Appendix

Appendix Table A: Reviewed literature on the AV capability, in chronological order

No	Authors	Year	Title	Journal	Aim	Framework	Methodology	Finding
1	Choi & Ji	2015	Investigating the importance of trust on adopting an autonomous vehicle	International Journal of Human-Computer Interaction	To predict the user's adoption aspects of AV and investigate trust building factors of AV.	Technology adoption model and trust theory	Partial least square method	Develops a model that explains the factors responsible for the acceptance of AVs. It shows that perceived usefulness and trust are significant factors of intention in using AVs.
2	Chen et al.	2016	Operations of a shared, autonomous, electric vehicle fleet: implications of vehicle and charging infrastructure decisions	Transportation Research Part A	To explore natural synergies of SAVs and electric vehicle (EVs) in overcoming the limitations of non-autonomous EVs with the help of SAVs	City zone limits concepts within a gridded metropolitan area	Discrete-time agent-based model	Shows 'smart' feature of AVs can overcome the limitations of non-autonomous EVs such as EV range, charging station density, and charging time management in a shared vehicle setting. Based on trip demand and charging station locations, fleet managed smart AVs can relieve from such concerns by managing vehicle range and charging activities.
3	Coppola & Morisio	2016	Connected car: technologies, issues, future trends	ACM Computing Surveys	To provide an overview of the opportunities offered by connected functionalities on cars, specially AVs and the associated technological	Literature on CV and AV technologies	Critical analysis of the literature	Explains the details of basic functional features of AV: Localisation; Perception; Planning, Control; Management. Automated driving systems of AVs perform all sort of dynamic driving tasks in all

					issues and problems, as well as to highlight benefits of connected and autonomous technologies.			driving environments with the application of these functions.
4	Luo et al.	2016	A dynamic automated lane change manoeuvre based on vehicle-to-vehicle communication	Transportation Research Part C: Emerging Technologies	To ensure collision between host and other vehicles while changing lanes through V2V communication.	Trajectory planning and trajectory tracking	Dynamic automated lane change manoeuvre	Proposes a dynamic automated lane change manoeuvre that allow host vehicle to avoid lane change related collision by adjusting its reference trajectory to maintain safe gap between host vehicle and other vehicles.
5	Meissner et al.	2016	Optimizing departures of automated vehicles from highways while maintaining mainline capacity	IEEE Transactions on Intelligent Transportation Systems	To maximise the freeway departures without compromising capacity.	Iteration	Coordination-based algorithm	Recommends two key points to ensure maximum number of collision free, safe departures from freeway: Decide when, and where to, an existing vehicle should change lane through V2I connectivity; Perform lane change through reservation-based approach.
6	Nie et al.	2016	Decentralized cooperative lane-changing decision-making for connected autonomous vehicles	IEEE Access	To ensure stability of traffic flow in a freeway environment.	Numerical simulation	Decentralized cooperative lane-changing decision-making framework	Proposes AV lane changing decision making in a decentralised connected vehicle environment. It resulted high potential in in ensuring improvement of traffic stability,

								homogeneity, and efficiency, and reduction in traffic congestion.
7	Nilsson et al.	2017	Lane change manoeuvres for automated vehicles	IEEE Transactions on Intelligent Transportation Systems	To ensure safe lane changing manoeuvre by an AV in a mixed vehicle environment.	Trajectory planning	Lane change manoeuvre algorithm	Elaborates how collisions during lane change attempt by a human driver can be avoided by selecting an inter-vehicle traffic gap and time instance to perform the lane change manoeuvre by executing a novel lane change manoeuvre algorithm in a mixed highway traffic environment with both human drivers and AVs with or without V2V and V2I communication.
8	Altche et al.	2017	An algorithm for supervised driving of cooperative semi-autonomous vehicles	IEEE Transactions on Intelligent Transportation Systems	To safely coordinate semiautonomous vehicles at intersections, roundabouts, and merging points	Mixed integer quadratic programming problem	Supervised coordination scheme	Reveals that in a near future traffic scenario, where all the vehicles have semi-autonomous features, and are driven by human drivers can remove the risk of collision or deadlocks with vehicles arriving from sides, either at intersections or roundabouts, or when merging on freeways through a supervised coordination framework.
9	Chen, He et al.	2017	Optimal design of autonomous vehicle zones in	Transportation Research Part B	To present a mathematical framework for the optimal design of	Mathematical framework	Mixed routing equilibrium model	Predicts that government authorities will dedicate certain areas of road networks to AVs to facilitate the formation of

			transportation networks		AV zones in a transport network.			vehicle platoons so that throughput and performance of the whole network improve. Numerical examples predict that social cost maybe substantially minimised through an optimal deployment of AVs.
10	Daziano et al.	2017	Are consumers willing to pay to let cars drive for them? Analysing response to autonomous vehicles	Transportation Research Part C	To find out consumers' level of willingness to pay for owning an AV.	Random parameter logit model	Discrete choice experiment	Finds that average household in the US is willing to pay $3.5K for partial automation and $5K for full AVs. The results suggest that demand for automation is approximately evenly distributed among 'high', 'modest', and 'no demand'.
11	Pendleton et al.	2017	Perception, planning, control, and coordination for autonomous vehicles	Machines	To provide a general overview of the recent developments in the realm of AV software systems.	Literature on AV software relevant to perception, planning, control, and coordination	Review of contemporary literature	Reviews the AV software systems and finds that: Perception is related to collection of information and extraction of relevant knowledge from the vehicle's environment; Planning is related to decision making in bringing vehicle from a start location to destination by avoiding obstacles and optimising designed heuristics; Control competency of software system refers to vehicle's/robot's ability

								to execute the planned actions as generated at planning stage.
12	Milakis, Snelder, et al.	2017	Development and transport implications of automated vehicles in the Netherlands: scenarios for 2030 and 2050	European Journal of Transport and Infrastructure Research	To identify plausible development trend of AVs in the Netherlands, and estimates potential impacts on traffic, travel behaviour and transport planning on a time horizon of 2030 to 2050.	Scenario analysis	Empirical study with expert consultation	Suggests that conditional AVs will be commercially available in between 2018-2028, and full AVs will be commercially available in between 2025-2045. Conditional to full automation will be influenced by public and private R&D investments, enhanced customers' demand and supportive regulatory framework.
13	Wadud	2017	Fully automated vehicles: a cost of ownership analysis to inform early adoption	Transportation Research Part A	To find out the early adopters of fully automated vehicle sector depending on total cost of ownership.	Scenario analysis, and sensitivity assessment	Total cost of vehicle ownership analysis	Analyses total ownership cost of private and commercial AV to compare the costs and benefits of vehicle automation in the UK. It reveals that commercial vehicle operations clearly ensure benefit because of reduction of the driver costs through automation.
14	Xie at al.	2017	Collaborative merging strategy for freeway ramp operations in a connected and autonomous vehicles environment	Journal of Intelligent Transportation Systems: Technology, Planning, and Operations	To improve traffic flow at freeway and reduce collision.	Nonlinear optimisation model	Optimisation based ramp control strategy	Performs an optimization-based ramp control strategy in a CAV environment to evaluate the performance of freeway due to presence of merging vehicle. Results demonstrate that 'optimal ramp control model' outperforms two

								other control cases: 'gradual speed limit' and 'do nothing' with regards to average delay time, vehicle throughput and average speed.
15	Zhou et al.	2017	On the impact of cooperative autonomous vehicles in improving freeway merging: a modified intelligent driver model-based approach	IEEE Transactions on Intelligent Transportation Systems	To smooth traffic oscillation and reduce travel time through specific type of AV penetration.	Microscopic traffic model	Cooperative intelligent driver model	Utilises AVs equipped with Inter Vehicle Communication through longitudinal and lateral detecting technology, and Advance Cruise Control to improve freeway merging. Results show that with an increased AV penetration on freeways, standard deviation of speed dispersion caused by merged-in vehicle could be reduced progressively.
16	Shladover	2018	Connected and automated vehicle systems: Introduction and overview	Journal of Intelligent Transportation Systems	To depict the difference between AV and CV technology and indicate improvements of AV system through integration of CV technology.	Literature on CV and AV technology, and their synergistic effects	Review of the literature and recommendations based on empirical and theoretical analyses	Reveals the real synergy between CV and AV technologies that can be achieved when AV technology is enriched with additional data support from CV technology.

Appendix Table B: Reviewed literature on the AV impact and planning, in chronological order

No	Authors	Year	Title	Journal	Aim	Framework	Methodology	Finding
1	Smith	2012	Managing autonomous transportation demand	Santa Clara Law Review	To identify potential impacts of AVs.	Literature on AVs impact	Review of the literature	Highlights some of the potential implications of AV operations: Time-cost; Capacity (supply) and VKT (demand); Congestion and emissions.
2	Brownell & Kornhauser	2014	A driverless alternative: fleet size and cost requirements for a statewide autonomous taxi network in New Jersey	Transportation Research Record	To suggest an autonomous taxi network (ATN) for whole of New Jersey as an alternative to the privately-owned cars considering five competitive advantages of ATN over traditional automobile	Pixelated transit grid	Personal rapid transit (PRT) model and smart paratransit (SPT) model	SPT model based ATN network emerges as economically more viable option over conventional car for whole of New Jersey.
3	Fagnant & Kockelman	2014	The travel and environmental implications of shared autonomous vehicles, using agent-based model scenarios	Transportation Research Part C	To design an agent-based model for SAV operations.	City zone limits concepts within a gridded metropolitan area	Agent-based simulation model	Estimates an SAV fleet size to accommodate almost all the trips. Results indicate SAVs can replace around 11 conventional private cars with an increase in 10% travel distance than that of base case.
4	Childress et al.	2015	Using an activity-based model to explore the potential impacts of automated vehicles	Transportation Research Record	To test a range of travel behaviour impacts due to development of AV technology.	Modelling different AV scenarios based on features	Application of activity-based transport model in context of Puget Sound Regional Council, Seattle, US	Develops four different AV scenarios. It finds that first three scenarios, with a capacity increase, contributes an increase in VMT. First two scenarios help in congestion reduction, while third scenario increases delay as people are willing to tolerate congestion. Fourth scenario will reduce VMT and VHT with respect to base scenario.
5	Fagnant et al.	2015	Operations of shared autonomous vehicle fleet for Austin, Texas, market	Transportation Research Record	To identify potential impacts of SAVs at low market penetration.	Dynamic traffic assignment	Agent-based simulation model	Reveals impacts of SAVs in the US city of Austin. Results show that SAVs could replace around 9 conventional cars within a specific area. It could also increase VMT because of SAV's

								unoccupied journeys to next customer or its repositioning by anticipating next demand period.
6	Greenblatt & Saxena	2015	Autonomous taxis could greatly reduce greenhouse-gas emissions of US light-duty vehicles	Nature Climate Change	To estimate GHG emissions and cost-effectiveness of ATs in context of the US.	Statistical data analysis	Comparative analysis of different type of energy driven light duty vehicles	Argues that ATs are likely to gain early market share through three synergistic future possibilities: Future prospect for decrease in electricity GHG emissions intensity; Availability of light weight smaller vehicles resulting from trip-specific AT on the public road; Significant increase in annual VKT, causing high-efficiency (in case of battery electric driven) and cost-effectiveness. Results indicate these factors could significantly reduce GHG emissions in 2030.
7	Levin & Boyles	2015	Effects of autonomous vehicle ownership on trip, mode, and route choice	Transportation Research Record	To find out the effect of AV ownership on transport mode choice.	Generalised cost function	Modified four step transport planning model	Reveals that transport demand will be driven by AV ownership and perceived VOT. AVs capability of parking fee avoidance and repositioning will lead to a change in mode choice. The parking cost avoidance and multitasking opportunity will also affect trip choice. Route choice during an AV trip will be governed by generalised cost function of time, fuel, and tolls. Capacity will be a function of AV proportion on the road link. Inclusion of these assumptions in the model resulted in a significant increase in personal vehicle trips and decrease in transit trips, and results also predict balancing of additional congestion by enhanced link capacity.

8	Zhang et al.	2015	Exploring the impact of shared autonomous vehicles on urban parking demand: an agent-based simulation approach	Sustainable Cities and Society	To estimate various levels of parking demand under shared autonomous vehicle systems.	Scenario based simulation process	Application of agent-based simulation model	Estimates the potential impact of SAV system on urban parking demand under different system operation scenarios. The model results show that up to 90% of parking demand for SAV clients can be eliminated. The results indicate that different spatial distribution of urban parking demand will be evolved against different SAV operation strategies and client's preferences.
9	Bagloee et al.	2016	Autonomous vehicles: challenges, opportunities, and future implications for transportation policies	Journal of Modern Transportation	To shed light on opportunity and hurdles linked with AV technology.	Literature on benefits and challenges of AV technology	Review of the literature	Underlines major impacts of AV operation: Safety and crashes; Congestion; Taxi and car ownership; Road capacity; Value of time; Land use; Environment.
10	Davidson & Spinoulas	2016	Driving alone versus riding together: how shared autonomous vehicles can change the way we drive	Road & Transport Research	To model AVs to identify their impacts on travel behaviour and road network operations.	Segmented, stochastic, slice, and simulation transport modelling	Predicting AVs market share, AV related assumptions, transport modelling incorporating AVs to identify implications of AVs	Models four AV scenarios to predict prospective changes in transport system parameters. Model outcome shows that SAV travel becomes cheaper, once vehicle owning cost is added to other scenarios. Higher marginal cost of travel of SAV will minimise PKT. PT and active transport will increase in SAV scenarios. Incorporation of SAVs in a multi-modal trip makes PT more attractive.
11	Farmer	2016	Autonomous vehicles: the implications on urban transportation and traffic flow theory	Institute of Transportation Engineers Journal	To investigate impacts of AV on conventional traffic flow theory.	Traffic flow theory	Analysis based on new assumptions for potential features of AVs	Discusses how AV might affect traditional 'rules' of traffic flow theory. Where all the vehicles in roads are fully autonomous, highway capacity might increase around 100%, expressway travel speeds would increase 20% and it would increase road safety significantly.

12	Gruel & Stanford	2016	Assessing the long-term effects of autonomous vehicles: a speculative approach	Transportation Research Procedia	To perform qualitative analysis, evolved from AV impact.	Speculative approach	Closed loop diagram of transport system	Finds the qualitative relationships among AV variables and overall transportation system. Scenario 1: private AV, but same vehicle ownership - may lead to a better mobility system than base scenario. Scenario 2: changes in vehicles use and travel pattern, but same vehicle ownership - increase in car travelling and congestion, with substantially higher VKT. This would further encourage sprawl, and public transit would become insufficient. Scenario 3: pure shared AV - require fewer parking spaces, but traffic volume and VKT would be higher than Scenario 2.
13	Guerra	2016	Planning for cars that drive themselves: metropolitan planning organizations, regional transportation plans, and autonomous vehicles	Journal of Planning Education and Research	To investigate how large metropolitan planning organisations are preparing themselves for AVs.	Literature on transport planning	Review of regional transportation plans, and conducting online and face-to-face interviews	Reveals that regional planners of metropolitan planning organisations started to consider AVs in their planning by modelling travel behaviour, developing planning scenarios, testing new transportation technologies, and considering regional investment priorities.
14	Harper et al.	2016	Estimating potential increases in travel with autonomous vehicles for the non-driving, elderly and people with travel-restrictive medical conditions	Transportation Research Part C	To estimate increase in VMT in a fully automated driving scenario.	Demand wedge from new mobility	Estimating increase in mobility through demand wedges of new user groups	Finds the greatest increase in annual VMT in a fully automated driving environment due to new mobility prospect from non-drivers, elderly drivers, and adult drivers with medical conditions in the US. Combined results from all three demand wedges represents a maximum 14% annual increase in light-duty VMT.

15	Krueger et al.	2016	Preferences for shared autonomous vehicles	Transportation Research Part C	To identify travel behaviour impact of SAV.	Mixed logit model	Stated preference survey	Identifies the user characteristics of travellers, who intend to adopt SAV services. Results indicate that travel cost, travel time, and waiting time are critical to the use of SAVs and acceptance of DRS. Results imply that young individuals and customer with multimodal travel pattern maybe more likely to use SAVs.
16	Mersky & Samaras	2016	Fuel economy testing of autonomous vehicles	Transportation Research Part C	To develop a method to accommodate impacts of AV technology within the boundary of current fuel economy test.	Autonomous drive cycle simulation	Virginia Tech comprehensive fuel consumption model	Introduces a method to estimate the changes in fuel economy by incorporating 'automated driving cycles' within the boundary of current fuel economy test. The results show that AVs designed without efficiency consideration can decrease fuel economy by up to 3%, while efficiency-focused AVs may increase the existing EPA fuel economy test results, by up to 10%.
17	Piao et al.	2016	Public views towards implementation of automated vehicles in urban areas	Transportation Research Procedia	To evaluate public opinions on the implementation of AV technology in La Rochelle, France.	Statistical exploration	Public opinion survey	Evaluates the implementation of AV technology based on public opinion. It finds that technology will lead to lower bus fare due to absence of bus driver in an automated bus; and 2/3 of the respondents preferred to use AV buses instead of conventional one. 3/4 people are interested in owing such a car; and the rest shows interest in sharing AVs through car-pooling, car-sharing or as taxis.

18	Smolnicki & Sołtys	2016	Driverless mobility: the impact on metropolitan spatial structures	Procedia Engineering	To find out a relationship between driverless mobility and metropolitan spatial structures.	Assumptions and principles of scenario-based approach	Chain effect of AVs technical and organisational solutions on scenario lines	Explores the impact of AVs on urban land use through two typical scenarios of urban transport mobility: Pedestrian friendly - promotes urbanisation and city revival; Rider friendly - promotes de-urbanisation and suburbanisation. In reality, transport network will tend to flow in between two scenarios, depending on transport and urban planning policy, prevailing local conditions, and dissemination of different driverless mobility solutions.
19	Wadud et al.	2016	Help or hindrance? The travel, energy and carbon impacts of highly automated vehicles	Transportation Research Part A	To identify mechanisms to estimate impact on energy consumption and GHG emissions through automation.	Activity level, modal share, energy intensity, fuel carbon content framework	Analysis through illustrative scenario	Finds that vehicle automation has the potential to substantially reduce energy consumption and emissions, though these reductions are not assured. Some of these reductions maybe influenced by better connectivity in vehicles, even in absence of full automation. It suggests that total VKT and fuel consumption could increase significantly due to sharp reduction in cost of driver's time.
20	Zakharenko	2016	Self-driving cars will change cities	Regional Science and Urban Economics	To model and analyse the effects of AVs operation on future of urban forms.	Location choice model	Analysing the effects of AVs on urban land use	Reveals the effects of AVs on urban forms. It shows that in presence of commuting AVs, daytime downtown parking will be relocated to the periphery, allowing increase in economic activity at downtown. Lower travel costs of AV will contribute city sprawl, allowing decline in rent outside CBD.
21	Chen, Gonder et al.	2017a	Quantifying autonomous vehicles national fuel consumption impacts: a data-rich approach	Transportation Research Part A	To evaluate fuel consumption impacts of AVs at the U.S. national level.	Analytical framework	Bottom up dynamic accounting model	Assesses the fuel consumption impacts of AVs at the national level of the U.S. Estimate shows that vehicle automation may contribute 45% savings on fuel consumption in optimistic scenario and

								30% additional fuel consumption in pessimistic scenario.
22	Crayton et al.	2017	Autonomous vehicles: developing a public health research agenda to frame the future of transportation policy	Journal of Transport and Health	To understand the public health implications arising from adoption of AV.	Literature on public health implications due to adoption of AV	Review of the literature	Ensures reduction of traffic congestion, travel time savings, and lower transportation costs of goods at the expense of individuals, currently employed in building, driving, and maintenance of automobiles. It also suggests spilling effects in labour market due to falloffs in certain related jobs, like diver licensing, traffic policing, and insurance sales.
23	Dia & Javanshour	2017	Autonomous shared mobility-on-demand: Melbourne pilot simulation study	Transportation Research Procedia	To develop simulation models to model autonomous mobility on-demand systems and assess their impacts on parking supply, congestion, mobility, and how they can be used to supplement existing transport systems.	Simulation through nanoscopic model	Application of agent-based simulation model	Develops simulation of a case scenario representing only traditional privately-owned vehicles, and two autonomous mobility on-demand scenarios on a real transport network in Melbourne, Australia. The results show that two scenarios resulted in a significant reduction in number of vehicles required, and the required on-street parking space. This result is achieved at the expense of a minor increase in the total VKT.
24	Levine et al.	2017	A largely unnoticed impact on real estate: self-driven vehicles	The Appraisal Journal	To examine the probable impact of AVs on real-estate.	Review of the literature on the impact of AVs on the real-estate	Review of the literature and expert opinion on probability of AV impacts	Finds the impact of AVs on real-estate. Suburbs may grow for personal and residential purposes. Traditional real-estate configurations for customer parking may decrease. Parking need for consumers and workers will drop. If travellers choose AVs instead of conventional car in concert with rapid transits or buses, commuter-related parking may change. In that case, excess space might be repurposed.

25	Meyer et al.	2017	Autonomous vehicles: the next jump in accessibilities?	Research in Transportation Economics	The paper aims to identify how AVs can impact the accessibility levels of Swiss municipalities.	Generalised cost function	Scenario-based approach	Simulates the impact of AVs on accessibility of the Swiss municipalities. The results show that AVs could suddenly improve accessibility in most of the municipalities. The nature of spatial distribution in accessibility refers to AVs favour towards urban sprawl may prove transit service superfluous except for dense urban areas.
26	Milakis, Arem et al.	2017a	Policy and society related implications of automated driving: a review of literature and directions for future research	Journal of Intelligent Transportation Systems	To explore potential effects of AV operations relevant to policy and society.	Ripple effect concept for AV implications	Review of the literature on AVs' societal impact and also impacts on government policy	Categorises the impacts of AVs based on the ripple effect concept, representing those at three stages. Review shows that some of the second and third order impacts like roadway capacity, vehicle emissions, fuel efficiency, and traffic accidents are expected to be beneficial and can be multiplied through combination of vehicle sharing, electrification, and increased automation level.
27	Scheltes et al.	2017	Exploring the use of automated vehicles as last mile connection of train trips through an agent-based simulation model: an application to Delft, Netherlands	International Journal of Transportation Science and Technology	To identify performance of electric AV fleet as a last mile connectivity tool for a train journey.	Scenario-based analysis for automated last-mile transport	Agent-based simulation model	Shows at baseline scenario ALMT system is competitive with walking mode only, and its performance has to be improved to be competitive with cycling. Pre-booking option of AV and relocation of empty vehicles might lead to a mentionable reduction in average waiting time, whilst allowing higher speed might ensure a significant reduction in travel time.
28	Martinez et al.	2017	Assessing the impacts of deploying a shared self-driving urban mobility system: an agent-based model	International Journal of Transportation Science and Technology	To explore the impacts of large-scale uptake of a shared and self-driving vehicle fleet in a mid-sized European city.	Modelling SAV scenarios	Case study of Lisbon, Portugal using an agent-based model	Investigates impacts of self-driving shared taxi and taxi-bus in Lisbon city, in place of conventional travel mode, but keeping existing metro service. AVs could contribute in reducing carbon emissions and in minimising congestion. It confirms significant

			applied to the city of Lisbon, Portugal					improvement in accessibility and drastic reduction in transport cost.
29	Truong et al.	2017	Estimating the trip generation impacts of autonomous vehicles on car travel in Victoria, Australia	Transportation	To develop a methodology for estimating possible impacts of AVs on car trips across all age groups.	Modelling AV scenarios	Case study of Victoria, Australia using a car trip model	Estimates the impacts of AVs on car travel in Victoria, Australia due to trip generation by both 'diverted trips from other modes' and 'entirely new trips'. Results indicate that AVs would increase daily car trips. In the case of unchanged car occupancy in AV scenarios, both entirely new and diverted trips from PT, walking and cycling would contribute to an increase in car trips.
30	Vander et al.	2017	Operational performance of a congested corridor with lanes dedicated to autonomous vehicle traffic	International Journal of Transportation Science and Technology	To estimate operational performance impact of AVs on a multi-lane freeway corridor.	Macroscopic traffic flow theory	Macroscopic simulation and analysis	Estimates the operational performance of AVs on a four-lane motorway corridor, where 1 lane is dedicated to AV and 3 lanes are dedicated to non-AV traffic. The results of an AV behaviour model indicate that the aggregate corridor performance parameters improve with the increased AV penetration rates up to 30%, 40%, and 50%, after which the performance indicators decline extremely.
31	Zmud & Sener	2017	Towards an understanding of the travel behaviour impact of autonomous vehicles	Transportation Research Procedia	To understand adoption and use pattern of AV technology.	A car technology acceptance model	Qualitative analysis through interviews	Determines four 'intent to use' categories: Rejecters; Conservatives; Pragmatists; Enthusiasts. Qualitative interviews among the 'pragmatists' and 'enthusiasts' were performed to determine the impact on their travel behaviour. Most of them preferred to own AVs than just utilise one, like a Lyft or Uber taxi.
32	Farhan & Chen	2018	Impact of ridesharing on operational efficiency of shared	Transportation Research Part C	To understand the impact of ridesharing	A capacitated vehicle routing	A discrete-time shared autonomous	Reveals the benefits of ridesharing in the context of shared autonomous electric vehicle operations. It shows that ridesharing contributes to

			autonomous electric vehicle fleet		with its inclusion in SAEV fleet operation.	problem with time windows.	electric vehicle simulation	decrease fleet size and number of operational charging stations. However, travellers are to experience longer response time with the increase of ridesharing per vehicle.
33	Loeb et al.	2018	Shared autonomous electric vehicle (SAEV) operations across the Austin, Texas network with charging infrastructure decisions	Transportation Research Part C	To find out the performance matrices through charging station assignment and SAEV simulations under different simulation scenarios across vehicle ranges, fleet sizes, and charging-rate.	An activity-based model	Agent based simulation	Finds inverse correlation between number of charging stations generated and vehicle range. However, charging stations generated has nothing to do with fleet size and charging times. But fleet size has a profound effect on response time. It is also recommended that faster charging times can provide better customer service as response time improves with faster charging.

Appendix Table C: Reviewed literature on AV policy, in chronological order

No	Authors	Year	Title	Journal	Aim	Framework	Methodology	Finding
1	Kohler & Colbert-Taylor	2014	Current law and potential legal issues pertaining to automated, autonomous and connected vehicles	Santa Clara Computer & High Technology Law Journal	To elaborate role of federal and state governments in formulating AV related laws and regulations.	Literature on the US. federal and state laws and regulations related to AV	Analysis of current and prospective laws and regulations on AV	Suggests that business willing to run a AV test drive on public roads should certify: AV has already been operated for some unspecified number of miles; Vehicle was already driven in the same road conditions as it would be tested; Data from earlier tests will be submitted to state; Submission of plans showing its effort to minimise risk; Submission of crash or near-crashes reports of earlier tests; Any instances, where vehicle prompted human driver to take proper and timely control in case of failure.
2	Fagnant & Kockelman	2015	Preparing a nation for autonomous vehicles: opportunities, barriers and policy recommendations	Transportation Research Part A	To provide policy recommendations for federal and state governments.	Literature on AVs' impact, and relevant policies	Review of the literature	Recommends legislative and agency policy actions from the federal level. Strong federal funding expansion for AV research is recommended. To ensure regulatory consistency, national framework and a set of national guidelines for AV certification at state levels should be developed by US DoT. This approach will promote a single document for all states, with little modifications by each state to suit local needs.
3	Yağdereli et al.	2015	A study on cyber-security of autonomous and unmanned vehicles	Journal of Defense Modeling and Simulation	To identify probable vulnerabilities of AVs, possible cyberattack to vulnerabilities and to recommend mitigation measure.	Literature on AVs' vulnerabilities to cyber-attack and respective mitigation measures	Review of the literature	Finds that technologies behind advancements of vehicle automation are more fragile and susceptible to cyber-attacks and software and hardware defects. AV technology should be equipped with defensive capabilities so that they can respond dynamically and automatically in case of accidental and deliberate attacks. Mitigation measures are suggested to avoid and resist the cyber-attack for the development of AVs.

4	Bruin et al.	2016	Autonomous intelligent cars on the European intersection of liability and privacy: regulatory challenges and the road ahead	New and Emerging Technologies	To highlight necessity of legislative reform in the arena of AV liability and privacy.	Literature on AVs' privacy and liability issues	Review of the literature	Explores that the EU aims to encourage innovations in the field of AV technology, taking into consideration acceptability, sustainability and societal desirability. It scrutinises challenges of product liability, liability for motor vehicles and information privacy for both technological innovation and acceptance with respect to current regulations. It discusses these challenges in view of a regulatory reform needed.
5	Dhar	2016	Equity, safety, and privacy in the autonomous vehicle era	Computer	To identify legal and technical solutions for a maximum data privacy of AV while improving safety and ensuring data liability.	Literature on accident liability, insurance pricing, and safety against data privacy at the advent of AV	Critical analysis including literature review	Reveals that the data generated by on-board vehicular systems of AV can be used to determine accident liability, rationalise insurance pricing, and improve safety—all are attainable by sacrificing minimal privacy as bounded by technical and legal solutions.
6	Gless et al.	2016	If robots cause harm, who is to blame? Self-driving cars and criminal liability	New Criminal Law Review	To clarify the boundary limit of liability responsibility and criminal punishment among operator, manufacturer and driving robots.	Literature on AVs' liability and criminal punishment issues	Review of the literature	Raises novel issues in criminal law as robot can malfunction and cause serious to people and property. These robots are not suitable for criminal punishment. It advocates in favour of limiting the liability of vehicle operators, if they undermine to initiate reasonable measures to control the risk emanating from robots.
7	Kalra et al.	2016	Driving to safety: how many miles of driving would it take to demonstrate autonomous vehicle reliability?	Transportation Research Part A	To show vehicle testing is impractical approach to ensure AV performance and safety.	Significance testing	Statistical analysis	Demonstrates that test driving of AVs in real traffic is not practical approach to assess safety. Considering current fatalities and accidents are rare events with respect to VMT, it is shown that AVs would have to be driven hundreds of millions or billion miles to ensure their reliability in terms of fatalities and injuries and it might take tens and hundreds of years to complete these miles—an impractical

								proposition to demonstrate reliability and performance prior to customer use.
8	Nowakowski et al.	2016	Determining the readiness of automated driving systems for public operation development of behavioural competency requirements	Transportation Research Record	To establish minimum behavioural competency standards for ADS as a part of DMV regulations for public deployment of AVs.	Behavioural competency standards for public deployment of ADS in California	Extension of author's previous study and review of contemporary literature	Proposes a set of minimum behavioural competency standards for ADS, in addition to functional safety and third-party certification, to ensure safety before public deployment. The minimum behavioural competency requirements and testing of ADS could be utilised to identify system's inadequacy before its public deployment. It is expected that testing methods for these competencies will be set by industry standard organisations.
9	Snyder	2016	Implications of autonomous vehicles: a planner's perspective	Institute of Transportation Engineers Journal	To suggest policies relevant to potential impacts of AVs.	Literature on AVs' impact, and relevant policies	Review of the literature	Recommends policy options for better operations of AV: The politics of algorithm; Pricing; Time advantage; Liability issues; Uniform traffic control device.
10	Collingwood	2017	Privacy implications and liability issues of autonomous vehicles	Information & Communications Technology Law	To highlight the necessity of legal aspects of privacy and liability issues of AVs	Literature on AVs' privacy and liability issues	Review of the literature	Explores legal aspects of privacy and liability issues of AVs in the UK. It predicts that well-established user privacy can build trust and confidence in adopting AV. It argues that legislation development will be critical not only for apportioning liability among the stakeholders, but also for the fact that different level of AV will penetrate, while traditional cars also ply on the same road approximately for the next 15-20 years.
11	Vellinga	2017	From the testing to the deployment of self-driving cars: legal challenges to policymakers on the road ahead	Computer Law & Security Review	To evaluate the AV testing and deployment regulation and propose a universal regulation for deployment and operations of AVs.	Literature on federal and state government legal issues relevant to AV testing and deployment	Reviewing contemporary literature on AV	Reviews the prevailing and proposed laws and regulation regarding AV testing, its liability identification, and insurance options in different countries. It shows that most of the proposed laws in those countries intended to shift the liability of the accidents from the driver to manufacturer. It expects that inconsistent regulations among the jurisdictions and manufacturers' insurance liability may hinder the development and timely deployment of AV.

12	Zushi	2017	Driverless vehicles opportunity for further greenhouse gas emission reductions	Carbon & Climate Law Review	To evaluate the environmental impacts of AV technology.	Literature on contemporary transport emission related the US environmental laws	Analysing existing GHG emission related laws and regulations	Suggests legal mechanisms to be adopted in California so that AVs would contribute in reducing GHG emission. The mechanisms are: Adopt specific GHG reduction goals for AVs; Provide financial incentives to promote SAVs; Adopt emission standards for AVs; Use SAVs as part of public transportation; Encourage efficient land uses by promoting tech-and-transit-oriented developments and creating 'parking to green hubs' programs.

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