Submission to the Inquiry into Electric Vehicles

11 December 2017

PUBLIC TRANSPORT USERS ASSOCIATION

1 Introduction

The Public Transport Users Association (PTUA) welcomes the opportunity to contribute to the Economy and Infrastructure Committee's Inquiry into Electric Vehicles. At the outset we would like to acknowledge the pressing need to switch from conventional internal combustion engine vehicles (ICEVs) to more sustainable alternatives given the substantial contribution of road transport to Australia's greenhouse gas emissions and air pollution. One of these alternatives is clearly electric motors, and we would welcome an increase in the proportion of electric vehicles (EVs) in the Victorian motor vehicle fleet.

We expect this inquiry to receive many submissions extolling the virtues of EVs and many of these may make valid points. Therefore we do not intend to duplicate these points other than to note that many of these benefits are already offered by electric trains and trams, and that these benefits could be expanded by filling in the various gaps in the rail network[1]. However, EVs are not a panacea and it is also important to recognise their limitations and the need for broader perspectives in transport policy.

2 Impacts of EVs

Conventional motor vehicles have a wide range of negative impacts, including the production of air pollution that causes a large amount of illness and death each year (Barnett, 2014). However, many of these negative impacts are not resolved by switching from liquid fuels to electric propulsion. As outlined below, many of the negative externalities of ICEV use also apply to EVs. Therefore encouraging greater use of motor vehicles, even if powered by electric motors, could increase the following impacts.

2.1 Noise

At high speeds the majority of vehicle noise is wind and tyre noise, so electric motors will not significantly reduce noise pollution produced by high speed traffic such as on motorways and arterial roads.

On the other hand, engine noise tends to dominate at lower speeds and EVs can therefore be expected to be quieter than ICEVs on some lower speed roads. As discussed in Section 2.5, this presents a risk to vulnerable road users.

1 https://www.ptua.org.au/campaigns/every10minutes/plan/

2.2 Land use

Car-oriented transport and land use practices consume a large proportion of urban land which reduces land available for housing, public open space and commercial activity (Figure 2). Extensive parking and high capacity roads lead to a barrier effect that impedes the movement of people on foot or bike and harms amenity (Jacobsen *et al.*, 2009). Furthermore, giving over large amounts of land to motor vehicles contributes to urban sprawl which destroys and fragments native vegetation and productive farmland to make way for urban development (Litman, 1995). Since private motor vehicles are very space inefficient (Figure 1), provision of land for cars can represent the largest subsidy to car use in terms of value (Diesendorf, 2002).

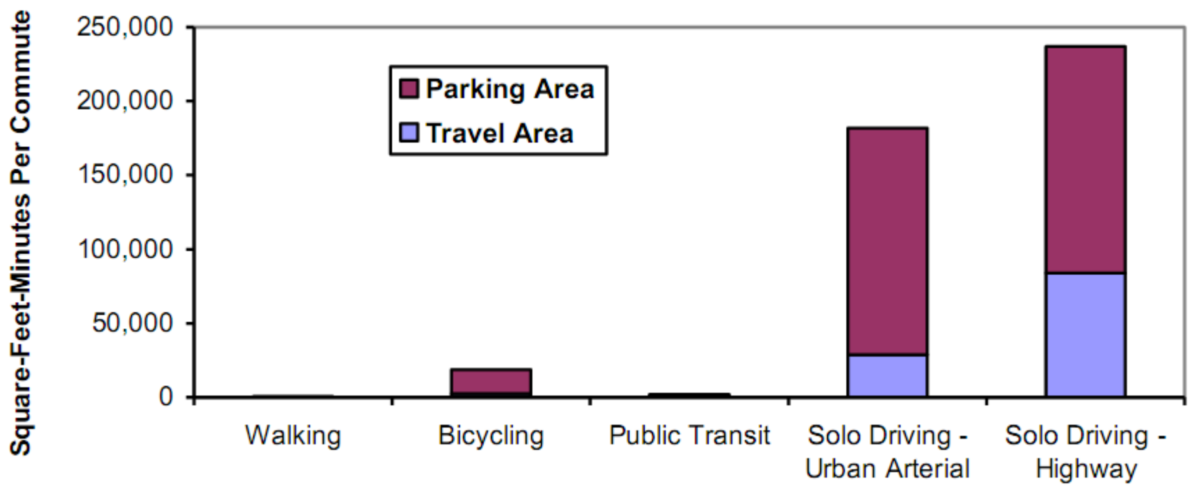

Figure 1: Space required by travel mode. Motor vehicle travel requires far more space for travel and parking than other modes (Litman, 1995).

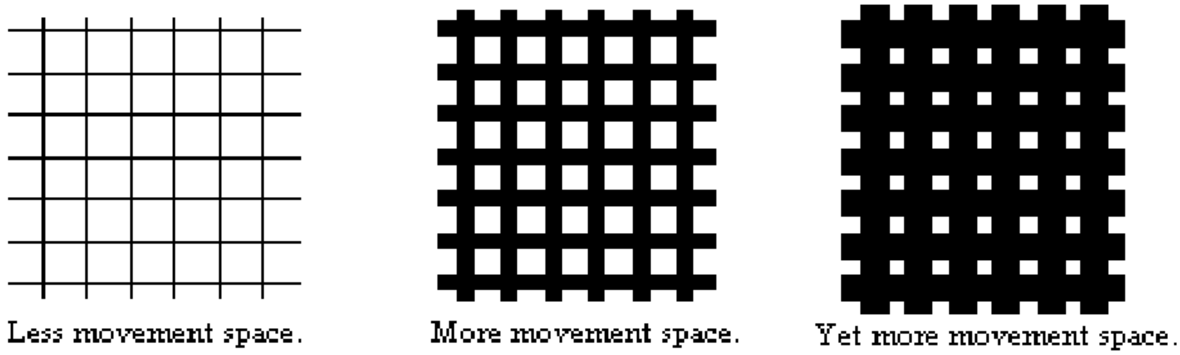

Figure 2: Land used for roads and parking. Motor vehicle transport requires relatively large amounts of land for roads and parking, which reduces the amount of land available for other activities. This tends to disperse destinations (Litman, 1995).

The space required for EVs is comparable to ICEVs, with the possible addition of charging facilities where parked.

2.3 Air and water pollution

While tailpipe emissions are generally the most obvious air quality impact of motor vehicles, there are a number of other negative impacts. EVs can still produce unhealthy levels of small pollution particles from brake and tyre wear (Barnett, 2014; Timmers & Achten, 2016; Kelly, 2017). Runoff of these and other substances from roads is also a major cause of water pollution (Trombulak & Frissell, 2000).

The climate benefits of EVs are contingent upon the carbon intensity of the energy source, and Victoria has one of the most carbon-intensive energy mixes in the world due to the dominance of brown coal (Lal, 2015; Zivin *et al.*, 2014). While the climate credentials of EVs could be enhanced by a rapid transition to renewable energy, this appears to face some political opposition in Victoria (Whittaker, 2017). Where EVs are charged by small-scale PV systems, this may reduce the level of solar energy exported to the grid from those systems for use by other consumers, thus continuing their reliance on legacy coal generators.

2.4 Physical activity

Lack of physical activity is a key risk factor for numerous lifestyle-related diseases that pose a major challenge for the Australian health system and economy more broadly (Ding *et al.*, 2016). Car-based travel is strongly linked with a lack of physical activity, while active travel is associated with higher levels of physical activity, including when part of a public transport journey (Burke *et al.*, 2014; Liao *et al.*, 2016; Mueller *et al.*, 2015; Xia *et al.*, 2015).

Use of EVs may come at the expense of public transport usage and active transport (Holtsmark & Skonhoft, 2014), and motor vehicle traffic in general can deter use of active transport by others (Jacobsen *et al.*, 2009), thus reducing physical activity across the community. Furthermore, as outlined in Section 2.5, EVs pose a heightened safety risk to people engaging in more active forms of travel.

2.5 Road trauma

Private motor vehicles are a relatively high risk form of transport (see Figure 3), and road trauma is one of the leading causes of death in some age groups in Australia (PTUA, 2011).

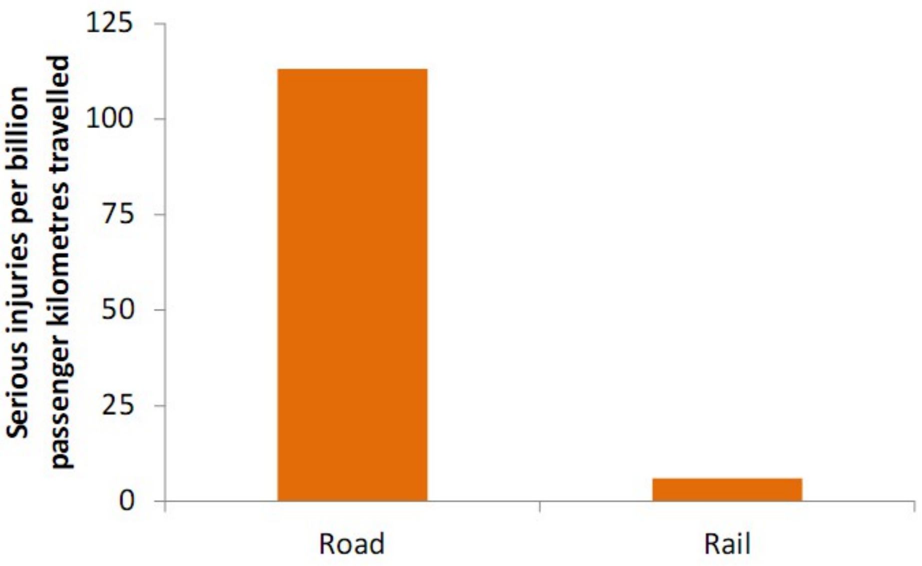

Figure 3: Serious injury rate by transport mode (BITRE, 2012, p.114)

EVs can be expected to be involved in collisions with other vehicles at a comparable rate to ICEVs. However, there is potential for a higher number of collisions with vulnerable road users given EV's lower engine noise which provides less warning of the presence of a moving vehicle (Brand *et al.*, 2013; Wu *et al.*, 2011). In particular, it appears that vulnerable road users are less able to locate a car sound when it is coming from directly behind them as an overtaking car would (Stelling-Kończak *et al.*, 2016). In light of this, there should be greater focus on reducing the risks posed by motor vehicles to vulnerable road users including pedestrians and cyclists. This includes speed limits that minimise stopping distances and the consequences of a collision (Rosén & Sander, 2009), physical separation from traffic (as distinct from just lane marking (Parkin & Meyers, 2010)), and the introduction of Minimum Passing Distance legislation to harmonise Victoria's road rules with other states.

2.6 Congestion

The road space requirements for EVs are equivalent to those for conventional cars shown in Figure 1. Therefore EVs will be just as liable to contribute to traffic congestion as ICEVs, with the potential for a rebound effect to result in additional traffic due to lower operating costs (Litman, 2005). As for the other impacts outlined in Section 2, provision of incentives to encourage usage of electric vehicles may also worsen traffic congestion.

3 Supporting uptake of EVs

While we support increasing the proportion of EVs in the Victorian motor vehicle fleet, Section 2 has highlighted that many of the negative impacts of car use apply to both ICEVs and EVs. Therefore great care should be taken to avoid implementing measures that encourage greater use of private motor vehicles relative to public transport and active transport. We discuss some commonly proposed measures below.

3.1 Toll exemptions and access to priority lanes

The value to road users of access to priority road space such as bus lanes is highest in areas where road space is most limited. Thus such privileges would be most likely to induce greater usage of EVs in congested urban areas that are a high priority for mode shift away from private motor vehicles and towards public transport and active transport (see Figure 1).

Furthermore, making bus lanes available to EVs would harm the efficiency of bus operations and cause delays to buses that are potentially carrying dozens of passengers per vehicle compared to the average car occupancy rate in Melbourne of 1.2 people per car (Aasness & Odeck, 2015; Bento *et al.*, 2014).

Allowing EVs to use bus lanes may create more capacity in general traffic lanes for ICEVs. Increasing road capacity is widely understood to induce additional traffic (Næss *et al.*, 2012), so increased capacity for ICEVs would lead to increased ICEV traffic and negate the air quality and emission reduction benefits of EVs that are allowed to use bus lanes (Bigazzi & Figliozzi, 2011; Noland & Quddus, 2006).

Melbourne also has a poor record of turning bus lanes over to general use. For example, a bus lane was introduced on Stud Road in Melbourne's east following the opening of Eastlink in order to lock in the supposed complementary benefits of the new motorway for public transport. However, this bus lane was subsequently returned to general traffic use once it became apparent that Eastlink did not solve congestion on existing arterials[2].

While it has been proposed that EVs only have access to bus lanes while they are in a minority, once EV market penetration reaches a significant level there will be significant political pressure to preserve their favoured access to bus lanes, and the contribution of bus lanes to efficient bus operations may be severely diminished indefinitely.

Granting toll exemptions would also encourage motor vehicle usage and add to road traffic (Holtsmark & Skonhoft, 2014). A study in Sweden found that exempting "green" cars from tolls reduced the effectiveness of Stockholm's congestion charge and resulted in higher

2 https://www.ptua.org.au/myths/compete/

traffic volumes than when the exemption was removed (Hultkrantz & Liu, 2012). Bakker and Trip (2013) found that toll exemptions and access to bus lanes were the least effective and efficient policy measures under consideration to support the adoption of EVs. They also noted "[t]hey may turn out to be costly when they are successful and may also counteract other attempts to make the urban transport system more sustainable (e.g. clogging bus lanes)" (*Ibid*, p.23).

Increased car use due to incentives for EVs would increase congestion with a direct impact on fuel consumption and emissions by other road users. The additional EV use would also result in additional stationary energy sector emissions either directly from charging the motor vehicle from fossil fuel derived electricity or indirectly as a result of renewable energy being used to charge the vehicle and consequently not being available to displace fossil fuel derived electricity from the grid.

If EVs are to be granted priority road space, this should be achieved by reserving existing general traffic lanes for EVs (and buses where bus lanes are currently absent) so that bus services are not hindered and additional motor vehicle traffic is not induced by expansion of road space for private motor vehicles (Næss *et al*., 2012; Zeibots & Elliott, 2011). As implied above, this should not be achieved by adding new general traffic capacity to replace the lanes reserved for EVs since this would induce additional ICEV traffic and negate the benefits of the uptake of EVs.

If the benefits of EVs are to be realised, their use should *replace* ICEV use rather than add to it. Thus any road space priority should be granted by reallocation of existing space used by private ICEVs and not from space used by public transport or active transport, nor through a net increase in capacity for private motor vehicles.

3.2 Reserved and free parking

As for access to priority road space (see Section 3.1), access to free parking is also likely to be of most value to EV drivers in areas where use of private motor vehicles should be discouraged in favour of more space-efficient modes (see Figure 1). Making parking freely available to EVs in such areas would act as a major incentive to drive rather than take other modes (Holtsmark & Skonhoft, 2014). As described by Shoup (2017), free parking comes with a hefty price tag for the rest of the community.

Bakker and Trip (2013) found that reserved parking for EVs ranked poorly among policy measures to support adoption of EVs, especially given its inconsistency with other transport goals such as encouraging use of public transport and cycling.

3.3 Free or subsidised charging

One of the purported benefits of EVs is lower operating costs relative to ICEVs. This suggests that further subsidising the operating costs of EVs through free charging would be unwarranted, and in any event would be likely to exacerbate any rebound effect leading to increased vehicle usage (Litman, 2005).

3.4 Tax rebates and subsidies

Economic analysis of subsidies for EVs has found that they are likely to decrease welfare due to an increase in external costs (such as those outlined in Section 2) and tax interaction effects, suggesting that emission taxes and public transport subsidies may be more efficient for mitigating climate change (Hirte & Tscharaktschiew, 2013).

The effectiveness of financial incentives for EVs is further questioned by research showing that many recipients of such incentives would have made the purchase in the absence of the subsidy, meaning taxpayers helped to finance a private purchase (often by comparatively high income households) while achieving no additional reduction in emissions (Bennear *et al.*, 2013). In addition, there is potential for manufacturers to capture some of the value of the subsidy rather than the retail price being lowered (Bakker & Trip, 2013).

The external costs of private motor vehicles, even if powered by electric motors, exceed the revenue from taxes and charges applied to road users (PTUA, 2016). Fuel excise is one of the more significant means of internalising some of these costs, however this falls short of covering external costs in most countries (Tscharaktschiew, 2015). Furthermore, electric vehicles are not subject to fuel excise meaning a large portion of their external costs will not be recovered. This would be exacerbated by financial incentives for EVs such as rebates or reduced taxes or charges.

Nonetheless, the existence of fuel excise can create an incentive for the uptake of EVs. For example, fuel excise in Norway is NOK 5.23 per litre[3], or around AUD 0.85, and an additional CO_2 tax is also payable of NOK 1.04 per litre[4], or around AUD 0.17. This combined fuel taxation of approximately one dollar per litre is about two and half times higher than fuel taxation in Australia (where fuel taxation is among the lowest in the developed world) and would provide a strong incentive for the take-up of electric vehicles in Norway. While this

3 http://www.skatteetaten.no/en/business-and-organisation/duties1/motor-vehicle-taxes/veibruksavgift-pa-drivstoff/

4 http://www.skatteetaten.no/en/business-and-organisation/duties1/environment/mineral-products/

may suggest scope for increasing fuel taxation rates in Australia, we would recommend this only be considered alongside improvements in the availability and quality of public transport services and active transport infrastructure in order to provide affordable transport alternatives.

3.5 Charging infrastructure

Range anxiety and the availability of charging infrastructure have been among the key deterrents to buying electric vehicles (Carley *et al.*, 2013). Therefore ensuring the availability and suitability of charging infrastructure has one of the strongest cases for government intervention among the commonly discussed measures for increasing the uptake of EVs (Bakker & Trip, 2013).

Australian governments should cooperate to ensure consistent standards for charging equipment (e.g. plugs and sockets) to avoid incompatibilities akin to the break-of-gauge problem that still afflicts Australia's rail network. Governments should also ensure that public charging stations are open access and not restricted to members of particular networks (Metternicht *et al.*, 2017). Building standards should also allow for vehicle recharging in private car parking, although not in such a way that increases total parking requirements (Kodransky & Hermann, 2011).

4 Manufacture and assembly of EVs

We are not aware of any evidence indicating a high likelihood of a mass production electric car industry establishing and succeeding in Australia. Similar factors that led to the demise of conventional mass production car manufacture seem likely to apply to electric cars. Therefore incentives for the purchase of EVs seem likely to encourage higher automotive imports.

However, there may be stronger prospects for more specialised manufacturing activities in Australia. Production of electric commercial vehicles, buses and other specialist vehicles is already taking place on a small scale in Victoria (Bailey, 2017; Payne, 2017). Public transport vehicle procurement policies could support the development of this sector domestically.

5 Public transport fleets

Electrified public transport offers the benefits of EVs (e.g. reduced engine noise and tailpipe emissions) but without many of the problems outlined in Section 2. International experience has indicated significant potential for the adoption of electric buses as part of public transport fleets (Gao *et al*., 2017; Mahmoud *et al*., 2016), and this could also be applied in Victoria.

While there does seem to be interest in electric buses as a future option, concerns remain among operators over operational performance (Mohamed, 2017). In common with the concerns of potential private EV purchasers, equipment standards and recharging requirements are among the key issues needing to be resolved to enhance confidence among fleet operators (*Ibid*.). Issues that are more specific to fleet operators include the availability of suitable skills for fleet maintenance and the substantial upfront cost of vehicles and fleet-scale charging infrastructure (*Ibid*.).

The Victorian government could help to address these barriers by facilitating the training of mechanics so that the required skillsets are available to fleet operators. This may form part of a transition program for former workers in the automotive or thermal electricity sectors.

The Government could also fund demonstration projects as proof of concept and learning opportunities for fleet operators. For example, a number of cross-town electric bus routes could be introduced in inner Melbourne to enhance non-radial transport options, such as the once-proposed “blue orbital” Smartbus linking suburbs such as Footscray, Moonee Ponds, Brunswick, Clifton Hill and Elsternwick. This would provide real-world experience in the Australian context to inform future expansion of electric bus fleets.

6 Conclusion

While we recognise that it may seem otherwise based on parts of this submission, we reiterate our support for increasing the proportion of EVs in the Victorian motor vehicle fleet and acknowledge there will be valid points in favour of their adoption in some other submissions. However, we also emphasise that doing the wrong thing in a slightly less harmful way is a poor objective. Given the numerous and serious negative effects of car dependence and usage that are not ameliorated by EVs (see Section 2), we recommend a focus on transport *system* efficiency rather than just *vehicle* efficiency (Litman, 2005). This can only be achieved by prioritising public transport and active transport to make them genuinely viable alternatives to private cars, and then discouraging the use of ICEVs among those that do choose to drive.

7 References

Aasness, M.A., & Odeck, J. (2015). The increase of electric vehicle usage in Norway—incentives and adverse effects. *European Transport Research Review*, *7*(4), 34.

Bailey, M. (2017) CSIRO, TomCar partner for electric, off-road future in Aussie carmaking. *Australian Financial Review*, 12 April. Retrieved from http://www.afr.com/business/manufacturing/csiro-tomcar-partner-for-electric-offroad-future-in-aussie-carmaking-20170410-gvhs9l

Barnett, AG. (2014) It's safe to say there is no safe level of air pollution. *Australian and New Zealand Journal of Public Health*. *38*(5). 407-408. Retrieved from http://onlinelibrary.wiley.com/doi/10.1111/1753-6405.12264/full

Bennear, L. S., Lee, J. M., & Taylor, L. O. (2013). Municipal Rebate Programs for Environmental Retrofits: An Evaluation of Additionality and Cost−Effectiveness. *Journal of Policy Analysis and Management*, *32*(2), 350-372.

Bento, A., Kaffine, D., Roth, K. & Zaragoza-Watkins, M. (2014). The effects of regulation in the presence of multiple unpriced externalities: Evidence from the transportation sector. *American Economic Journal: Economic Policy*, *6*(3), 1-29.

Bigazzi, A., & Figliozzi, M. (2011, January). An analysis of the relative efficiency of freeway congestion mitigation as an emissions reduction strategy. In 90th Annual Meeting of the Transportation Research Board (pp. 23-27). Washington, DC: Transportation Research Board.

Brand, S., Petri, M., Haas, P., Krettek, C., & Haasper, C. (2013). Hybrid and electric low-noise cars cause an increase in traffic accidents involving vulnerable road users in urban areas. *International journal of injury control and safety promotion*, *20*(4), 339-341.

Bureau of Infrastructure, Transport and Regional Economics (BITRE) (2012). *Yearbook 2012: Australian Infrastructure Statistics*, Statistical Report, BITRE, Canberra

Burke, M, Stanley J, Duncan M, et al. Action area 4: Active transport. In: *Blueprint for an active Australia*. 2nd edn. Melbourne: National Heart Foundation of Australia, 2014.

Carley, S., Krause, R.M., Lane, B.W., & Graham, J.D. (2013). Intent to purchase a plug-in electric vehicle: A survey of early impressions in large US cites. *Transportation Research Part D: Transport and Environment*, *18*, 39-45.

Diesendorf, M. (2002). The Effect of Land Costs on the Economics of Urban Transportation Systems. In *Traffic And Transportation Studies* (2002) (pp. 1422-1429).

Ding, D., Lawson, K.D., Kolbe-Alexander, T.L., Finkelstein, E.A., Katzmarzyk, P.T., van Mechelen, W., Pratt, M., & Lancet Physical Activity Series 2 Executive Committee, (2016). The economic burden of physical inactivity: a global analysis of major non-communicable diseases. *The Lancet*, *388*(10051), 1311-1324.

Gao, Z., Lin, Z., LaClair, T.J., Liu, C., Li, J.M., Birky, A.K., & Ward, J. (2017). Battery capacity and recharging needs for electric buses in city transit service. *Energy*, *122*, 588-600.

Hirte, G., & Tscharaktschiew, S. (2013). The optimal subsidy on electric vehicles in German metropolitan areas: A spatial general equilibrium analysis. *Energy Economics*, *40*, 515-528. Retrieved from http://www.sciencedirect.com/science/article/pii/S0140988313001734

Holtsmark, B., & Skonhoft, A. (2014). The Norwegian support and subsidy policy of electric cars. Should it be adopted by other countries?. *Environmental science & policy*, *42*, 160-168.

Hultkrantz, L., & Liu, X. (2012). Green cars sterilize congestion charges: A model analysis of the reduced impact of Stockholm road tolls. *Transport Policy*, *21*, 110-118. Retrieved from www.sciencedirect.com/science/article/pii/S0967070X12000

Jacks, T. (2017) Why electric cars have hit a dead end in Australia, *The Age*, 13 October, Retrieved from http://www.smh.com.au/business/innovation/why-electric-cars-have-hit-a-dead-end-in-australia-20171012-gyzs5j

Jacobsen, P.L., Racioppi, F., & Rutter, H. (2009). Who owns the roads? How motorised traffic discourages walking and bicycling. *Injury prevention*, *15*(6), 369-373.

Kelly, F. (2017) London should lead in showing electric cars will not tackle air pollution, *The Guardian*, 4 August. Retrieved from https://www.theguardian.com/environment/2017/aug/04/london-should-lead-in-showing-electric-cars-will-not-tackle-air-pollution

Kenworthy, J., & Laube, F. (2000), *Millennium Cities Database For Sustainable Transport*, Institute for Sustainability and Technology Policy, Distributed by the International Union of Public Transport (www.uitp.com)

Kodransky, M., & Hermann, G. (2011). *Europe's Parking U-Turn: From Accommodation to Regulation*. Institute for Transportation & Development Policy. New York. Retrieved from http://www.itdp.org/wp-content/uploads/2014/07/Europes_Parking_U-Turn_ITDP.pdf

Lal, N. (2015). Teslas in Victoria aren't greener than diesels. *The Conversation*. 30 April. Retrieved from http://theconversation.com/teslas-in-victoria-arent-greener-than-diesels-40834

Liao, Y., Tsai, H.H., Wang, H.S., Lin, C.P., Wu, M.C., & Chen, J.F. (2016). Travel mode, transportation-related physical activity, and risk of overweight in Taiwanese adults. *Journal of Transport & Health*, *3*(2), 220-225.

Litman, T. (1995). Evaluating transportation land use impacts. *World Transport Policy & Practice*, *1*(4), 9-16. Retrieved from http://vtpi.org/landuse.pdf

Litman, T. (2005). Efficient vehicles versus efficient transportation. Comparing transportation energy conservation strategies. *Transport Policy*, *12*(2), 121-129. Retrieved from http://www.vtpi.org/cafe.pdf

Mahmoud, M., Garnett, R., Ferguson, M., & Kanaroglou, P. (2016). Electric buses: A review of alternative powertrains. *Renewable and Sustainable Energy Reviews*, *62*, 673-684.

Metternicht, G., Drozdzewski, D., & Broadbent, G. (2017) Negative charge: why is Australia so slow at adopting electric cars? *The Conversation*. 9 November. Retrieved from https://theconversation.com/negative-charge-why-is-australia-so-slow-at-adopting-electric-cars-86478

Mohamed, M., Ferguson, M., & Kanaroglou, P. (2017). What hinders adoption of the electric bus in Canadian transit? Perspectives of transit providers. *Transportation Research Part D: Transport and Environment*.

Mueller, N., Rojas-Rueda, D., Cole-Hunter, T., de Nazelle, A., Dons, E., Gerike, R., Goetschi, T., Panis, L.I., Kahlmeier, S., & Nieuwenhuijsen, M. (2015). Health impact assessment of active transportation: a systematic review. *Preventive medicine*, *76*, 103-114.

Næss, P., Nicolaisen, M.S., & Strand, A. (2012). Traffic forecasts ignoring induced demand: a shaky fundament for cost-benefit analyses. *European Journal of Transport and Infrastructure Research*, *12*(3), 291-309.

Noland, R.B., & Quddus, M.A. (2006). Flow improvements and vehicle emissions: effects of trip generation and emission control technology. *Transportation Research Part D: Transport and Environment*, *11*(1), 1-14.

Parkin, J., & Meyers, C. (2010). The effect of cycle lanes on the proximity between motor traffic and cycle traffic. *Accident Analysis & Prevention*, *42*(1), 159-165.

Payne, N. (2017) Greens roll out first electric bus made at Avalon, push for more, *Geelong Advertiser*, 8 February

PTUA (2011) *National Road Safety Strategy 2011-2020. Submission in response to Consultation Draft*. Public Transport Users Association, Melbourne. Retrieved from https://www.ptua.org.au/files/2011/national_road_safety_strategy_2011-02-18.pdf

PTUA (2016) *Myth: Motorists pay more in taxes and fees than is spent on roads.* Retrieved from https://www.ptua.org.au/myths/petroltax/

Rosén, E., & Sander, U. (2009). Pedestrian fatality risk as a function of car impact speed. *Accident Analysis & Prevention*, *41*(3), 536-542.

Shoup, D. (2017). *The High Cost of Free Parking: Updated Edition*. Routledge.

Stelling-Kończak, A., Hagenzieker, M., Commandeur, J.J., Agterberg, M.J., & van Wee, B. (2016). Auditory localisation of conventional and electric cars: laboratory results and implications for cycling safety. *Transportation research part F: traffic psychology and behaviour*, *41*, 227-242.

Timmers, V.R., & Achten, P.A. (2016). Non-exhaust PM emissions from electric vehicles. *Atmospheric Environment*, *134*, 10-17.

Trombulak, S.C., & Frissell, C.A. (2000). Review of ecological effects of roads on terrestrial and aquatic communities. *Conservation biology*, *14*(1), 18-30.

Whittaker, J. (2017) Guy pledges to keep Valley stations open, *Latrobe Valley Express*, 6 April. Retrieved from http://www.latrobevalleyexpress.com.au/story/4579572/guy-pledges-to-keep-valley-stations-open/

Wu, J., Austin, R., & Chen, C.L. (2011). *Incidence rates of pedestrian and bicyclist crashes by hybrid electric passenger vehicles: An update* (No. HS-811 526).

Xia, T., Nitschke, M., Zhang, Y., Shah, P., Crabb, S., & Hansen, A. (2015). Traffic-related air pollution and health co-benefits of alternative transport in Adelaide, South Australia. *Environment international*, *74*, 281-290.

Zeibots, M.E., & Elliott, J.R. (2011). Urban road building and traffic congestion: What went wrong?. *World Transport Policy & Practice*, *17*(3).

Zivin, J.S.G., Kotchen, M.J., & Mansur, E.T. (2014). Spatial and temporal heterogeneity of marginal emissions: Implications for electric cars and other electricity-shifting policies. *Journal of Economic Behavior & Organization*, *107*, 248-268.