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ICT'S change transport and mobility: mind the policy gap!

Daniëlle Snellen [a,*], Guus de Hollander [a]

[a] *PBL Netherlands Environmental Assessment Agency, The Hague, The Netherlands*

Abstract

In recent years both our need or desire for mobility and the opportunities and tools available to meet them have changed (and keep on changing) as a result of information and communication technologies (ICT's). ICT's have influenced both our transport modes and infrastructure as well as our behaviour. In this paper we discuss the main features of these changes and investigate how they could put public values in the transport debate in a tight corner or lead to new policy challenges.

Transport comes with benefits and burdens and often a unequal distribution of both. Moreover, there are tensions between short and long term interests, public and private interests and between efficiency and equity. Analysing how new developments impact public values that are considered relevant in the transport debate shows that there is a wide range of aspects to consider. We discuss four public values. Accessibility is concerned with providing access for all, making sure there are transport options available as well as taking care that people have the capabilities to access them. Affordability or (cost) efficiency is about spending public money wisely. Availability reflects the need for a reliable transport system, today and in the future, as this is crucial for economic performance and social interaction. Acceptability is a broad category including issues with regard to justice and solidarity, the impact on safety and other external effects, the impact on the market playing field and respect for privacy.

ICT's change transport in very different ways. They have changed the world of travel and traffic information, bringing more options and alternatives under people's attention. Public transport information is widely available, GPS's guide our car trips and provide real time information on traffic conditions, and platforms enable us to find a shared car or a Uber taxi fast and easy. They have enabled new forms of transport, such as new services offered through internet platforms, and probably will enable other new modes like self-driving vehicles. ICT's change our need or desire to travel and our travel experience. They change the geography of our destinations. All in all, ICT's change our behaviour in many ways, making us more flexible leading to more fragmented patterns in space and time. And with all these changes, the transport system also becomes more complex.

Assessment of new developments in the transport system as a result of ICT's leads us to four major challenges, requiring policy makers to adopt a more proactive approach in order to deal with these. First, the behavioural patterns in space and time are becoming more and more whimsical and less predictable, while infrastructure such as road or rail is inherently robust, inert and takes a long time to plan and build. Yet somehow, the mice and the elephant will have to (learn to) dance together., Second, social equity is a major concern when accessibility becomes more and more dependent on privately run platforms and transport service providers using unknown algorithms. Access can be limited in multiple ways. Physical access can be an issue (service provider may shun certain neighbourhoods). However, more and more it is a matter of skills and psychological flexibility to keep

* Corresponding author
E-mail address: Danielle.Snellen@pbl.nl

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up with new things (for example smart ticketing in public transport or using apps for travel information) and not everyone can cope with that. Third, there appears to be a strong 'winner-takes-it-all' tendency in the ICT sector. Tech companies become rich, powerful and unassailable, while they profit from collectively financed infrastructure (e.g. Uber). The costs for development, maintenance, education, safety etcetera are left to the public domain, as are the consequences of monopolisation, unfair competition and loss of innovation power. The question is how to price public goods and external effects properly. And fourth, robots and algorithms are quickly becoming independent actors in the transport system, while our rules and regulations are primarily made for humans and organisations. We need to think about requirements for (self-learning) software and robots such as self-driving vehicles, reflecting what moral choices we prefer in critical situations, what we want them to do for us and what not and how to deal with the liability issues that arise.

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1. Introduction

Developments in information and communication technologies (ICT's) are changing both our demand for mobility as well as the opportunities and tools available to meet this demand. ICT's have influenced our transport modes, our infrastructure, available transport services, our destinations and through that, our behaviour. In this paper we discuss the main features of these changes. We found that, in many ways, our transport system and our travel experiences improve through these innovations. However, some of the developments can potentially compromise public values relevant in the transport debate and lead to new policy challenges.

This article is structured as follows. First we sketch an overview of what changes are happening in transport through ICT's or are expected to happen in the near future. Seven major changes are discussed. Then we discuss how these developments relate to relevant public values like accessibility, availability, (financial) efficiency and acceptability. They reflect a wide range of issues, not rarely in conflict with each other, as transport comes with benefits and burdens and often an unequal distribution of both. Moreover, there are tensions between the short and long term, public and private interests and between efficiency and equity. Finally, we identify some new challenges for transport policy. This work is based on a recent study on how ICT's impact the infrastructure for transport and electricity in the Netherlands (PBL 2017).The focus in this article is on passenger transport.

2. Major changes in transport

ICT's influence transport and traffic in several different ways, impacting both the physical transport structures, the organisation of transport services and the demand and preferences for travel. Based on a review of literature (e.g. Aguiléra et al. 2012; KiM 2013; KiM 2014; Litman 2014; Mokhtarian 2009; Van de Weijer 2015, Townsend 2013, Townsend 2014), insights from the 2015 Disrupting Mobility Conference (MIT, Cambridge MA, November 2015) and a number of interviews with experts in the field we identified seven major changes with a variety of effects on activity patterns, travel behaviour and traffic flows.

2.1. More and more informed

ICT's make us more and more informed, since they provide us with a deluge of information on travel options and (unexpected) changes in traffic conditions and transport services. Moreover, the available information on potential destinations (also further afield) has exploded. Individuals and businesses are therefore in a position to make different choices, sometimes leading to new trips, different mode choice or new destinations. We now know about that amazing new club, the convention of fans of our favourite tv show and that wonderful glamping destination in rural France. We can also adapt our time of day for a trip, our mode choice and route, based on (multimodal) travel information apps. More information leads to more optimal choices, lower travel resistance and, likely, to more kilometres travelled.