

Changing driving laws to support automated vehicles

Date: 21 November 2017

Dear Ms McKillop,

We refer to the discussion paper [Changing driving laws to support automated vehicles](#) and welcome the opportunity to provide comment and perspective on behalf of the City of Melbourne. The consultation questions have been reviewed and responses are attached as Appendix 1. Importantly, comments relating to this issue are generally more strategic and high level than the scope of the consultation questions provided. The comments focus on the need to ensure a measured regulatory response in order to capture long-term benefits that Autonomous Vehicles (AVs) may provide.

We understand that these comments will be considered by the NTC in developing reform options for the Transport and Infrastructure Council, to be presented in May 2018.

Summary

Please note that this feedback is provided on behalf of the management of the City of Melbourne and does not represent the views of the Council. This submission is supported by endorsed council policy and strategies including:

- [Future Melbourne 2026](#)
- [Transport Strategy](#)
- [Last Kilometre Freight Plan](#)
- [Road Management Plan](#)
- [Road Safety Plan](#)
- [Knowledge City Strategy](#)

As stated in the discussion paper, the City of Melbourne recognises that AVs are already being trialled on Australian roads and are likely to become commercially available from around 2020. Regulatory reform is required to ensure that legal responsibility is clarified and understood to coincide with the commercial availability of these new technologies.

AVs will have different impacts in different environments, and the NTC should consider this. The focus of this submission reflects considerations of a dense urban environment as exists within the City of Melbourne municipality. The City of Melbourne's transport strategies support a declining role for private motor vehicles with future growth in mobility to be supported by an expansion of space-efficient transport such as public transport, walking and cycling. Private vehicles are more suited to providing mobility in lower density urban and rural areas so the benefits of private AVs may be more pronounced in those contexts. From the City of Melbourne's perspective, autonomous public transport vehicles may offer more significant benefits than small passenger AVs.

AVs will have significant implications for deliveries and freight vehicles as well as industries with professional drivers such as bus, taxi and freight. These impacts are not well understood at this time and should be further explored.

In order to capture the potential benefits of AVs, regulatory reform must consider alternate future scenarios, and be structured to support an optimal outcome. Given that the effect of these new technologies is unpredictable and these outcomes unclear, we submit that responsive, proactive yet precautionary regulatory reform is required.

The NTC discussion paper is limited in its consideration of the benefits of AVs. Potential challenges or problems are not fully considered. We recommend that regulatory reform to support AVs requires greater analysis of the potential positive and negative impacts of AVs and should seek to do more than simply enable AVs under the law.

As set out in this submission, the following considerations are essential in the development of regulatory reform:

Key considerations

1. The benefits of AVs previously identified by the NTC appear to be contingent upon shared ownership and shared use. Regulatory options should seek to prioritise and enable AVs to operate with shared user structures or 'Mobility as a service' operations. Expanded private ownership and use of AVs in central Melbourne is likely to lead to much greater traffic congestion with negative impacts on on-road public transport.
2. Improving road safety is both the biggest opportunity for AVs, and also the most important consideration. Vulnerable road users (pedestrians and cyclists) should be offered the greatest protection and greatest priority.
3. Encouraging innovation and investment is critical. We are supportive of ongoing trials and testing to better inform the regulatory response.
4. The potential operational benefits of AVs are limited within dense urban environments. In these locations walking and cycling supported by public transport should be prioritised. Pricing mechanisms to better manage trip demand may be required to mitigate increases in congestion resulting from empty vehicles circulating instead of parking.
5. We support the continued control of existing road authorities to manage roads.
6. We cannot accurately predict the impacts of AVs, and reform options should be responsive and nimble to reflect this. Ongoing research into traffic impacts, scenario and traffic modelling should be used to understand future driver behaviour and guide regulatory reform.

Project scope

The scope of the *Changing driving laws to support automated vehicles project* (the project) is to identify high level approaches and options for legislative reform to:

- ensure an Automated Driving System (ADS) can legally perform the dynamic driving task when it is engaged
- ensure a legal entity is responsible for the actions of the ADS when it is engaged
- ensure the intent of existing driver obligations is maintained—in particular, for road safety.

Given the imminent arrival of commercial AV technology, this scope supports the urgency with which these reforms must be implemented. However, we submit that there is a significant risk in this scope being too narrow and that regulation could fail to capture the potential benefits of AVs as a result. We submit that the

NTC should expand the considerations underpinning the regulatory reforms to recognise the disruptive and unknown impacts that AVs may have.

The responsibility for actions attributed to a legal entity may include emissions, congestion, health and safety considerations, as these impacts are direct results of the actions of the ADS and should be considered through reforms.

City of Melbourne Transport Strategy Refresh

The City of Melbourne is currently refreshing its Transport Strategy. This refresh will include extensive consideration of emerging transport technologies including AVs. This strategic work will examine future scenarios, potential urban planning and design impacts, and provide guidance on future infrastructure requirements.

The existing key directions of the Transport Strategy 2012 are to be maintained, strengthened and extended. These directions are of interest and significance to these reforms and include:

- Integrate transport and land use planning
- Go anywhere, anytime public transport
- Support PT, walking and bikes as the dominant modes in the central city
- Develop high mobility streets
- Make Melbourne a cycling city
- Foster low impact innovative freight

Transport Integration Act 2010

The Victorian Government *Transport Integration Act 2010* (the Act) provides a framework for the provision of an integrated and sustainable transport system in Victoria consistent with the vision statement. The principles and objectives of this legislation are of relevance to the NTC's work to provide regulatory options for AVs and should be considered during the reform options development.

Transport system objectives

1. Social and economic inclusion
2. Economic prosperity
3. Environmental sustainability
4. Integration of transport and land use
5. Efficiency, coordination and reliability
6. Safety and health and wellbeing

These objectives and the Act more broadly are firmly supported by the City of Melbourne and identified in the council endorsed Transport Strategy 2012 (p.13).

Key issues

Key consideration 1:

The mobility benefits of AVs identified by the NTC appear to be contingent upon shared ownership and shared use. Regulatory options should seek to prioritise and enable AVs to operate with shared structures or 'Mobility as a service'. Expanded private ownership and use of AVs in central Melbourne is likely to lead to much greater traffic congestion with negative impacts on on-road public transport.

The NTC has cited the capacity of AVs to decrease traffic congestion as one of the principal benefits of the technology. This potential benefit has been identified by vehicle manufacturers (Parliament of the

Commonwealth of Australia: House of Representatives Standing Committee on Industry, Innovation, Science and Resources, 2017, pp. 11–14, 23–27, 56.). The City of Melbourne is concerned that this benefit may have been overstated. In particular we suggest that a reduction in traffic congestion due to AVs is not likely to occur within a dense, inner city urban environment. Also, any congestion benefits are not likely to occur until there is an extensive market up-take of the vehicles towards a fully autonomous fleet.

AVs will always be restricted by the constraints of space, and in a dense urban environment, space allocated for transport is limited. The spatial efficiencies of various transport modes will not be significantly transformed by the arrival of fully autonomous vehicles if they are privately owned, with comparable vehicle occupancy to that which we see in Melbourne today.

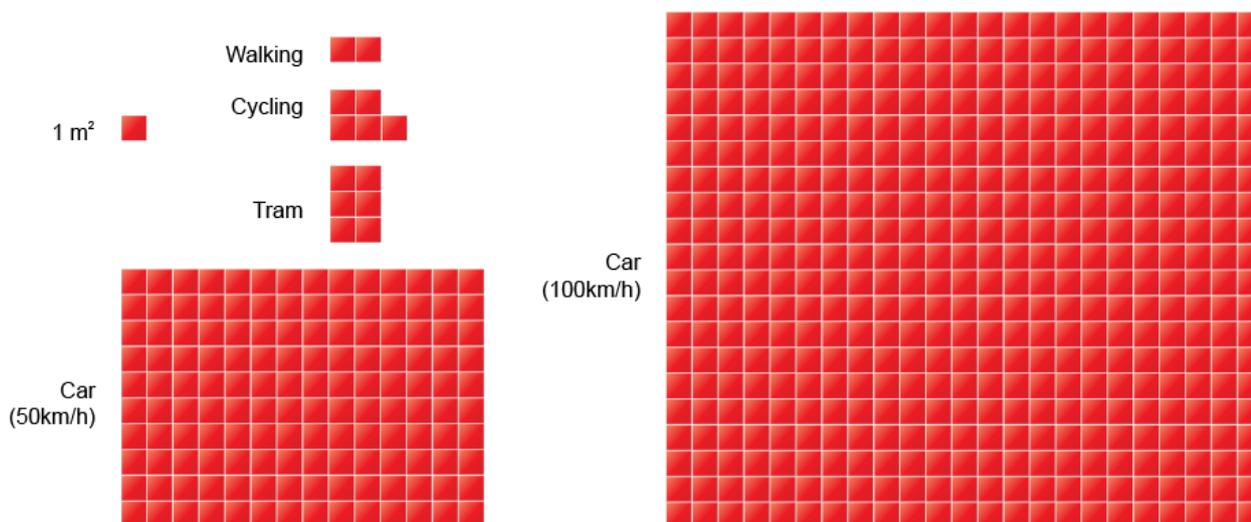


Figure 1: Space footprint per commuter (City of Melbourne Transport Strategy 2012)

Figure 1 demonstrates the relative space required for a single commuter to travel by different transport modes. Whilst AVs may require less space than a car today (assuming a fully autonomous fleet and reduced braking distances), AVs will be unable to match the efficiency of walking, cycling and public transport.

Approximately 903,000 people travelled to, or were present in, our municipality on an average weekday in 2016. This number is projected to reach 1.4 million by 2036. This means more people will be in the same amount of space. Concurrently, more space will be required for pedestrians as well as more trees and urban greening to mitigate the effects of climate change.

The Transport Strategy 2012 prioritises space efficient transport modes to facilitate access to and around the central city. Transport by private vehicles (including autonomous vehicles) cannot cater to situations where large numbers of people wish to reach the same destination at the same time. A combination of train, tram, walking, cycling and reducing the overall need for travel through land use policies will remain intrinsically more efficient for the city’s core transport tasks.

One way in which AVs could significantly improve the space efficiency of car travel would be through car-pooling to increase the occupancy of vehicles. Currently occupancy rates for motor vehicles in Melbourne are around 1.1 people per vehicle and have been consistently decreasing. Car-pooling reduces the footprint of each commuter. If AVs were to be used by multiple commuters from different pick up points, the space efficiency of vehicles could be improved, although not to the efficiency of walking, cycling and public transport. A situation where multiple users can share a single vehicle should be encouraged. This should seek to reduce the total vehicle fleet and reduce individual car ownership. A fleet of small, on demand autonomous buses would amplify this effect.

Melbourne City Council is a member of the International Council for Local Environmental Initiatives (ICLEI). In October 2017, ICLEI launched the Shared Mobility [Principles](#) for Liveable Cities which include:

We support that autonomous vehicles (AVs) in dense urban areas should be operated only in shared fleets. Due to the transformational potential of the autonomous vehicle technology, it is critical that all AVs are part of shared fleets, well-regulated and zero emission. Shared fleets can provide more affordable access to all, maximize public safety and emissions benefits, ensure that maintenance and software upgrades are managed by professionals, and actualize the promise of reductions in vehicles, parking and congestion, in line with broader policy trends to reduce the use of personal cars in dense urban areas.

Melbourne City Council is considering its response to these principles, and has not signed on at this time.

Key consideration 2:

Improving road safety is both the biggest opportunity for AVs, and also the most important consideration. Vulnerable road users should be provided the greatest protection and greatest priority.

Substantial road safety benefits are identified as a key benefit of AVs. This is of benefit to the City of Melbourne and enabling road safety improvements should be a key objective of regulatory reform. Reducing the incidence of vehicle, pedestrian and cycling incidents in the municipality would be of great value as we seek to support active transport modes. Any reduction in road trauma enabled by AVs represents a significant community benefit.

Greater protection of pedestrians and cyclists may have significant effects upon street design and reduce the need for the separation of different transport modes. Making the city safer and more accessible for pedestrians and bike riders is supported by council policy including the [Transport Strategy](#), [Road Safety Plan](#), [Walking Plan](#) and [Bike Plan](#). Regulation should recognise the vulnerability of different modes, and the operation of AVs should be regulated assist in the expansion of walking and cycling as preferred modes of movement in our city.

Further research, testing and trials are required to better understand how AVs will interact with high quality pedestrian environments. In low speed environments and shared spaces, the behavioural response of pedestrians will need to be considered. The creation of more mid-block crossings is likely to be required to ensure safe crossing opportunities and optimise pedestrian connectivity. These effects are unclear and reinforce the need for responsive regulatory mechanisms.

These considerations are in line with Council goals, particularly the creation of a City for People. A city for people welcomes all. It is accessible, affordable, inclusive, safe and engaging. It promotes health and wellbeing, participation and social justice.

Key consideration 3:

Encourage innovation and investment. We are supportive of prompt regulatory reform complemented by ongoing trials and testing to better inform the regulatory response.

The timeliness and clarity of reforms to support AVs are of great importance. In a scenario where regulation and policy settings are unclear, there is a risk that innovation and market uptake will be reduced. In this scenario, investment is limited as manufacturers and service providers attribute greater risk to the market and choose to invest elsewhere. To avoid this outcome, a timely and coordinated reforms package is required. We support the NTC in its work to achieve this.

The [Knowledge City Strategy](#) established the City of Melbourne as a leader and promoter of efforts to enable new technologies and support innovation. In this role we have collaborated to support the AIMES test bed with the University of Melbourne and the Victorian Government. Recently this project has facilitated a trial of the driverless bus on Drummond Street, Carlton. Such trials can be used to better inform the regulatory response.

Key consideration 4:

The potential operational benefits of AVs are limited within dense urban environments. In these locations walking and cycling supported by public transport should be prioritised. Pricing mechanisms to better manage trip demand may be required to mitigate increases in congestion resulting from empty vehicles circulating instead of parking.

We recognise that in some locations it is likely that there may be increases in throughput efficiency from AVs including on freeways and highways. However, the spatial characteristics of the central city severely restrict the benefits that AVs are likely to provide.

If AVs are not required to park or be stored in the city, there may be an opportunity to reallocate on and off street car parking to higher value uses. This could be a significant benefit. There are a number of conflicting demands for the way in which this space should be reallocated in the future including towards wider footpaths, new bike lanes, new public open spaces, tree planting and other future uses unforeseen. Given the growth in visitation identified above, the City of Melbourne would not support an increase in road space allocation to AVs.

Research and scenario development surrounding AVs has explored the possibility of privately owned vehicles circulating without passengers. This could contribute significantly to congestion and regulatory options should seek to prevent such an outcome. In a scenario where privately-owned cars make two trips during each peak (one into city and one out of city) to avoid parking fees, congestion has the potential to greatly increase. Of particular concern to the City of Melbourne would be any increased congestion which negatively impacted the operation of public transport, cycling or walking.

While Council does not have a specific view on the use of incentives or user charging, there are options which have been implemented in other jurisdictions, and the costs and benefits of these for the greater Melbourne context should be considered as part of the scope of the review.

Key consideration 5:

The City of Melbourne supports upfront the continued control of existing road authorities to manage roads.

The City of Melbourne supports the NTC in its efforts to provide consistent legal controls and guidelines nationally. All systems need to sit under Australian Government control.

Local measures will continue to require contextual knowledge and responses. While infrastructure requirements may change significantly (e.g. speed reductions could be programed rather than requiring traffic calming), we submit that existing authorities should be maintained in order to ensure road management is contextually specific.

Key consideration 6:

We cannot accurately predict the impacts of AVs, and reform options should be responsive and nimble to reflect this. Ongoing research into traffic impacts, scenario and traffic modelling should be used to understand future driver behaviour and guide regulatory reform.

There may be benefits from vehicle automation of which we are not aware at this time, and these should be explored extensively prior to developing policy that may inadvertently clear or block the path of AV adoption. Infrastructure Victoria (IV) is currently undertaking research to provide [advice on automated and zero emission vehicle infrastructure](#). This will build on its recent 30 Year Infrastructure Strategy and include scenario development and testing. The City of Melbourne has previously made submissions to IV and been actively involved in discussions with IV about this work.

Conclusion

The City of Melbourne has identified a number of key aspirations, supported by the above and broadly consistent with current Council policy, which would benefit the city with the arrival of commercially available AVs:

- Support shared use and shared ownership of AVs
- Improve road safety, in particular through greater protection of vulnerable road users
- Support better management of trip times and purpose to reduce congestion and emissions, the importance of which will be amplified with AVs
- Reduce overall vehicle fleet, reduce car ownership to improve efficiency of mobility and reduce social inequalities across the metropolitan area
- Support better experiences for pedestrians of all abilities in the city.

We would welcome the opportunity to discuss this feedback with you further. As noted above, we are undertaking substantial work currently to better understand the implications of emerging technologies including AVs. We have met with the NTC recently and would be interested in doing so again as we progress this work.

Thank you for the opportunity to provide this feedback.

Yours sincerely

Kate Vinot
Director City Strategy and Place

Appendix 1

Please note: the responses below are supported by work underway for the City of Melbourne Transport Strategy Refresh. This work is ongoing and these positions have not been endorsed by Council at this time.

1. Do you agree that reform to existing driving laws is required to:
- (i) allow an ADS to perform the dynamic driving task when it is engaged?
 - (ii) ensure a legal entity (ADSE) is responsible for the actions of the vehicle when the ADS is engaged?

It seems likely that changes to driving laws will be required to realise the potential benefits of AVs. Allowing an ADS to perform the dynamic driving task without the responsibility of a human 'operator' would likely be required to facilitate the desired outcome.

2. Do you agree that if the ADS is engaged, legislation should provide that the ADS is in control of the vehicle at conditional, high and full levels of automation? If not, do you think a human in the vehicle should be considered in control of the vehicle, and at what levels?

Changes to the law to facilitate the uptake of AVs for shared use and shared ownership should be prioritised. We are supportive of associated measures that facilitate the uptake of AVs, which may include placing legal control of vehicles with the ADS.

3. Do you agree that the proper control offence should not apply to the ADS, provided there are appropriate ways to hold the ADSE to account for the proper operation of its ADS?

If AVs can be shown to provide tangible benefits, changes to the law that will facilitate their uptake should be supported. This includes changing the application of the proper control offence (pertaining to the degree of control a human holds at a given time).

4. Do you agree that if a safety assurance system is approved that requires an ADSE to identify itself, the identified ADSE should be responsible for the actions of the vehicle while the ADS is engaged? If the ADSE is not identified through the safety assurance system, how should the responsible entity be identified in legislation?

It would appear that AVs could deliver benefits to the community if properly managed. As such we are supportive of measures that facilitate the uptake of AVs, which may include placing legal responsibility for the actions of the vehicle with the ADS.

5. Do you agree that when the ADS is engaged:
- (i) an ADSE should be responsible for compliance with dynamic driving task obligations?
 - (ii) obligations that are part of the dynamic driving task that the ADS cannot perform should be modified where appropriate, or the ADS exempted from the obligation?
 - (iii) an ADSE should not be responsible for existing driver duties and obligations that are not part of the dynamic driving task?

It would appear that AVs could deliver benefits to the community if properly managed. At this point in time it appears that (iii) will discourage the use of ADS technology.

6. How should legislation recognise an ADS and an ADSE? In assessing the options in section 5.6, please consider the following factors:
- (i) legislative efficiency
 - (ii) timeliness
 - (iii) impact on compliance and enforcement
 - (iv) impacts on other schemes such as compulsory third-party insurance
- Are there other options that you prefer? Please provide details of how it would work.

Changes to legislation that facilitate the uptake of AVs in a manner that maximises benefits while minimising negative impacts will be supported. Such legislation should be carefully drafted with community participation.

involvement from all levels of government and with national consistency as a goal. Given the change and uncertain future for AVs legislation should be nimble in responding to developments in the technology.

7. Do you agree that driver obligations need to be assessed to ensure there are no obligations that cannot be fulfilled if an ADS is in control? If gaps are identified, should other appropriate entities—such as fallback-ready users, other vehicle occupants, registered operators and operators—be made responsible for the obligation?

Placing unreasonable obligations on vehicle occupants could discourage the use of AVs. Any obligations placed on occupants must be reasonable and must not place a burden on occupants that will prevent the full benefits of AV technology being realised. Changes to the law that will facilitate the uptake of AVs for shared use and shared ownership are supported – this consideration is of relevance to this issue.

8. Do you agree that obligations on a fallback-ready user of a vehicle with conditional automation, who will be required to take over driving if requested by the ADS should include:

(i) sufficient vigilance to acknowledge warnings and regain control of the vehicle without undue delay, when required?

(ii) holding the appropriate licence for the vehicle type?

(iii) complying with drug, alcohol and fatigue driver obligations?

Do you agree that the fallback-ready user should be allowed to perform secondary activities?

Placing unreasonable obligations on vehicle occupants may discourage the use of AVs. Any obligations placed on occupants must be reasonable and must not place a burden on occupants that will prevent the full benefits of AV technology being realised. Changes to the law that will facilitate the uptake of AVs for shared use and shared ownership are supported – this consideration is of relevance to this issue.

9. Do you think it is necessary to impose readiness-to-drive obligations on humans who will take over driving when a vehicle with high automation that includes manual controls reaches the limit of its operational design domain?

The City of Melbourne will support changes to the law that will achieve an optimal road safety outcome. There are significant issues in this situation and the City of Melbourne does not hold a position at this time.

10. Do you agree that no readiness-to-drive obligations should be placed on passengers in dedicated automated vehicles (designed to be 'driverless')?

Changes to the law that will facilitate the uptake of AVs for shared use and shared ownership are supported – this consideration is of relevance to this issue.

11. Should exemptions from the drink- and drug-driving offences concerning starting a vehicle and being in charge of a vehicle be provided to a person who is starting, or who is a passenger in, a dedicated automated vehicle?

City of Melbourne does not hold a view on this issue at this time.

12. Should exemptions from the drink- and drug- driving offences concerning starting a vehicle and being in charge of a vehicle be provided to a person who is starting a vehicle with high or full automation that includes manual controls?

City of Melbourne does not hold a view on this issue at this time.

13. How do you think road traffic penalties should apply to ADSEs?

City of Melbourne does not hold a view on this issue at this time.

14. Do you think obligations and penalties on ADSEs in the safety assurance system should complement, or be an alternative to, road traffic offences?

City of Melbourne does not hold a view on this issue at this time.