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Editorial

Desirable transport futures

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ABSTRACT

This overview article for the special issue on 'Desirable Transport Futures' sets out with a brief introduction of the current development of the global transport system, suggesting that it remains unclear whether transport systems are heading towards desirable change. This desirability is defined as a reduction in the system's negative externalities, including accidents, congestion, pollutants and/or noise, while retaining its functionality. There is evidence that transport externalities continue to grow with an increasingly mobile and growing global population. Against this background, the article discusses what may constitute more desirable transport futures, as well as the barriers that have to be overcome to move towards such futures. The article concludes that transport governance will be essential to far-reaching change, and that greater focus has to be placed on individual and societal socio-psychological perspectives shaping mobility consumption. Nine papers contained in this special issue provide in-depth analyses of transport systems, as well as insight into how these may be changed in more systemic ways. A concluding research agenda is offered that outlines a number of innovative approaches researchers may pursue as part of further efforts to engender desirable transport futures.

1. Diverging transport futures

There can be little doubt that transport systems are changing worldwide, and rapidly. A bicycle revolution is underway in most large cities in the world, facilitated and advanced by greater awareness of healthy lifestyles, convenience, cost and convention (Aldred and Jungnickel, 2014; Oosterhuis, 2016; Steinbach et al., 2011). Growing traffic density, air pollution, and obesity linked to automobile lives have simultaneously forced policy makers to reconsider the desirability of the car, and to promote bicycling and to restrict the car (EC, 2011; Pucher and Buehler, 2008). Bicycle sharing in its various stationary and free-floating forms (Shaheen et al., 2010) is entering cities throughout the world, increasing the accessibility of bicycles at a low cost (Tang et al., 2017). Information and communication technologies (ICT) have revolutionized 'shared mobility', offering opportunities to collect travel information about different public transport modes, to plan and pay for trips, to rent bicycles or cars, or to hail transport services (Shaheen and Cohen, 2013). These developments have been linked to a decline in motorized vehicle use (Fishman et al., 2014; Martin et al., 2010), as well as an observed decline in driving licensure in important car countries such as France and Germany (Delbosc and Currie, 2013; Kuhnimhof et al., 2012). Several authors have declared 'peak car' (Goodwin and van Dender, 2013; Newman and Kenworthy, 2011), postulating a "shift away from the prime position the car has held in society since the end of the Second World War" (Fishman, 2016: 1).

While these observations seem to indicate a fundamental shift in mobility patterns, they do not necessarily translate into a decline in transport demand. For example, the decline in *auto*mobility identified by Newman and Kenworthy, (2011) may reflect a growing interest in *aero*mobility linked to income and social capital generation (Enzler, 2017; Urry, 2011). As outlined by Aguiléra et al. (2012: 666), travel is no longer only addressing instrumental needs, but is also making up for "relational deficits", and offering the promise of emotional connectedness. With the rise of social media, it has become increasingly important to share distant lives (Germann Molz, 2012), in a competitive process of social capital generation and social comparison that is to a considerable degree based on movement (Cohen and Gössling, 2015). Even other developments may have bi-directional outcomes. For example, new ICT solutions not only facilitate public transport, they also support automobility, by identifying the fastest route, the cheapest fuel

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stations, or the next available parking (Gössling, 2017b). Automated, electric cars are expected to reduce congestion, but they are likely to incur various rebound effects, such as a lower cost for travel (vís-a-vís a higher vehicle purchase cost) and opportunities to use travel time more productively or leisurely, increasing willingness to spend time in the car (cf. Thomopoulos and Givoni, 2015).

Notably, changes in individual countries are not representative of global developments: 'peak car' is not evident in absolute numbers, with expectations that 1.3 billion vehicles in 2014 (Statista, 2016) will grow to 2 billion by 2030 (Dargay et al., 2007). Growth in aviation is equally fast. Currently, international aviation relies on a fleet of 23,480 aircraft, with expectations that there will be 46,950 by 2036 (Statista, 2017). This expansion is at least partly attributable to the low-cost business model, which is now also competing on long-haul routes, and the rapid development of the aviation industry in emerging world regions, especially Asia (McManners, 2016). The US Energy Information Administration suggest that humanity collectively travelled 38 trillion passenger kilometres (pkm) in 2012 (EIA, 2016), a number that could grow to 104–150 trillion pkm by 2050 (Schäfer et al., 2009).

With the global transport system drifting in diverging directions, it seems difficult to affirm an overall trend towards greater sustainability in terms of the system's current negative externalities. Yet, it is these externalities that demand a fundamental change in global transport regimes and travel patterns across all spatial scales, including unsustainable resource use, energy requirements, congestion, air pollution, noise, human health (lack of physical activity, accidents, respiratory diseases), and social inequalities.

2. A system in need of transformation

Negative externalities of transport systems have been discussed at length. Worldwide, transportation is responsible for 55% of the total end use of liquid fuels, with estimates that the sector's consumption will increase, in both relative and absolute terms (EIA, 2017). Aviation, for example, is projected to double its fuel consumption between 2015 and 2040. As a consequence, the transport sector's overall contribution to emissions of CO_2 is expected to steadily rise, in a situation where emissions from all other sectors would fall under global decarbonisation scenarios (EIA, 2017; IPCC, 2014). This growth will also require additional infrastructure, with expectations that new airports, roads and ports will be developed worldwide, increasing the transport system's land requirements. The International Energy Agency (IEA, 2013) suggests that to meet growing transport demand, including freight, some 25 million road kilometres and 334,000 rail track kilometres will be needed by 2050, i.e. 50% more than currently available. To accommodate cars in increasingly automobile societies, up to 45,000 km^2 of new parking spaces will be needed, increasing the world's total land use for road, rail and parking to 250,000–350,000 km^2 (IEA, 2013), an area equivalent to the size of the UK. These infrastructures also have significant implications for wildlife ecology (e.g. Forman, 2000).

The global transport system is also characterized by its contribution to deadly accidents. Annually, some 1.25 million people die in traffic accidents, and 50 million more are injured (WHO 2016). The significance of these accidents is seldom acknowledged, as most are caused by cars, and distributed globally. Yet, fatal accidents from automobility correspond to one full Airbus A380 crashing every four hours. Air pollution, to which transportation makes a significant contribution, is responsible for 16% of deaths worldwide, incurring annual welfare losses of US$4.6 trillion (Lancet Commission, 2017). Noise, which is linked to a wide range of stress-related diseases (Ouis, 2001), affects a significant share of the global population, with the World Health Organisation (WHO, 2011) estimating that in Europe alone, up to one million healthy life years are lost as a result of traffic-related noise. Obesity is now a global problem, involving some 500 million people (WHO, 2017). Car-reliance has been linked to lack of activity and weight gain (Frank et al., 2004), with overweight people increasing the demand for larger and less fuel-efficient vehicles (Li et al., 2011). In many cities, congestion is becoming worse every year, incurring a growing cost of travel time, operation and fuel costs (e.g. Texas A&M Transportation Institute, 2015). Finally, with regard to social injustice, there is evidence that the distribution of burdens, risks, and levels of access in the transportation system is unevenly distributed (e.g. Lucas, 2012; Rivas et al., 2017). In light of these facts, as well as current trends that, globally, are likely to increase rather than decrease environmental and social costs of transportation, the desirability of a business-as-usual development of the motorized transport system is certainly questionable.

3. How to frame 'desirable transport futures'?

Any discussion as to what defines desirable transport futures will expose widely varying viewpoints as to what defines 'desirable', and will be rooted in personal and cultural values and norms. Notions of 'desirable transportation' were first discussed by Koike (1970), who developed an index of 'satisfaction levels', designed to measure improvements in a transportation system aspect linked to a social goal. As the description indicates, what is 'desirable' in this model is both normative and subjective, and has been originally linked by Koike to urban sprawl, travel time, congestion and pollution. He suggested that urban planners improve transportation networks using his model, in a way that would raise general satisfaction levels.

Over almost 50 years, the term 'desirable transportation' resurfaced in various publications. Kim (1979) presented a general equilibrium transportation demand model, suggesting that a subway system would be economical and desirable for a hypothetical city with a population of two million and an average density of 6900 residents per square mile. Mokhtarian (1991) discussed telecommuting as a desirable strategy to reduce transportation needs. Gordon and Richardson (1997) wondered whether compact cities should be a desirable planning goal, given issues of land use change, energy use, as well as changes in various 'costs' (e.g., expanding transit use and transit-oriented developments). Freund and McKnight (1997) discussed how an independent transportation network could be designed to make non-private automobile transport desirable for the elderly. Agrawal et al. (2010) found growing acceptance of market-based policies including 'green' transportation taxes and fees, to encourage socially desirable transportation choices. Recently, Cascetta et al. (2015) suggested that desirable transportation planning processes should combine rational decision-making and stakeholder engagement.