Submission No 4

TRANSPORT TECHNOLOGY SECTOR

Organisation: Lynxx

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Inquiry into the Transport Technology Sector

NSW Legislative Assembly Committee on Transport and Infrastructure

May 2021

LYNXX
data inspired by people

Background

This is Lynxx's response to the NSW Legislative Assembly Committee on Transport and Infrastructure's inquiry into the transport technology sector.

That inquiry is looking at: how transport technology could be used to provide Mobility as a Service (MaaS); real time public transport journey information; and first and last mile transport services. How data might be used to improve access and safety for travellers, especially women; and the ethical considerations and regulations in the development of connected and automated vehicles (CAVs).

Contents

1 Who we are

Lynxx is a global advanced analytics, operations research and systems consultancy company, specialising in the public transport sector.

We opened our Asia-Pacific branch in NSW 4 years ago, in part because of the world-leading approach that NSW has with regards to open data in the public transport sector.

We have become a NSW success story – producing and exporting our software tools and specialist public transport advice globally; and an actively employing and growing business.

We have taken part in a number of Transport for NSW (TfNSW) Open Data innovation challenges, including those that cover the content of this report which means we've already done a lot of thinking about, or have services and solutions in the areas under this inquiry's purview.

We are also active globally in the transport and technology data policy space, with an excellent understanding of current themes relating to policy in a number of international public transport contexts which also informs this response.

1 What we do

Because of our work in **transport technology**, we are already a very active international player in the content and context of this inquiry.

Our public transport software and advice includes:

- **Tranzer**: global Mobility as a Service platform – tested in NSW.
- **NetworkSim**: digital twin agent-based network simulation of transport networks (built and used initially in NSW and now exported globally).
- **NetworkSO**: timetable optimisation (operations research) built in NSW and exported globally.
- **OPS**: live network system monitoring (built in NSW and used in Australia and NZ).
- **Predictions Engine**: machine learning platform for live transport vehicle arrival predictions built in NSW and used globally.
- **Demander:** vehicle booking and dispatch platform (built in NSW and exported globally).
- **Urban Engine**: geospatial timetable quality simulation (used extensively in NSW and around Australia).

networksim
DYNAMIC NETWORK SIMULATION

networkso
NETWORK SCHEDULER - OPTIMISER

OPS
operations performance system

TRANZER

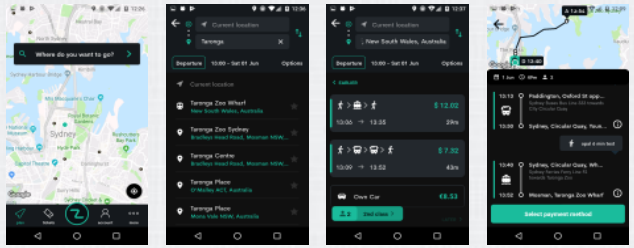
Predictions Engine
powered by LYNXX

Demander
powered by LYNXX
Demand Responsive Transport

2 Mobility as a Service (MaaS) - enablement

- We have deployed MaaS platforms globally, including piloting Tranzer as a single-mode option in Sydney, and almost deploying Tranzer as a MaaS solution in Sydney (TfNSW MaaS innovation challenge).
- There are inconsistent definitions: single app, versus single non-traditional mode, versus journey planning versus ecosystem.
- We define MaaS as an **ecosystem** of interconnected transport operators, planning and ticketing apps – putting the customer at the heart of the experience – and avoiding multiple systems for planning, ticketing, paying.
- MaaS platforms (like ours) should compete for customers based on experience and customisation (best options) not lock-in or lock-out.
- The technology is largely mature – nothing stopping full MaaS enablement at a technology level.
- The policy layer is problematic – very little enabling MaaS enablement (see next page).

TRANZER



2 Mobility as a Service (MaaS) – policy constraints

- **Issue 1: no level playing field for access to ticketing. We advocate standard sales commission for MaaS ecosystem:**

  There is no access to ticketing for MaaS platforms without individual agreements (which will protect commercial interests). Public Transport data and planning was opened up via TfNSW Open Data, but not access to fulfil (sell) those journeys, which is the essential second part for MaaS enablement. Opal Connect may serve this purpose but masks the necessary commercial incentives to roll-out. We would recommend a sales commission mechanism for the use of Opal Connect (MaaS operators receive commission for selling MaaS).

  - Example: UK rail travel ticketing – standard access for anyone (through a licence) to sell rail tickets and receive commission – has created a customer-serving ticket sales industry.
  - Example: travel agent market – access to sell hotels at standard commissions across industry – share of a bigger pie is better than an entire smaller pie.

- **Issue 2: too much given up for too little in return. We advocate *quid pro quo* policy for access to the public realm:**

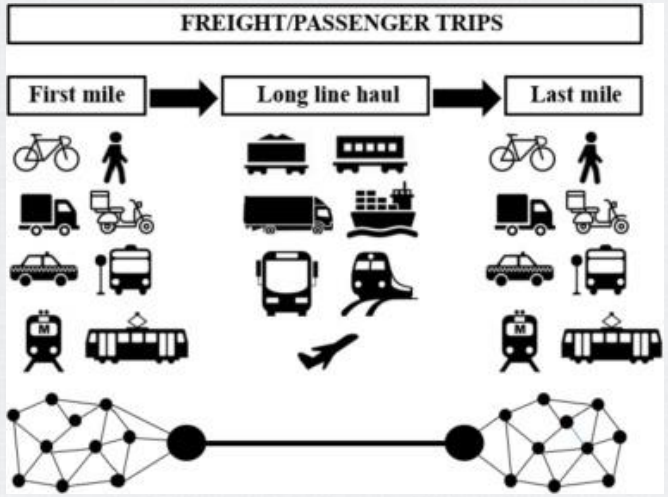
  Cities provide access to the public realm for MaaS transport operators (e.g. micromobility, taxi, ride share) but do not typically require access to data and ticketing in return. What if, in return for allowing a e-scooter to be parked on a footpath, the e-scooter operator had to make their data available to the MaaS ecosystem. This would allow for much more efficient transport planning and interconnectedness (note point above about ticketing access too). Our view is that public transport authorities have given away too much for too little in return.

3 Real time public transport journey management

- NSW is already a global leader in this space with open data solutions and initiatives (so should be commended).
- Real time journey management relates a lot of the other responses to this inquiry so isn't, perhaps, an end in its own right.
- We would advocate expanding open data activity to include the MaaS ecosystem, including:
  - Micro mobility operators (in return for getting access to the public realm)
  - First & Last Mile operators, including on-demand services
  - Car share
  - Ticketing platform (API) with standard commission models.
- There are potentially other crowdsourced data sets that could contribute to journey management
  - Safety hotspots ("avoid this area") – see section 4
  - Preferred journey types (e.g. tree-lined streets).
- There remains a question about monetisation of these features – building data sets is relatively easy, but commercialising them is harder. There may not be a sustainable market, which may require an investment in crowdsourcing access platforms (e.g. open source apps).

4 First and last mile transport services

- There are inconsistent definitions available: any ‘mode’ could be a first mile/last mile service (depending on journey purpose).
- We have assumed that this relates to personal or shared transport, rather than public transport, so in this context is micro mobility, on-demand services, ride share, walk.
- We advocate:
  - Inclusion in open data (quid pro quo policy)
  - Inclusion in MaaS ecosystem (anyone can see)
  - Payment integration with MaaS ecosystem (anyone can book/sell).
- This may require enhanced open data protocols.



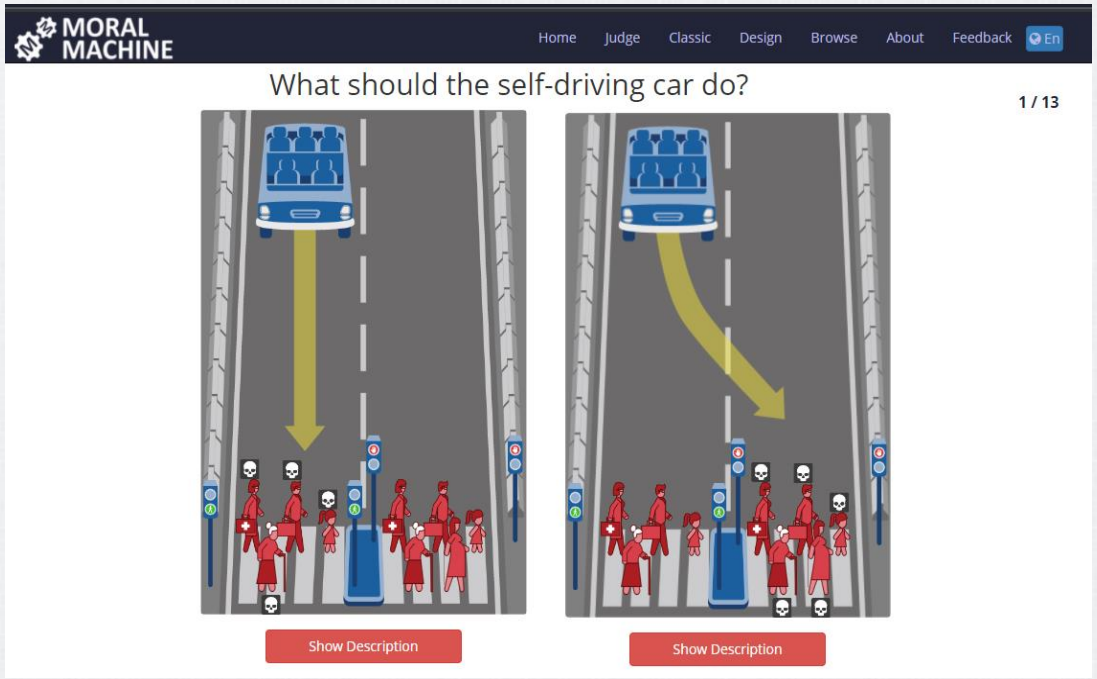
Source: Nocera, S., Pungillo, G. and Bruzzone, F., 2020. How to evaluate and plan the freight-passengers first-last mile. *Transport Policy*.

5 Access and safety for travellers, including women

- We are very supportive of any initiative than enhances safety and access.
- We note that this will be a very personal requirement (there will be a wide range of perceptions of safe, and a wide range of definitions of suitable access).
- This lends itself to a very customised set of data with the ability for travellers to review and choose what is very specifically important to them.
- Our view is that crowdsourcing is the best source of perception data for safety.
- Access data can be more objectively defined and can include much more information than current. For example, road topology, step counts, curb heights, drains and ramp locations could be mapped (and probably already exists with Local Authority laser road/footpath condition mapping).
- The issue will be the commercialisation of the crowdsourcing or enhanced data. We don't believe that people should have to pay to get access to data to allow them to feel safe or to make a journey. Crowdsourcing is likely to be a good way to assemble data but providing access in a meaningful way is likely to require TfNSW action (to fund a market gap). We proposed this for the TfNSW Safety after Dark innovation challenge.

6 Ethical considerations and regulations for CAVs

- There is a significant and growing body of research into CAVs with academic and public scrutiny.
- The common narrative presents the development of CAVs as something that will inevitably benefit society by reducing the number of road fatalities, but fatalities that do happen will need to be 'designed'. See next page for commentary on progression.
- We would encourage NSW not to generate another set of standards, but to work within emerging International standards (e.g. it would be nonsensical if a CAV crossing from NSW to QLD should have to switch into "QLD ethics mode" with a different set of standards or algorithmic regulations).
- We commend the European Commission's ethical considerations and encourage global collaboration into a single set of detailed standards. Transparency of algorithms will be key to that working.



Source: moralmachine.net

6 Ethical considerations and regulations for CAVs

In a practical sense, there is some way to go before CAVs will need to make 'ethical' (algorithmic) choices. Currently the major challenges are:

1. **Digital engineering standardisation**: such as the accuracy of sensor capability, agreement across the industry on the machine learning protocols and key algorithms to allow interconnected participation in a road network.

2. **Infrastructure engineering**: such as the mapping of road data, object taction on open roads, corresponding transport markers and waypoints or road-based infrastructure requirements.

3. **Regulation challenges**: Lack of a sufficient standards and regulations for systems as a whole (and the complexity of cross-border rules and liability provisions).

4. **Ethical challenges**: inconsistency of societal expectations (CAVs versus human driver) to drive decision making programming.

Overall, we would encourage NSW to foster rapid adoption but by contributing to and adopting emerging global standards and would encourage a flexible approach (secondary legislation) to allow roll-outs that test emerging practical challenges, not 'just' whether CAVs work. Our experience with data is that they are messy, so we also need to encourage real-world data and trials, not just sterile test environments. We expect the public are ready for more in this space.

Contact

We would welcome the opportunity to further clarify any of the points made in this submission or to present this information in person.

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