

## **Horizon Scanning Series**

# **The Effective and Ethical Development of Artificial Intelligence: An Opportunity to Improve Our Wellbeing**

### *How AI Will Impact Transport and Mobility in Australia and New Zealand*

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## **Input paper for ACOLA report on how AI will impact transport and mobility in Australia and New Zealand**

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Autonomous vehicles are one of the most highly anticipated AI developments which will likely have far-reaching impacts on life in Australia and New Zealand. This input paper explores a series of issues relating to the impact of AI on transport and mobility.

### **1. AI, mobility and regulation**

Much of the current debate focuses on the advances in AI technologies themselves and their differential capabilities. Whilst there is understandably a thirst to predict how AI driven autonomous vehicles will likely evolve, so that we can plan for their 'arrival', social scientists have emphasised that it is highly dangerous to imagine technologies in this way, as if they have a life of their own, as this overlooks the ways that technological developments are always embedded within different fields of power and politics, reflect vested interests and corporate ambitions, and replicate human biases and preferences (Wajcman, 2017). As such, it is vital that these technological developments in AI as they relate to transport and mobility are viewed within a wider context of influences and drivers (Bissell, 2018a). It is important to emphasise that specific future driverless technologies involving AI are absolutely not inevitable. Rather, we have a societal responsibility to critically and rigorously debate the kinds of driverless futures that we might want to see. Accordingly, governments must play a lead role in the regulation of these emergent technologies which seek to ensure that equity and social justice are central concerns.

### **2. Understanding the evolution of AI ecologically**

There is much uncertainty about the evolution of autonomous vehicles. Projections suggest that a shift to autonomous vehicles will not necessarily be a like-for-like substitution. Instead there is a high probability there will be a staggered, or stepwise, transition (Geels 2006). Furthermore, it is vitally significant to understand the impacts of AI on transport and mobilities ecologically. In other words, how changes in other domains of life influence the requirements and demands in the transportation space (Bissell, 2018b). Changes to workplace practices over the coming decades, for instance, will likely impact on the demand for transport, through an increase in flexible working practices, the feasibility of working from home, and the prevalence of co-working spaces.

### **3. Impact of AI on intersecting mobilities**

One of the qualities that differentiates AI from previous forms of automation is the use of predictive and anticipatory actions of machine learning, rather than rule driven inputs. Research on autonomous vehicle systems indicates how human decision-making practices and scheduling might be altered as a result of AI (Lipson and Kurman, 2016). Where decision making practices relating to transport, such as timing and mode, are currently decided upon by users, the capacity of AI to learn people's everyday routines will likely increase the possibility of predictive and anticipatory decision-making practices by AI applications. This opens up the possibility for increased convergence between autonomous vehicle systems and

personal schedules, such that both the choice of travel mode and decisions relating to timing and routing through a city might be devolved to an automated system that coordinates and makes decisions on people's behalf, linked to personal schedules. Such developments would require the integration of data sources from personal calendars and GPS locations, which raises important political questions about the scope and acceptability of data sharing.

Furthermore, as transport researchers have suggested, public transport will remain the most efficient way of moving large numbers of people quickly and efficiently. How autonomous vehicles intersect with public transport, especially in the provision of 'last mile' services between home and public transport hub will likely become an important concern. Different mobility service providers will need to cooperate to provide connected, seamless journey experiences. It is paramount that governments take an active role in facilitating this seamlessness.

#### **4. Impact of AI on sharing**

Autonomous vehicles will likely be shared, rather than individually owned. In anticipating possible transitions to AI-assisted driverless automobility, it is vital to appreciate the importance of understanding how much of the current appeal of private automobility is derived from affective and experiential dimensions, raising questions about the desirability of shared autonomous vehicles. Recent research (Kent, 2014, 2016) suggests that private car use is an entrenched practice in many parts of Australia not only because it is viewed as a time-saving device, but also because private car use is attached to some people's cultural sense of self, in that it is viewed as an inalienable source of freedom and autonomy by some Australians. This current cultural reality in Australia therefore potentially poses a challenge to attempts to develop a public and highly regulated network of shared fully automated transport vehicles, as some commentators and industry futurists have envisioned (Silberg et al., 2012).

Given that mobilities researchers have highlighted how public transport is a key site where social tensions can play out (Bissell, 2016), consideration needs to be given to how sharing spaces can be designed to minimise social conflict. Indeed, there might be exciting opportunities to consider how these new shared mobile public spaces might be occasions for new kinds of positive sociability and connection. Whilst behavioural campaigns have been a common albeit repressive way of controlling the shared spaces of public transport, the development of automated vehicles opens up opportunities to rethink the design of the car which could facilitate more affirmative forms of learning to be with others.

#### **5. Impact of AI on social inequalities**

Autonomous vehicle technologies have the potential to produce new—or perpetuate existing—forms of social inequality. Drawing from the insight that autonomous systems not only reflect but also refract unequal social relations between, across, and within different social contexts (Lutz, 2014), the design of autonomous vehicles is not value neutral. Hildebrand and Sheller (2018), for instance, show in relation to car previews by manufacturers, social differences, such as gender, race, and class, are in varying levels present in how autonomous vehicle technologies are currently depicted, and these not only inform future realizations of driverless systems, they also can position certain groups as being more technologically 'competent' or advanced than others (cf. Walkerdine, 2006). Alternatively, Jensen's (2007) research highlights how the development of new mobility

systems can intensify social segregation, leading to multi-tier services based on differential speed and comfort. For autonomous vehicles, the ‘kinetic elite’ (Elliott and Urry, 2010) may have greater access to autonomous vehicle services, such that they can travel farther and faster than others, and these privileged services may also provide higher levels of flexibility and comfort.

The increased convergence between physical and virtual mobilities that will likely underpin the operation of autonomous vehicles has significant implications for surveillance. Indeed, AI may transform and, in some cases, intensify how human mobilities are subjected to surveillance and how surveillance itself can be mobilized. Through the mechanism of ‘sorting’ (Adey, 2004), networked driverless technologies will likely have the capability to track—and thus to regulate—who and what is being transported and where, when and with what frequency these movements are taking place. As a growing body of research has explored (Burrell, 2016), the effects that algorithms have on people’s lives can often be opaque. As such, questions of data protection will become more prominent.

The development of autonomous vehicles also introduces issues relating to how risk is transferred. As some studies have discussed, autonomous vehicles may radically transform how car insurance operates, leading to new forms of inequality. It may significantly reduce the market for insurance (McDonald, 2013), thus reducing this sector’s role in economies, and it may also lead the costs of accidents to be borne by non-motorist parties (Duffy and Hopkins, 2013).

## **6. Impact of AI on transport labour**

The development of autonomous vehicles will likely have significant implications for transport labour in Australia and New Zealand. Predictions have been made that the long-term consequences for the transportation labour force are likely to be negative, given that the economic rationale for driverless trucks, especially, is to reduce labour costs and increase safety (Validakis, 2013). Predictions are therefore for fewer workers with one operative potentially overseeing multiple vehicles. The potential introduction of driverless public transportation demands that transport operators consider how staff might be redeployed in passenger-facing roles.

In the coming decade, there is still much uncertainty about whether taxis will be fully automated, or will involve a human operative. Whilst transportation platform companies have made clear their aspiration for fully driverless vehicles, experts indicate that this is unlikely in the short term. Therefore, in the meantime, the issue of employment rights for operatives of increasingly automated technologies is important. There is evidence that some platform companies are undercutting traditional transportation providers by lowering workers’ rights (Glöss et al., 2016). Designated as independent contractors, these workers have no rights to sick leave, annual leave, or maternity pay, and from a legal perspective have little protection from the organisations that they provide their labour for. It is vital therefore in the transition to automated mobilities that the kinds of employment that are created are scrutinised for their labour standards.

## **7. Impact of AI on changing travel time use**

Research on mobilities suggests that the emergence of autonomous vehicles will likely change how travel time is valued and used. Rather than understood as dead time, research on

travel time on public transport shows that passengers put this time to all kinds of productive ends that can make the journey itself a valuable experience (Bissell, 2018b). Preliminary studies of autonomous automobility have found that, with the driver released from driving and thus able to become a passenger, the driverless car could become a new mode of both private and professional dwelling. Mobilities scholarship on the capacities and affordances of passengering here provides insights into what these might involve (Adey et al., 2012), such as an enhanced capacity to appreciate the environments moved through, or affordances to withdraw from attentive activity altogether. Thus, autonomous vehicles may open up new ways of valuing car travel time, through new possibilities for work, rest, leisure, communication, and social interaction. As Lipson and Kurman (2016) suggest, the interior cabin of cars, subsequent to the eclipse of a human driver, will likely be significantly reconfigured in design, providing greater flexibility for work, leisure and related social activities.

Other studies consider how the car might become, first and foremost, a ‘dwelling space’ (Laurier and Dant, 2012, 237). Urry’s (2008) speculations on urban driverless ‘pods’, for instance, are suggestive of a hi-tech cocoon in which passengers are cushioned from the external environment by smart grids and informational road systems on the one hand and surrounded by micro-electronics and digital technology, including the Web, email, messaging and social media on the other. In this regard, fully autonomous vehicles may represent a sanctuary, a zone of privatism, however minimal, between points of departure and arrival.

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