

Toward data-driven transportation policies?

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Abstract:

The digitization of society has wreaked disruption. After several other sectors, transportation is being shaken by the talk about driverless vehicles and by services such as Uber. Transportation authorities face the same problem as in other sectors: how to foster positive innovations by creating new services while improving what exists without sacrificing all of it? The question in the title is provocative, since the answer has apparently been found: big data are definitely going to be put to use. This article, while outlining how this transition should take place, provides keys to understanding for those readers who want to delve deeper into this subject...

Changes in mobility

The digital transition has affected the transportation sector in two rather different ways.¹ Let us start by pointing out that transportation is a physical action and that digital means alone definitely cannot solve its problems. This fact shielded this sector for a while from the disruptions wrought by digital technology.

- First of all, the optimizations possible thanks to data processing are considerably altering our uses of means of transportation. The example that comes to mind is driverless vehicles steered thanks to data from sensors. In fact, no vehicle, whether car, airplane, boat or train, is likely to be exempt from having its operations improved by data-processing (if for no other purpose than preventive maintenance). Now omnipresent in transportation, data significantly reduce costs and improve comfort.
- A second effect (stemming from the first), is much more fundamental. The circulation of data provides us with a much better view of the transportation system, and this modifies how the system is used. We might mention the planning of logistic rounds, which can now be optimized in real time. The concept of mobility best resumes this change. We no longer need transportation; we need mobility. Implying a short time scale, the idea of mobility as a service is fundamentally disruptive, in particular for the governance of transit systems. A public transit system can hardly be reconfigured within a few minutes, a period during which Uber can muster a large number of drivers. This reactivity was starkly set in a negative light by the attacks in London, when prices instantaneously doubled. A positive point however: customers were reimbursed afterwards, and the system did attract drivers to points where they were needed.

Let us emphasize, once again, that these changes are rooted in our societies because they satisfy a need and have several positive aspects. However they also raise questions about their long-term impact.

¹ This article has been translated from French by Noal Mellott (Omaha Beach, France).

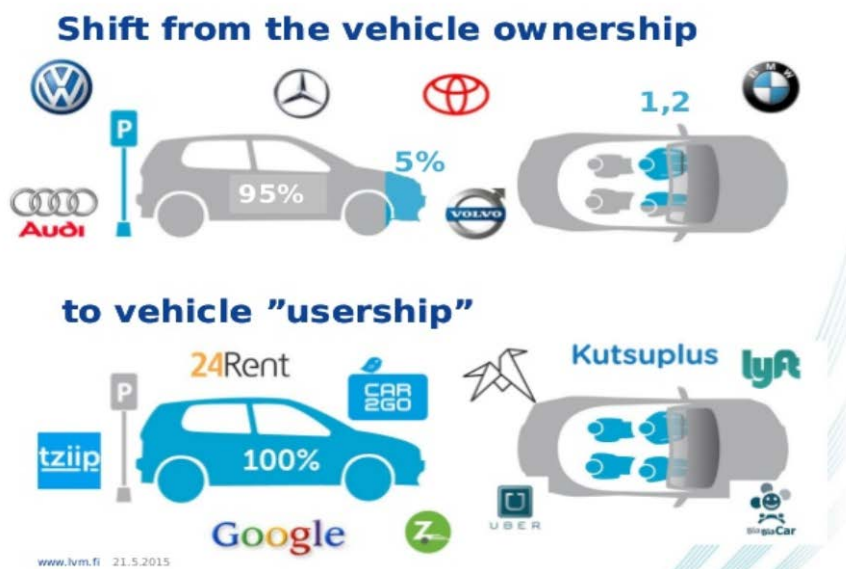
Public policies and the need to modify them

The automation of transportation, the circulation of data and mobility as a service are trends that will swell. However the experts do not agree on the time scale, nor on the technical options, nor on future uses and services. The role of those who organize transportation (in the broad sense) is to prepare for this change and not just follow up on it. But they have before them contradictory visions of the future.

- The optimistic vision is that the optimizations due to digital technology will improve road safety (*e.g.*, assisted driving), reduce greenhouse gas emissions (better motors and engine systems) and increase network capacities (“flocking” or “platooning” as the distance between vehicles is optimized). These improvements will be bolstered in transportation systems owing to global optimizations that lead to the emergence of “services of mobility”.
- However there is also a negative vision that sees the effects of these improvements being canceled by a more intense use of the means of transportation (*e.g.*, as people move away from downtown areas) and that predicts, as a consequence, more urban sprawl or foresees that more empty vehicles looking for customers will saturate highways (an observation already made about Uber vehicles in New York). All of this will have an impact on the labor market.

A question logically crops up: how to prepare for this change without rejecting its positive effects (as would happen if the deployment of this technology were severely restricted) but while warding off, or at least limiting, its negative effects?

Figure 1: The idea of mobility as a service drastically changes transportation, its uses, regulations and ownership.



What means are now available for organizing transportation? Among the direct means at the disposal of public authorities are public transit systems. Nonetheless, the means available in OECD countries are mostly legal and regulatory, even though such means are widely considered to be impediments to the diffusion of innovation and to keep us from reaping the benefits. This holds true even if we admit that talk about technology is too optimistic. Some forms of technology are mature and very positive, but appropriate policies are needed for their diffusion on a very large scale.

Let us return to the two changes mentioned at the start.

The change related to vehicles (especially driverless vehicles) has attracted more attention. Given that the market is global, a big effort has been made at the international level, in particular by the OECD through its International Transport Forum (*cf.* the references) and at a more global level through the United Nations Economic Commission for Europe (UNECE WP.29). Although these processes are, as we are well aware, unfolding much too slowly in relation to private firms' expectations, they are already having effects. Temporary regulations (Nevada, California, England) have made it possible to launch several innovative projects. But as the recent accidents with fatalities have proven (in particular the accidents involving Uber vehicles in Arizona), regulations, if too optimistic, risk being counterproductive owing to the radical changes made in reaction to public outbursts — to which there is no response since such experiments were propped up by a fully optimistic vision.

In contrast, responses to the second change concerning “services of mobility” have been quite varied. The services proposed by transportation network companies (TNCs: we mainly think of Uber or Lyft) directly compete with traditional services of transportation (such as subways or busses). Nonetheless, they tend to claim to be complementary means of transportation (the talk about “shared mobility”) or to be part of a “circular economy”. So, can they be regulated like busses or subways — also examples of “shared mobility”? Apparently not, because innovations, owing to their speed, slip through the regulatory net.

Data at the service of transportation policies

Nowadays, a fundamental problem of transportation policy-making is to react fast to sudden changes but while keeping in view the need for a durable system. One solution would be to adapt data-driven policies. In brief, the regulatory framework would remain focused on the long term, but with short-term adjustments being made by using data. Such a policy would rely on the strength of a regulatory system: its guarantee of healthy competition thanks to more transparency (in structures and decisions) and its continued oversight of the system in matters of security and fairness (setting minimal levels of service, accessibility, fee schedules, etc.). Let us point out that this already exists. A well-known example is the setting of variable speed limits that can be adjusted in real time on major highways as a function of pollution. This idea is evidently attractive, but implementing it requires much more cooperation than is usually imagined.

In effect, the data to be used come from various sources. Data from the infrastructure (cameras, magnetic bands, etc.) are being replaced with data from moving objects (vehicles, smartphones, etc.). The data-providers have changed; they are now private and heterogeneous. How to circulate such data while guaranteeing their quality and upholding privacy when geographical location is of key importance? Should the sharing of data be an obligation? If so, who is under the obligation? And which data? The answers are not evident. By the way, similar issues arise for the Internet of Things (IoT), a topic that extends beyond the field of transportation policy.

Besides, do transportation authorities have the technical means needed to process these streams of data? Since private companies seem to be more advanced in this field than public authorities, should certain responsibilities be transferred to them? Or should this concern only part of the (aggregated) data? Filtering big data is a complicated, daunting task — especially if the data might have systematic biases. Services might be offered in certain areas, probably the more profitable ones. Are other areas to be ignored?

In conclusion, transportation policies have no choice but to change — what they have already been doing. The current trend signals a real transformation. Future policies definitely have to be reactive and capable of tapping data. Unfortunately, we do not know which data, nor how to retrieve them, nor how to process them. What we do know is that the sources of data are dynamic. These considerations are at the center of the thought devoted to this topic by the OECD and its International Transport Forum. Some of the publications mentioned hereafter will help readers deepen their understanding of the ideas outlined in this article.

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