THE RACE IS ON FOR AUTONOMOUS VEHICLES
Global Policy Update

February 2019

*The 100-year old business model of automakers as simply manufacturers is being challenged. Societal, economic and regulatory pressures are impacting the auto industry at an unprecedented pace. **Rapid disruption is the new norm, and autonomous vehicles are at the center**.*

With its potential economic, safety and environmental benefits, the autonomous vehicle (AV) is being touted as part of the solution to today's most pressing transportation challenges, ranging from environmental concerns to urban mobility issues. This technology also holds the potential to have far reaching impact into sectors such as insurance, tech, logistics and cyber. A recent study commissioned by Intel concluded that **AVs will generate $7 trillion per year by 2050.**[1] Companies must engage now to prepare for the future of mobility or risk failure, as the global race for AVs is most definitely on.

Despite the potential that this burgeoning industry presents, fragmented global regulation is creating uncertainty and risks slowing down mass deployment of AVs. A global, harmonised approach will be key to ensuring wide-spread adoption of AVs.

In this second edition of FTI Consulting's global AV snapshot, we offer insights into the state-of-play and expected developments in the U.S., EU and Asia, as well as at UN level.

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[1] https://newsroom.intel.com/newsroom/wp-content/uploads/sites/11/2017/05/passenger-economy.pdf?cid=em-elq 26916&utm_source=elq&utm_medium=email&utm_campaign=26916&elq_cid=1494219

- **100-year old car manufacturing model under threat.**

- **Expectation that AVs will generate $7 trillion per year by 2050.**

- **Is global AV regulation keeping pace with innovation?**

EXECUTIVE SUMMARY

The potential impact of autonomous vehicles (AVs) on society and the broader economy is both far reaching and hard to predict – but it is clear that they will change more than just the auto industry. From tech companies and insurance providers to tire manufacturers, construction and logistics companies, AVs have the potential to completely reshape existing business models. While this will create new opportunities and markets, it will also disrupt the status quo, leading to business uncertainty and job loss.

Adding another layer of complexity, AVs will require a comprehensive regulatory framework written collaboratively by various policymakers and regulatory bodies, considering inputs from a number of different industries, which will, ideally, be harmonised with global standards. The legislative framework will need to include solutions to issues including car-type approval, data access and ownership, ethics, liability and job loss. Indeed, as AVs become reality, governments and industry need to work together to develop future-proof regulations to deal with the unintended consequences and ramifications of this new technology.

For industry, the time to position itself is now. The shaping of both national and international legislation has started, and companies involved from the start will get a leg up over their competition, both by shaping the regulatory framework and leveraging it for growth.

This snapshot will present and analyse the current legislative landscape in key geographical areas (EU, U.S., Asia and UN). Some of the takeaways include:

- As regulations move slowly or stall altogether in some regions, the uptake and hype of AV technology will also begin to fade. In such scenarios, AV companies are likely to spend the next few years on commercialisation strategies while trying to earn consumers' trust.

- Due to differences in political models, we see China catching up fast to other markets, despite entering the field later. Combined with China's investment in new technologies, this could result in major challenges for incumbent companies, which are primarily based in the U.S. and Germany.

- Original equipment manufacturers (OEMs) and tech companies will need to partner to survive expected disruptions from costly regulatory compliance. OEMs are no longer competing just with each other, but also with other global regions in the race for AV deployment. Global reach and access to capital will be key to positioning and advancement.

- In an AV world, brand differentiators will no longer be powertrain technologies, but the in-car services and the luxury features that are provided. For example, when utilising an AV, the differentiator may be access to streaming Netflix vs. Amazon Prime.

- Deindustrialization and associated job loss have been linked to the rise of populism, social fairness issues and major political upheavals in the past years. AVs could bring about the next major blow to blue collar jobs, such as truck drivers, the automotive aftermarket, car rental companies and many others.

- The industry is confronting the challenges of deploying AVs at scale while technological, regulatory and commercial limitations slow progress. However, at the heart of it all is the issue of public trust and whether the public will deem AVs as a safe, affordable and all-around better alternative to move people and goods is yet to be seen.

UNITED STATES

The U.S. auto industry remains one of the largest sectors in terms of jobs, GDP, R&D and investment. Its relevance to the economy, as a global trading partner, and to the everyday life of most Americans is undeniable.

At the same time, many would argue that the momentum behind one of the biggest shifts this sector has ever faced comes largely from outside the biggest auto manufacturers. Companies like Google, Tesla and Uber—whatever their scale, maturity or expertise in mobility— are now rivaling traditional car makers in their development of AVs.

The resulting "marriages" between OEMs and tech companies have led to a simultaneous pattern of intense competition and surprisingly flexible collaboration. Despite private sector efforts however, the novelty of AV technology has made it difficult to agree upon cohesive AV legislation at the federal level, leaving states to decide for themselves how best to address the rapidly growing pool of automated cars. While some proponents argue that loosening regulations will spur further industry growth, critics believe that deploying these vehicles too early could lead to unintended consequences regarding consumer safety and the associated backlash.

Federal Level

In October 2018, the U.S. Department of Transportation (DOT) published a policy update on AV guidelines known as "Automated Vehicles 3.0."[2] Building on version 2.0 (released in September 2017),[3] the 3.0 guidelines ease current oversight, pledge to review vehicle safety standards, encourage the modernization of AV testing regulations and provide a boost for nationwide AV testing. The policy also covers the commercial-use of AVs through long-haul trucks, transit and rail, in addition to passenger vehicles. Furthermore, it allows DOT to overrule state or local requirements that interfere with federal trucking regulations.[4] DOT solicited comments on AV 3.0 through December 2018, providing automotive, tech companies, think-tanks and safety experts an opportunity to convey their positions. With this feedback in hand, the agency is slated to begin the rulemaking process that would formalize the National Highway and Traffic Safety Administration (NHTSA) regulations around AVs in a way that continues to promote the efficient development of self-driving automotive technologies.[5]

"The safe integration of automated vehicle technology into our transportation system will increase productivity, facilitate freight movement and create new types of jobs."[6]

Secretary of Transportation Elaine Chao

Two major AV proposals in the 115th Congress, one House bill and one Senate bill, made headway – yet would need to be re-introduced in some form in the new Congress:[7]

SELF DRIVE ACT	AV START ACT
Introduced in the House	Introduced in the Senate
National Highway Traffic Safety Administration (NHTSA) would be responsible for regulating self-driving cars safety.	
Limit manufacturer exemptions for sale to 25,000 vehicles in the first year, 50,000 in the second year, and 100,000 in subsequent years.	Limit manufacturer exemptions for sale to 15,000 vehicles in the first year, 40,000 in the second year, and 80,000 in subsequent years.
NHTSA would have to establish a 30-member AV advisory council, representing business, academia, state and local governments, and others advising on a number of AV policies.	DOT would have to establish a 15-member AV technical committee to provide advice on rulemaking and policies for autonomous vehicle performance and safety standards.
Within two years of the bill's enactment, DOT would have to issue a rule requiring developers of highly automated vehicles or systems to submit certifications that show how they are addressing safety concerns.	Within 90 days of enactment, manufacturers would have to provide DOT with a safety evaluation report on their autonomous vehicles or driving systems before testing or selling them.
Does not address domestic manufacturing of AVs.	Requires DOT to study ways in which AVs and their parts could be produced domestically.
Requires manufacturers to develop written privacy plans concerning the collection and storage of data generated by AVs vehicles, as well as a method of conveying that information to vehicle owners and occupants.	Requires NHTSA to establish an online, searchable database that would describe types of information, including personally identifiable information (PII), that are collected about individuals during operation of an AV.
Passed in House (9/6/17)	Reported by Committee (11/28/17)

In a recent survey, FTI Consulting found that only 40% of American voters support reintroducing the SELF Drive Act. However, the proposed legislation is supported by 50% of Gen Z/Millennials, and only 32% of Baby Boomers – meaning legislators will need to consider the generational split on this issue. On the business side, 63% of capital markets professionals believe that legislation facilitating the testing and rollout of autonomous vehicles across the U.S. would positively impact the

U.S. equity market, showcasing the long-term positive expectations by the financial industry.[8]

Most notably, both Acts would allow further exemptions to be issued for new technologies under the Federal Motor Vehicle Safety Standards (FMVSS), paving the way for increased deployment of AVs on the road.[9] The 116th Congress is well underway, however with a large-scale battle over immigration policy, a government shutdown, and a focus on investigations, AVs may not be considered a priority in the context of the broader political and policy agenda for quite some time.

"People need to be assured, and they need to be assured over time. You can't just dump something on a freeway and have people looking over saying, 'My God, there's no driver."

Senator Dianne Feinstein (D-CA)

Federal spending for AV research is on the rise, however, with $118.1 billion allocated in the 2019 federal budget. The budget, which establishes R&D funding for all major government agencies, acknowledges the importance of supporting AV projects. Its priority list even includes "Integrating Autonomous and Unmanned Systems into the Transportation Network."[4]

State Level

All regulation, currently varying state by state, may be rendered moot if federal legislation supersedes it. According to the National Conference of State Legislatures, twenty-nine states and Washington, D.C. have passed legislation related to AVs. They differ on many levels including requirements for vehicle operators, insurance and liability, and cybersecurity. Ten state governors have issued executive orders regarding the operations of AVs. Only nine state legislatures across the country have not considered AV regulations.[10]

California is often seen as the leader on AV policy because it is the most populous state and its Silicon Valley hosts the center of auto technology development. California has granted over 50 companies a license to test AVs, and this year gave the official green light to begin testing on public roads without a human driver on board. Waymo was the first company cleared to test, and its self-driving cars will now be able to cruise at speeds up to 65 miles per hour.[11] This measure certainly gives California an

advantage over other states where there must still be a driver in the vehicle to take over in case of an emergency.

Neighboring states Arizona and Nevada also allow testing without a safety driver; however, California is the most populated state to permit this type of testing to-date.[12] States like Colorado have implemented controlled pilot programs for fully autonomous vehicles and freights[13]. Texas, on the other hand, requires a "natural person" riding in the vehicle[14]. Until last year, no AV testing could be carried out in New York due to safety regulations. In October, the state passed legislation that allows for AV testing and began accepting license applications from autonomous technology firms. This year, Cruise Automation and GM anchored their AV technology tests in New York, where mapping has begun in a geofenced area. And, in Miami, Florida, Ford is working with local business to test commercial deliveries with AVs.[15]

"Without a national regulatory framework for autonomous vehicles, states have become laboratories not just for the technology itself but also for the rules emerging to shape it."

Alison Snyder, a reporter at Axios

While regulations around safety and testing are the biggest hurdles for AVs in the U.S., the deployment of 5G will also play a critical role in bringing AVs to consumers. Over 20 states have enacted legislation to streamline small cell installation,[16] while others are concerned about health issues and vehicle aesthetics.[17] With the Federal Communication Commission's recent decision to limit local governments to a 90-day review of small cell applications and capping the fees they can charge companies for installation, states and cities are pushing back[18] – further hampering the country's adoption of nationwide 5G capabilities.

U.S. Conclusions

With a patchwork of state policies across the country and a race to get AVs on the road, companies are continuing to seek out the best markets for testing AVs. However, the lack of a cohesive national framework to support AV deployment could hinder the U.S.'s position in the global race, reducing current efforts to little more than extended testing programs. Until Congress and the

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[8] FTI survey conducted in December 2018 – for more information please contact FTI Consulting D.C. office

[9] http://energyfuse.org/autonomous-vehicle-exemptions-explained/

[10] http://www.ncsl.org/research/transportation/autonomous-vehicles-self-driving-vehicles-enacted-legislation.aspx

[11] https://www.mercurynews.com/2018/10/30/waymo-to-begin-testing-driverless-cars-in-california/?utm_source=newsletter&utm_medium=email&utm_campaign=newsletter_axiosautonomousvehicles&stream=autonomous-vehicles

[12] https://www.brookings.edu/blog/techtank/2018/05/01/the-state-of-self-driving-car-laws-across-the-u-s/

[13] https://www.denverpost.com/2017/06/29/self-driving-beer-truck-world-record/

[14] https://www.brookings.edu/blog/techtank/2018/05/01/the-state-of-self-driving-car-laws-across-the-u-s/

[15] https://www.axios.com/newsletters/axios-autonomous-vehicles-ee5fd907-f8e6-4752-818d-114e26facc4c.html

[16] https://www.politico.com/newsletters/morning-tech/2018/09/20/the-race-to-5g-345764

[17] https://www.adweek.com/digital/fcc-ruled-against-u-s-cities-to-speed-5g-deployment/

[18] https://www.adweek.com/digital/fcc-ruled-against-u-s-cities-to-speed-5g-deployment/

administration put AV policy at the top of its docket, the U.S. will continue to lag behind Europe, and states will simply remain as fertile testing grounds for unmanned vehicles.

EUROPEAN UNION

Europe's automotive industry is the world's second largest producer of motor vehicles, behind only China[19]. The industry provides over 13 million jobs and the turnover generated by the automotive sector represents 6.8% of EU GDP. It is also the largest private investor in R&D, with almost €54 billion invested annually.[20]

With that said, the European auto industry is arguably facing its toughest challenges to date. Aside from regulatory burdens and market disruptions, European OEMs are still reeling from "Dieselgate" in 2015, and subsequent scandals. More than ever, they must regain consumer trust while reinventing their business models and positioning themselves as a solutions provider to Europe's most critical mobility challenges, including air quality and the associated public health concerns.

In the EU, AVs are touted as the future of urban mobility. The AV market is expected to grow exponentially with revenues exceeding €620 billion by 2025 for the EU automotive industry and €180 billion for the EU electronic sector[21]. However, up until now, the EU has not provided any legislation that addresses AVs directly, only legislating on connectivity and intelligent transport systems. In the meantime, some Member States have adopted legislation to move forward on AV testing, risking policy fragmentation within the EU and creating uncertainty for industry. To alleviate this issue, the European Commission has now made AVs one of their top priorities, as evidenced by the publication of the Connected and Automated Mobility (CAM) Strategy on 17 May 2018, as part of Europe on the Move.

"By producing key technological solutions at scale… we will also get closer to a triple zero: emission, congestion and accidents."

Maroš Šefčovič, Vice President for the Energy Union

While the Strategy is not a legislative document, it outlines what the EU intends to accomplish in this area in the short to medium-term. Mainly, the Commission will focus on safety, connectivity, liability, ethics and data access. Related to the Strategy, the Commission has gathered public and industry comments to develop a Recommendation on CAM to be published in early 2019, which will set out the guidelines informing future

legislation in the areas of cybersecurity, data, and the use of 5G commercial bands.

Established funding is another example of the Commission's commitment to connected and automated mobility. Up to €450 million is available under the Connecting Europe Facility to foster the digitalisation of transport. Further, the European Union recently allocated a €300 million budget for AV innovation and research[22], and in the next 7-year EU budget (2020-2027), establishment of a new partnership is foreseen to ensure a consolidated approach towards research and pre-deployment.

However, two main factors are currently affecting EU policymaking around CAM. First, there are three different departments in the Commission with competency over CAM (transport, digital and internal market). Although there are efforts to coordinate and collaborate, the process is quite political and bureaucratic. Largely, issues are being dealt with in a piecemeal approach, thus broader and more comprehensive alignment will be required to ensure EU legislation that is conducive for large scale deployment of AVs.

Secondly, there is not yet a legal framework at EU level on key and potentially contentious issues such as liability, data flows, privacy and cybersecurity. In fact, a request was made by some Parliamentarians in May 2018 asking for new EU rules on the sharing of car data to allow service providers, such as app developers and maintenance companies, to operate services[23]. However, given the upcoming EP elections, the Commission is only expected to legislate on the issue in its next term.

Another contentious issue is the recent battle on whether AVs in the EU will use Wi-Fi or 5G technology. The Commission recently published a delegated act defining detailed measures on connectivity, and has chosen to start with Wi-Fi, as it is currently seen as the more developed and widely available technology. The Commission wants to ensure interoperability, so that once 5G becomes available, new AVs can use the technology while remaining interoperable with older AVs that use Wi-Fi. However, some argue that the legislation is written in such a way that when the cellular technology becomes mature, it actually forces conformity with the older technology instead of the other way around. The Commission is still hammering out the details with stakeholders before finalising.

With regards to ethics, another question mark remains. The EC has established a high-level Expert Group on Artificial Intelligence, which published the AI Ethical Guidelines[24], providing a comprehensive approach on ethical issues, including for autonomous systems. Member States have also established a dedicated Task Force focusing on ethics. The EC is leveraging

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[19] https://www.acea.be/statistics/tag/category/world-production
[20] https://www.acea.be/automobile-industry/facts-about-the-industry
[21] https://ec.europa.eu/transport/sites/transport/files/3rd-mobility-pack/com20180283_en.pdf
[22] https://ec.europa.eu/transport/sites/transport/files/3rd-mobility-pack/com20180283_en.pdf

[23] MEPs Ismail ERTUG (S&D, DE), István UJHELYI (S&D, HU), Henna VIRKKUNEN (PPE, FI), Karima DELLI (Verts, FR) and Daniel DALTON (ECR, UK) were the ones who addressed the letter to the European Commission.
[24] https://ec.europa.eu/digital-single-market/en/news/draft-ethics-guidelines-trustworthy-ai

the work of the Task Force by creating a Forum, working in collaboration with the European Group on Ethics in Science and New Technologies and the European AI Alliance, to facilitate discussions at the EU level. This approach has the support of the Parliament, which has already called for the development of ethical guidelines in its non-legislative report on autonomous vehicles.

Companies are also beginning to address the issue of ethics by forming ethical oversight committees. These groups are high-level governance bodies often reporting directly to CEOs, which showcase their importance and high-profile within the company.

But many questions - from data access and liability to ethical issues - remain unanswered as the EC further develops the legislative framework to regulate AVs. From 2019 onwards, we can expect the EC to work towards finalising the legislative framework. This has already been alluded to in the Graz Declaration[25] signed off by Member States' Transport and Environment Ministers on 30 October 2018, which calls for a new Mobility Package by 2021. In this context, the European institutions will require significant and coordinated input from industry.

Member States

In the past several years a number of EU Member States have implemented country-wide AV regulations focused on testing, invested into AV R&D and, have started looking into the ethical questions posed by autonomous mobility. For example, Germany published the world's first AV ethical guidelines in 2017 the Netherlands passed a legislation allowing driverless testing of AVs, and the Baltic countries are establishing an experimental 5G cross-border AV testing corridor[26].

By prioritising infrastructure connectivity, and launching pilot programs, Europe is leading with regards to a coordinated approach to AV testing.

EU Conclusions

In time for the EU Parliamentary elections in May 2019, the EU should have adopted legislation on connectivity (5G vs Wi-Fi) and developed the broader Connected and Autonomous Mobility Recommendation, which will guide the next legislature.

To ensure that the development of legislation is well coordinated, it is rumored that the next College of Commissioners will have a dedicated "Mobility" Commissioner. Although we can expect a legislative lull in the second half of 2019, it is clear that the EU is putting the necessary framework in place now to address the tough issues post elections.

ASIA

Asia is home to the world's largest automotive market with Chinese dominance in the last decade. As Asia is projected to accommodate a burgeoning population in the coming decades, the adoption of AVs is critical in relieving strains t on infrastructure and resources.

Singapore

The Singapore government has identified the deployment of AVs as part of the Smart Urban Mobility project - one of the six key Strategic National Projects under its "Smart Nation" strategy.[27]

Unlike some other countries where private-sector tech giants or automakers are driving the research and development of AV technology, it is the Singapore government that is taking the lead in the innovation challenge. There are ongoing government efforts, together with foreign and local businesses and research institutions, conducting trials on public roads of self-driving vehicles, with the aim of eventually deploying them for public transport and other uses. Currently, fourteen self-driving cars are being tested on lightly-used public roads in Singapore under stringent regulations such as, having a safety driver on board and having a black box data recorder installed in the vehicle.[28] To underpin the government's ambition, in February 2017 the parliament adopted amendments to the Road Traffic Act (Road Traffic Act) to introduce rules for testing on public roads.[29]

"The technology for autonomous vehicles is about 80% developed, leaving 20% yet to be accomplished. Solving the problems that remain is going to be harder than the first 80%".

Pang Kin Keong, Permanent Secretary at the Ministry of Transport and Chairman of the Committee on Autonomous Road Transport for Singapore (CARTS)

The government aims to begin limited deployment of autonomous vehicles for consumer use in the coming four to five years, starting with a few buses deployed in newer areas so that Singaporeans can get a feel of what transporting with autonomous vehicles will be like. The Singapore government in January 2019 released a set of provisional national standards, known as Technical References 68 (TR 68), to guide and promote the safe deployment of fully driverless vehicles in Singapore.[30] The standards cover four areas – vehicle behavior, vehicle functional safety, cybersecurity and data formats.

[25] https://www.eu2018.at/latest-news/news/10-30-Graz-Declaration.html
[26] https://ec.europa.eu/digital-single-market/sites/digital-agenda/files/cam_1.jpg
[27] https://www.smartnation.sg/newsroom/press-releases/page/2
[28] https://www.straitstimes.com/politics/parliament-14-autonomous-vehicles-currently-being-tested-on-roads-with-low-traffic

[29] https://www.straitstimes.com/singapore/new-rules-for-autonomous-vehicles
[30] https://www.lta.gov.sg/apps/news/page.aspx?c=2&id=8ea02b69-4505-45ff-8dca-7b094a7954f9

Japan

Japanese Prime Minister Shinzō Abe has identified autonomous driving and artificial intelligence as key innovations to drive economic growth amid Japan's greying society. The Abe Cabinet issued the "Future Investment Strategy 2018" in June 2018 towards the realisation of "Society 5.0".[31] The strategy delved into the establishment of next generation mobility systems- including automated driving as a priority area- unveiling government plans to begin testing a driverless car system on public roads with the goal of launching self-driving cars before the 2020 Tokyo Olympics. The Japanese government aims to commercialise the system as early as 2022. The Cabinet Secretariat issued the "Charter for Improvement of Legal System and Environment for Autonomous Driving Systems" in April 2018, which summarises the government's policies on the implementation of automated driving by 2020.

In Japan's mobility space, high-profile partnerships form the engine driving innovation of AVs. Baidu[32], Nissan and General Motors[33] are the major foreign players that have collaborated with Japanese companies in 2018 to test driverless vehicles in Japan.

In December 2018, Japan's National Police Agency unveiled a draft bill stipulating revisions to the nation's road traffic law. The draft bill, which categorized AVs into a number of levels depending on autonomous features, included an initial test for AVs with a high level of autonomous features (Level 3 AVs) to run on public roads. The draft rules, which have been released for public feedback before a bill is submitted to the Diet in early next year, will also oblige each vehicle to have a "black box" that stores all driving data for the car. Like for many other countries, legal issues and the implementation of new safety regulations remain the key challenge. Japanese consumers are also found to be skeptical of AV technology; this skepticism may likely be an obstacle for widespread consumer acceptance and adoption of AVs in the future.

South Korea

South Korea also has large ambitions for AV technology; the country drastically slashed red tape to allow autonomous vehicles with issued licenses to operate on public roads and has launched an 88-acre facility site called "K-City" that it claims will be the largest test bed for autonomous driving in the world.[34]

So far, provisional permits have been granted for forty-six vehicles from seven players, including Hyundai Motor, Kia Motors, Audi-Volkswagen and the Seoul National University.[35] The government most recently revealed plans to establish a "smart" traffic system and detailed road maps for self-driving cars.[36] A proof-of-concept project to develop autonomous buses and trucks and an accompanying monitoring system with high-definition mapping and vehicle-to-everything support is also underway and will last until 2021.[37]

China

Being a global market leader in the automobile industry and in internet technologies, China has identified autonomous cars as one of the key sectors in its "Made in China 2025" programme. The country has an ambitious roadmap for driverless cars. According to a blueprint by the Ministry of Industry and Information Technology and China's Society of Automotive Engineers, China aims for half of cars sold to have some form of autonomy by 2020 and 10% of cars to be fully autonomous by 2030.

In April 2018, the country's Ministry of Industry and Information Technology, the Ministry of Public Security and the Ministry of Transport jointly issued China's first national guidelines for testing self-driving cars, "Intelligent and Connected Vehicle Test Management Practices", which permit individual Chinese cities to develop standards that allow for on-the-road testing of AVs on public roads. The guidelines are expected to facilitate accelerated development of autonomous driving in China with Chinese internet giants Baidu, Tencent and Alibaba already jumping onboard to test AV technologies in Chinese cities.

> *"2018 marks the first year of commercialization for autonomous driving. From the volume production of Apolong, we can truly see that autonomous driving is making great strides."*
>
> *Robin Li, Baidu Chairman and CEO on the production of the 100th Apolong vehicle.*

China is relatively late to the game in Asia to issue national guidelines for testing self-driving cars, but the speed with which it has caught up in the last year is remarkable, and with increasing investments in the sector, the potential for China to surge ahead in the global AV race looks promising.

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[31] https://www.kantei.go.jp/jp/singi/keizaisaisei/pdf/miraitousi2018_en.pdf
[32] https://www.bloomberg.com/news/articles/2018-07-04/baidu-unveils-ai-chip-as-it-revs-up-self-driving-bus-production
[33] http/www.japantimes.co.jp/news/2018/10/04/business/tech/honda-teams-gms-cruise-start-develop-autonomous-vehicles/#.W9KE3HszZxA
[34] http://www.koreaherald.com/view.php?ud=20171106000459

[35] http://english.yonhapnews.co.kr/news/2018/06/17/0200000000AEN20180617003000320.html
[36] http://world.kbs.co.kr/service/news_view.htm?lang=e&Seq_Code=135015
[37] https://www.zdnet.com/article/south-korea-to-trial-autonomous-public-transport/

The country's impending prominence will be aided by its pioneering efforts in other technologies critical to the success of AVs, such as 5G and AI. Strong government backing, and positive public perception of AV technology puts China in good stead to accelerate the country's development and widespread adoption of the technology.

Asia Conclusions

Singapore, Japan, Korea and China are all firmly committed to join the global race with guiding regulations and government-set timelines on AV development and deployment in the next five to ten years. Recent news of Japan and China cooperating on setting international standards for self-driving technology may set a trend for regional collaboration at the governmental level, accelerating even further Asia's progress towards next-generation vehicles.[38]

UNITED NATIONS

The United Nations Economic Commission for Europe (UNECE) is actively working to update UN policy together with industry stakeholders as AV technology advances. Under the UNECE, working parties (WP) specialising in AV issues have been established. The UNECE World Forum for Harmonisation of Vehicle Regulations – WP.29 – based in Geneva Switzerland, offers a unique framework for globally harmonised regulations on vehicles in areas such as road safety, environmental protection, trade, and more recently, CAM issues.

At its February 2018 session, the Inland Transport Committee (ITC) acknowledged the importance of WP.29 activities related to CAM and requested that they consider establishing a dedicated subsidiary Working Party. Following ITC's request, WP.29 decided to convert the Working Party on Brake and Running Gear (GRRF) into the Working Party on Automated/Autonomous and Connected Vehicles (GRVA) and to reallocate some former GRRF activities (tyres, coupling and tank vehicles) to other Working Parties.

The GRVA has only recently begun its work and is currently moving towards a non-regulatory approach on AV-specific issues (i.e., guidance). Although the ultimate goal is global harmonisation, there is concern with setting regulations now that aren't future-ready. However, the GRVA will play a critical role in setting global standards in the future and companies should be monitoring/participating in this important Working Party.

CONCLUSIONS

While companies in a range of sectors, from automotive and digital to insurance, are already moving into the AV space, the key current global trend is legislative uncertainty, which will most likely continue to be an issue in the coming years. This uncertainty reflects itself at national and global level. Nationally, the complex issues which AVs bring to the table, in relation to potential impact on a broader societal level, such as on jobs and ethics, means that policymakers will most likely be cautious when legislating. This will result in delaying some of the more controversial decisions until AVs are more developed and closer to full autonomy. Globally, with different countries at different levels of regulatory development in this field, multinational businesses could face increased costs to ensure their products comply with divergent regulatory requirements.

Regulatory divergence can already be observed on a global level, with China choosing 5G and the U.S (and most likely the EU too) starting with wi-fi as a clear example. Lack of harmonisation could therefore act as a trade barrier, leaving different countries in their "AV silos". UN's WP29 Working Group should, in the long term, prevent this from happening, but the question is how fast and how well it can work together to reach consensus.

Automated driving is one of the cutting-edge technologies reshaping our world, and a priority on the global level as it is critically important to enable a vision of zero fatalities, zero congestion and zero emissions. Given the scale and complexity of AV deployment, regulation will be required to guide our behavior and ensure the rule of law. However, in this fourth industrial revolution, innovation is often developing faster than regulators can keep up with. To a certain extent, it will be up to companies to proactively work with regulators, with each other, and with a clear foundation of values to ensure positive outcomes in such a complex environment. A global harmonised approach, including consumer awareness and education, will be necessary to ensure wide-spread adoption of AVs

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[38] https://asia.nikkei.com/Economy/Trade-War/China-s-self-driving-game-plan-shuns-US-partners-for-Japan

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