Autonomous vehicles

The future of transport in the United States: A brave new world?

November 2020

Kennedys

Contents

Introduction

The world is on the cusp of a transport revolution: one in which machines will increasingly take control from humans. That shift raises fundamental concerns around public safety and where the liability rests when accidents occur. It also means a major shift in the amount of data that is collected by vehicles, and how that data is stored and used. Faced with these challenges, the views of end-users will be integral to deciding the scale and speed at which markets choose to adopt autonomous vehicle technology.

Gearing up for this new era of transportation presents many challenges, which our report, *Autonomous vehicles – The future of transport: A brave new world?*[1], published in July 2019 (and prior to the COVID-19 pandemic) explored in greater detail. With considerations across a range of transport sectors – road, rail, aviation and maritime – we looked at how the application of autonomous vehicle technology across these sectors will present unique obstacles and opportunities. This report was informed by primary research, undertaken by Cicero Group, involving:

- An online survey of over 6,000 adults across six markets – Australia, China, Hong Kong, Singapore, United Kingdom (UK) and the United States (US) – to help us assess the current state of public opinion in each jurisdiction and to identify common concerns and potential barriers to the adoption of new driverless technology.
- A range of in-depth interviews with market practitioners across different transport sectors (aviation, automotive, insurance, public transport and shipping) to identify potential technical and legal obstacles to adopting the technology. We engaged senior practitioners across Australasia, Denmark, Singapore, UK and US.

This summary report is tailored specifically for the US market. It explores the views of 1,000 US end-users to help us assess public opinion and to identify common concerns and potential barriers to the adoption of new driverless technology and the associated risks.

The United States (US): in focus

When considering autonomous vehicle technology, it is important to remember that we are not dealing in science fiction. We can already see in our everyday lives how autonomous vehicle technology is reshaping transport systems.

It is already an integral design feature in many existing road vehicles – including vehicle tracking, anti-lock braking (ABS), traction control (TCS), all-wheel drive (AWD), electronic stability control (ESC), adaptive headlamps, assisted parking, blind spot monitoring and traffic sign recognition. These technologies have been adopted by a receptive motoring community keen to use technology to make their lives easier and safer.

The US: regulators leading the push

In KPMG's 2020 index of autonomous vehicle readiness, the US sits fourth within the top 10 countries in autonomous vehicle readiness.[2] This position is primarily driven by how it ranks with regard to technology and innovation (sitting in second place, with Israel in first). Despite scoring well in terms of policy and legislation and infrastructure, the US falls behind other frontrunner nations in those two areas.

The nationwide policy agenda for autonomous vehicles in the US stems from the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) 2016 policy directive, the Federal Automated Vehicles Policy. It should be noted, however, that the majority of the US's federal positioning on autonomous vehicles has been through voluntary best practice and policy positioning. This has been a deliberate tactic, the government stated, so the technology can develop without the added pressure of having to abide by government rules.[3]

Although individual states enact their own legislation to manage the impact of these vehicles on their roads, the NHTSA's initial policy and subsequent iterations seek to provide voluntary guidance on best practice for legislation, and later on the removal of regulatory hurdles. State legislation initially focused on the ability to test autonomous vehicles, but has since evolved in an effort to build upon the adoption of electric vehicle technology with the deployment of autonomous vehicle technology. It should be noted, however, that states such as Arizona have tightened rules on road use following the fatal collision of an autonomous Uber killing a pedestrian in March 2018.

KPMG's 2020 index of autonomous vehicle readiness highlights Detroit and Pittsburgh among the 'cities to watch', citing them as strong examples of the governmental work being undertaken at state and city level to introduce AVs.

With regards to what comes next, further preparation for automation will require guidance, best practice and pilot programs to encourage the necessary investment in developing the new technology. The evolution of new technology will be steered by the new Federal Motor Vehicle Safety Standards (FMVSS).

US Department of Transportation (USDOT) will continue to modernize regulations through technology-neutral policies. As with other jurisdictions, this includes the need to redefine terms such as 'driver' and 'operator', to recognize that such terms no longer refer exclusively to humans and may include automated systems. Currently, many NHTSA standards do not permit fully autonomous ('Level 5') technology, in which humans are unable to take back control of the vehicle.

USDOT will also seek to promote regulatory consistency between Federal, State and local laws and regulations to reduce confusion. For example, vehicle technology standards are governed by Federal laws under the authority of the NHTSA, but traffic laws, such as speeding limits, are determined locally.

Finally, thinking specifically about liability-based legislation, the US will require clarification of control of the vehicle, and who is responsible between the driver, the original equipment manufacturer (OEM) and the insurer. In 2016 Michigan passed a law designating that the auto manufacturer assumes responsibility, but how this plays out more widely has not yet been determined.[4]

While the US ranks among the global leaders with regards to autonomous vehicle readiness, particularly in relation to policy and legislation, for notable progress to occur, two key questions remain:

- Do the public, as end-users of transport systems, accept the drive towards autonomy?
- What potential barriers to adoption need to be addressed?

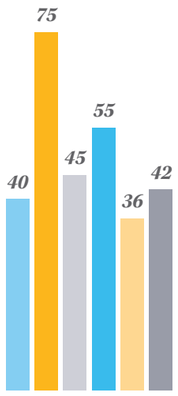
2019 Ranking	Country	Policy and legislation	Technology and innovation	Infrastructure	Consumer acceptance
1	Singapore	1	11	5	1
2	The Netherlands	3	10	1	7
3	Norway	10	5	3	5
4	United States	6	2	9	6
5	Finland	4	8	11	2
6	Sweden	15	6	8	3
7	South Korea	16	7	2	10
8	United Arab Emirates	8	22	4	4
9	United Kingdom	2	9	16	12
10	Denmark	12	15	10	8
15	Japan	18	3	6	18

Source: *KPMG, 2020 Autonomous Vehicles Readiness Index*
N/B Included in the table are rankings 1-10 and 15. The 11-14 rankings are: 11 – New Zealand; 12 – Canada; 13 – South Korea; 14 – Israel

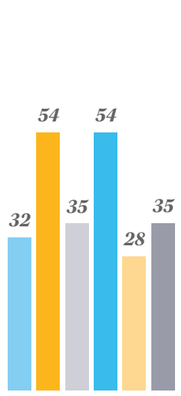
Public attitudes toward autonomous vehicles: imagine the US in 2039

To help answer these questions, we asked 1,000 US adults to think ahead to 2039 and try to imagine whether they foresee any fundamental changes taking place over the next two decades. The study revealed some interesting findings.

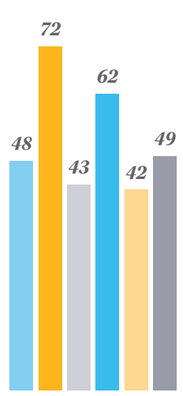
To what extent do you agree that the following describes how the world will look in the year 2039 (% agree/strongly agree):



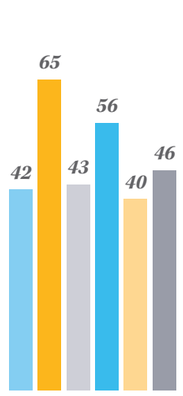
Our roads will have a fully functioning AV network in place (%)



The increase in car share schemes means no one will need to own their own car (%)



The changing nature of how we travel means most people will take out on-the-go car insurance (%)



Due to an increase in flexible working, the daily commute will become a thing of the past (%)

More than two in five US adults agree that by 2039 the US will have a fully functioning autonomous vehicle network in place.

Of the markets covered in the survey, the US sits just behind the Asia-Pacific markets in terms of consumers believing that we will have a full functioning autonomous vehicle network in place by 2039.

> Just over a third of US adults agree that by 2039 people will not need to own their own car due to the increase in car share schemes.

Although the US has a strong history of personal car ownership, it is also the birthplace of car sharing (ZipCar) and ride-hailing (Uber, Lyft). While there is a perception that car ownership patterns are set to change as these platforms continue to penetrate the market, this sentiment is still relatively weak in the US, with just over a third of people thinking that in 2039 individuals will not need to own their own cars.

> Nearly half of US adults believe that by 2039 most people will take out on-the-go insurance.

As a result of these changing ownership patterns, insuring 'on-the-go' will increasingly meet society's changing needs. Half of American adults currently think that most people will take out on-the-go insurance – roughly in line with those in Australia and the UK, but a far lower proportion than we see in China and Singapore.

> Over two-in-five US adults believe that by 2039 the daily commute will become a thing of the past.

More fundamentally, there will be less need for mobility at all as working patterns change and the daily commute may fade out of dominance. Our survey (taken before the COVID-19 pandemic) found that driving license ownership was highest in the US (92% of adults), and data from the 2017 American Community Survey finds that 85% of US workers aged 16 or over use a car, truck or van to travel to work (76% of all US working adults drive alone and 9% carpool), and only 5% work at home. Despite these road commuter trends, nearly half of Americans anticipate that the daily commute will become outdated as transportation methods change.

Levels of public support

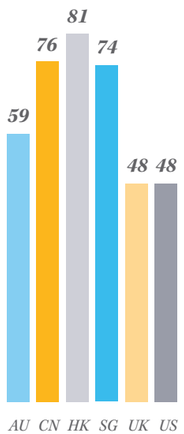
While people readily acknowledge that the world of mobility will look very different in 2039 compared to today's transport systems, the journey toward a more autonomous world will not be without obstacles.

Our findings reveal that just under half of the US respondents support further moves towards partial autonomy (48%), meaning that, along with the UK, it is the market with the lowest support for partial automation within our study.

However, when faced with the prospect of 'ghost vehicles' on our roads, where the vehicle is fully autonomous with no human at the wheel, we see that the public support diminishes significantly – with just 3% continuing to lend their support to the technology. Support for full autonomy is flat across all markets covered in our survey.

> Only 3-4% of respondents support fully driverless vehicles with no human override facility.
>
> Nearly half of US adults surveyed support partial automation though there remains largescale resistance to full autonomy.

Provided the infrastructure was in place, to what extent should the vehicles on your roads be automated?



Support for autonomy: Partial (%)

The perceived benefits of more autonomous vehicles

In a speech at the giant global tech trade show CES 18 in January 2018, US Secretary of Transportation Elaine Chao spoke of the transformative technologies that are “poised to revolutionize transportation” (on the proviso that transportation policy equally revolutionizes).

In particular, Chao spoke to the impact on security, access and jobs, but most significantly, the enhancement of traffic safety. America’s elderly population and people with disabilities could have a better quality of life and greater mobility, Chao argued, as well as driver error no longer being the greatest risk on the road.[5]

US consumers broadly identify these same factors as the key benefits of autonomous vehicles. However, it should be noted that across most answers, fewer people in the US saw these potential benefits when compared with Australia, China and the UK.

US consumers typically identify improved mobility for the elderly or disabled and fewer accidents as key benefits of autonomous vehicles.

Benefits	%	Public acknowledgement of benefits
Elderly/disabled people can maintain their independence	39	Improved mobility for elderly and disabled people tops the list of benefits for US respondents
Cost of car insurance will fall if fewer accidents	37	Nearly two in five people identify falling insurance costs as a benefit of autonomous vehicles
Fewer accidents on the roads	33	Closely linked to insurance costs, nearly two in five Australians see fewer accidents on the roads as a benefit of autonomous vehicles

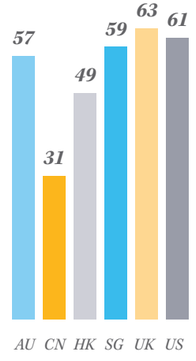
Barriers to adoption: public concerns over further automation

How far do we place our trust in technology to direct transport systems?

Autonomous vehicle technology is already commonly used, to varying degrees, across all modes of transport. The extent to which that technology is visible to the end-user also varies hugely. Where the technology is invisible, for example, autopilot features in aviation or urban rail networks, the public demonstrates little or no concern. Critical to the public support for this type of automation is the knowledge that there is at least a high degree of human supervision and involvement.

In all countries, we see a widespread concern about the further extension of automation where that technology limits the ability of humans to take control of autonomous vehicles. People are not prepared to put all of their trust in machines, especially where public safety is concerned. This is particularly the case in the US, reflecting the strongly established relationship between driver and vehicle in the US psyche and the lower levels of public support in the US (in comparison to the other markets covered in the study).

Why do you not support fully autonomous vehicles?



I do not trust the judgement of a computer over that of a human (%)

> Three in five of those US adults not supporting fully autonomous vehicles do not trust the judgement of a computer over that of a human.

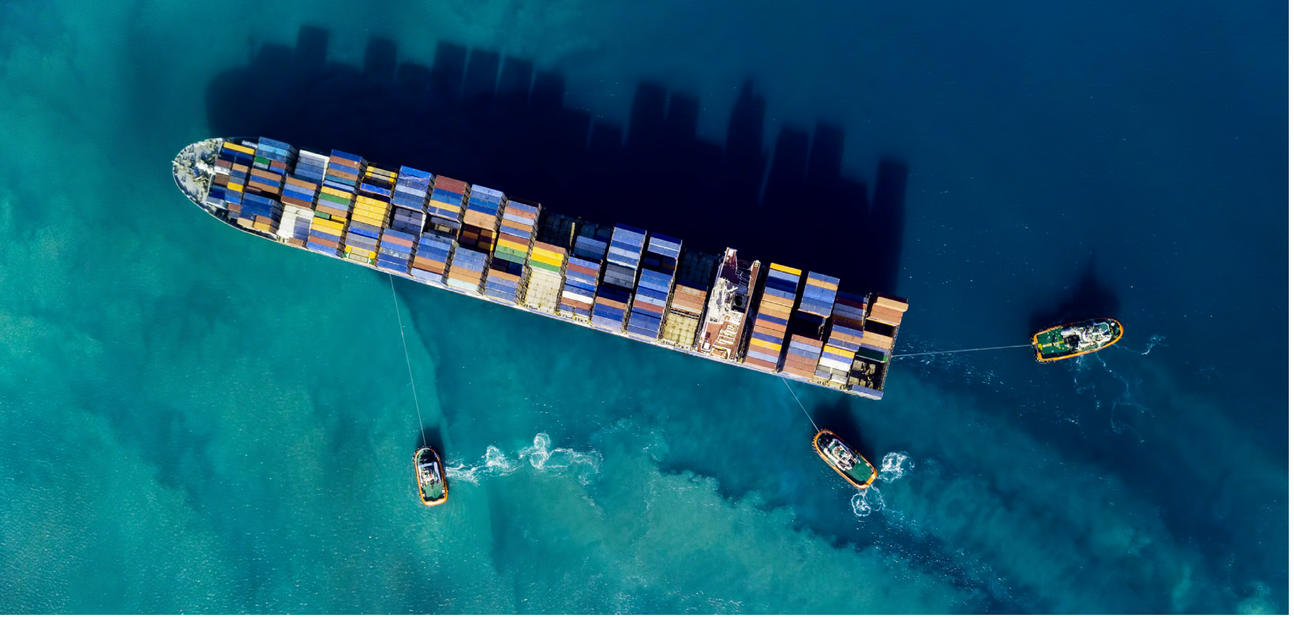
Putting the brakes on full automation

This mistrusting mindset should not present an obstacle in moving from Level 3 'conditional' automation towards Level 4 'high' automation. Level 3 features are already found on road vehicles today: the vehicle can handle all safety critical functions but the driver must be ready to retake control. Level 4 retains levels of trust, where the vehicle can operate without driver input or oversight, though it may request driver intervention via a hand-back feature. However, lack of trust peaks and subsequently presents a serious constraint with the next level of autonomy towards 'pods' (Level 5) in which the vehicle is fully automated, and humans cannot intervene to take control in any condition. Public education is clearly required if we are to see widespread public acceptance of such pods.

Provided the infrastructure was in place, to what extent should the vehicles on your roads be automated?

	Level3	Level 4	Level 5 (full automation)
AU	26%	26%	3%
CN	40%	25%	4%
HK	29%	29%	3%
SG	36%	29%	3%
UK	21%	20%	4%
US	23%	17%	3%

> 43% of US adults surveyed support increased automation, though only 3% support fully autonomous vehicles.



Attitudes toward other modes of transport

How do public attitudes shift when thinking about rail, aviation and maritime transport?

The catch-all term of autonomous vehicles goes beyond just cars, and as technology develops, this remit is increasingly including the likes of trains, planes, ships and drones. These could change the way both passengers and freight travel across both long and short distances.

In the case of drones, the regulatory environment has not been as accommodating as it has been in the nurturing of autonomous technology. Instead, at the state level at least, these have typically been to counter risks and impose flying restrictions. The Federal Aviation Administration's conservative approach to risk assessments on unmanned aircraft systems has led, according to the National Academies of Sciences, Engineering, and Medicine, to an inability for the US to accommodate its potential benefits. These benefits include preventing derailments, inspecting cellphone towers, delivering medical devices to patients in cardiac distress and assisting firefighters.[6]

As the home of Silicon Valley, a myriad of US companies are working towards autonomous delivery and transport methods, both big and small. Amazon is one of many companies developing a delivery robot, and Tesla has unveiled a semi-autonomous fully electric Class 8 freight truck with the potential to form a convoy on highways. However, the creation and testing of the technology does not necessarily equate to social acceptance of such driverless vehicles on highways. Research from the Warehousing Education and Research Council found that three-in-five warehouse managers are not likely to incorporate drones and driverless vehicles into their organization, and only 18% so far have implemented robotics and automation.[7]

Despite the regulatory efforts and the extensive trials taking place across the country (particularly with the developments of semi-autonomous freights and the trialing of delivery robots and autonomous taxis) the US public remains uncomfortable with the idea of each form of automated transportation. In particular, comfort is lower in the US than other markets in the study with regards to driverless trains.

The backdrop to autonomous road vehicles in the US differs from that in other countries in that there have already been high-profile fatalities. An Uber autonomous car was involved in a fatal crash in which a pedestrian was killed in Arizona in March 2018. This resulted in Uber halting its tests. In the same month, another fatal crash occurred in California, when a Tesla in Autopilot mode crashed into a roadside barrier and caught fire. Not surprisingly, the US authorities are particularly mindful of the implications of driverless vehicles for public safety – and this is similarly reflected in the public's view.

If they were introduced more broadly, how comfortable would you feel if each of the following were allowed?

(% somewhat comfortable/very comfortable)

	AU	CN	HK	SG	UK	US
Driverless trains	36	59	32	58	31	28
Use of drones to deliver parcels	38	71	29	50	31	39
Commercial vehicles platoons controlled by lead vehicle	28	58	17	33	26	26
Allowing personal ownership of driverless cars	28	65	19	35	26	28
Driverless taxis	25	55	15	29	23	25
Driverless buses	25	56	15	32	22	24
Shipping/ferry boats operating with no captain	20	48	17	22	18	23
Airlines operating pilotless craft	15	50	13	16	16	18

Case study

The Maritime Administration (MARAD) and the Federal Motor Carrier Safety Administration (FMCSA) are jointly exploring how SAE Level 4 truck automation might improve operations at intermodal port facilities. Currently at many of the nation's busiest ports, commercial vehicle drivers must wait in slow-moving queues for hours to pick up or deliver a load. MARAD and FMCSA are evaluating how automation might relieve the burden on a driver under these circumstances, and the regulatory and economic feasibility of using automated truck queueing as a technology solution to truck staging, access, and parking issues at ports. The study will investigate whether full or partial automation of queuing within ports could lead to increased productivity by altering the responsibilities and physical presence of drivers, potentially allowing them to be off-duty during the loading and unloading process.

This lack of comfort in the US may well also relate to the strongly established legacy of personal vehicle ownership and the emotional attachment that comes with it. However, in other modes of transport, the concern of moving towards full autonomy does not reflect the degree to which numerous urban rail systems around the world and the US itself already operate.

A number of American airports are home to the highest level of automated rail systems (Grade of Automation 4, or GoA4), including the Satellite Transit System at Seattle-Tacoma International Airport first established in 1973. Meanwhile, metropolitan transit systems such as the Bay Area Rapid Transit, Washington Metro and several lines on the New York City Subway operate GoA2 systems. Given the 'move-fast-and-break-things' attitude of Silicon Valley and the ambition of incumbents and start-ups alike to test the parameters of the business advantage that autonomous technology can bring, consumer sentiment in the US is yet to catch up with both the developments and aspirations of manufacturers. Policymakers, meanwhile, must move beyond voluntary policy guidance to greater top-down direction of autonomous technology, liability and greater collaboration between federal and state rulings.

Recommendations

As the technology for autonomous vehicles matures, industry and public bodies alike must adapt their models, processes and positioning to keep pace in this brave new world.

For vehicle manufacturers, operators and insurers, the task of transforming business models will take years of careful planning and investment. The need to develop a deep understanding of the emerging risks associated with new technologies, as well as the emerging legal frameworks, will be a vital component of any investment decision.

End-users will be a critical factor in the adoption of new technology, how it evolves and the speed with which it can be adopted. Ensuring public confidence throughout this process of innovation and taking every step to raise public awareness around the benefits will be essential in building greater trust and allaying public concerns.

Global automotive original equipment manufacturers (OEMs) will need to determine if they should redesign their business model to accommodate different ownership models or whether to focus on one market. Collaboration between OEMs is crucial in ensuring we avoid a fragmented approach in operating systems between different jurisdictions.

On data protection and privacy, setting out clear policies on what data is being collected and how this is used is critical to build consumer trust. With regards to data management, there are clear benefits in the creation of a central industry-wide data-hub shared by manufacturers, insurers and government agencies alike.

Technology firms are driving much of the innovation currently being taken with vehicle sensors and how these interact with personal devices, such as smartphones and the Internet of Things. This generates greater amounts of data and insights to create opportunities for dynamic-pricing, single-payment, and consumption-based models to become much more prevalent. This not only affects how people access transport, but also how they insure the risks associated with transportation.

Insurers are faced with strategic challenges in continuing to support the classic insurance model towards new risk models in which the liability moves towards product manufacturers, and will need to broaden their understanding of driverless technology. Insurers must adapt at a time when consumer appetite for insurance products is likely to shift away from annual renewals towards on-the-go insurance, which develops more transactional relationships where less is understood about the risk profiles of individual drivers.

Connected and autonomous vehicles will create a massive increase in data, access to which will be increasingly important to insurers when autonomous vehicles are on the roads. To help improve risk pricing and ultimately reduce premiums, such data must not be siloed. Insurers, technology firms and OEMs should therefore focus on developing collaborative approaches to data sharing and risk modelling.

For public bodies, autonomous vehicles present opportunities to unlock new capacity in urban transport systems and build better cities by improving efficiency within the existing infrastructure. Realizing the potential to reduce the need to invest billions into new metro or rail systems would allow the re-deployment of precious funds, and by drastically reducing the need for parking, autonomous solutions can liberate prime new real estate in cities. In order for such opportunity to be maximized, there is a clear need to ensure real-world 'test beds' are available to manufacturers to effectively pilot new technology and ensure a sufficient enough body of evidence to support wider roll-out.

Governments will increasingly have to work in collaboration to develop common standards to ensure that new technologies are developed consistently between different transport manufacturers and between different jurisdictions. Fundamentally, governments will also need to embrace such innovation in the first place and ensure the correct fiscal conditions (tax and funding) are put in place to help turn the opportunities into reality.

There is a strong relationship between public understanding of the technology and subsequent levels of support. With much misunderstanding around road safety and data sharing, building greater awareness and public support will be essential in ensuring that the technology is quickly adopted.

On the issue of security and hacking specifically, greater control and clarification are essential. The ability to build a 'back door' into autonomous vehicle software for use by law enforcement agencies has obvious appeal. However, building in such access then also creates weaknesses. What then the consequences should these 'back doors' be hacked?

Furthermore, there is a privacy issue. Where there is commercial value there is the potential for manufacturers to sell data or provide insights to retailers, service providers, councils, lobby groups etc.

These are deep questions that public bodies should be trying to answer. For public trust to be ensured and maintained, it is essential that this process be as transparent as possible.

Contacts

John Gilfillan
Partner, United States
t +1 908 848 1234
e john.gilfillan@kennedyslaw.com

Richard West
Partner, United Kingdom
t +44 1245 299 877
e richard.west@kennedyslaw.com

Pasquale Pontoriero
Partner, United States
t +1 908 848 1232
e pat.pontoriero@kennedyslaw.com

Deborah Newberry
Head of Corporate and Public Affairs, United Kingdom
t +44 20 7667 9508
e deborah.newberry@kennedyslaw.com

About Kennedys

Kennedys is a global law firm specializing in dispute resolution and advisory services with over 2,000 people in 22 countries around the world.

We handle both contentious and non-contentious matters and provide a range of legal services, including corporate and commercial advice, but with a particular focus on providing coverage and defense of insurance and liability claims. Insurance is deeply ingrained in every Kennedys office globally. Our lawyers provide counsel to insurers and reinsurers, corporates, healthcare providers, public sector bodies and other organisations, for all lines of business, delivering straightforward advice even when the issues are complex. We support our clients, beyond the law. By providing them with innovative products and thought leadership, we empower them to better position their businesses for the future.

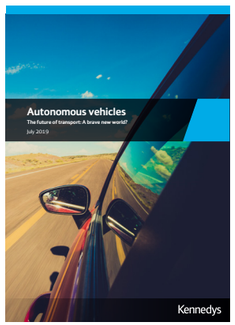
kennedyslaw.com

About Cicero
Cicero Group is a full-service communications and market research agency. It designs and delivers award-winning corporate, brand, political and regulatory campaigns across all major business sectors from offices in London, Brussels and Dublin.

cicero-group.com

This report does not represent the views of Kennedys Law LLP. The report is based on a survey with a sample of 6,000 adults in Australia, China, Hong Kong, Singapore, the UK and the US, commissioned by Cicero Research between 31.03.2019 and 03.06.2019. It is also based on interviews with nine senior practitioners representing the following sectors: aviation, automotive/road, insurance, public transport and shipping. The report attempts to present a balanced analysis based on the surveys conducted. Kennedys Law LLP is not aligned with any campaign group.

Endnotes

1 

Autonomous vehicles

The future of transport: A brave new world?

As one of the largest studies on attitudes towards autonomous vehicles to date, this report explores public support across the globe and insights from key industry leaders.

kennedyslaw.com/autonomous-vehicles

2 KPMG, 2019 Autonomous Vehicles Readiness Index
https://home.kpmg/uk/en/home/insights/2020/07/2020-autonomous-vehicles-readiness-index.html

3 US Department of Transportation, Public Listening Summit on Automated Vehicle Policy: Summary Report, July 2018
https://www.transportation.gov/sites/dot.gov/files/docs/policy-initiatives/automated-vehicles/314091/usdot-public-listening-summit-automated-vehicle-policy-summary-report.pdf

4 Kennedys, The future of liability insurance in the age of the driverless car: the US perspective, 4 January 2019
https://www.kennedyslaw.com/thought-leadership/article/the-future-of-liability-insurance-in-the-age-of-the-driverless-car-the-us-perspective

5 US Department of Transport, Remarks Prepared for Delivery by US Secretary of Transportation Elaine L. Chao, CES Panel on "Incorporating Drones and Self-Driving Vehicles into Communities", Las Vegas, Nevada, 10 January 2018
https://www.transportation.gov/briefing-room/%C2%AOincorporating-drones-and-self-driving-vehicles-communities

6 National Academies of Science, Engineering and Medicine, Assessing the Risks of Integrating Unmanned Aircraft Systems (UAS) into the National Airspace System, June 2018
https://www.nap.edu/catalog/25143/assessing-the-risks-of-integrating-unmanned-aircraft-systems-uas-into-the-national-airspace-system

7 WERC, DC Measures – 2018 Trends and Challenges, 2018
https://werc.org/store/ViewProduct.aspx?id=11535540

Kennedys

kennedyslaw.com/autonomous-vehicles

Kennedys

KennedysLaw

KennedysLaw

Kennedys is a global law firm operating as a group of entities owned, controlled or operated by way of joint venture with Kennedys Law LLP.
For more information about Kennedys' global legal business please see **kennedyslaw.com/regulatory**

kennedyslaw.com