New European Mobility Policies

A project on behalf of Rebecca Harms MEP, 2018

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Summary of the Final Report

For a century, technologies in the transport sector have essentially remained the same. The use of private cars dominated our lives, our cities, our landscapes, our economies and our imagination. For decades, the arguments in the transport debate have also essentially remained the same. Environmentalists, consumers, spatial planners and public transport have been in opposition to a mighty car industry, only slowly shifting perceptions and behaviours, but preparing the terrain for deeper change.

Today, two new factors require a completely new approach and offer the opportunity to overcome ritual partisanship: the availability of new technologies and new actors in the international competition.

The present report aims at promoting a debate on innovative EU policies in the field of transport and mobility. An urgent debate, as the results show: The transformation of the transport system and of mobility behaviours may be more rapid and far-reaching than most people believe. To reap potential environmental and social benefits and to manage inevitable problems, the development of appropriate regulatory frameworks is essential and a challenging task.

In Chapter 2, the report provides short impressions of the speed of change and resulting challenges. Based on a system analysis of technology innovation, the transport system and its societal dimensions (summarised in Appendix I), the report then focuses on the political force field involving the drivers of change and a variety of actors (Chapter 3). Finally, in Chapter 4, it identifies key elements of appropriate new European mobility policies.

Strong drivers for a deep transformation of the transport system

A first driver are fundamental technical innovations: electric vehicles, driverless vehicles and sharing platforms. All promising less pollution, less climate change, cheaper transport, higher efficiency, more comfort, more safety. A second driver is international competition: Emerging economies and IT companies are new and determined players in the game. A third driver is urbanisation: growing dense conurbations call for more space efficient mobility.

The speed of change is hard to predict, but we need to be prepared for disruptive changes within the next ten years. While each of these drivers pushes for change, the economics of their combination may be irresistible: When driverless electric vehicle fleets for passengers and freight, flexibly organised through sharing platforms, can provide relatively clean and comfortable transport at less than half the present cost, those who try to defend the incumbent system will not be able to resist for long. China makes huge efforts to build a globally leading vehicle industry based on these new technologies. European and US car makers and governments have lost their power to control the agenda.

Delaying change is no option for Europe

Given the outstanding importance of the automotive industry for European economies, Europe has much to lose in this transformation. Vested interests in old technologies, the jobs of millions of drivers, the difficulties of adapting the existing mobility system to new structures – all these all are tempting arguments for trying to slow down change.

But by moving too slow, European car industries may be seriously threatened in their existence and other European industries may suffer as well.

The objectives of new European mobility policies must therefore be twofold:

- to realise the potential environmental, economic and social benefits of new technologies and
- to maintain the strength of the mobility sector

This requires a far-sighted, sophisticated approach and – as there will be winners and losers – will not be possible without some pain.

Attractive transformation paths of the mobility system

Starting from present dominant transportation modes, we can conceive a number of different transformation paths, which all follow three basic trends: low tech to high tech; products to services; low density to high density. Of particular interest are transformation paths substituting present combustion engine cars and trucks for cheaper and environmentally and socially more friendly solutions.

An economically and environmentally beneficial transformation of the present private car may consist of substituting 1) the combustion engine by an electric drivetrain, 2) the driver by an automatic system, 3) private ownership by a publicly accessible fleet 4) individual rides by shared rides, and finally 5) integrating these vehicles in a comfortable seamless intermodal system. It appears that the largest environmental benefits are reaped through electrification (step 1) and shared rides (4), whereas the largest savings occur in the shift to public systems (3) and shared rides (4).

Shifting vehicle ownership and operation from private individuals to publicly accessible and governed ride-sharing systems is therefore a key feature of the transformation. For short distances improved infrastructure may support low-power individual “active” mobility including walking, bicycles, scooters etc.

In long-distance freight transport, economic drivers point into the opposite direction: Substituting conventional trucks with driverless road carriers will strongly reduce transport costs, favour large private fleet operators and make it difficult for rail freight to compete. However, for dense cities, confronted with the growth of online trade, it might become attractive to establish some kind of public freight distribution system, ensuring more efficient last-mile delivery by a small number of operators with specialised low-power vehicles, operating from local hubs.

Problems to be tackled

Considering such an attractive scenario in a larger context, several problems arise.

The shift to electric drivetrains and a declining number of vehicles is a difficult challenge for the European car industry – even if it tries to compensate reduced hardware production by offering mobility services. However, sticking to old technology trajectories may result in a dangerous loss of competitiveness, compromising also the overall innovation capacity of European industries.

Employment losses may even be more serious among drivers of all categories than among highly skilled workers in the car industry. The need for requalification is inevitable in any case and may only

be mitigated by developing appropriate programmes in time. Problems may be particularly hard in specific regions – not only in those where automobile production is concentrated but also in those where working as a truck-driver is one of the few remaining occupations.

Another complex issue are the spatial effects of new mobility offerings. Will the gap between metropolitan and peripheral areas grow because mobility services are more profitable with high population density? Will roads be congested by cheap autonomous taxis? Are new services a threat for traditional public transport? These questions are intrinsically linked to the challenge of developing an appropriate regulatory framework for mobility services.

Conditions for the success of European mobility policies

This report concludes that the dual objective explained above can only be reached if European policies succeed to ensure:

1. A rapid shift towards space-efficient flexible mobility services
 - shared use of high-tech high-power vehicles (“passive mobility”)
 - a framework for public transport systems
 - more emphasis for individual low-power mobility (“active mobility”)
2. A forward looking industrial policy for Europe based on this orientation

The need to develop a new framework for public transport and mobility systems

No special regulations are needed for switching to electric propulsion. Tighter emission norms, however, may speed up the process. The situation is different for driverless vehicles and new passenger mobility services: they need new legislation and permits. Ensuring safety for autonomous vehicles is not enough. As discussions about Uber have shown, traditional rules for taxis and mass transit are not appropriate for services based on the new technologies and business models.

There is an obvious danger, that new private monopolies could dominate the passenger transport sector and optimise their operations for private profit and not for the public good – if they were free to fully exploit network effects and data across all transport functions. Under generous laissez-faire policies, one or two companies might take over the Mobility-as-a-Service market in metropolitan areas, maximise the number of rides, put traditional public transport under heavy pressure, control data on passenger flows essential for public policies, influence passenger itineraries according to commercial interests, dominate the communication infrastructure for autonomous driving and neglect peripheral areas where services are less profitable ...

This report argues that traditional monopolistic municipal public transport companies are also no solution for a rapid shift from 20% to perhaps 80% essentially public transport. We need a transport governance structure that ensures that private and publicly owned operators both contribute in providing a seamless system of public transport services. The report calls for learning from the difficult experience of establishing differentiated governance structures in the electricity and telecom markets: Different functions in the overall system must be distinguished, specific markets and market roles must be defined so as to ensure competition, and the pursuit of public interest must be ensured by setting appropriate rules. As we have seen with the different network, railway, telecom etc. authorities, as well as with institutions ruling the financial sector, permanent learning and an independent authority will be essential. Starting to structure mobility markets in this way is extremely urgent as information and communication structures are already being built without a coherent

concept defining market roles. Data governance will be a key element in future mobility governance structures.

A forward-looking industrial policy is possible

Decreasing transport costs will reduce turnover in directly transport-related activities – but may trigger growth in other areas. But also, in the mobility sector many new activities can be created securing international competitiveness in time, instead of losing mobility markets to non-European competitors.

The transition to more sustainable modes of transport and the shift to a comprehensive publicly governed mobility system opens many new opportunities:

- New kinds of vehicles for efficient and comfortable passenger mobility: for high-speed shared-ride “passive” mobility and for low-speed self-controlled “active” mobility
- New kinds of vehicles and devices for efficient micro-logistics
- Smart infrastructures including information and navigation systems, freight hubs, comfortable multimodal passenger interchanges, adaptation of roads and useless parking spaces...
- New services for supplying and maintaining transport means, for navigation in all modes, for increasing comfort for passengers in seamless mobility services, including enhanced use of travel time for work and leisure.
- New activities in now peripheral areas....

Modern economies depend on high degrees of multiple rapid interactions. Therefore, despite all new telecommunication opportunities, urban agglomerations are more than ever growth poles attracting increasing shares of the population. Ensuring efficient, comfortable and affordable transport is therefore one of the most effective economic development measures.

Industrial policies envisioning such a transformation require determined and far-sighted action not only at the national level. Coordinated European efforts will be necessary for facilitating active transformation of incumbent industries, speeding up requalification of human capital, encouraging innovation and supporting the emergence of new European champions in an increasingly competitive global context. On the other side we will need much more experimentation at the municipal and regional level for developing models able to give answers to the urgent challenges outlined here.

Most instruments of an effective industry policy are known. However, they are useless if not guided by a joint vision.

Start now to organise a broad European learning process

The challenges outlined in this report are larger and more urgent than the general public or the political sphere are acknowledging. Rapid developments in transport in mobility affect our personal lives and our economies more directly than the much-discussed changes in the electricity sector. We urgently need to start a broad European discussion about joint visions and options and we need to organise an intense mutual learning process for being able to cope with the challenges in time, to seize the opportunities for environmental, social and economic benefits and to avoid severe damages in the European economic tissue and in our ability to control most important infrastructures for everyday life.

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