Transport Research Colloquium 2020

November 2020 | Emerging transport technologies – what's next?

Ministry of Transport
TE MANATŪ WAKA

Emerging transport technologies

- The Strategic Policy & Innovation team has responsibility for policy related to new and emerging technologies across the transport system. We focus on both the opportunities and risks associated with these technologies.

- This is a broad area & includes things like autonomous vehicles, drones, micromobility, mobility as a service, autonomous ships, future fuels (e.g. hydrogen), on-demand public transport, car-sharing, connected vehicles, autonomous freight delivery, and many other technologies.

- We are focussing primarily on the first four of these today.

- All of our work is guided by the transport outcomes framework – as policies around new technologies should ultimately be focussed on what it can deliver rather than the technology itself

What we are focussed on right now? (AVs)

- **benefits** of AVs are potentially broad (safety, congestion, reduced private car ownership), but completely uncertain & many risks
- New Zealand needs capabilities & processes to ensure vehicles are safe **throughout their life cycle**
- many potential parties involved in **AV incidents**:
  - manufacturer, driver, owner, operator, government agents, supplier, vehicle inspector, other road users…
  - guidance, regulation, legislation, status quo, other? And when?
  - Crown Law advice on current laws around **liability** when autonomous functions are in operation (Level 3+)
- increasingly, core vehicle functions are enabled by **software**:
  - security of components will become new measure of quality in the automotive industry
  - implications for liability and safety obligations between manufacturers and suppliers & vehicle owners

Key uncertainties (AVs)

Development and deployment pathways – uptake, timing and pattern (use cases)

- **privately owned** vehicles on public roads, AV **shuttles** in specified areas, **trucks**
- testing and trialling (led by Waka Kotahi), but increasing **interest from investors** (Queenstown, Auckland)
- what's happening **overseas**

Infrastructure & connectivity investment – role for government, investment criteria

- **infrastructure** needs for AVs – **NZ roads not ready**, varied deployment pathways (chicken or egg?)
- **connectivity** features not essential for AVs to operate, not the preferred option for manufacturers – investment (when, who, why?)

Data & cybersecurity – capability gaps, points of vulnerability

- government access to AV generated **data** (Police currently need subpoena):
  - needed to conclude **crash investigations** involving AVs
  - could also **improve** traffic flow, reduce congestion and better target future infrastructure investment

What are we focussed on right now? (Micromobility)

- **Understanding the regulatory system for shared/rental micromobility**

  We are currently working on understanding the regulatory system in which shared and rental micromobility schemes operate through interviewing councils and companies

- **Collaborating with TAs on a range of initiatives to improve outcomes of micromobility**

  We are part of a Micromobility Working Group which brings together local and central government to collaborate on different challenges and opportunities of micromobility

- **The Accessible Streets Regulatory Package**

  We are waiting to see how the new Government wants to progress with the Accessible Streets Package. This will inform our work on the regulatory system

Key uncertainties (Micromobility)

Our biggest uncertainty is around the net impact micromobility devices have on the wider transport system.

Some specific research gaps include:

- What is the current status of access to micromobility services in different cities in New Zealand? What are the contributing factors to lack of access to micromobility services/devices (e.g. income, age, etc.)?
- What impact do micromobility services/use have on economic activity in different regions?
- How does micromobility use affect physical, mental, and social wellbeing?
- What are the environmental impacts of micromobility? What are the reasons for these impacts? How are these compared to the environmental impacts of bikes, cars, or buses?
- How has micromobility affected travel patterns or habits in New Zealand?

What are we focussed on right now? (Drones)

- We are focussed on drones because of their broad **economic benefits**. Drones have a wide range of use cases and have the potential to life productivity and improve safety outcomes across the economy, in areas like precision agriculture, surveying, forestry, conservation and search and rescue

- We’re also interested in how drones might be used within the transport sector for the transportation of goods and eventually people

- Our work programme is currently focussed primarily on putting in place some of the regulatory foundations that will enable drones to be used safely and securely

- We’re also trying to think about what comes next, and how drones might impact transport outcomes over the longer term

Key uncertainties (Drones)

We already have good research/evidence on:

- The economic benefits of drones and where they are likely to be used
- Who is currently using drones (both commercially and recreationally), what they're being used for, the different types of drones in New Zealand and their capabilities, and people's awareness and understanding of the Civil Aviation Rules
- We have some understanding of people's perceptions of drones, including passenger carrying drones (NZ was included in a global survey commissioned by Airbus)
- We were also involved in an ITF report (not yet published) which looked at some of the broader social/economic impacts of drones – e.g. impacts on emissions, noise, wildlife, social equity, congestion, and urban form. Much of this was quite speculative, and it was drawn from a limited number of global studies which are not all relevant to New Zealand.

The biggest gaps/uncertainties:

- Getting a more nuanced understanding of the likely rate of uptake of different types of drones, and the costs and benefits of different use cases
- Environmental impacts – especially noise and emissions. We know that these vary significantly depending on the type of drone being used, where it is operating, what activities it is undertaking, the materials used to produce the drones, and the energy source used to power them. There is scope for more NZ specific research on these issues
- Public acceptance will continue to be an area of focus. We're interested in understanding what the key concerns are (e.g. around noise, privacy and visual disturbance) and the sorts of mitigations or measures that could be put in place to address those concerns.

Mobility as a Service

- Mobility as a Service (MaaS) has been defined in many ways, but broadly it is the concept of having a single platform which can be used to book and pay for a range of transport services, along a single journey
- The platform would be a mobile app, or web-based, which can be easily accessed from smart phones or tablets
- MaaS requires more than one mode of mobility to be used throughout a single journey, like a train trip connecting to a bus or scooter trip – integration is the key
- MaaS is often seen as something which could help reduce the need for people to own their own vehicle (or have the need for a second vehicle)
- MaaS also has the potential to help shape travel behaviour, by comparing prices for different travel modes, and by providing information around the greenhouse gas emissions related to travel choices
- At present the Ministry does not have any specific work underway around MaaS, but it is a key area of interest, and one we are interested in exploring further. Some of the specific questions we are interested in include:
  - *How could a MaaS platform be designed to encourage the use of public transport and promote active travel choices?*
  - *How can private sector transport providers be incentivised to share their data with MaaS platform providers?*
  - *How do we overcome the legacy technology and payment methods on public transport to support MaaS?*
  - *What should the Government's role be in encouraging the development and use of MaaS platforms? Why should Government get involved at all?*

Thank you