DENTONS

2025 Global Guide to Autonomous Vehicles

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Dentons' Global Autonomous Vehicles group

The Dentons Global Autonomous Vehicles Group partners with organizations around the globe to understand and leverage international, national, regional, and local laws and regulations to drive forward the development, deployment, and commercialization of autonomous vehicles. The Dentons team offers a full array of corporate, investment, technology, regulatory, transactional, and litigation support to the autonomous mobility ecosystem, including to start-ups, emerging companies, multinational vehicle manufacturers, technology firms, insurance organizations, and financial institutions.

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Questions?

If you have questions about the guide or the sector overall, please feel free to contact the leaders of our Global Autonomous Vehicles group, found below.

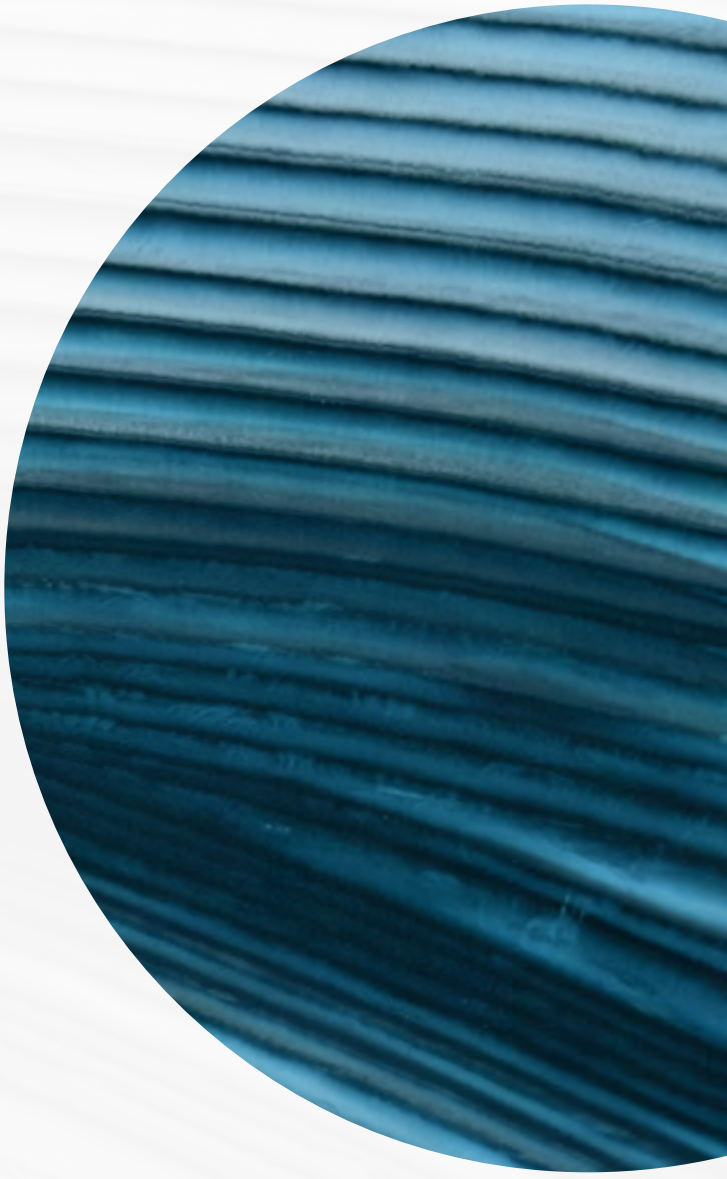
Eric Tanenblatt
Co-leader, Global Autonomous Vehicles and Principal, Washington DC and Atlanta
eric.tanenblatt@dentons.com

Michael Malterer
Partner, Munich
michael.malterer@dentons.com

Peter Stockburger
Co-leader, Global Autonomous Vehicles and Partner, San Diego
peter.stockburger@dentons.com

Executive Summary

As the global autonomous vehicles market continues to evolve and be shaped by advancements in artificial intelligence and robotics, so too has the legal and regulatory landscape governing their development and deployment. Autonomous vehicles are poised to materially impact how we collectively think about transportation, mobility, and smart cities. Yet widespread deployment and adoption remain delayed due to regulatory headwinds, public hesitation, and technological challenges. What is next for the future of autonomous vehicles globally?



This 2025 Global Autonomous Vehicles Report surveys the current global landscape for autonomous vehicles, providing a comprehensive overview of the current state of autonomous vehicle laws, regulations, and developments in the following jurisdictions:

- Austria
- Canada
- China
- Germany
- Hungary
- India
- Japan
- South Korea
- Switzerland
- United Kingdom
- United States

Austria

1. What are the latest autonomous vehicle developments in Austria?

Austria is actively advancing autonomous vehicle (AV) technology, focusing on pilot projects and regulatory development.

- Currently, only partially automated driving (SAE Level 2)[1] is permitted. Drivers must monitor and control the vehicle at all times.
- Fully autonomous vehicles (SAE Level 3) are restricted to test operations, with no commercial applications allowed.
- As of May 2024, 65 test certificates for autonomous vehicle trials have been issued.
- Notable projects include an autonomous shuttle bus operated by SURAAA in Klagenfurt and an autonomous taxi trial in Woergl launched in September 2024.

2. Is Austria experiencing any roadblocks regarding autonomous vehicle development and deployment?

Austria faces several challenges in its AV initiatives:

- **Regulatory Restrictions:** The current legal framework does not permit advanced automated driving (SAE Levels 3 or 4). Adjustments are necessary to enable commercial deployment.
- **Public Concerns:** Liability, safety, and public acceptance remain critical barriers.
- **Technological Integration:** Infrastructure upgrades, such as C-ITS systems (Cooperative Intelligent Transport Systems), are required to support more sophisticated AV functions.

3. Are there any recent updates in the cybersecurity/privacy space related to autonomous vehicles?

Austria aligns its data protection laws with EU standards, particularly regarding the privacy challenges of AVs.

- Vehicles are required to implement safeguards such as black boxes (event data recorders) under EU Regulation 2019/2144.
- Strengthened cybersecurity measures ensure the safe transmission of data between vehicles and infrastructure.

4. Are there any recent updates in the 5G space related to autonomous vehicles?

The expansion of Austria's 5G network is progressing rapidly, with 92% coverage achieved by 2024.

- By 2025, nationwide 5G coverage is expected, enabling critical AV features like real-time vehicle-to-infrastructure (V2I) communication.
- Intelligent infrastructure, such as communicative traffic lights and smart road signs in regions like Carinthia, supports AV testing and operations.

1 The Society of Automotive Engineers (SAE) defines 6 levels of driving automation ranging from 0 (fully manual) to 5 (fully autonomous). These levels are largely adopted by various regulators globally.

5. Have any new laws/regulations been passed within the last year that have affected the deployment of autonomous vehicles?

Significant legal updates in 2025 include:

- The Third Amendment to the Automated Driving Regulation (AutomatFahrV):
  - Unified and expanded use cases for autonomous driving.
  - New provisions for highway safety vehicles and standing passengers in autonomous transport.
  - Increased speeds and passenger capacity in test vehicles.
- EU Regulation 2019/2144 mandates that all newly registered vehicles feature advanced driver-assistance systems, including emergency braking, lane-keeping assist, and black boxes.

6. What advancements in autonomous vehicles should we expect in Austria in 2025?

In 2025, Austria is poised for further progress:

- Anticipated legal updates could enable SAE Level 3 vehicles for commercial use.
- Expanded pilot projects, particularly in autonomous public transport and urban mobility.
- Continued investments in intelligent infrastructure and nationwide 5G rollout will further position Austria as a leader in AV innovation.

Author

Michael Malterer
Partner, Munich
michael.malterer@dentons.com

Canada

1. What are the latest autonomous vehicle developments in Canada for 2025?

In February 2024, the Canadian federal government announced an $8-million investment for the Ontario Centre of Innovation, through the Ontario Vehicle Innovation Network ("OVIN"), to create two world-class live-environment piloting sites in southern Ontario for the development and commercialization of new transportation technologies. The first location is in Toronto, Ontario focusing on urban transportation, while the other is in Windsor/Sarnia, Ontario focusing on cross-border and multi-modal scenarios. These sites will serve as a launch pad for over 40 small or medium-sized enterprises as they pilot and commercialize over 40 new technologies, predominantly within the Zero Emission Vehicles and Connected and Autonomous Vehicle areas.[1]

In March 2024, Tesla announced that its Full Self-Driving subscription would be released in Canada.[2] The company claims this software does not make its vehicles autonomous and requires active driver supervision.[3] The software assists the vehicle with steering, accelerating, and braking for other vehicles and pedestrians within its lane, working alongside features like emergency braking, collision warning and blind-spot monitoring.[4]

2. Is Canada experiencing any recent roadblocks regarding autonomous vehicle developments?

See question 5 below.

3. Are there any recent updates in the cybersecurity/privacy space related to autonomous vehicles?

In May 2024, the Ontario government introduced Bill 194, the *Strengthening Cyber Security and Building Trust in the Public Sector Act, 2024*.[5] The Act aims to regulate the use of AI within the public sector and to reform the *Freedom of Information and Protection of Privacy* Act ("FIPPA"). The Act received royal assent on November 25, 2024.[6] The Act requires certain public entities using AI systems to provide public information about their use, develop accountability frameworks, manage associated risks, ensure oversight and transparency, and comply with the relevant restrictions or prohibitions. This framework is expected to shape the future use of autonomous vehicles by public-sector institutions regulated under the FIPPA and the *Municipal Freedom of Information and Protection of Privacy Act*, such as transit commissions and health boards. By establishing strict requirements for transparency, risk management, and accountability, the Act provides public entities with a framework for the responsible deployment of autonomous vehicles.

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1 Government of Canada, Government of Canada supports establishment of two world-class automotive and mobility technology piloting sites (February 22, 2024).
2 Karandeep Oberoi, "Canada to get long-awaited Tesla Full Self-Driving subscription in the 'coming weeks'" (March 11, 2024) <https://mobilesyrup.com/2024/03/11/tesla-full-self-driving-subscription-coming-to-canada/> .
3 Reuters, Tesla cuts Full Self-Driving subscription prices in US, Canada <https://www.reuters.com/business/autos-transportation/tesla-cuts-full-self-driving-subscription-prices-us-canada-2024-04-12/> (April 12, 2024).
4 Tesla, Autopilot and Full Self-Driving (Supervised) <https://www.tesla.com/en_ca/support/autopilot#usingautopilot>.
5 Legislative Assembly of Ontario, "Bill 194" (May 13, 2024).
6 Legislative Assembly of Ontario, "Bill 194, Strengthening Cyber Security and Building Trust in the Public Sector Act, 2024 - Legislative Assembly of Ontario."

4. Are there any recent updates in the 5G space related to autonomous vehicles?

As part of a multi-year 5G network slicing partnership between Rogers Communications, a Canadian telecommunications company, and Ericsson, a Swedish multinational networking and telecommunications partnership, the two companies have deployed Canada's first Ericsson Private 5G network at a mine in Sudbury, Ontario, paving the way for smart mines in the future.[7] 5G connectivity in mines enable safer, more productive, and sustainable mining by allowing mines to leverage autonomous vehicles, remote-controlled drilling, and advanced Internet of Things ("**IoT**")[8] applications – all features that Wi-Fi alone cannot provide.

At the Mobile World Congress held in Barcelona in February 2024, American multinational digital communications technology conglomerate Cisco, and Canadian telecommunications company Telus Corporation, announced their partnership to launch new 5G capabilities in North America to serve IoT use-cases, with a particular emphasis on connected cars.[9] Telus and Cisco plan for their 5G network to allow the original vehicle manufacturers to leverage Telus' wireless network for 5G enabled telematics, infotainment applications and network services, and subscription Wi-Fi services to customers.

5. Have any new laws/regulations been passed within the last year that have affected the deployment of autonomous vehicles?

Section 303.2 of the *Motor Vehicle Act* (British Columbia) came into effect in April 2024, prohibiting a person from driving or permitting the driving of vehicles with Level 3 autonomy or higher on public roads.[10] This legislative development is meant to protect pedestrians and cyclists. However, there is an exception for vehicles that are part of a government-approved pilot project.[11] Pursuant to an addition to B.C. Reg. 26/58, a breach of the offence of driving or permitting the driving of Level 3, 4, and 5 automated vehicles will result in a penalty of 3 points being recorded.[12] Pursuant to an addition to B.C. Reg. 89/97, a contravention of the *Motor Vehicle Act* (British Columbia) may result in a fine ranging from $48 to $368.[13] Other penalties include 6 months of imprisonment.[14]

6. What advancements in autonomous vehicles should we expect in Canada in 2025?

In November 2024, the Canadian federal government announced the e-Auto Challenge program, expected to launch in mid-2025. This new program aims to fund the research and development of zero-emission auto technologies in Canada.[15] The National Research Council of Canada invites stakeholders across the light-duty automotive supply chain, including researchers, academic institutions, not-for-profits and Indigenous governments and organizations, to collaborate in

7 Mining.com, "JV Article: How Ericsson technology, Rogers 5G connectivity at NORCAT lay the foundation for smart mines of the future" <https://www.mining.com/joint-venture/jv-article-how-ericsson-technology-rogers-5g-connectivity-at-norcat-is-the-foundation-for-smart-mines-of-the-future/> (November 15, 2024).

8 IoT refers to devices with sensors, processing abilities, software and other technologies that connect and exchange data with other devices and systems over the Internet or other communication networks.

9 Cisco, "Cisco and TELUS Pave the Road for Enhanced Connected Car Experiences and New Revenue Opportunity for Carmakers" <https://investor.cisco.com/news/news-details/2024/Cisco-and-TELUS-Pave-the-Road-for-Enhanced-Connected-Car-Experiences-and-New-Revenue-Opportunity-for-Carmakers/default.aspx> (February 26, 2024).

10 Motor Vehicle Act, RSBC 1996, c 318, s. 303.2. Also see: Government of British Columbia, "Automated (self-driving) vehicles" (April 4, 2024).

11 Electric Autonomy Canada, B.C. bans Level 3 and above road autonomy <https://electricautonomy.ca/automakers/autonomous-vehicles/2024-04-18/b-c-level-3-autonomy-ban/> (Apr 18, 2024). See also: Government of British Columbia, "Automated (self-driving) vehicles" (April 4, 2024).

12 Motor Vehicle Act Regulations, B.C. Reg. 26/58, Division 28, Table 2.

13 Violation Ticket Administration and Fines Regulation, BC Reg 89/97, Schedule 3.

14 Government of British Columbia, "Automated (self-driving) vehicles" (April 4, 2024).

15 National Research Council Canada, "e-Auto Challenge program" (November 20, 2024).

advancing innovative electric vehicle technologies. One of the program's areas of focus is connected and autonomous vehicle systems, signaling the government's commitment to facilitating the development of autonomous technologies. The e-Auto Challenge is open to collaborating with stakeholders and suppliers across Canada, but places a particular emphasis on supporting Southern Ontario, where a critical mass of the automotive industry is concentrated.[16] This initiative is part of Canada's broader goal to achieve 100% zero-emission vehicle sales for all new light-duty vehicles by 2035.[17]

7. Aside from Robotaxis, do you see any other developments in the commercial space regarding AVs, including farming, commercial trucking, food delivery, etc.?

Alberta

In July 2024, Calgary-based Suncor Energy Inc. reported deploying 35 autonomous haulage systems trucks in its oil-sands mining operations. Suncor states that the deployment is on track with the plan for 91 trucks to be active by the end of 2024.[18]

British Columbia

In October 2024, Cellula Robotics, an autonomous underwater vehicle ("AUV") company headquartered in Burnaby, British Columbia, expanded to Dartmouth, Nova Scotia in response to the growing demand for the company's AUVs in the commercial offshore energy and subsea security sectors.[19] The company develops hydrogen fuel cell powered AUVs for long-range, multi-month autonomous missions for clients in the defence, mineral exploration and oil and gas industries.[20]

Manitoba

In December 2022, the Winnipeg Richardson International Airport became the first airport in North America to offer its passengers autonomous wheelchairs. Initially, the wheelchairs would transport the passenger from the check-in counter, through security, to the boarding gate. In 2024, the wheelchairs have been programmed to accommodate access to restrooms or coffee shops. Since the launch of the self-driving wheelchair service, more than 2,100 passengers have benefited from its use.[21]

Ontario

In October 2024, the Ontario government introduced a framework for a 10-year Automated Commercial Motor Vehicle ("ACMV") Pilot Program.[22] The pilot program may be implemented through a new regulation under the *Highway Traffic Act*. The framework applies to trucks weighing over 4,500 kilograms and focuses on the capabilities and safety of heavy-duty commercial vehicles with Levels 3, 4, and 5 automation. Participating ACMVs are able to engage in commercial activity during the pilot testing without paying any regulatory costs. The government's aim is to improve road safety and the movement of goods while supporting the province's growth in the AI sector.[23] There are various "streams" of testing, based on the SAE International ("SAE") level of autonomy for the vehicle. Stream #1 is mainly targeted at, but not restricted to, SAE Level 3 autonomy vehicles, for which case a driver must be present in the driver's seat and be prepared to

16 Electric Autonomy, "Canada announces e-Auto Challenge program" <https://electricautonomy.ca/ev-supply-chain/2024-11-26/canada-e-auto-challenge-program/> (November 26, 2024).
17 Transport Canada, "Canada's Zero-Emission vehicle sales targets" (October 28, 2024).
18 Suncor, "Growing the largest autonomous fleet in Canada" (July 10, 2024).
19 Design Engineering, "B.C.'s Cellula Robotics expands AUV operations into N.S." <https://www.design-engineering.com/bc-cellula-robotics-expands-auv-operations-into-ns-1004044190/> (October 30, 2024).
20 Cellula, "Products" <https://www.cellula.com/all-auv-products>.
21 Winnipeg Airports Authority, "On the move with our accessibility partner WHILL" <https://www.ywg.ca/en/newsroom/view/190/on-the-move-with-our-accessibility-partner-whill/> (February 21, 2024).
22 Environmental Registry of Ontario, "Automated Commercial Motor Vehicle Pilot Program" (October 16, 2024).
23 Ontario's Regulatory Registry, "Proposed framework for an Automated Commercial Motor Vehicle (ACMV) Pilot Program" (October 16, 2024).

engage the vehicle as necessary. Stream #2 applies to vehicles with SAE Level 4 or 5 autonomy. In this case, there will be no driver, and this level of testing requires an assistant to be ready to provide oversight of the ACMV, either from within the vehicle or from a different location in Ontario.

Quebec

In July 2023, FPInnovations, a Quebec-based private not-for-profit research and development organization, has partnered with Maryland autonomous truck technology provider Forterra to address staffing challenges in the logging industry. This partnership will continue in 2024 and beyond. The two companies are testing autonomous truck platoons on off-highway logging routes in a Northern Quebec forest to transport logs safely and efficiently from the forest to the mill. A key goal is to adapt autonomous driving technology to Canada's unique conditions, including polar climates and rural areas without wireless coverage.[24] One of the "greatest commercial use cases" of autonomous off-road technology is in forestry, "in areas where you have a lack of human resources or where they're incredibly remote and it's just hard to get people to do the jobs," says Gabe Sanga, head of commercial growth of Forterra.[25]

8. Have any AI laws impacted deployment?

The *Artificial Intelligence and Data Act* ("AIDA") was introduced as part of Bill C-27, the Digital Charter Implementation Act of 2022. Still in its bill stage, the AIDA has not yet affected the deployment of autonomous vehicles but is anticipated to have an impact once enacted. The AIDA aims to establish nationwide standards for the design, development and use of AI systems, and prohibit certain conduct that may cause harm to individuals. It is designed specifically to regulate "high-impact" AI systems, including systems critical to health and safety, such as autonomous driving systems.[26] In November 2023, the Minister of Innovation, Science and Industry proposed amendments to update the definition of "high-impact" to include seven distinct classes: employment-related decisions; the provision of services; the processing of biometric information; the moderation and prioritization of search engine or social media content; healthcare and emergency services; courts and administrative decision makers; and law enforcement.[27] While the proposed amendments do not specifically address autonomous vehicles, they have the potential to impact the deployment of autonomous vehicles in public and commercial services.

The 2024 Canadian federal budget dedicates $2.4 billion in AI-focused investments to solidify Canada's AI advantage,[28] supporting the development of technologies like autonomous vehicles. The funding starts in 2024 through 2025. This includes $2 billion over five years to launch the AI Compute Access Fund and Canadian AI Sovereign Compute Strategy, which aims to provide Canadian researchers, startups and businesses with the computational power needed to compete globally. $200 million will support AI startups and accelerate the adoption of new technologies in sectors such as manufacturing and clean technology. The National Research Council's AI Assist Program will receive $100 million over five years to help small and medium sized businesses develop and implement AI solutions, including those in the autonomous vehicle sector. Lastly, $50 million over four years will support workforce training for those impacted by AI, ensuring workers in industries such as automotive and transportation are equipped for the

24 FPInnovations, "News release – FPInnovations announces the successful completion of the baseline tests of the truck platooning project" <https://web.fpinnovations.ca/fpinnovations-announces-the-successful-completion-of-the-baseline-tests-of-the-truck-platooning-project/> (July 18, 2023).

25 Truck News, "Autonomous trucks cutting a path in forestry sector" <https://www.trucknews.com/technology/autonomous-trucks-cutting-a-path-in-forestry-sector/1003179602/> (November 13, 2023).

26 Canada, "The Artificial Intelligence and Data Act (AIDA) - Companion document".

27 Parliament of Canada, "Correspondence from the Honourable Francois-Philippe Champagne, Minister of Innovation, Science and Industry – Amendments to AIDA" (November 28, 2023).

28 Canada, "Budget 2024".

changes brought by AI advancements, including autonomous vehicles.

The budget also proposes allocating $50 million over five years, beginning in 2024-2025, to establish the AI Safety Institute of Canada, to focus on ensuring the safe development and deployment of AI technologies.

Authors

Michael Ledgett
Partner, Toronto
michael.ledgett@dentons.com

Amer Pasalic
Partner, Toronto
amer.pasalic@dentons.com

Helen Wang
Articling Student, Toronto
helen.wang@dentons.com

Oliver Nam
Articling Student, Toronto
oliver.nam@dentons.com

China

1. What are the latest autonomous vehicle developments in China for 2025?

In 2024 saw many significant developments relating to AVs in China.

The Ministry of Transport and the National Development and Reform Commission jointly released the "Action Plan for Reducing Costs, Improving Quality and Increasing Efficiency in Transportation and Logistics," promoting intelligent and connected vehicle access and pilot operations, focusing on key regions like the Yangtze River Delta and the Guangdong-Hong Kong-Macao Greater Bay Area. Multiple departments, including the Ministry of Industry and Information Technology, have supported the industry's growth through events such as the 2024 World Intelligent and Connected Vehicles Conference and issuing application pilot notices. Over 50 cities across the country have carried out road testing demonstrations, with 32,000 kilometers of open roads, approximately 10,000 kilometers of intelligent road renovations, and the installation of over 8,700 roadside units.[1]

Technologically, China is following an integrated approach of vehicle-road-cloud collaboration and single-vehicle intelligence. There are 47 national-level intelligent and connected vehicle testing demonstration zones, 16 dual-intelligence pilot cities, and seven intelligent and connected vehicle pilot areas. For example, Baidu's Apollo Go has been conducting manned testing and operations in 11 cities and is testing fully unmanned autonomous mobility services in five major cities, with a single-vehicle peak of over 20 orders per day. Hardware configurations have also been continuously improved to ensure passenger safety.

The market performance is strong. In 2024, China's autonomous driving market is expected to reach 383.2 billion yuan, with great potential. With the expansion of the new energy vehicle market, consumer demand for intelligent driving is increasing. In 2023, the penetration rate of L2-level new passenger vehicles in China reached 47.3%, and it exceeded 50% from January to May 2024.[2]

In addition, the 2024 World Intelligent and Connected Vehicles Conference attracted over 250 enterprises and institutions, showcasing more than 200 new technologies and products, and releasing achievements such as the global 10 big breakthroughs and 10 big trends. Various regions have also been actively building testing areas, issuing testing licenses, and carrying out comprehensive demonstration projects. The testing mileage has exceeded 120 million kilometers, continuously laying a solid foundation for the development of autonomous driving and intelligent and connected vehicles.

In general, in 2024, this field has made coordinated progress in multiple aspects such as policy, technology, and the market, and is moving towards a more intelligent, safe, and efficient direction.

2. Is China experiencing any recent roadblocks regarding autonomous vehicle developments?

Great challenges in road condition recognition: The urban road conditions are complex, with a large number of pedestrians and vehicles, as well

1 https://wap.miit.gov.cn/jgsj/zbys/gzdt/art/2024/art_42f3b1e3a35a46c2be22c931bb404a86.html#:~:text=.
2 https://news.qq.com/rain/a/20240725A008JJ00.

as construction and temporary control situations. Frequent behaviors such as extreme lane cutting by vehicles and large vehicles cutting in increase the uncertainty of road traffic. Moreover, extreme weather and light changes also affect the detection of sensors, making it extremely difficult for the autonomous driving system to accurately identify and respond.

Weak ability to deal with complex road conditions: In urban scenarios, traffic participants are numerous and their behaviors are unpredictable. The traffic signals are complex and the road conditions change rapidly. Autonomous vehicles often make wrong decisions or have untimely responses in scenarios such as facing intersections, and it is difficult for them to handle these complex situations well.

Difficulties in dealing with extreme weather: Severe weather reduces visibility and increases risks such as slippery roads, posing challenges to sensor performance and vehicle driving, braking, and steering. More advanced sensors and intelligent algorithms are needed to ensure safety, but there are still limitations in this regard at present.

The problem of liability determination remains to be solved: Traditional traffic regulations are designed around human drivers, while for autonomous vehicles, especially those at the L4 - L5 level, the actual controller becomes the autonomous driving system, which is different from the current regulations. In terms of liability determination, it is difficult for the driver to prove fault in tort liability, and in product liability, it is difficult to prove causality due to the weak interpretability of the algorithm, and it is difficult to determine the responsible party when an accident occurs.

Despite these obstacles, with the progress of technology, such as the optimization of sensor technology, the improvement of algorithms, and the development of multi-sensor data fusion, it is expected to enhance the ability of AVs to handle road conditions and complex scenarios. At the same time, improving relevant laws and regulations and establishing ethical norms can provide guarantees for their commercial operation and promote the continuous development of autonomous vehicles.

3. Are there any recent updates in the cybersecurity/privacy space related to autonomous vehicles?

In the area of policies, regulations, and standards:[3] China has introduced several relevant regulations and implemented multiple vehicle-side security standards and over 10 platform security standards. Many recommended national standards have also been established, and the security system is gradually being established.

Departments such as the Ministry of Industry and Information Technology have determined the pilot projects for the access and on-road operation of intelligent and connected vehicles, placing safety as the top priority and emphasizing that related work should be carried out under the premise of ensuring safety. These measures provide policy and standard-level guarantees for the cybersecurity and privacy protection of autonomous vehicles.

In terms of industry discussions and awareness-raising: The "Intelligent and Connected Vehicle Security Sub-Forum" was held during the 2024 National Cybersecurity Publicity Week, and experts in related fields suggested accelerating the construction of a closed-loop security management system for intelligent and connected vehicles, triggering in-depth discussions in the industry on the cybersecurity and privacy issues of intelligent and connected vehicles.

At the Intelligent and Connected New Energy Vehicle Security Sub-Forum of the 2024 Beijing Cybersecurity Conference, Qi Xiangdong, the chairman of Qi An Xin, stated that intelligent and connected vehicles must pay attention to cybersecurity issues during their rapid development, and data security will become a major problem

3 https://www.toutiao.com/article/7413249483024253450/?upstream_biz=doubao&source=m_redirect.

they face, further enhancing the industry's security awareness.[4]

In enterprise practices and technological cooperation: Many listed cybersecurity companies have continued to make efforts. For example, Qi An Xin and Seres Motors have cooperated to establish a vehicle cybersecurity operation center. By combining intrusion detection and prevention systems with the vehicle networking security operation platform, risks and threats can be better identified and predicted.[5]

Venustech and China Mobile have established technological cooperation in the aspect of intelligent vehicle networking to study information security and data security in scenarios such as network communication, vehicle-side applications, and high-precision positioning of intelligent vehicles, helping to build an information and network security environment covering the entire life cycle of "vehicle, road, cloud, and network."

In terms of the introduction of privacy protection labels: At the 2024 China Automotive Software Conference hosted by the China Association of Automobile Manufacturers, the CAAM officially released the "Automotive Privacy Protection" label. Tesla became one of the first car companies to pass the evaluation and obtain the label authorization, which is an important measure in China's automotive privacy protection.[6]

4. Are there any recent updates in the 5G space related to autonomous vehicles?

Network construction[7]

China Mobile Beijing has completed the coverage of 5G-A network on the Yongchang section of the high-level autonomous driving demonstration area in Beijing Yizhuang. This is the first vehicle networking test road deployed with 5G-A network and vehicle-network computing power collaboration technology. On the 5-kilometer section, 19 5G-A base stations have built a vehicle networking private network, using the dual-band of 2.6GHz + 4.9GHz. Through advanced technologies, the maximum uplink rate can reach 1Gbps, providing strong support for the application of autonomous driving technology. Meanwhile, multiple departments in Henan Province have promoted the construction and operation of relevant demonstration areas and actively created a national vehicle networking pilot area.

Industrial cooperation[8]

The cooperation between SAIC HONGYAN and Utopilot have achieved remarkable results. The 5G + L4 intelligent heavy truck jointly developed by them was unveiled at the exhibition, showing great advantages in the port transportation scenario. This vehicle comprehensively utilizes a variety of advanced technologies, is equipped with the Honghu Zhijia system, and realizes all-round perception with various sensors. Five vehicles can drive in an autonomous formation in an orderly manner on the Donghai Bridge and have multiple intelligent driving functions. After nearly four years of commercial operation, it has accumulated an actual operation test mileage of over 7 million kilometers and transported over 200,000 TEUs, providing valuable experience for the commercialization of unmanned driving technology.

Technology research and development[9]

Huawei has continuously made breakthroughs in the research and development of autonomous driving technology. Yu Chengdong said that ADS 4.0 will be launched in 2025 to achieve the commercial application of L3-level autonomous driving on highways and the pilot application of L3-level autonomous driving in urban areas. This will deepen the application of 5G in autonomous driving and improve the intelligence of vehicles. ADS 3.0 has strengthened its functions to ensure the safety of

4 https://www.toutiao.com/article/7377576646708183615/?upstream_biz=doubao&source=m_redirect.
5 https://www.toutiao.com/article/7377576646708183615/?upstream_biz=doubao&source=m_redirect.
6 https://stock.hexun.com/2024-11-11/215461451.html.
7 https://www.toutiao.com/article/7350499891975668265/?upstream_biz=doubao&source=m_redirect.
8 https://m.elecfans.com/article/2540397.html.
9 https://finance.sina.cn/tech/2024-10-18/detail-incsxqvc8881238.d.html.

passengers. Huawei also emphasized the role of lidar in ensuring the autonomous driving system in bad weather.

Industry exchanges[10]

The concurrent side event of the 2024 World Intelligent and Connected Vehicles Conference was successfully held, focusing on the content related to advanced communication technologies for vehicles. Many experts shared their achievements and experiences in the keynote speeches. In the roundtable discussion session, in-depth discussions were held on topics such as intelligent cockpit and autonomous driving applications. It is believed that the large-scale application of vehicle networking requires cross-industry coordination.

5. Have any new laws/regulations been passed within the last year that have affected the deployment of autonomous vehicles?

In terms of laws and regulations, the Ministry of Natural Resources released the "Notice on Strengthening the Security Management of Surveying, Mapping and Geographical Information Related to Intelligent and Connected Vehicles," and the Ministry of Industry and Information Technology, the Ministry of Public Security, the Ministry of Natural Resources, the Ministry of Housing and Urban-Rural Development, and the Ministry of Transport jointly issued the "Notice on Carrying out the Pilot Work of 'Vehicle-Road-Cloud Integration' Application of Intelligent and Connected Vehicles."

In terms of national standards, three mandatory national standards, GB 44495-2024 "Technical Requirements for Vehicle Information Security," GB 44496-2024 "General Technical Requirements for Vehicle Software Upgrade," and GB 44497-2024 "Data Recording System for Autonomous Driving of Intelligent and Connected Vehicles," were approved and released and will be implemented on January 1, 2026.[11]

Locally, Jiangsu's newly revised "Jiangsu Province Road Traffic Safety Regulations" took the lead in conducting provincial exploratory legislation. It clearly stipulates that conditional and highly autonomous vehicles should be equipped with drivers and relevant requirements when on the road, and also regulates the data management and law enforcement management of intelligent and connected vehicles.[12]

Guangzhou released the "Draft Amendment (Draft for Solicitation of Opinions) of the Guangzhou City Regulations on the Innovative Development of Intelligent and Connected Vehicles," supporting its application in scenarios such as highways and airports and planning to fully open operating roads.

Beijing released the "Draft for Solicitation of Opinions of the Beijing Autonomous Driving Vehicle Regulations," covering aspects such as industrial innovation, infrastructure construction, and innovative activity specification. Meanwhile, the revision of the "Road Traffic Safety Law" has been included in the 2024 legislative plans[13] of the State Council and the Standing Committee of the National People's Congress and will make provisions on many aspects of autonomous driving. These laws and regulations have a profound impact on the development of AVs.

Hefei actively promoted the legislation of intelligent connected vehicles. The "Draft Regulations on the Application of Intelligent Connected Vehicles in Hefei (Draft for Soliciting Opinions)" has started to solicit public opinions. In terms of industrial innovation, it encourages multiple parties to jointly conduct research and development, and supports the construction of related facilities and the development of enterprises. In terms of promotion and application, the opening of test sections and areas is flexible, and it supports business model innovation and the mutual recognition of results in different places.

10 https://www.toutiao.com/article/7433961842969559567/?upstream_biz=doubao&source=m_redirect.
11 https://www.news.cn/tech/20240905/01339aedf206418f9da820b31b467e9e/c.html#:~:text=.
12 https://www.toutiao.com/article/7322535912053768730/?upstream_biz=doubao&source=m_redirect.
13 https://www.toutiao.com/article/7407660026854212137/?upstream_biz=doubao&source=m_redirect.

6. What advancements in autonomous vehicles should we expect in China in 2025?

In terms of technological innovation: According to the relevant national strategies, by 2025, the relevant systems of China-standard intelligent vehicles will be basically formed, conditional autonomous driving vehicles will be produced on a large scale, and highly autonomous driving vehicles will be marketized in specific environments. It is expected that 70% of the new mass-produced vehicle models will have L3-level autonomous driving capabilities, and L4-level will also be applied on a large scale, with the proportion of new L4 and L3 autonomous driving vehicles exceeding 20%.

In terms of industrial ecology: It will feature diversification and open cooperation. The core of the industrial chain will shift to chips, software, and data, and the value chain will be reconstructed. It is expected that in 2025, the penetration rate of advanced assisted driving and autonomous driving in new vehicles in China will exceed 60%, and the industrial ecology will change from closed to open, cooperative, and win-win. After enterprises enter the market, it will gradually become more centralized.

In terms of infrastructure construction: A number of national-level autonomous driving test bases and pilot application demonstration projects will be built, and large-scale applications will be achieved in some scenarios. For example, cargo demonstration applications will be carried out in relatively closed areas such as ports and airports and at the end of express mail service. The application of assisted driving technology in public transportation and passenger transportation will also be steadily promoted, and demonstration applications of autonomous driving commuter buses will be explored.

In terms of regulations and standards: A batch of basic and key standards will be introduced. The map standard system supporting vehicle autonomous driving will be initially constructed to meet the urgent needs of intelligent vehicle basic map applications. At the same time, a relatively complete vehicle networking network security standard system will be formed, and more than 100 key standards will be formulated and revised.

In terms of product supervision: The regulatory system of laws and regulations will be improved around the entire industry chain to strengthen product quality inspection and safety management. A sound test evaluation system and test basic database will be established to provide technical support for supervision.

In terms of network security: A complete vehicle networking network security standard system will be formed, covering various security aspects. The security protection of intelligent vehicle basic maps will be strengthened, and enterprises will also strengthen their own network security construction.

7. Aside from Robotaxis, do you see any other developments in the commercial space regarding AVs, including farming, commercial trucking, food delivery, etc.?

In the agricultural field: Many car manufacturers are deploying autonomous agricultural vehicles to build a "smart agricultural ecosystem." The Beidou agricultural machinery autonomous driving system has entered the intelligent stage. With the help of Beidou satellite navigation and sensors and algorithms on agricultural machinery equipment, it can achieve autonomous field operations, improving agricultural production efficiency and accuracy. At the same time, the construction of high-standard farmland has driven the development of intelligent agricultural vehicles, drones, and other equipment, and the market size of the agricultural GNSS RTK autonomous driving system is also expanding. Automotive innovation is also safeguarding food security.

In the commercial trucking field: Driven by technology, the market, and policies, the domestic substitution of key components of the wire-controlled chassis has accelerated, and the iteration of high-computing-power SoC chips has assisted unmanned transportation. Jiangling Motors has cooperated with Wen Yuan Zhi Xing, and unmanned freight vehicles have carried out "pure unmanned testing" and "cargo testing" in Guangzhou. In

addition, unmanned mining trucks are showing an explosive trend and have become a mature niche market. SAIC Utopilot's intelligent heavy trucks are also gradually carrying out regular operations and can operate continuously even in bad weather, effectively reducing costs, increasing efficiency, and enhancing safety, promoting the development of the industry.

In the food delivery field: It is transitioning from traditional manual and vehicle delivery to automated delivery. Key technologies such as the Internet of Things, artificial intelligence, unmanned delivery vehicles, and drones are playing a role, enabling real-time tracking of food status, optimizing delivery routes, and improving efficiency and user satisfaction. Online ordering platforms are using unmanned delivery vehicles to provide faster services. Although facing challenges such as food safety, related applications still show great potential.

In the unmanned sanitation field: XianTu Intelligence has launched a "multi-purpose" sanitation vehicle.[14] Many enterprises are expanding their markets. And WeRide has obtained the M1 license for its autonomous sanitation vehicle S6 and the T1 license for its unmanned sweeper S1 from the Land Transport Authority of Singapore, enabling it to carry out demonstration operations there.[15] Technically, the recognition technology has been upgraded and the management system has become more sophisticated. In terms of policies, many places in China are deepening the marketization of sanitation services, opening up tests and application scenarios to support the large-scale operation of unmanned sanitation vehicles. Meanwhile, relevant departments and enterprises are actively exploring and formulating corresponding standards to regulate the development of the industry.

8. Have any AI laws impacted deployment?

According to the "2024 Legislative Work Plan of the State Council" issued by the General Office of the State Council in May 2024, the "Draft of the Artificial Intelligence Law" has been included again in the preparatory projects to be submitted to the Standing Committee of the National People's Congress for deliberation, which means that the country is continuously advancing the legislative process related to artificial intelligence. Once this law is officially introduced, it will inevitably have a comprehensive and profound impact on autonomous driving vehicles, which are important application fields of artificial intelligence.[16]

On the morning of March 16, 2024, the "AI Good Governance Forum - Prospects for the Legal Governance of Artificial Intelligence" thematic seminar was held in Beijing, and the "Scholars' Draft of the Law of the People's Republic of China on Artificial Intelligence" was released at the meeting. This draft is mainly characterized by promoting industrial development, and some of its principles, systems, and norms may provide legal directions and regulatory guidance for the development of autonomous driving vehicles.[17]

14 https://www.toutiao.com/article/7349971289349603892/?upstream_biz=doubao&source=m_redirect.
15 https://www.toutiao.com/article/7437091245086523943/?upstream_biz=doubao&source=m_redirect.
16 https://www.gov.cn/zhengce/content/202405/content_6950093.htm.
17 https://news.qq.com/rain/a/20240318A03QFJ00?suid=&media_id=.

Authors

Henry Chen
Senior Partner, Shanghai
henry.chen@dentons.cn

Link Lin
Attorney, Shanghai
link.lin@dentons.cn

Simon Zhu
Attorney, Shanghai
simon.zhu@dentons.cn

Germany

1. What are the latest autonomous vehicle developments in Germany for 2025?

Germany has maintained its position as a leader in the development of autonomous vehicles throughout 2024, leveraging its strong automotive industry, robust regulatory frameworks, and innovative public-private partnerships. Key developments include advancements in Level 3 and Level 4 automation, expansion of public transport initiatives, and progress in integrating smart infrastructure with AV technologies:

- **Advancements in Level 3 Automation:** Mercedes-Benz introduced the latest version of its Level 3 Drive Pilot system on September 23, 2024. The updated system, certified for speeds up to 95 km/h on German highways, operates in both traffic jams and free-flowing traffic under specific conditions, making it the fastest Level 3 system in any production vehicle globally. BMW has achieved a first in the industry by combining Level 2+ and Level 3 functionalities within its flagship 7 Series. The Autobahnassistent (Level 2+) enables hands-free driving up to 130 km/h on highways with physically separated lanes, including automatic lane changes and overtaking. Audi and Porsche are expected to follow BMW's lead by launching their own Level 3 systems in 2025, expanding the availability of advanced AV capabilities in luxury vehicles. These developments signify growing competition among German automotive manufacturers to enhance their autonomous driving portfolios.
- **Public Transport Initiatives:** Germany is leveraging AVs to enhance mobility systems, particularly in urban and rural areas. In Hamburg, the ALIKE project is piloting up to 20 autonomous shuttles, designed to integrate seamlessly with public transport. These shuttles provide an app-based on-demand service, supporting urban mobility goals. Meanwhile, the LEAF project is addressing rural transportation gaps by deploying autonomous shuttles to connect residents to train stations and bus stops, improving access and reducing social mobility barriers.
- **Regulatory Milestones:** Germany's regulatory landscape continues to evolve. As of January 2024, Germany permits highly automated driving at speeds of up to 130 km/h on highways, marking a significant regulatory milestone. While automotive manufacturers are still refining their systems to meet this allowance, the groundwork has been laid for the next generation of autonomous driving technologies. This change aligns with UN Regulation R157, which extended automated lane-keeping system (ALKS) capabilities to higher speeds, facilitating the progression of Level 3 and Level 4 systems. In July 2024, the EU's General Vehicle Safety Regulation (EU 2019/2144) became mandatory for all new vehicles, providing a legal framework for deploying Level 4 and fully autonomous vehicles. This complements Germany's Autonomous Driving Act, which allows for Level 4 vehicles to operate within defined areas under external technical supervision.
- **Technological Testing and Innovations:** Volkswagen's ID. Buzz prototypes, designed for autonomous ride-pooling services, continue testing in Hamburg, with commercial rollout planned for 2025. Other test environments, including urban centers and designated rural zones, foster AV system development

by providing diverse real-world conditions for refinement.

- **Commercial Use Cases:** Logistics remains a key sector for AV deployment. Autonomous trucks are increasingly being tested for hub-to-hub operations, while Mercedes and Bosch's automated valet parking system at Stuttgart Airport continues to expand, offering convenient and efficient parking solutions.

Germany's AV advancements are supported by its comprehensive testing infrastructure, government funding for research, and collaborative efforts among car manufacturers, technology firms, and regulators. These developments place Germany at the forefront of automated mobility in Europe.

2. Is Germany experiencing any recent roadblocks regarding autonomous vehicle developments?

Despite Germany's leadership in autonomous vehicle innovation, several challenges are slowing progress in achieving widespread adoption and higher automation levels. These roadblocks stem from technological, regulatory, societal, and infrastructural factors.

- **Technological Hurdles:** Achieving Level 4 automation remains a significant challenge. Current sensor systems, especially lidar and radar, require advancements to enhance redundancy and reliability. While lidar costs have decreased, they remain a barrier to mass adoption. Furthermore, developing robust electronic architectures to handle real-time data processing and ensuring software stability under diverse conditions demand substantial investments in research and development.
- **Testing and Validation:** The validation of AV systems through real-world testing is complex and time-consuming. While Germany has robust testing environments, including urban test fields and rural trials, replicating the unpredictable nature of real-world conditions remains a challenge. Achieving comprehensive system reliability and safety continues to delay broader deployment.
- **Regulatory Harmonization:** Although Germany has one of the most advanced legal frameworks for AVs, aligning national regulations with evolving EU and UNECE standards remains an ongoing issue. These discrepancies complicate cross-border AV operations and hinder collaboration on international mobility solutions.
- **Consumer Skepticism:** Public acceptance of AVs is mixed. Concerns about safety, ethical decision-making, and the potential impact on jobs - especially in industries like trucking and logistics - contribute to hesitancy. German consumers are particularly cautious about Level 4 and Level 5 automation due to the need for proven reliability under adverse conditions.
- **Data Privacy and Sharing:** Stringent data protection laws like the GDPR, combined with varying international data-sharing regulations, present obstacles for AV deployment.
- **Infrastructure Readiness:** While Germany has made significant strides in expanding its 5G network, gaps in rural coverage persist. AV systems depend on reliable telecommunications for vehicle-to-infrastructure (V2I) and vehicle-to-vehicle (V2V) communication. These connectivity issues pose challenges to AV deployment in less developed areas.
- **Liability and Insurance Frameworks:** As automation levels increase, determining liability in accidents becomes more complex. The evolving balance between driver, manufacturer, and insurer responsibilities needs further legal clarity, particularly as the EU's AI Liability Directive reshapes accountability frameworks.

Addressing these challenges requires continued collaboration among regulators, industry stakeholders, and research institutions. While the roadblocks are significant, Germany's comprehensive approach to tackling these issues positions it to overcome them and maintain its leadership in AV development.

3. Are there any recent updates in the cybersecurity/privacy space related to autonomous vehicles?

Germany has taken significant steps to address the cybersecurity and data privacy challenges associated with autonomous vehicles in 2024, leveraging updated regulations, technological standards, and consumer protection laws to safeguard the rapidly evolving ecosystem.

- **Cybersecurity Regulations:** Germany has fully adopted UNECE's UN R155 and UN R156 regulations, which mandate certified cybersecurity management systems (CSMS) and software update management systems (SUMS) as prerequisites for AV type approvals. These standards ensure vehicles remain protected against cyber threats throughout their lifecycle and facilitate secure over-the-air (OTA) updates for software.
- **ISO/SAE 21434 Standardization:** Automotive manufacturers are increasingly implementing the ISO/SAE 21434 standard, which provides technical guidelines for managing cybersecurity risks during design, production, and operation. This ensures vehicles are equipped to counter vulnerabilities as technology evolves.
- **GDPR Compliance and Data Sovereignty:** As AVs collect significant amounts of personal data (e.g., location and sensor data), compliance with the GDPR remains paramount. Manufacturers are required to obtain informed consent for data processing, prioritize transparency, and implement privacy-by-design principles. Users must have access to their data, with mechanisms to delete or restrict processing when appropriate.
- **AI Act and High-Risk Systems:** The EU AI Act categorizes AV systems as high-risk, introducing stringent documentation, risk assessment, and transparency requirements. These measures ensure that AV technologies adhere to ethical standards while mitigating security risks. The Act also facilitates oversight through the European AI Office, established in 2024.
- **IT Security Act Updates:** This act mandates cybersecurity standards for critical infrastructures, including transport networks supporting AVs. Operators must demonstrate compliance with "security by design" principles, ensuring vehicles and connected systems remain resilient against cyberattacks.
- **Consumer Rights Enhancements:** New data protection measures empower users to access and control personal data generated by AVs. These include the right to obtain data copies and demand stricter deletion protocols when data is no longer necessary.
- **Automotive-Specific Safeguards:** German automotive manufacturers are isolating security-critical vehicle systems (e.g., driving control systems) from infotainment and navigation applications. This minimizes potential entry points for cyber threats and aligns with privacy-by-default principles.

Germany's proactive measures reflect its commitment to balancing technological innovation with robust security and privacy standards. By fostering collaboration between automotive companies, regulatory bodies, and tech providers, Germany aims to protect consumers and infrastructure while advancing AV deployment.

4. Are there any recent updates in the 5G space related to autonomous vehicles?

Germany has made significant advancements in its 5G infrastructure throughout 2024, recognizing the pivotal role it plays in enabling autonomous vehicle communication and operation. As AV technologies heavily rely on seamless connectivity for vehicle-to-everything (V2X) interactions, these updates are instrumental in advancing the country's autonomous mobility goals.

- **Nationwide 5G Expansion:** In 2024, over 90% of Germany's population has access to 5G networks, marking a significant improvement from previous years. This expansion supports real-time data transmission essential for AV functionalities such as vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I)

communication. However, gaps in rural coverage persist, posing challenges for deploying AV systems in less connected areas.

- **Network Slicing for AVs:** Germany is implementing advanced network slicing technologies, which allocate dedicated virtual network segments for specific applications, including AV operations. This ensures minimal latency for critical tasks, such as safety-related decision-making and real-time navigation adjustments, even during peak network usage.
- **Collaborations with Industry Leaders:** German automotive manufacturers like Mercedes-Benz, Volkswagen, and BMW are partnering with telecom providers such as Deutsche Telekom and Vodafone to integrate AV systems with 5G connectivity. These collaborations aim to ensure consistent and reliable communication between vehicles and their environment.
- **5G Standalone (5G SA) Networks:** The transition from 5G Dynamic Spectrum Sharing (5G DSS) to 5G Standalone (5G SA) networks is underway. Unlike DSS, which dynamically shares spectrum with 4G, 5G SA offers dedicated bandwidth for AVs, reducing latency and improving the efficiency of data transmission. This shift enhances the reliability required for fully autonomous driving.
- **Smart Infrastructure Integration:** Germany is actively developing intelligent infrastructure to leverage 5G capabilities. Smart traffic systems, including connected traffic lights and road sensors, are being integrated with 5G networks to improve AV situational awareness and optimize traffic flow. These systems are being deployed in urban testbeds and major highways, with plans to expand to rural areas.
- **Support for Public and Commercial Use Cases:** Projects such as Hamburg's ALIKE initiative and rural mobility trials like LEAF are leveraging 5G to support on-demand ride-pooling services and rural shuttle connections. Additionally, the logistics sector benefits from 5G-enabled autonomous trucking, improving efficiency in hub-to-hub operations.

These developments underline Germany's commitment to building a robust 5G ecosystem that supports the country's vision for autonomous mobility. By addressing connectivity challenges and enhancing infrastructure, Germany is laying the foundation for a fully connected and intelligent transportation system.

5. Have any new laws/regulations been passed within the last year that have affected the deployment of autonomous vehicles?

Germany has introduced several legislative updates in 2024 that have a profound impact on the deployment of autonomous vehicles (AVs). These measures address critical aspects such as cybersecurity, data privacy, technical standards, and ethical considerations, reflecting Germany's commitment to maintaining its leadership in autonomous mobility:

- **Permission for High-Speed Automated Driving Up to 130 km/h:** Since January 2024, Germany allows highly automated driving (Level 3) on highways at speeds of up to 130 km/h. This represents a major shift from the previous 60 km/h limitation and aligns with UN Regulation R157, which expands automated lane-keeping system (ALKS) capabilities to higher speeds. Manufacturers are actively preparing their systems to utilize this allowance.
- **UN Regulation R157:** This regulation, adopted within the EU and Germany, sets specific requirements for automated lane-keeping systems (ALKS). It governs critical functionalities such as safe lane changes, automated acceleration and braking, and emergency response. Vehicles with ALKS, particularly Level 3 systems, must demonstrate compliance with R157 before receiving type approval. The regulation directly supports the deployment of autonomous systems, enabling wider adoption of AV technologies in Germany.

- **General Vehicle Safety Regulation (EU 2019/2144):** Effective July 2024, this EU-wide regulation mandates the integration of advanced driver assistance systems (ADAS) in all new vehicles. It also provides a legal framework for type approvals of fully autonomous vehicles (Level 4 and above), facilitating their introduction across Europe. This regulation ensures that vehicles meet rigorous safety requirements, particularly concerning automated driving functions.
- **Cyber Resilience Act (CRA):** Adopted in early 2024, the CRA focuses on cybersecurity standards for all digital products, including AV systems. It emphasizes the principle of "security by design," requiring manufacturers to implement robust risk management protocols and continuous updates to mitigate vulnerabilities. The act mandates that critical digital infrastructure, such as AVs, remain secure against cyberattacks, addressing a major concern in the automated mobility ecosystem.
- **AI Act:** Set for full implementation in 2025, the EU AI Act classifies AV systems as high-risk technologies. This designation imposes strict obligations on developers, including risk assessments, transparency in algorithmic decision-making, and comprehensive documentation. These measures aim to ensure AV technologies operate ethically and securely while fostering trust among users and stakeholders.
- **Data Act:** Effective September 2025, the Data Act enhances user rights over data generated by connected products, including AVs. It requires manufacturers to provide users with access to and control over their data. By reinforcing data sovereignty and compliance with GDPR principles, the act balances technological innovation with user privacy.
- **Autonomous Vehicles Approval and Operation Ordinance (AFGBV):** Updates to this ordinance expand the operational scope of Level 4 AVs in defined areas, provided technical supervision is in place. This regulation enables projects like Hamburg's ALIKE initiative, which is testing autonomous shuttles, to scale operations under a structured legal framework.
- **Ordinance on IT Security for Critical Infrastructure:** Enhancements to Germany's IT Security Act incorporate transportation networks supporting AVs. These measures ensure robust cybersecurity for infrastructure such as connected traffic systems and road sensors, reinforcing public trust in autonomous mobility.

These updates demonstrate Germany's comprehensive approach to fostering AV innovation while addressing safety, security, and ethical concerns. By aligning national regulations with EU-wide initiatives, Germany ensures a forward-looking framework that promotes sustainable and responsible autonomous vehicle deployment.

6. What advancements in autonomous vehicles should we expect in Germany in 2025?

In 2025, Germany is expected to achieve significant milestones in the autonomous vehicle sector. These developments will accelerate the integration of AVs into everyday life, transforming public transport, commercial logistics, and consumer mobility.

- **Robotaxi Expansion:** Hamburg's ALIKE project, featuring Level 4 autonomous shuttles, is set to officially launch its ride-pooling services. Initially piloted with 20 vehicles, these shuttles will integrate seamlessly with public transport, offering app-based, on-demand services that reduce urban traffic congestion and dependency on private vehicles. The success of this initiative is expected to lead to broader adoption across Germany, making it a model for urban AV integration.
- **Enhanced Rural Accessibility:** The LEAF project will continue to address mobility challenges in rural areas by deploying autonomous shuttles. These vehicles will provide critical links between remote communities and transport hubs, such as train stations and bus stops, offering residents improved access to essential services and reducing transportation gaps.

- **Commercial Trucking Innovations:** Autonomous trucking is anticipated to expand further in 2025, particularly in hub-to-hub logistics. These vehicles will address labor shortages in the freight industry while improving operational efficiency and reducing transportation costs. Trials of long-haul, driverless trucks will increase, with a focus on optimizing supply chain logistics.
- **Advancements in Smart Infrastructure:** Germany will accelerate the deployment of 5G-enabled infrastructure, such as intelligent traffic systems, connected road sensors, and adaptive traffic lights. These advancements will enhance the situational awareness of AVs, improving safety, traffic management, and energy efficiency, particularly in dense urban areas.
- **AI-Driven Upgrades:** Manufacturers will refine AI-driven AV technologies, enabling vehicles to navigate complex and dynamic conditions, such as adverse weather and heavy traffic. Enhanced AI will support better decision-making, increasing the reliability and appeal of Level 3 and Level 4 vehicles.
- **Enhanced Level 3 Systems:** Vehicles equipped with ALKS, as defined by R157, will become more widely available. For example, Mercedes-Benz and BMW are expanding their offerings of R157-compliant Level 3 systems, allowing drivers to safely disengage from active control under specified conditions. These advancements will drive consumer adoption of automated technologies.
- **Research and Development Investments:** Government-backed projects and public-private partnerships will focus on scaling innovations and addressing challenges such as cybersecurity, interoperability, and public acceptance. These efforts will drive the transition from pilot projects to fully operational AV systems.

With these advancements, 2025 is poised to be a pivotal year for AV adoption in Germany, enhancing urban mobility, rural connectivity, and commercial logistics while solidifying the country's position as a global leader in autonomous transportation.

7. Aside from Robotaxis, do you see any other developments in the commercial space regarding AVs, including farming, commercial trucking, food delivery, etc.?

Yes, Germany is making notable advancements in the commercial application of autonomous vehicles (AVs) across a range of industries. These developments demonstrate the transformative potential of AV technologies in addressing efficiency, labor shortages, and sustainability goals.

- **Commercial Trucking:** Autonomous trucks are leading innovation in Germany's logistics sector. With the expansion of hub-to-hub operations, these vehicles are being tested for long-haul freight transport, optimizing delivery times and reducing operational costs. They address critical labor shortages in the trucking industry while lowering emissions through optimized driving. German manufacturers and logistics companies are piloting AV trucks, integrating advanced AI systems to ensure safety and reliability during complex cross-border routes.
- **Agricultural Automation:** Autonomous technologies are revolutionizing farming in Germany. Tractors, harvesters, and drones equipped with AI and GPS enable precision agriculture, automating tasks like planting, monitoring crops, and harvesting. These systems reduce resource use, such as water and fertilizers, and increase productivity. Germany's agricultural sector is increasingly adopting these technologies to meet sustainability goals and cope with labor shortages in rural areas.
- **Food and Package Delivery:** Urban areas are experiencing a rise in autonomous last-mile delivery solutions. Companies are piloting small delivery robots and drones for food and package transport, enhancing efficiency and reducing urban congestion. These systems complement traditional logistics networks,

offering eco-friendly alternatives for short-distance deliveries in dense city centers.

- **Airport Operations:** Germany's major airports, such as Frankfurt and Munich, are leveraging AVs to improve ground operations. Self-driving baggage carts and passenger shuttles enhance efficiency and streamline airport logistics. These systems reduce manual labor requirements and provide seamless transport experiences for passengers, aligning with Germany's focus on technological integration in high-traffic environments.
- **Construction and Mining:** Autonomous heavy machinery is being deployed in construction and mining projects to automate labor-intensive and hazardous tasks. These systems operate using AI and advanced sensors to navigate complex terrains, enhancing productivity and safety on worksites. These technologies are particularly valuable in large-scale projects requiring continuous and precise operations.
- **Warehouse Automation:** Autonomous robots and forklifts are increasingly utilized in warehouses to streamline inventory management and order fulfillment. These systems enhance speed and accuracy, reducing operational costs for logistics hubs and supporting Germany's robust e-commerce industry.

Germany's diverse applications of AV technologies demonstrate their potential to transform commercial operations across multiple sectors. With ongoing research, regulatory support, and public-private partnerships, the commercial AV landscape in Germany is set for significant growth, contributing to sustainable and efficient business practices.

8. Have any AI laws impacted deployment?

Yes, recent AI-related legislation at both the European Union (EU) and national levels is significantly shaping the deployment of autonomous vehicles (AVs) in Germany. These legal frameworks aim to balance innovation with safety, accountability, and ethical considerations, ensuring that AI technologies in AV systems meet stringent standards.

- **EU AI Act:** Scheduled for full implementation in 2025, the AI Act categorizes AV systems as high-risk AI technologies, imposing robust compliance requirements. Developers must conduct comprehensive risk assessments and maintain transparency in algorithmic decision-making. The act also mandates detailed documentation of system capabilities, limitations, and testing processes. By fostering legal certainty, the AI Act encourages further investment in autonomous technologies while addressing public concerns about safety and data use.
- **AI Liability Directive:** Proposed as a complement to the AI Act, this directive simplifies legal claims involving AI-related incidents, including those caused by AVs. It introduces a presumption of causality, making it easier for injured parties to prove that an AV system failure caused harm. This framework shifts more accountability onto manufacturers and incentivizes rigorous safety testing and quality assurance during development.
- **Cyber Resilience Act (CRA):** Effective from 2024, the CRA establishes cybersecurity standards for digital products, including AV systems. The act emphasizes "security by design," requiring manufacturers to implement continuous risk management processes and ensure resilience against cyber threats. The CRA aligns with the ISO/SAE 21434 standard for automotive cybersecurity, ensuring that AV systems remain protected throughout their lifecycle.
- **Data Act:** Effective from September 2025, the Data Act grants users greater control over the data generated by connected products, including AVs. Manufacturers must design systems that allow users to access, manage, and restrict the use of their data, ensuring compliance with GDPR principles. This legislation fosters user trust by emphasizing data sovereignty.

- **GDPR Compliance and Data Privacy:** Germany's adherence to the GDPR ensures that AV systems prioritize informed consent, transparency, and privacy-by-design principles. Vehicle manufacturers are required to safeguard sensitive data, such as location and sensor information, collected during AV operations.

These legislative measures collectively address the ethical, safety, and security challenges of deploying AI-driven AV systems. While compliance may introduce complexities for developers, the laws provide a stable and predictable regulatory framework, fostering public trust and driving innovation. Germany and the EU are setting global benchmarks for responsible AI integration in autonomous mobility, ensuring a safer and more ethical future for AV technologies.

Author

Michael Malterer
Partner, Munich
michael.malterer@dentons.com

Hungary

1. What are the latest autonomous vehicle developments in Hungary for 2025?

The key regulatory instruments governing autonomous vehicles remained unchanged in Hungary over the past few years. Testing of autonomous vehicles on public roads is permitted; however, a test driver with special qualifications must always be present to monitor the systems and must be able to intervene if necessary. Most Hungarian policymakers and key business figures support the implementation of modern technologies, such as 5G and electric vehicles, and the development of autonomous vehicles, even if other policy issues take precedence at certain points.

The former Minister of Technology and Innovation introduced the Artificial Intelligence Strategy of Hungary in 2020 for the next 10 years.[1] The Strategy mostly contains general aims for developments in the field of artificial intelligence. The Strategy includes the aim to form a supporting research and development environment for the symbiotic development of all professions necessary for the creation of the self-driving ecosystem. The Strategy aims to further develop testing facilities of autonomous vehicles and integrate them into the European testing environment.

In 2022, the former Minister responsible for transportation announced at a press event that Hungary was working on legislation to allow Level 3 autonomous driving; however, no further plans were announced since then in this regard.

In 2024, the Government of Hungary adopted the Industrial and Technology Action Plan of Hungary for 2024-2030[2], which sets out the Government's high-level strategic objectives, including the reviewing and revising of the subsidy schemes available to Hungarian companies for autonomous driving technologies, 5G deployment and other robotics and automation developments.

2. Is Hungary experiencing any recent roadblocks regarding autonomous vehicle developments?

The main regulatory obstacle to the introduction of comprehensive AV testing may be the lack of specific regimes for AVs. In certain areas, for example in case of liability rules, the same regulations apply to all vehicles in the testing phase, irrespective of the specific needs of autonomous vehicles. Fortunately, however, the COVID-19 pandemic, the economic disruption caused by the war in Ukraine and high inflation levels and economic setbacks in the EU seemingly did not affect the ongoing autonomous vehicle projects, but it appears that regulators now have different priorities than autonomous developments.

3. Are there any recent updates in the cybersecurity/privacy space related to autonomous vehicles?

The provisions of the General Data Protection Regulation (Regulation (EU) 2016/679) (GDPR) are directly applicable to data privacy issues in Hungary. However, there are a number of areas where the GDPR permits Member States to enact national legislation. In the course of implementing the provisions of the GDPR, the Hungarian Parliament adopted an act, the Right of Informational Self-Determination and on Freedom of Information Act

1 Hungary's Artificial Intelligence Strategy 2020 – 2030; Ministry for Innovation and Technology; May 2020.
2 Hungary's industrial and technology action plan 2024 – 2030; Government Decree No. 1073/2024; March 2024.

"Hungarian Information Act". AVs are governed by both the provisions of GDPR and the Hungarian Information Act. All data collected by autonomous vehicles relating to individuals is considered "personal data," as these data are information relating to an identified or identifiable natural person (e.g., location data).

According to the rules pertaining to AVs for development purposes, such vehicles must be equipped with a data recording device, which shall collect the following data: (i) name of the test driver; (ii) information on whether the vehicle operates in a manual or in an automatic mode; (iii) speed of the vehicle; (iv) GPS coordinates; (v) operation of the lighting and light signaling devices; and (vi) usage of the audible warning device.

Additionally, under the GDPR, personal data cannot be stored longer than it is necessary for the purposes for which it is processed. The rules pertaining to AVs for development purposes specify that after the end of the test, the data specified above must be stored securely for 72 hours. Upon request, the data (including video and audio recordings) shall be sent to the competent authorities. In the case of a traffic accident, the data collected one hour before and one minute after the accident must be stored for three years.

4. Are there any recent updates in the 5G space related to autonomous vehicles?

In July 2019 - to fulfil the obligation stipulated in Directive (EU) 2018/1972 regarding 5G - the National Media and Infocommunications Authority of Hungary organized an auction for 5G frequencies in the 700 MHz, 2100 MHz, 2600 MHz and 3600 MHz frequency bands. The bidding companies purchased frequency usage rights for 15 years in three frequency bands for more than HUF 125 billion (approximately USD 320 million). The final results were published in 2020.

5G deployment in Hungary is in development, all major network providers offer 5G services, and as of 2024, 5G services are available in most cities and along major transportation routes. At the same time, due to the availability of full 4G network coverage, 3G telecommunications services in Hungary have been terminated in November 2023.[3]

In Hungary's Industrial and Technology Action Plan for 2024 through 2030[4], the Government decided to review and revise the subsidy schemes available to Hungarian companies for autonomous driving technologies and the utilization of 5G, and to assess whether there is a need to allocate dedicated 5G frequency bands to industrial players.

5. Have any new laws/regulations been passed within the last year that have affected the deployment of autonomous vehicles?

There have been no new laws or regulations passed within the last year.

6. What advancements in autonomous vehicles should we expect in Hungary in 2025?

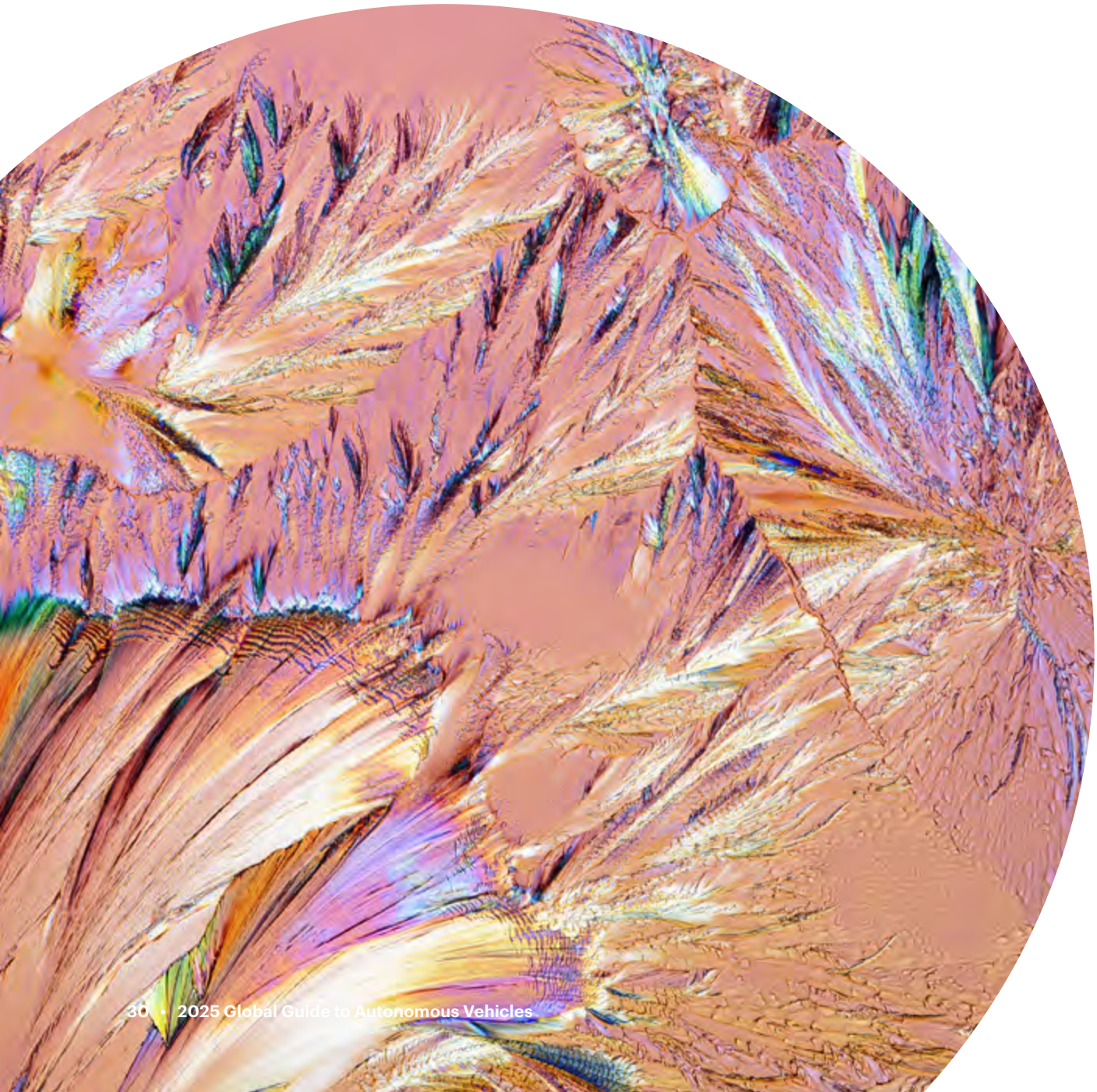
It appears that regulators now have different priorities than autonomous developments; but it will be worth monitoring how Hungary's Industrial and Technology Action Plan will be translated into policy and action in the nearer future. Hungary has further continued to increase its support for education in the field of autonomous technologies, with the Budapest University of Technology and Economics (BME) offering a master's program specializing in autonomous vehicle control engineering, and the Eötvös Loránd University (ELTE) offering a master's program specializing in computer science for autonomous driving.

3 3G services terminated in Hungary in November 2023 (villanyautosok.hu).
4 Hungary's Industrial and Technology Action Plan 2024 – 2030; Government Decree No. 1073/2024.; March 2024.

Authors

Zsombor Frankó
Partner, Budapest
zsombor.franko@dentons.com

Marcell Szőnyi
Partner, Budapest
marcell.szonyi@dentons.com



India

1. What are the latest autonomous vehicle developments in India for 2025?

The automotive market in India continues to be driven by continual technological advancements in the automotive sector. These advancements have provided an impetus to increased adoption of artificial intelligence ("AI"), Internet of Things (IoT) and machine learning.

As per publicly available reports, India is on track to become the largest electric vehicles ("EV") market by 2030, with a total investment opportunity of more than US$ 200 billion over the next 8-10 years. The Indian Government aims to commit that 30% of the new vehicle sales in India by 2030 would be electric, paving the way for the country to be a leader in shared mobility, providing opportunities for electric and autonomous vehicles, considering that the push for EVs also complements the demand for AVs.

India has seen an uptick in demand for cars with advanced driver-assistance systems ("ADAS"). These systems use automated technology to assist the driver, but require the driver to be present and monitoring, as opposed to being completely autonomous. ADAS technology is focused primarily on safety, and includes features like lane keep assist, emergency braking, and adaptive cruise control.

The ADAS market in India is currently segmented by the type of autonomous features and type of vehicles such as passenger or commercial vehicles. As per reports, the size of ADAS market in India is estimated at approximately USD 2.51 billion in 2024, and is expected to reach USD 5.96 billion by 2029, growing at a compound annual growth rate of 18.33% during the forecast period (2024-2029). Further, government regulations mandating the inclusion of certain safety features in new vehicles being sold in India are accelerating the adoption of ADAS technologies.

Swaayatt Robots, a start-up founded by an alumnus of Indian Institute of Technology, Delhi has conducted a trial in March 2024 demonstrating an AV driving through traffic and other environmental scenarios wherein the AV assumed a generic autonomous navigation behavior, negotiating complex traffic scenes. As of now, the startup which focuses on developing AV technology, specifically targeting affordable and accessible self-driving solutions for India and other regions with challenging traffic conditions, has showcased over 80 demonstrations of human-less driving vehicles and has accumulated over USD 7 million as part of its funding.

2. Is India experiencing any recent roadblocks regarding autonomous vehicle developments?

In a move primarily aimed at securing employment of people engaged in the automotive industry, the Road Transport and Highways Minister of India has on several occasions emphasized his reservation on permitting operation of driverless cars in the near future.

3. Are there any recent updates in the cybersecurity/privacy space related to autonomous vehicles?

Vehicles with varying levels of automation process a lot of data including personal data to provide assistance and interpret the surroundings. Personal data includes high resolution imaging of passengers, and people in the vehicle's field of view, and location and behavioural data of passengers. In vehicle-to-vehicle or vehicle-to-infrastructure communication,

vehicle's movements and location may be shared. Such data collection raises privacy concerns.

In 2023, the Indian Parliament passed the Digital Personal Data Protection Act, 2023 ("DPDP Act"), which is legally a 'statute,' however, the provisions and the rules thereunder have not yet come into effect. The provisions of the DPDP Act will come into force on a date as may be notified in the official gazette by the Indian Government, which may opt to enforce the provisions of the DPDP Act in a phased manner. Currently, the Information Technology Act, 2000 (IT Act) read with the Information Technology (Reasonable security practices and procedures and sensitive personal data or information) Rules, 2011 (IT Rules) continue to be the current data protection legislations in India.

Recognising the growing privacy concerns surrounding AVs, the Automotive Research Association of India ("ARAI") has recently developed AIS 189, a technical standard for automotive security and data privacy in connected vehicles. AIS 189 inter alia outlines guidelines for anonymising data, minimising data collection, implementing robust security measures to protect vehicle data, and ensuring user consent for data collection and usage. The AIS 189 is still in its draft stage.

4. Are there any recent updates in the 5G space related to autonomous vehicles?

The Telecom Regulatory Authority of India ("TRAI"), which is an independent regulator of the Indian telecommunications industry, recently published a consultation paper titled "*Issues Related to Critical Services in the Machine to Machine* ("M2M") *Sector, and Transfer of Ownership of M2M SIMs*" ("Consultation Paper") in June 2024. An inter-ministerial working group was constituted to deliberate on issues concerning M2M services, recommending a list of 20 services to be classified as 'critical' along with broad regulatory requirements for such critical services which *inter alia* included those relating to connected and autonomous cars/ three and two wheelers.

M2M refers to the technologies that allow wired/ and wireless systems to communicate with devices of the same ability. M2M uses a device (sensor, meter etc.) to capture an 'event' (motion, meter reading, temperature, etc.), which is relayed through a network (wireless, wired or hybrid) to an application (software program), that translates the captured event into meaningful information.

Whilst TRAI had earlier recommended that critical services in the M2M sector should be mandated to be provided only by connectivity providers using licensed spectrum, however, the Consultation Paper sought industry views as to whether critical services in the M2M sector should be permitted to be provided by using unlicensed spectrum as well.

Transatel, which is a global cellular Internet of Things (IoT) connectivity solutions provider, in its response to the Consultation Paper stated that a balanced approach is required to improve customer experience, drive innovation and increase affordability for connected and services related to AVs.

Vodafone Idea ("Vodafone"), another telecommunication company, has in year 2024 provided its comments to TRAI's consultation paper on "*Digital Transformation through 5G Ecosystem*" dated September 29, 2023, which discussed various sectors, including AVs. Vodafone has emphasized establishing strict liability regimes for manufacturers and operators of autonomous systems wherein they are held liable for damages without the need to prove negligence. Further, it has been recommended to mandate human oversight for decisions made by autonomous systems where there is a significant impact on individuals or the public.

5. Have any new laws/regulations been passed within the last year that have affected the deployment of autonomous vehicles?

There have not been any legislative developments in 2024 which could have affected the deployment of AVs and the Motors Vehicle Act, 1988 ("MV Act") and the Consumer Protection Act, 2019 ("CPA") continue to be the two major laws currently governing the operation of motor vehicles in India. As mentioned in the Dentons' Global Guide to Autonomous Vehicles

2024, neither the MV Act nor the CPA (in their present form) specifically regulate AVs or self-driving vehicles.

Whilst the future of AVs is still at a nascent stage in India, however, it has the potential to bring about significant changes in the way the society thinks about transportation. It is important that there are clear rules and guidelines for testing and using self-driving cars. Without a set of laws and regulations, it will be unlikely for companies in India to build and sell AVs. The future of AVs is promising, and the potential benefits of these vehicles make it an exciting area of development. With technological advancements by various start-ups, the future of AVs appears bright.

6. What advancements in autonomous vehicles should we expect in India in 2025?

Recent years have seen a notable increase in the popularity of AVs. The future of AVs is promising, with rapid advancements in technology and growing societal acceptance.

As AI and green technology continue to revolutionize, AVs will become more capable, affordable, and accessible. The convergence of these technologies has the potential to transform transportation. As per industry reports, by 2025, India is likely to witness a surge in semi-autonomous features in motor vehicles. Technologies such as self-parking systems and lane-keeping assistance, which are currently present in less than 5% of cars sold in India, are expected to become more widespread.

AV technology also holds promise to positively impact ride-hailing services. A 2024 study by the Indian Urban Transport Institute predicts that driverless taxis could reduce ride costs by up to 40%, potentially revolutionizing urban transportation in India.

7. Aside from Robotaxis, do you see any other developments in the commercial space regarding AVs, including farming, commercial trucking, food delivery, etc.?

Foresight Autonomous Holdings has announced a collaboration with Tata Elxsi, a fully integrated global design and technology consultancy, to develop ADAS and AV technologies using Foresight's 3D perception solutions. The collaboration aims on accelerating development of solutions for semi/fully AVs with innovations first targeting the Indian automotive market and gradually expanding globally, marking a significant growth in various sectors including passenger vehicles, heavy machinery, and agriculture. The partnership further aims to leverage Tata Elxsi's integration expertise and Foresight's cutting-edge technology to enhance safety and efficiency in transportation.

Recently, VRD Motors which specializes in advanced farming technology, has been transforming the agricultural sector with cutting-edge designs and technology as the world's first electric, autonomous, AI-powered tractor manufacturer. The startup aims to provide sustainable agricultural solutions that maximizes farm yields, supports environmental sustainability, and enhances farmers' livelihoods.

Minus Zero, an AI startup in Bengaluru, which introduced India's first prototype of an AV in June 2023 has entered into a partnership with Ashok Leyland, the country's leading commercial vehicle manufacturer. The partnership aims to revolutionize commercial trucking through the deployment of autonomous solutions. Leveraging Ashok Leyland's esteemed product portfolio and safety standards along with Minus Zero's expertise in self-driving technology, the collaboration aims for safe and scalable adoption of autonomous driving in commercial vehicles.

8. Have any AI laws impacted deployment?

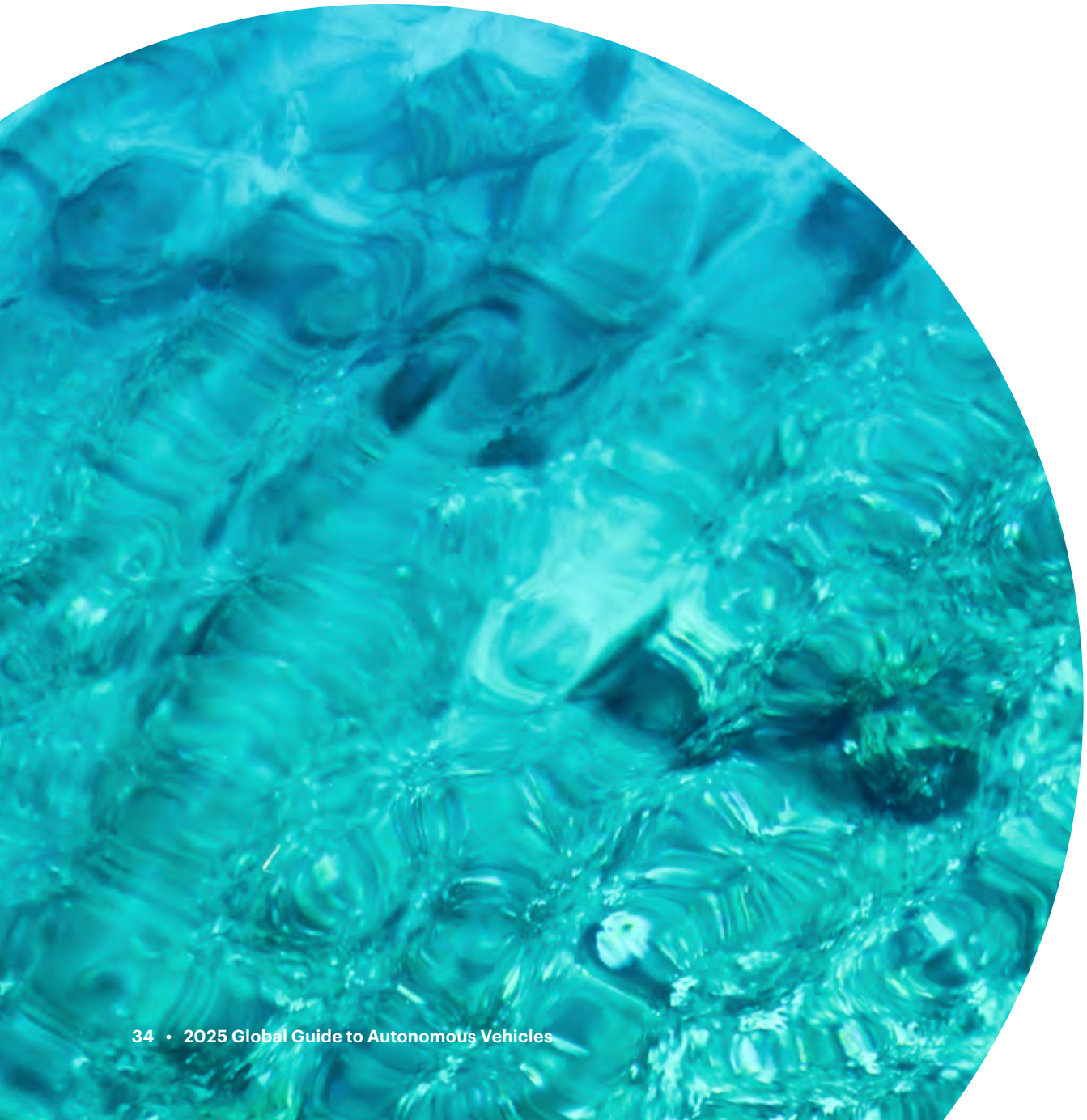
Whilst India has introduced several initiatives for responsible development and deployment of Artificial Intelligence ("AI") technologies, however, there are currently no specific laws regulating AI in India.

Authors

Anuj Trivedi
Partner, New Delhi
anuj.trivedi@dentonslinklegal.com

Kartikeya Singh
Principal Associate, New Delhi
kartikeya.singh@dentonslinklegal.com

Udbhay Handa
Associate, New Delhi
udbhay.handa@dentonslinklegal.com



Japan

1. What are the latest autonomous vehicle developments in Japan for 2025?

- **Advancement of level 4 autonomous driving with revision of Road Traffic Act**
  Japan's Road Traffic Act (RTA) was revised and put into effect on April 1, 2023, to make it possible to engage in driverless, self-driving transportation services (level 4). With this, in 2024 we have witnessed a variety of advancements with regard to level 4 autonomous driving in Japan.

- **Launch of Japan's first level 4 self-driving bus operations and remaining issues**
  Japan's first level 4 self-driving bus operations were launched in HANEDA INNOVATION CITY, operating on private roads adjacent to the Haneda Airport, on August 1, 2024.[1] The service is operated by a private Japanese company, said to be the first private company to obtain a permit to operate level 4 autonomous vehicles.

  In addition, on October 28, 2024, Japan's first ever level 4 self-driving bus public road verification testing was conducted in Kamishihorocho, Hokkaido.[2]

  Depopulation and declining birthrates in Japan's rural areas and hilly and mountainous areas have led to a decline in public transportation, and level 4 self-driving buses and other driverless, self-driving transportation services are expected to resolve this issue.[3] However, such rural areas and hilly and mountainous areas face a variety of issues, including narrow roads, the inability of autonomous vehicles to determine their locations due to snowfall or fog, and lack of profitability.[4] Thus, future advancements in technology and increased efforts toward commercialization are still important goals to be achieved.

- **Demonstration and Testing of level 4 self-driving trucks on expressways**
  The Japanese government is promoting the verification testing of level 4 self-driving trucks on expressways to facilitate their public implementation. The first verification testing on Japan's expressways occurred in November 2024. See response to Q6 for the details.

- **Japanese government moves to accelerate the commercialization of level 4 autonomous driving**
  In an effort to accelerate the commercialization of level 4 autonomous driving, in June 2024, the Japanese government compiled measures to expand the base of stakeholders and heighten social acceptance by promoting the introduction of new autonomous driving services and through other efforts. See response to Q2 for the details.[5]

1 https://haneda-innovation-city.com/news/2024/08/08/2685/.
2 https://www.nikkei.com/article/DGXZQOFC257OC0V21C24A0000000/.
3 https://www.mlit.go.jp/policy/shingikai/content/001623770.pdf, p. 3.
4 https://www.mlit.go.jp/road/ir/ir-council/road_space/pdf/chu-matome.pdf.
5 https://www.cas.go.jp/jp/seisaku/digital_gyozaikaikaku/pdf/torimatome_honbun.pdf, p. 9.

2. Is Japan experiencing any recent roadblocks regarding autonomous vehicle developments?

- **Issues with the examination procedures for autonomous driving**
  One barrier to the public implementation of autonomous driving in Japan has been that examinations to ensure the safety of autonomous vehicles have been highly specialized, and the administrative procedures associated with these examinations tend to be lengthy. In June 2024, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) cooperated with the National Police Agency (NPA) and Ministry of Economy, Trade and Industry (METI) to develop and release "Efforts to Ensure the Required Transparency and Fairness for Autonomous Driving Examination Procedures" in an effort to accelerate the examination procedures[6]. The goal is to promote the expanded introduction of new autonomous driving and to broaden the base of stakeholders by aiming for faster completion of examinations and administrative procedures associated with autonomous driving. Examinations and procedures which have taken approximately 11 months in the past are now aimed to be completed in 2 months as a result of the government: (i) creating a national support system; (ii) clarifying the examination content, procedures, forms and other details (such as formulation of Guidelines for Ensuring the Safety of Autonomous Driving[7]); and (iii) releasing and sharing past examination cases and making other efforts to streamline examinations as well as by the complete digitization of the process.[8] These efforts are expected to accelerate the spread of autonomous driving.

- **Example of Delay of start of self-driving bus operations**
  On March 22, 2024, pursuant to the Road Transport Vehicle Act (RTVA), the MLIT Tohoku District Transport Bureau approved the operation of autonomous vehicles that do not require drivers (level 4) for BRT[9] on the JR Kesennuma Line.[10] Level 4 autonomous driving operations were scheduled to start from the fall of 2024, and the fact that these were large buses with a maximum speed of 60 kph generated considerable interest. However, on October 28, 2024, East Japan Railway Company announced that the start of these operations would be delayed.[11] While the detailed reasons are uncertain, the delay is said to have been due to delays in the progress of testing, construction and procedures. As in our response to Q7, while the introduction of autonomous driving is advancing in a variety of sectors, there are cases such as this where advancements do not proceed as planned.

3. Are there any recent updates in the cybersecurity/privacy space related to autonomous vehicles?

- **Trends in laws, regulations, and guidelines**
  In 2024, there have been no revisions or other significant changes to domestic laws and regulations or the guidelines pursuant thereto with regard to cybersecurity and the protection of privacy related to autonomous driving. The WP.29 Regulations, the Notification Establishing Security Standards and the Details for the Road Transport Vehicle Act, the Personal Information Protection Act and other regulations continue to apply.

- **Government trends**
  The Ministry of Internal Affairs and Communications (MIC) released the 2024

6 https://www.mlit.go.jp/report/press/jidosha07_hh_000504.html.
7 https://www.mlit.go.jp/jidosha/content/001746489.pdf.
8 https://www.mlit.go.jp/jidosha/content/001746487.pdf.
9 Abbreviation for Bus Rapid Transit.
10 https://wwwtb.mlit.go.jp/tohoku/content/000334947.pdf.
11 https://www.jreast.co.jp/press/2024/20241028_ho01.pdf.

edition of its White Paper on Information and Communications in Japan on July 5, 2024.[12] With regard to ensuring the reliability of the communications systems required for safe and effective autonomous driving, the plan is to develop a collection of models which can be referenced by regions that are considering the introduction of autonomous driving sometime in 2024. (As of December 2024 there is no information regarding the completion thereof). The models will be based on the results of the ongoing Regional Digital Infrastructure Utilization Promotion Project (Autonomous Driving Level 4 Verification). This process will support the development of information and communications environments in these various regions, in line with these models.

- **Trends in the Industry**
  On November 12, 2024, the Japan Automobile Manufacturers Association, comprised of 14 domestic automotive manufacturers, released explanatory materials on the priority items in the Automative Industry Cybersecurity Guidelines first published in 2022.[13] These materials set out the matters that should be addressed first among the level 1 (the minimum that should be implemented in the automobile industry) security measures, which include, among other things, the development of procedures for responding to security incidents and the gathering of information on prior server attacks.

  Also, on September 13, 2024, VicOne Corporation (a subsidiary of Trend Micro Inc.), which supplies the automotive industry with cybersecurity software, released a report summarizing the most recent cybersecurity trends in Japan's automotive industry.[14] This report addresses the results of investigations of domestic and international cybersecurity attacks and the risk countermeasures that can be put in place on the software side.

4. Are there any recent updates in the 5G space related to autonomous vehicles?

- **2024 government trends and examples of 5G utilization**
  In June 2024, the Japanese government formulated the National Comprehensive Digital Lifeline Development Plan in an effort to accelerate the public implementation of autonomous driving and other digital lifelines. Under this plan, the establishment of "autonomous driving service support roads" (road sections where a safe operating environment for autonomous vehicles is provided and where driving data can be shared) was slated to be promoted in 2024, and the development of 5G SA and other V2N communication environments or local 5G communications was scheduled to be advanced for the establishment of these roads.[15]

  As part of this plan, Hitachi City in Ibaraki has been designated as a region for the advance introduction of "autonomous driving service support roads," and in December 2024, verification testing was conducted in Hitachi City to ensure safe spacing between pedestrians and self-driving buses at narrow intersections that utilize local 5G communications.[16]

  Additionally, the Japanese government is targeting the nationwide development of region-restricted level 4 autonomous driving services (with a target of 50 locations in 2025), and on April 23, 2024, the MIC announced that the verification group had been selected for the Regional Digital Infrastructure Utilization Promotion Project for the achievement of these goals.

12 https://www.soumu.go.jp/johotsusintokei/whitepaper/r06.html.
13 https://www.jama.or.jp/operation/it/cyb_sec/cyb_sec_guideline.html#reference2.
14 https://vicone.com/jp/company/press-releases/vicone-japan-automotive-cybersecurity-report-2024.
15 keikaku.pdf.
16 https://jpn.nec.com/press/202410/20241021_01.html.

The verification group is conducting verification testing for level 4 autonomous driving utilizing communications systems, including 5G, in seven municipalities across Japan. For example, in September 2024, verification of a communication system that proactively switches to the optimal connection destination from among multiple network services in anticipation of predicted degradation in the wireless quality, utilizing 5G communications provided by carriers and local 5G communications, was conducted in Yokohama City in Kanagawa.[17]

- **Future utilization of 5G**
  In response to the delay in the commercialization of autonomous driving services in Japan, on June 21, 2024, the Mobility Working Group at the Digital Agency compiled the Mobility Road Map 2024 as the measures that should be taken by individual government agencies.[18] This roadmap positions 2025 and 2026 as the "advance commercialization stage," and places emphasis on the advancement and implementation of technology in the data linkage and communications sector. Future trends regarding the utilization of 5G for automated driving need to be closely monitored.

5. Have any new laws/regulations been passed within the last year that have affected the deployment of autonomous vehicles?

The RTA and related laws and regulations were revised in April 2022 to make level 4 (full system driving control under specific conditions (including emergency responses, etc.)) autonomous driving a possibility. This revision took effect from April 2023, and no subsequent revisions that have a material impact on the development of autonomous vehicles have been made to the RTA and related laws.

Meanwhile, now that level 4 autonomous driving is a possibility, the manuals and other documents setting out practical operations have been undergoing revisions and updates in 2024.

For example, the Guidelines on Safety Assurance Measures for Autonomous Vehicles[19] were revised in June 2024. (The Guidelines on Safety Assurance Measures for agricultural equipment[20] were also revised in March 2024). Additionally, the standards for the granting of this permission[21] were revised in September 2024 (In Japan, obtaining permission to use public roads is required for engaging in verification testing on public roads unless a driver is seated in the vehicle's driver's seat to regularly monitor the surrounding traffic conditions and the vehicle's status, and to take control in emergencies or when otherwise required to ensure safety).

Furthermore, on May 31, 2024, the Sub-working Group on the Review of Social Rules for Autonomous Vehicles in the Age of AI established under the Mobility Working Group under the Digital Society Promotion Council at the Digital Agency, released a report setting out issues (short-term issues and medium to long-term issues) regarding the state of social rules related to autonomous vehicles and compiling the results of reviews on the direction that should be taken.[22] This report is likely to have a certain degree of influence on the future enactment or revision of regulations.

Continued attention will have to be paid to regulatory trends.

6. What advancements in autonomous vehicles should we expect in Japan in 2025?

- **Advancement of self-driving truck technology for expressways**
  The Japanese government is promoting the introduction of autonomous driving technology

17 https://www.nttdata-strategy.com/newsrelease/240930/.
18 https://www.digital.go.jp/assets/contents/node/basic_page/field_ref_resources/2415ad00-6a79-4ebc-8fb1-51a47b1b0552/53e634ee/20240621_mobility-working-group_main_01.pdf.
19 https://www.mlit.go.jp/jidosha/content/001749839.pdf.
20 https://www.maff.go.jp/j/kanbo/smart/attach/pdf/index-172.pdf.
21 https://www.npa.go.jp/bureau/traffic/selfdriving/roadtesting/2409dourosiyoukyokakijun.pdf.
22 https://www.digital.go.jp/assets/contents/node/basic_page/field_ref_resources/1fd724f2-4206-4998-a4c0-60395fd0fa95/9979bca8/20240523_meeting_mobility-subworking-group_outline_04%20.pdf.

to achieve level 4 autonomous driving on expressways by 2025[23], and major technological advancements for the practical implementation of self-driving trucks are expected in 2025. This will be backed by demands for the resolution of logistics personnel shortages and the improvement of logistics efficiency. In Japan, the 2024 revision of the Labor Standards Act and other working hour regulations will place a cap on overtime hours for truck drivers, and there are concerns that logistics will bottleneck with the accompanying reduction in manpower.[24] Accordingly, the Japanese government is working with truck manufacturers and logistics companies to vigorously pursue the practical and social implementation of self-driving trucks on expressways.

- **Implementation of verification testing for self-driving trucks on expressways**
  The Japanese government is promoting verification testing on public roads for the practical and social implementation of self-driving trucks. In November 2024, autonomous vehicle lanes were installed on an expressway between Tokyo and Nagoya for verification testing, and the plan is to install autonomous vehicle lanes and conduct verification testing in six more sections from 2025 and beyond.[25] Such tests are conducted to verify risk avoidance associated with autonomous driving[26], and the commercialization of self-driving trucks is accelerating.
- **Commercialization of self-driving trucks and technical issues**
  In 2025, some Japanese enterprises aim to realize the commercialization of self-driving truck services compatible with level 4 autonomous driving.[27] Of course, large vehicles face a variety of unique issues, including the need for a large number of sensors and cameras to widen their detection range.[28] Companies are competing to develop technologies to resolve these issues, and significant technological advances and even the commercialization of self-driving trucks are expected in Japan in 2025.

7. Aside from Robotaxis, do you see any other developments in the commercial space regarding AVs, including farming, commercial trucking, food delivery, etc.?

- **Self-driving agricultural machinery**
  The Safety Assurance Guidelines for Self-driving Agricultural Machinery[29] established in March 2017 were partially revised in March 2024.[30] In anticipation of the commercialization of robotic agricultural machinery used by remote monitoring[31], this revision adds the safety assurance measures, etc. required for this machinery.
- **Autonomous delivery robots**
  With the revision of the RTA having come into effect in April 2023, autonomous delivery robots are now able to travel on public roads as "remotely operated small vehicles" (RTA Article 2, Paragraph 1, Item (11)-5) if they meet certain

23 MLIT, Trends in the Realization of Autonomous Driving (2022 1st Review Meeting on Ensuring Safety, etc. in Vehicle Transportation Business utilizing Autonomous Vehicles), p. 3.
24 MLIT, Policy on the Use of Autonomous Vehicles, etc. that Contribute to the Resolution of Social Issues, p. 7.
25 MLIT, Testing of Self-driving Trucks on Expressways, p. 5.
26 NPA, Current Status and Issues for Social Implementation of Self-driving Trucks.
27 https://t2.auto/company/.
28 Others include the need for multiple communications means and antennas/detection equipment for covered cargo, and the need for the recognition of greater distance information due to difficulties in sudden stopping and steering. NPA, Current Status and Issues for Social Implementation of Self-driving Trucks.
29 Notification of the Director-General of the Production Bureau, Ministry of Agriculture, Forestry and Fisheries (MAFF), No. 28 *seisan* 2152, dated March 31, 2017. (https://www.maff.go.jp/j/press/nousan/gizyutu/attach/pdf/240327-2.pdf).
30 https://www.maff.go.jp/j/press/nousan/gizyutu/240327.html.
31 Referring to vehicle-type agricultural machinery that incorporates sensors, combined intelligent control systems and drive systems (robotic technology) that is used in fields and other locations for agricultural work. (Safety Assurance Guidelines for Self-driving Agricultural Machinery, preamble 4).

conditions. In February 2024, METI established Guidelines for the Use of Autonomous Delivery Robots to provide a centralized understanding of the processes and actions that need to be taken prior to the initial use of autonomous delivery robots, as well as the relevant laws and regulations.[32] Additionally, Uber Eats Japan G.K. introduced delivery robots in Tokyo and Osaka in 2024.[33]

- **Moving toward the automation of cargo delivery at domestic airports**
  The MLIT Civil Aviation Bureau is promoting public-private collaboration in verification testing for the transportation of luggage, cargo and passengers within restricted airport areas, and the first test run of a level 4 self-driving[34] towing tractor[35] was conducted at the Tokyo International Airport between July 1 and 19, 2024. The goal is to launch level 4 autonomous driving operations in airport restricted areas within 2025.[36]

8. Have any AI laws impacted deployment?

At present, Japan has yet to adopt an approach for the development of comprehensive regulatory laws and regulations regarding AI.

Regulations envisioning the use of AI are incorporated in the existing regulations for each sector, and for autonomous driving, the regulations regarding the use of AI and autonomous driving technologies are incorporated in the RTA, RTVA and other existing regulations for automobiles.

To date, we have yet to see any regulations that restrict the types of AI or the AI training methods that can be used in autonomous driving, but the possibility cannot be ruled out that some type of regulations will be put in place in the future based on the discussions and the like in other sectors.

Continued attention will have to be paid to regulatory trends.

32 https://www.meti.go.jp/policy/economy/distribution/deliveryrobot/guidance.html.
33 https://www.uber.com/ja-JP/newsroom/osaka-robot-2024/.
34 Under certain conditions, the system performs all driving tasks without a driver in the vehicle.
35 Vehicles that tow trailers loaded with luggage or cargo, containers and other items at airports and other locations.
36 https://www.mlit.go.jp/report/press/kouku09_hh_000254.html.

Authors

Noriko Higashizawa
Partner

Masashi Komori
Associate

Yuki Mori
Associate

Hiroaki Sekoguchi
Associate

Takahiro Tateno
Associate

South Korea

1. What are the latest autonomous vehicle developments in South Korea for 2025?

New Temporary Autonomous Vehicle Operation Permits Increased for 4 Years, But Decreased to Only 10 in 2024

The number of applications for new 'temporary autonomous vehicle operation permits', which allow developed autonomous vehicles to be tested on actual roads without official registration, increased for 4 years, but has shown a downward trend in 2024 due to the sluggish electric vehicle industry, including electric autonomous vehicles. Specifically, there were 43 new applications in 2020, 66 in 2021, 86 in 2022, and 151 in 2023, but in 2024, the number plummeted to 10 as of June 2024.

The launch of Level 3 autonomous vehicles that were scheduled to be released has been delayed, causing the number of applications to decrease significantly.

Hyundai Mobis's Level 4 Autonomous Vehicle Runs on The Roads in Incheon

Hyundai Mobis, an affiliate of the Hyundai Motor Group, is conducting test drives of its Level 4 autonomous vehicle prototype around the Songdo and Yeongjongdo areas in Incheon. To run a test vehicle, Hyundai Mobis signed a Memorandum of Understanding (MOU) with the Incheon Free Economic Zone Authority and Incheon Technopark.[1]

The autonomous vehicle prototypes are scheduled to operate across a 60 km section, focusing on Incheon Bridge and extending to the Songdo and Yeongjongdo areas, until the first half of next year. Through this pilot program, Hyundai Mobis aims to validate the capabilities of its self-developed autonomous driving solutions. The AVs are equipped with computing technologies optimized for Level 4 autonomy and designed to collect meaningful data through extended urban driving.

Also, Hyundai Mobis plans to concurrently develop mass-production-level systems through this pilot program. To achieve this, the prototype vehicles are equipped with high-performance processors that replace dozens of microcontroller units (MCUs) responsible for vehicle control.

KG Mobility Aims to Expand Routes, Car Models for Trial-based Self-driving Taxi Project

In September 2024, KG Mobility launched the service with three self-driving hail taxi units in the 11.7-square-kilometer area in central Gangnam and part of the neighboring Seocho-dong during late night hours from 11 p.m. to 5 a.m.[2] It plans to expand service routes and car models for its trial-based nighttime autonomous taxi service in Seoul through cooperation with local software company SWM.

KG Mobility plans to expand unmanned taxi service to additional areas, including the nearby neighborhoods of Sinsa, Nonhyeon and parts of Samsung-dong, in the near future.

1 Further details available at https://www.iotworldtoday.com/transportation-logistics/hyundai-mobis-plans-major-self-driving-test-in-south-korea#close-modal.

2 Further details available at https://www.koreatimes.co.kr/www/tech/2024/10/129_383619.html.

2. Is South Korea experiencing any recent roadblocks regarding autonomous vehicle developments?

Autonomous driving beyond Level 3 still faces technological barriers, as nighttime driving conditions, with less light than daytime, pose greater challenges for autonomous vehicles. Hyundai Motor, a Korean automaker, had originally planned to add a Level 3 autonomous system to its Genesis G90 by the end of 2024. However, the company has postponed that launch indefinitely. Vehicles with Level 3 technology, also known as 'conditionally automated driving,' can monitor their environments and manage most aspects of driving without human assistance, though they will occasionally request human intervention. The company will continue evaluations until it can be 100 percent confident in driver safety.

From 2020 to June of 2024, there were a total of 56 traffic accidents involving autonomous vehicles operating on temporary permits. The highest number occurred in 2023, with 27 incidents, followed by 15 incidents in 2024 and 7 in 2022. These accidents may impact the public's trust in current autonomous vehicles technology and limit forward progress until technological improvements occur to further reduce accidents.

Obtaining permits to operate and test autonomous vehicles has been challenging. However, the Ministry of Land, Infrastructure and Transport is implementing a streamlined permit system for temporary operation of autonomous vehicles and expanding the scope for recognizing identical autonomous vehicles. Notably, they are improving regulations to extend the current five-year temporary permit period by two additional two-year extensions, allowing for a maximum duration of up to nine years.

3. Are there any recent updates in the cybersecurity/privacy space related to autonomous vehicles?

The Guidelines for Cybersecurity

The Korean government issued Guidelines based on international standards for automobile cyber security in December 2020 as a first step in addressing cybersecurity risks. The government stated it planned to enact laws/legal standards regarding automobile cybersecurity, with the goal of implementing such laws. On January 25, 2024, the Ministry of Land, Infrastructure, and Transport (MOLIT) amended the Motor Vehicle Management Act to establish automakers' obligations regarding cybersecurity management systems and software update safety measures for vehicles, as well as the authority of the Ministry as a relevant regulatory body. This amendment lays the institutional foundation for incorporating the international standards on automotive cybersecurity established in 2020.

Amended Motor Vehicle Management Act (Effective beginning August 2025)

Autonomous vehicle manufacturers must establish cybersecurity management systems and obtain certification from the MOLIT for self-certification.

The cybersecurity management system signifies the organization, means, and procedures for monitoring cyber threats at all times from vehicle production to operation and responding quickly to threats when they occur.

The MOLIT may investigate the compliance of autonomous vehicle manufacturers with software updates through a performance testing agency and order corrective measures for inappropriate updates.

Global Information Security Standard

Hyundai Motor and Kia are strengthening in-car cybersecurity features. They have earned certifications of their cyber security and management system (CSMS) as meeting the United Nations Economic Commission for Europe (UNECE) regulation R-155 for new car releases as of July 2022. They changed the work process for establishment and operation of the CSMS during the entire life cycle of cars.

LG Electronics received 'TISAX (Trusted Information Security Assessment Exchange)' certification in all major areas of their electronic devices business to

strengthen competitiveness in the automotive parts business.

TISAX is a global information security certification created by a German automobile industry association to standardize the security evaluation criteria of different automobile manufacturers. It evaluates security in four aspects: information security system, partner security system, data protection system, and prototype protection system.

4. Are there any recent updates in the 5G space related to autonomous vehicles?

5G+ Strategy

In April 2019, the Korean government announced a "5G+ Strategy" to realize innovative growth by 2026 based on 5G technology, through cooperation among related departments and agencies. The government selected 10 "core industries" and 5 "core services" as strategic 5G industries and introduced support plans customized to each industry, based on market maturity and demand.

'5G vehicles-to-everything (V2X)' was selected as one of the ten "core industries," while 'autonomous vehicles' was selected as one of the five "core services."

For the selected "industries" and "services," the government is supporting the development of the technology and under such support some major Korean companies are devoting significant resources to its development.[3]

Development/progress currently

On November 12, 2024, LG Electronics introduced its new cockpit concept for future mobility, called the 'Digital Cockpit Gamma.' The Digital Cockpit Gamma consists of three main modules: Vision Display, Intelligent HMI, and Connectivity & Content. It features a modular system that allows users to select their desired functions.[4]

The Vision Display uses a transparent OLED instrument panel to provide essential driving information. The Intelligent HMI is an interface system that integrates artificial intelligence (AI) to facilitate interactions between the driver and the vehicle. The AI analyzes the driver's condition in real time, offering smart services, such as suggesting nearby cafes for coffee if it detects drowsy driving. Connectivity & Content is characterized by 5G communication, enabling fast data exchange and providing unique entertainment experiences. Passengers can enjoy high-definition content and live broadcasts comfortably through the webOS content platform in the car.

The digital cockpit is part of the Mobility Labworks series, dedicated to researching the future of mobility with a focus on integrating innovative technologies in transportation. LG actively collaborates with car manufacturers to offer systems adapted to industry and user requirements. LG continues to strengthen its position in the automotive technology market, and the new Labworks series supports the company's commitment to advancing the future of mobility.

5. Have any new laws/regulations been passed within the last year that have affected the deployment of autonomous vehicles?

Act on The Support For The Innovation and Revitalization of Mobility (Effective as of October 19, 2023)

Act on The Support For The Innovation and Revitalization of Mobility (hereinafter the "**Act**") was enacted to support diverse and creative mobility services led by the private sector, as the integration of innovative technologies, such as information and communication technology (ICT) in the transportation sector has emphasized user-oriented mobility and increased the importance of the mobility industry as a future growth driver. The Act establishes the first institutional framework to support the introduction and expansion of new

3 Further details available at https://www.businesskorea.co.kr/news/articleView.html?idxno=30733#:~:text=The%2015%20%20industries%20consist%20%20of,%2C%20information%20security%2C%20edge%20computing%2C.

4 Further details available at https://www.mk.co.kr/en/business/11164745.

mobility and foster innovation-driven growth led by the private sector.

The regulatory sandbox system included in the Act consists of two main components: the Regulatory Fast-Track System and the Experimental Exception System.[5] The Regulatory Fast-Track System is a system that grants exemptions from all or part of the regulations in cases where the laws governing permits or approvals for businesses utilizing new mobility means, infrastructure, services, or technologies lack applicable standards, where applying existing standards is deemed inappropriate, or where it is impossible to apply for permits or approvals.

Revised Autonomous Vehicle Act (Effective as of July 10, 2024)

A system for the discretionary designation of pilot operation zones that cover two or more cities and provinces has been newly established.[6]

The authority to grant permits for passenger transport businesses within the pilot operation zones has been transferred from the Minister of Land, Infrastructure, and Transport to the heads of local governments in respect of the pilot operation zones.[7]

The formation and operation of the autonomous vehicle pilot operation zone committee has been changed to a discretionary provision, allowing the committee to be dissolved upon achieving its purpose.

Road Traffic Act Amendment (Effective as of September 20, 2024)

The new amendment to the Road Traffic Act contains a requirement that drivers of partially autonomous vehicles respond to the autonomous driving system's direct driving request without delay and directly operate the steering wheel or brakes.[8]

Persons with a temporary driving permit must receive safety education for driving an autonomous vehicle.

The commissioner of the national police agency may establish and operate a traffic information center to collect, analyze, and provide traffic information.[9]

6. What advancements in autonomous vehicles should we expect in South Korea in 2025?

Kia Will Launch Mid-sized Purpose-built Vehicle PV5 in 2025

Kia Corp., an affiliate of the Hyundai Motor Group, is set to unveil its first mid-sized, purpose-built vehicle (PBV) model in 2025.[10] The PBV is designed as a total mobility solution that combines purpose-built electric vehicles with advanced software. Notably, it features a conversion function that allows for the replacement of various life modules based on usage purposes such as vehicle calling, delivery, and utilities. Additionally, it will enhance connectivity between the SDV (Software-Defined Vehicle), routes, information, and other external data, enabling the simultaneous operation of multiple vehicles.

Kia plans to expand its reach to large logistics companies, mobility firms, and individual users by adding both large and small PBV lineups. At this stage, digital control and autonomous driving technologies will be fully integrated into Kia's PBVs, while the range of data connectivity will be expanded through AI-based vehicle control and management support. The long-term goal is to further develop the PBVs into a "bespoke mobility solution," fully customized to individual preferences and purposes.

5 *See* Article 11 and 12 of the Act on The Support For The Innovation and Revitalization of Mobility.
6 *See* Article 7(2) of the Autonomous Vehicle Act.
7 *See* Article 9(2) of the Autonomous Vehicle Act.
8 *See* Article 56(2) of the Road Traffic Act.
9 *See* Article 145(2) of the Road Traffic Act.
10 Further details available at https://www.kedglobal.com/korean-innovators-at-ces-2024/newsView/ked202401090017.

25 Korean Standards Planned for Autonomous Driving by 2025

The Korean government will establish national standards for autonomous vehicles by 2025, aiming to strengthen its capacity to respond to international standards.[11] The National Institute of Technology and Standards (NITS) has identified three major strategies and eight key tasks to promote the commercialization of autonomous vehicles in Korea and secure leadership in the global market. By 2025, it plans to establish 25 new Korean standards (KS) and propose 30 international standards.

To advance the practical application of autonomous vehicles in Korea, the government is prioritizing the development of V2X (Vehicle-to-Everything) data standards. V2X is a communication technology that enables the exchange of data necessary for autonomous driving between vehicles (V2V) and between vehicles and road infrastructure (V2I). The NITS plans to establish seven national standards, including scenarios and data formats for various situations that may arise during autonomous driving, by 2025, and will also work on proposing international standards.

7. Aside from Robotaxis, do you see any other developments in the commercial space regarding AVs, including farming, commercial trucking, food delivery, etc.?

Government's Supportive Stance

In June 2021, the Korea Transportation Safety Authority established the AV Transportation and Logistics Master Plan 2025 to commercialize autonomous driving-based transportation and logistics systems through the commercialization and proliferation of autonomous vehicles.

Hyundai Motor and Kia's DAL-e Delivery Robot Arrives, Ready to Revolutionize Indoor Autonomous Delivery Services

Hyundai Motor and Kia's autonomous delivery robot, DAL-e Delivery, has undergone significant improvements in both design and performance to provide swift and reliable delivery services in complex indoor environments.[12] DAL-e Delivery is equipped with four Plug & Drive (PnD) modules, a mobility solution that combines a motor with steering, suspension, braking systems, and environmental recognition sensors. It can reach speeds of up to 1.2 m/s, with the free-moving PnD modules and advanced autonomous driving technology allowing it to recognize obstacles and navigate easily through congested areas. Additionally, the robot's enhanced suspension ensures a smooth ride over floor bumps, maintaining stable delivery.

The key feature of DAL-e Delivery is its autonomous driving capability to navigate and transfer to and from all building floors, seamlessly interfacing with the elevator and door control system. Also, it ensures quick delivery service by creating optimal routes in real-time.

CJ Logistics Tests Autonomous Parcel Trucking

CJ Logistics, a leading supply chain and technology innovator, plans to expand logistics automation by introducing autonomous driving technology for its delivery trucks.[13] In April 2024, CJ Logistics launched a pilot project with autonomous driving startup Mars Auto to use autonomous trucks for parcel deliveries. An 11-ton autonomous truck, loaded with actual parcels, travels on a 135-mile (218 km) route from CJ Logistics' Incheon Center to the Okcheon Hub Terminal six times a week.

CJ Logistics' autonomous driving truck operates manually in urban areas and switches to autonomous driving on the highway. With a driver

11 Further details available at https://www.korea-certification.com/en/25-ks-planned-for-autonomous-driving-by-2025/.
12 Further details available at https://www.hyundai.com/worldwide/en/newsroom/detail/hyundai-motor-and-kia%25E2%2580%2599s-dal-e-delivery-robot-arrives%252C-ready-to-revolutionize-indoor-autonomous-delivery-services-0000000716.
13 Further details available at https://newsroom.cj.net/cj-logistics-tests-autonomous-parcel-trucking/.

on board for emergencies, it can switch to manual driving if necessary. CJ Logistics anticipates that autonomous driving will reduce truck drivers' workload and enhance safety.

8. Have any AI laws impacted deployment?

The Personal Information Protection Commission (PIPC) Releases Guidelines on the Protection and Use of Personal Visual Data for Mobile Visual Processing Devices

The PIPC's guide establishes specific standards for using personal information, such as facial images, collected by mobile devices operating in public spaces.[14] It also stipulates obligations under Article 25(2) of the Personal Information Protection Act (PIPA), which regulates mobile video processing for business purposes in public areas.

When video recordings are made by rapidly moving devices, such as autonomous vehicles, it is recommended that device operators (i) delete unnecessary footage after operation and (ii) anonymize or pseudonymize video data to reduce the need for individuals to exercise rights such as requesting access or deletion of the footage. In addition, using footage recorded during test operations for autonomous vehicle technology research, such as AI training, without pseudonymization or anonymization, would likely not be considered foreseeable to the data subject.

Driverless Vehicle Testing and Deployment

STRADVISION, a trailblazer in deep learning-based vision perception technology for the automotive industry, in May 2023 established a new 'Autonomous Driving Workshop' in Dongtan, Gyeonggi-do, South Korea. This workshop is focused on enhancing vehicle object recognition technology. Spanning nearly 18,000 square feet, STRADVISION's facility is dedicated to the optimization and calibration of cameras and sensors for autonomous vehicles. The workshop boasts facilities for testing and advancing camera-based autonomous driving, as well as other sophisticated technologies like lidar and radar, facilitating a variety of research and development projects tailored to different levels of autonomous driving technology.

Current AI Laws and Deployment

With respect to AI laws in South Korea, AI-related legislation was proposed in the 21st National Assembly since 2020. However, the AI Basic Act failed to pass during the 21st National Assembly and was subsequently discarded. It is now being revisited in the 22nd National Assembly (in session from 2024 until 2028), with 10 bills currently proposed. The legislation includes provisions for supporting technology development, establishing ethical principles and trustworthiness, and creating a management framework.

The Government Expands Financial Support for AI Chips, Boosting Development of High-Efficiency and Automotive Semiconductors

The Ministry of Trade, Industry and Energy (MOTIE) is expanding financial support for the development of AI semiconductors to strengthen the competitiveness of the semiconductor industry and is focusing on supporting material, component, and equipment suppliers as well as back-end packaging companies.

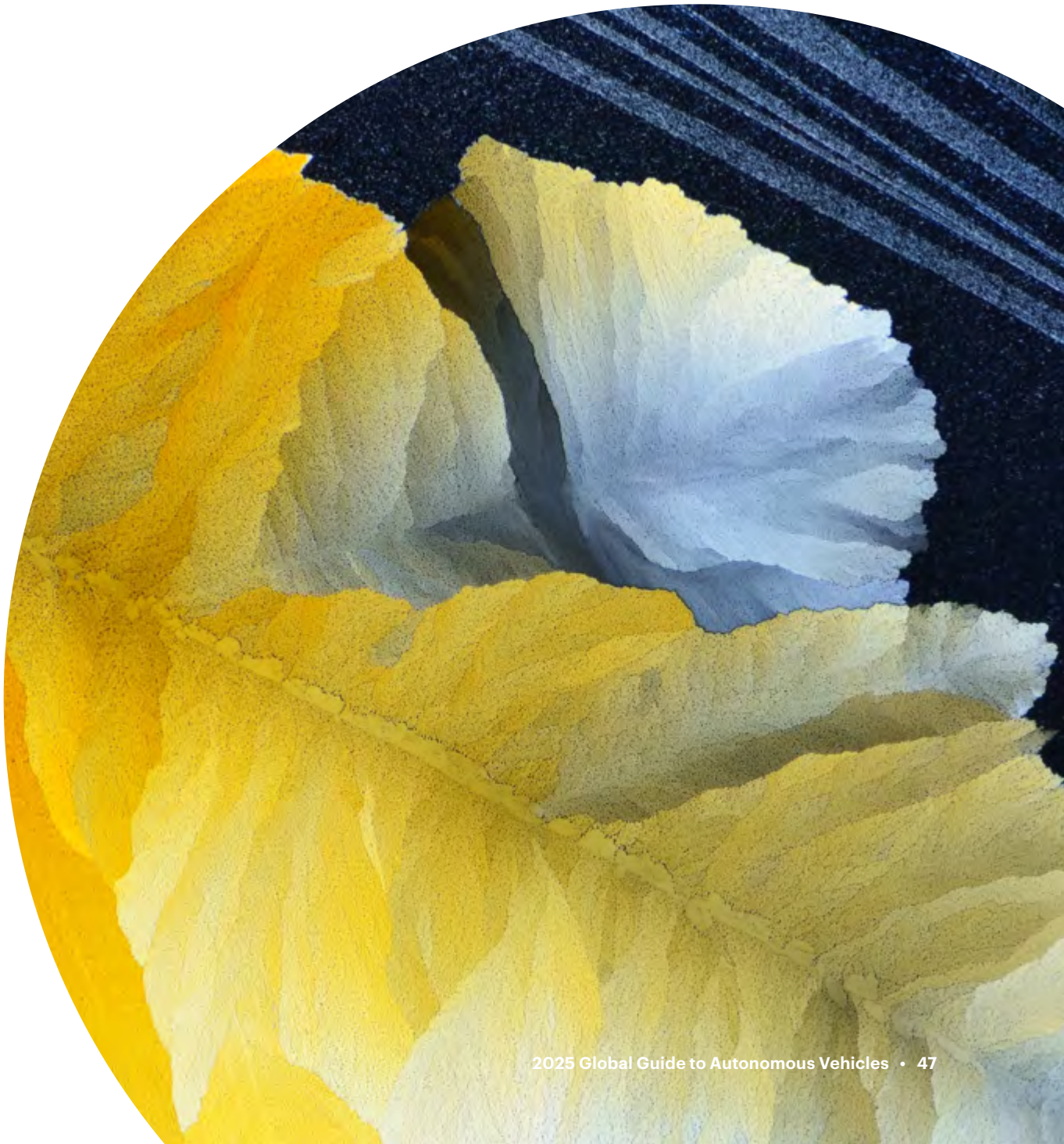
The MOTIE plans to develop a generic, open next-generation vehicle AI accelerator semiconductor for software-defined vehicles (SDVs), capable of 1,000 trillion operations per second (TOPS).[15] Also, it aims to develop the world's first commercial high-speed autonomous vehicle network system and core semiconductors capable of 10 gigabits per second (Gbps) to enable full Level 4 autonomous driving.

14 Further details available at https://babl.ai/south-korea-sets-new-standards-for-ai-development-with-guidelines-on-personal-video-data-protection/.

15 Further details available at https://www.businesskorea.co.kr/news/articleView.html?idxno=216388.

Author

Kurt Gerstner
Senior Attorney, Seoul
kurt.gerstner@dentons.com



Switzerland

1. What are the latest autonomous vehicle developments in Switzerland for 2025?

Switzerland remains focused on preparing the legal and technological framework for higher levels of autonomous driving.

- **Current Status:**
  - Autonomous driving at **SAE Level 3** is not yet approved in Switzerland.
  - Drivers must keep their hands on the wheel at all times, in accordance with **Article 31 of the Swiss Road Traffic Act (SVG)**.
- **Ongoing Projects:**
  - **13 active projects** focus on autonomous driving, including **shuttle buses** and controlled systems.
  - A large-scale testing program by **Carvolution** and the **Federal Roads Office (ASTRA)** examines safety, connectivity, and societal acceptance. Results are expected in a forthcoming report.

2. Is Switzerland experiencing any recent roadblocks regarding autonomous vehicle developments?

Switzerland faces challenges in fully enabling autonomous driving:

- **Technological Challenges:** Issues with system reliability, secure networking, and robust cybersecurity.
- **Social Acceptance:** Concerns over public trust and societal acceptance of automated systems.
- **Legal Limitations:** Adjusting laws that mandate constant driver presence and addressing liability issues for SAE Levels 3 and above.

3. Are there any recent updates in the cybersecurity/privacy space related to autonomous vehicles?

Autonomous vehicles collect significant personal data (e.g., environmental, mobility, and video data), potentially subject to Article 5(a) of the Swiss Data Protection Act (DSV).

- Responsibility for data privacy remains unclear (e.g., manufacturer, owner, driver, or seller).
- Case Example: Tesla's "Sentry Mode" assigns data responsibility to the vehicle owner.
- The legal framework for broad data collection remains unsettled.

4. Are there any recent updates in the 5G space related to autonomous vehicles?

Switzerland has achieved **99% 5G coverage**, providing the infrastructure required for advanced autonomous systems:

- The high-speed network supports vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication, critical for SAE Level 3 and above.
- 5G's reliability underpins automated parking and other real-time AV functionalities.

5. Have any new laws/regulations been passed within the last year that have affected the deployment of autonomous vehicles?

Legal updates paving the way for higher levels of automation are underway:

- **SAE Level 3 Approval (from 2025):**
  - Drivers will be allowed to take their hands off the wheel and temporarily disengage from active monitoring.
  - Systems from BMW and Mercedes-Benz have already received regulatory approval.
- **Automated Parking:** New regulations will permit automated parking in designated areas.
- While Switzerland does not directly align its legal framework with EU regulations, **harmonizing technical standards** is considered beneficial for cross-border mobility.

6. What advancements in autonomous vehicles should we expect in Switzerland in 2025?

In 2025, Switzerland is preparing for:

- The introduction of **SAE Level 3 vehicles**, following the establishment of legal and technical frameworks.
- Expansion of **pilot programs** to further test public acceptance and system reliability.
- The use of **advanced infrastructure**, supported by the extensive 5G network, to facilitate autonomous parking and intelligent transport systems.

Author

Michael Malterer
Partner, Munich
michael.malterer@dentons.com

United Kingdom

1. What are the latest autonomous vehicle developments in United Kingdom for 2025?

Response:

The UK government expects connected and autonomous vehicles to be a key area of growth over the coming decade, predicting that the technology will lead to the creation of 38,000 new high-skilled jobs, and that the industry could be worth over £40 billion by 2035.

To ensure that the UK is able to benefit from these new technological developments, steps are now being taken to ensure that the necessary legislation is in place to attract investment and to enable self-driving vehicles to be used on public roads.

Following extensive industry engagement and consultation, which included the publication of the Law Commission's *Joint Report on Autonomous Vehicles* (the **Joint Report**) and *Connected & Automated Mobility 2025: Realising the benefits of self-driving vehicles in the UK* by the UK government in August 2022 (**Mobility 2025**), the government has now drafted the Automated Vehicles Act 2024 (the **AV Act**). This new legislation introduces a new legal framework which aims to facilitate the deployment of self-driving vehicles in the UK.

In Mobility 2025, the government set out its vision for connected and automated mobility: "By 2025, the UK will begin to see deployments of self-driving vehicles, improving ways in which people and goods are moved around the nation and creating an early commercial market for the technologies. This market will be enabled by a comprehensive regulatory, legislative and safety framework, served by a strong British supply chain and skills base and used confidently by businesses and the public alike."

The AV Act actions many of the recommendations made by the Law Commission in their Joint Report, and ultimately delivers on the vision set out in Mobility 2025.

The primary purpose of Mobility 2025 was to realize the full potential of autonomous technologies in the UK's transport network, with a focus on the following areas:

- **Safety and security:** Mobility 2025 sets out proposals for a new safety framework which builds upon the existing safety framework for road and vehicle usage. Mobility 2025 will ultimately create a framework that allows for the safe operation of partial or fully autonomous vehicles on public roads, together with existing conventional driver-operated vehicles
- **Securing industrial and economic benefits:** the government states that its focus will now shift from supporting the development of early-stage technology and development to providing an environment which supports attempts to commercialise these technologies.
- **Delivering societal benefits:** ensure that the deployment of autonomous technology and its adoption by the public remain fit for purpose.

2. Are there any recent updates in the cybersecurity/privacy space related to autonomous vehicles?

Response:

By its nature, the operation of autonomous vehicles will result in the collection and processing of vast amounts of data. Different types of data can be collected, generated, transmitted or processed, much of which will relate to the driver and/or passengers (for example, location data, information

about the owner or driver of the vehicle and certain telematics data), and therefore be personal data for the purposes of the Data Protection Act 2018, the UK GDPR and the Privacy and Electronic Communications (EC Directive) Regulations 2003. While existing data protection laws were not drafted with autonomous vehicles in mind, these laws are *technology neutral* and so, where personal data is being processed by any autonomous driving system, it must be done so in compliance with all applicable data protection laws.

The UK Information Commissioner's Office (ICO) has considered the processing of personal data by autonomous driving systems and vehicles, and has published a response to the Law Commission's Joint Report, which provides key guidance on the application of data protection laws to the operation of automated and self-driving vehicles.

The ICO emphasizes the importance of *data protection by design*, meaning that developers of autonomous technology should consider potential issues which could arise from the processing of personal data from the outset of the design process, to ensure that adequate protections are built into the technology and not left to be addressed at a later stage of development. Autonomous technologies should be designed to minimize the collection of personal data, provide privacy-protective default settings and ensure that data subjects are well informed and have the option to easily modify configurations associated with their personal data. Additionally, such systems should aim to process personal data *locally* where it is possible to do so, to avoid the need to transfer personal data outside of the vehicle itself; where personal data must be transferred out of the vehicle itself, care must be taken to anonymise or pseudonymise such data where it is possible to do so. The developer of any automated vehicle system must undertake data protection impact assessments to identify and mitigate the identified risks.

For the purposes of data protection law, the entity which is operating the autonomous systems and providing the service to the end user will be the controller of that personal data. Developers of autonomous technology should consider the following issues in particular:

- **Legal basis for processing:** The controller must ensure that it has a valid legal basis for processing all personal data which is collected by the system, in accordance with the requirements of Article 5 of the UK GDPR.
- **Data minimization:** To comply with data minimization requirements, the developer of the autonomous system must ensure that the system only collects personal data which is relevant and necessary to deliver the legitimate purpose of the processing. Developers of autonomous technologies are particularly encouraged to ensure that they only collect location data where it is absolutely necessary to do so, due to the invasive nature and the potential for location data to be used for surveillance purposes.
- **Notification of processing:** The controller of the personal data collected by the autonomous system must make a data privacy notice available to the data subjects, containing all necessary information required to comply with the requirements of Articles 13 and 14 of the UK GDPR. This can be particularly difficult in the case of autonomous vehicles where personal data can be collected from a number of data subjects in addition to the driver or owner of the vehicle (for example, passers-by who are captured by the autonomous vehicles recording equipment), and the controller must ensure that it has a workable way in which to provide notification of the data processing in situations where it does not have a direct relationship with the data subject or where the data is not obtained directly from the data subject.
- **Security:** The controller must ensure that adequate measures are in place to guarantee the security and confidentiality of all personal data which it collects and stores in the process of operating any autonomous vehicles. All reasonable steps should be taken to prevent such personal data being accessed by any unauthorized persons; for example, by using

state-of-the-art algorithmic technology to encrypt such personal data, controlling access to the relevant systems through the use of passwords and other reliable user authentication technologies, setting up system partitions to ensure that personal data is segregated from other functions of the vehicle which also have online connectivity so that any compromise of a related system will not lead to loss of personal data stored separately and remaining vigilant to emerging cybersecurity threats and rapidly deploying patches to remedy identified vulnerabilities.

3. Are there any recent updates in the 5G space related to autonomous vehicles?

Response: N/A

4. Have any new laws/regulations been passed within the last year that have affected the deployment of autonomous vehicles?

Response:

The AV Act sets out legal frameworks for the following key concepts:

- **Authorization**

  The AV Act establishes a regulatory scheme for a vehicle to be authorized to operate in "self-driving" mode on public roads in Great Britain.

  Authorization may be limited to an individual vehicle, or extend to all vehicles of the type described in the applicable authorization.

  The AV Act introduces the concept of "Authorised Self-Driving Entities", which are appointed in respect of each automated vehicle which is authorised to operate in the UK. Each Authorised Self-Driving Entity will be responsible for ensuring that each authorised vehicle continues to meet the self-driving test, and any additional conditions which may have been imposed as a condition of the vehicle's authorisation. These entities will likely be automated vehicle manufacturers or companies who develop self-driving software.

- **Self-driving test**

  For the purposes of the AV Act, a vehicle will be considered "self-driving" where it satisfies the "self-driving test" set out in the legislation.

  A vehicle satisfies this test if:

  (a) it is designed or adapted with the intention that a feature of the vehicle will allow it to travel autonomously; and

  (b) it is capable of doing so, by means of that feature, safely and legally.

  The first part of this test is met where, a vehicle drives 'autonomously' if it is being controlled not by an individual but by equipment of the vehicle, and secondly, neither the vehicle nor its surroundings are being monitored by an individual with a view to immediate intervention in the driving of the vehicle.

  However, even where the vehicle is deemed to travel autonomously, it will need to do so 'safely' and 'legally'. 'Safely' means it travels to an acceptably safe standard, and in assessing whether a vehicle can travel autonomously and safely, the Secretary of State must have particular regard to the 'statement of safety principles' which the Secretary of State is to prepare. 'Legally' on the other hand, means that the vehicle travels with an 'acceptably low risk' of committing a traffic infraction.

- **Insurance**

  The Automated and Electric Vehicles Act 2018 confirmed the role of the insurance industry in compensating victims of accidents that involved automated vehicles and the AV Act builds on this concept by providing further detail around liability for driving offenses and accidents.

  The AV Act introduces the distinction between 'user-in-charge' and 'no-user-in-charge'. A 'user-in-charge' is the individual in the vehicle and in a position to operate the driving controls whilst a 'no-user-in-charge' is an operator which is responsible for overseeing vehicles that operate without the need for a user-in-charge.

The AV Act grants immunity from liability to drivers when automated vehicle features are in use, meaning that liability will likely fall on the manufacturer of either the vehicle, or the particular component of the vehicle which was responsible for the incident.

Additionally, civil liability to other road users will initially be met by insurers under the Automated and Electric Vehicles Act 2018. These insurers can then seek to recover any amounts paid out from the party in the liability chain deemed responsible for causing or contributing to the incident.

- **Operation of vehicles**

  The AV Act develops a new operator licencing scheme and register.

  The aims of the licencing scheme are that a licensed no-user-in-charge operator should have general responsibility for the detection of, and response to, problems arising during a no-user-in-charge journey overseen by them, and that a licensed no-user-in-charge operator should be of good repute and financial standing, and capable of competently discharging any requirements imposed on it for the purposes of having general responsibility.

  The details of this scheme are yet to be configured by the Secretary of State but these regulations may make provision for and about the grant, retention, variation, renewal, expiry, suspension or withdrawal of licences. In addition, the regulations may impose on a licensed no-user-in-charge operator a requirement to comply with any conditions that are attached to an individual licence.

- **Information gathering**

  The AV Act gives the government considerable information-gathering powers for the purposes of monitoring and investigation.

  Regulated bodies under the AV Act - for example, authorized self-driving entities and no-user-in-charge operators - must nominate an individual who will be responsible for the provision of relevant information.

  Information may be required for:

  - assessing whether a regulatory requirement is being met;
  - investigating whether, how or why an authorized automated vehicle has committed a traffic infraction;
  - assessing whether an authorized automated vehicle satisfies the self-driving test;
  - investigating a suspected offense of false or withheld information relevant to vehicle safety, or of an aggravated offense where death or serious injury occurs.

  The Secretary of State can compel information through interviews and in-person attendance, and the information gathered can be shared with overseas authorities to assist with international investigations.

- **Monitoring and investigations**

  The AV Act imposes a general duty on the government to monitor and assess the performance of authorised autonomous vehicles.

- **Civil sanctions**

  The AV Act sets out a range of civil sanctions for failure to comply with its regulatory provisions.

- **Criminal offenses and enforcement**

  Making provision for a host of new driving offenses which will apply to the use of automated vehicles, including in particular amendments to existing road traffic laws to bring software with the scope of existing offenses relating to the fitting and supply of defective car parts, and in relation to vehicle tampering.

- **Marketing restrictions**

  The AV Act introduces marketing restrictions aimed at avoiding consumer confusion about the capabilities and limitations of a vehicle's self-driving features.

- **Automated passenger services**

  The AV Act makes provisions for the licensing of automated passenger services, and the disapplication of existing taxi, private hire and bus legislation to licensed automated passenger service providers in certain circumstances. It is anticipated that these proposals will pave the way for the development of automated mobility services in the future as the technology matures.

While the AV Act has only recently entered into force, and many of the concepts are currently only high level until further details or guidance is published by the UK Secretary of State, the AV Act has brought much needed clarity to the UK's regulatory landscape, which should in turn encourage further innovation, development and investment in this sector.

5. What advancements in autonomous vehicles should we expect in United Kingdom in 2025?

Response:

Whilst it is unlikely that we will see fully autonomous vehicles in the UK at scale during 2025, we can expect to see a new wave of self-driving technology being incorporated into commercial vehicles which provide self-driving functions in certain limited situations, but which fall short of full autonomy and so require the driver of the vehicle to remain responsible for the vehicle when such technologies are activated, and be able to take control of the vehicle when prompted. An example of such a technology is automated lane keeping systems.

The UK Department for Transport has recently published the findings from its research into the use of such automated technologies, and the suitability of existing prompts to the driver notifying them that control of the vehicle will be returned to them, and considering the time taken by the driver to regain situational awareness.

6. Have any AI laws impacted deployment?

Response:

AI laws have not yet notably impacted the deployment of autonomous vehicles in the UK, however, it is expected that the incorporation of AI into the autonomous vehicle technology stack will accelerate the ultimate deployment of autonomous vehicle technology.

Wayve, a UK company focused on developing cutting-edge AI technology to power autonomous vehicles, recently hailed the UK's "AI ecosystem" as having been a key factor in the company securing the largest ever investment in a UK AI company during their most recent fundraising round.

Author

Matthew Gilhooly
Senior Associate, Glasgow
matthew.gilhooly@dentons.com

US Executive Summary

The policy, regulatory, and legal landscape governing the development and deployment of AVs within the United States (US) continues to evolve. The Trump Administration unveiled a new AV framework, designed to remove regulatory barriers, encourage private sector innovation, and ensure US leadership in the global race for autonomous mobility. This new framework along with a new national strategy on artificial intelligence may usher in a new era for US federal oversight and promotion of the AV ecosystem.

We continue to see significant activity from a policy and legal perspective at the state level, with multiple states developing legislation governing AV testing, safety, connectivity, and commercial deployment. Laws and regulations governing data privacy, cybersecurity, and AI also continue to take shape at the state level, driving critical compliance challenges for AV developers and others in the AV supply chain.

Artificial Intelligence

The US debate about AI regulation will undoubtedly shape the future of the AV industry. AVs today utilize a combination of complex AI systems to test and run the vehicles on roadways. As AI continues to evolve as a technology, and concepts such as embodied AI become a commercial reality, the trajectory of AV development and deployment in the US may change rapidly.

The introduction of agentic AI into the AI lexicon may also impact how AV companies deploy their systems across the US. Further advancements may also arise in the near future as AI evolves from machine learning to more evolved systems capable of edge computing and natural intelligence. For example, Verses AI (an advanced AI company) and Volvo recently announced how the use of active inference AI models (an alternative form of AI to machine learning and generative AI) can help predict the appearance of pedestrians, cyclists, and cars that are obscured behind stationary vehicles and objects – an AI advancement that would potentially accelerate the deployment of AVs on city streets.[1]

Federally, President Trump's return to the White House coupled with Republican control of Congress is already having an impact on the AI policy landscape. President Trump repealed former President Biden's October 2023 AI Executive Order impacting federal agency development and deployment of AI, and replaced it with an Executive Order of his own[2] focused on the acceleration and advancement of AI. President Trump also tapped David Sacks as his AI "czar",[3] announcing new AI initiatives[4] and rebuking global AI regulation[5] in an effort to promote AI acceleration and minimize talk of its dangers and risks.

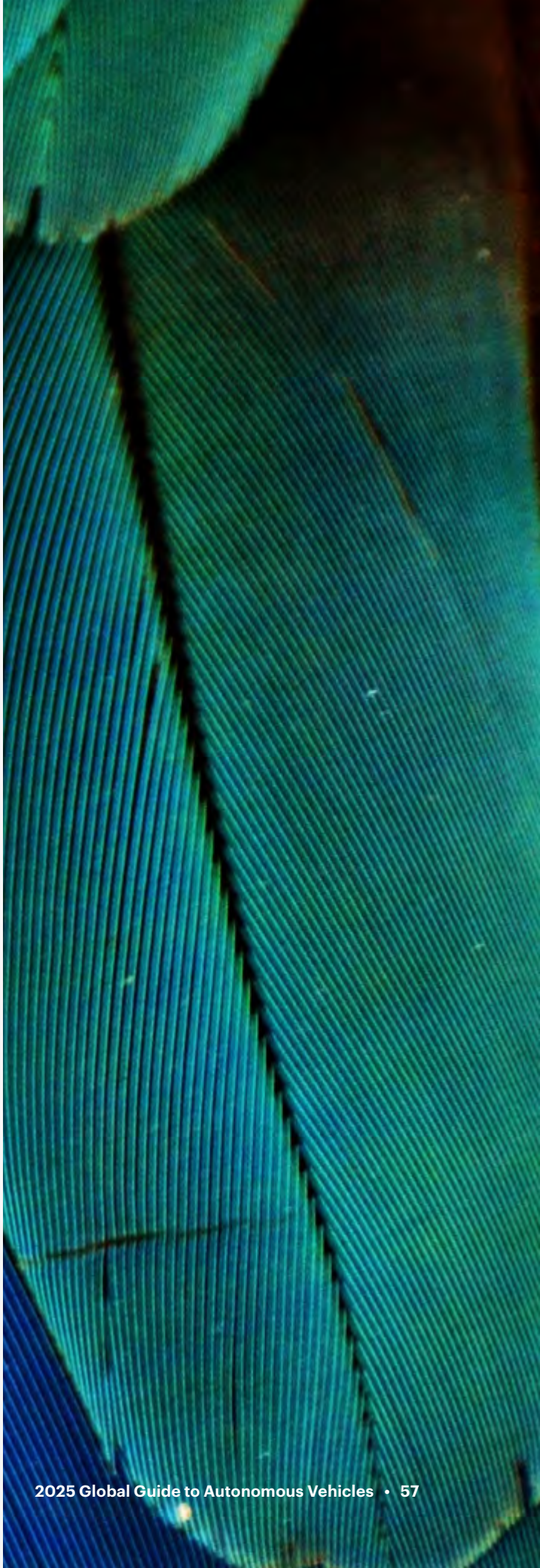
At the state level, we see multiple bills and laws presented relating to AI that may impact how AVs are tested and deployed. There is not yet a consensus amongst the states as to how AI legislation and policy will roll-out amongst all 50 states.

1 https://www.verses.ai/news/verses-and-volvo-cars-demonstrate-pedestrian-vehicle-safety-advancement.
2 https://www.whitehouse.gov/presidential-actions/2025/01/removing-barriers-to-american-leadership-in-artificial-intelligence/.
3 https://www.reuters.com/world/us/trump-appoints-former-paypal-coo-david-sacks-ai-crypto-czar-2024-12-06/.
4 https://www.bbc.com/news/articles/cy4m84d2xz2o.
5 https://apnews.com/article/paris-ai-summit-vance-1d7826affdcdb76c580c0558af8d68d2.

Liability Insurance

One of the more complex legal issues surrounding AVs in the US revolves around questions of liability in the event of an accident. Traditional car accidents often turn on negligence standards relating to human drivers. With AVs, questions remain about whether responsibility will shift away from the driver to the manufacturer, software developers, sensor suppliers, or even network operators. This shift complicates insurance models and legal proceedings, prompting the need for new frameworks.

These new realities also complicate the insurance industry around AVs. Car insurance is historically based on risk assessments and premiums on driver behavior and accident history. As AVs advance, manufacturers or fleet operators might carry comprehensive coverage that includes all vehicles in a fleet. Other organizations may experiment with usage-based insurance models that track a vehicle's operational domain (urban vs. highway), time of day, or miles driven. While these models are already present for human drivers, they could be refined for AVs to incorporate data from the vehicle's sensors, providing more granular risk assessments.



Privacy and Cybersecurity

The laws governing data privacy and cybersecurity in the US continue to pose a challenge to the deployment of AVs. AVs collect and process enormous quantities of data, including high-resolution sensor data, GPS coordinates, camera images, and even occupant biometrics. This data can be crucial for safe operation, but they also may trigger privacy and security concerns. The data protection laws in the US are comparatively fragmented and often industry-specific, leading to ambiguities about how AV-generated data is collected, stored, shared, and used.

Recent regulatory enforcement activity concerning connected vehicles also poses a challenge to original equipment manufacturers and their suppliers. Privacy enforcement continues to be on the rise in the US, which will ultimately impact how AVs are deployed commercially.

5G and Connectivity

5G networks are the foundation of the AV industry. Thanks to ultra-fast speeds and low latency, 5G promises the ability to share data among AVs, roadway infrastructure, and other vehicles in real-time, creating safer and more connected smart cities. As 5G networks expand across the country, they are facilitating new opportunities for AV integration. Continued investment from government stakeholders, including funding and flexible regulations that promote innovation, signals opportunities for quicker adoption across the AV ecosystem and a US AV industry that is poised for global leadership.[6]

An autonomous future has been over two decades in the making at the Federal Communications Commission (FCC). In 1999, the FCC allocated the 5.9 GHz spectrum band for use by intelligent transportations systems (ITS), and specifically Dedicated Short-Range Communications (DSRC)-based technologies. Then, after observing that the band was being underutilized by ITS users, the agency reassigned a portion of the band for unlicensed Wi-Fi use in 2020. At that time, the FCC also recognized that ITS services increasingly relied on Cellular Vehicle to Everything (C-V2X) technology instead of DSRC and sought comments on transitioning licensed operations in the band to C-V2X. The primary differences between DSRC and C-V2X are that DSRC is derived from WiFi and allows for only short-range communications; C-V2X is derived from cellular technology and has significantly longer range and improved performance with obstructions. Between 2020 and 2024, the United States Court of Appeals for

6 https://news.engin.umich.edu/2024/01/off-road-autonomy-automotive-research-center-funded-with-100-million-through-2028/.

the District of Columbia and the FCC, respectively, issued a series of decisions that reinforced the nation's commitment to C-V2X.

Most recently, in November 2024, the FCC adopted rules to finalize the transition of 5.9 GHz ITS operations from DSRC to C-V2X. These final rules codify C-V2X technical parameters, including power and emission limits, message prioritization, and channel bandwidth, and set a timeline to complete the transition from DSRC to C-V2X. The rules, which went into effect on February 11, 2025, were adopted in a unanimous decision backed by new Chairman Brendan Carr, who has been a strong advocate for modernizing infrastructure rules to support 5G and autonomous vehicle technologies.

The new technical rules include requirements for: (i) antenna power and height limits applicable to C-V2X roadside units, (ii) power limits for C-V2X on-board units, and (iii) out-of-band emission limits for both roadside s and on-board units. Additionally, the rules prescribe a hierarchal system for prioritizing safety communications. Safety-of-life messages will receive the highest priority, followed by public safety messages, then non-priority messages. The FCC declined to adopt rules that would prohibit the operation of commercial applications in the band. The agency reasoned that it expected the prioritization system to encourage development of safety applications and discourage the development of commercial applications such as paid advertising and marketing messages. Regarding channel bandwidth, the FCC will allow users to combine the band's 10-megahertz channels into either a contiguous 20-megahertz or 30-megahertz channel without limitation to facilitate development of a broad range of applications and services.

The FCC's most recent action is also notable for what the agency did not do. Specifically, the agency declined to mandate a technical standard for C-V2X. Instead, the FCC said that it would like industry stakeholders to develop a consensus approach to technical standards that align with the technical parameters contained in the rules. Additionally, the agency abandoned a requirement for registered roadside units to designate an intended area of operation, referred to as a "communications zone," finding that these designations were not necessary to manage congestion.

The FCC has required all ITS operations to convert to C-V2X or cease by December 14, 2026. The FCC's Public Safety and Wireless Bureaus have been instructed to publish filing requirements, if any, for implementing the transition. Prior to the transition's completion, existing and prospective 5.9 GHz licenses should familiarize themselves with the new C-V2X framework to identify technical and operational changes that their organization may need to implement.

Federal Overview

Developments and roadblocks

As AVs increasingly join human drivers on public roads within the US, the federal government continues to develop a cohesive strategy governing their testing and deployment. It is estimated that more than 3.5 million AVs will be on public roadways in 2025.[1] With states like California, Texas, Arizona, and Nevada becoming home to hundreds of AVs, from robotaxis to delivery vehicles, federal lawmakers and regulators are continuing to wrestle with developing "rules of the road" for original equipment manufacturers, secondary party manufacturers, AV developers, researchers, and testers.

From a legislative perspective, progress has slowed since 2017 when the US House of Representatives passed the SELF DRIVE Act and the US Senate Commerce Committee passed the AV START Act. Issues of preemption, technology, arbitration and trucks continue to hamper discussions. Since 2017, no AV bill has moved out of the US Congress, despite more than 20 congressional hearings[2] over the past 10 years. At the beginning of 2023, the Autonomous Vehicle Industry Association (AVIA) released federal policy recommendations to Congress, outlining recommendations for the development of a federal framework governing AVs.[5] The AVIA published an updated federal policy framework for AVs on January 7, 2025, continuing policy recommendations that build on the US Department of Transportation's framework proposed in 2020. Whether and to what extent those recommendations will be adopted in 2025 and beyond remains to be seen.

Although inaction on federal legislation from Congress has limited the rollout of AVs within the US, lawmakers on Capitol Hill are indicating a desire to address the technology with comprehensive legislation. Momentum is building amongst members of the bipartisan Congressional Autonomous Vehicle Caucus, which added 15 additional members in 2022. In 2023, the House Energy and Commerce Subcommittee on Innovation, Data, and Commerce hosted a legislative hearing entitled "Self-Driving Vehicle Legislative Framework: Enhancing Safety, Improving Lives and Mobility, and Beating China," as the initial step toward reviving the legislation regulating AVs introduced in 2017. Additional Congressional committees have since held hearings on AV safety concerns.

Leaders on the Energy & Commerce Committee agreed that in order to ensure Americans can reap the benefits of self-driving vehicles, the Congress must enact a comprehensive national law that establishes a pathway to safe deployment. Leaders on committees of jurisdiction and those representing Congressional districts that include major auto manufacturers are setting their sights toward progress. It is anticipated that any federal legislation would need to address issues such as foreign AV testing on US roads, which is collectively seen as a security concern, clarify the levels of automation, develop strategies for consumer education, and better define policies such as right to repair and data privacy.

The epicenter of these discussions on Capitol Hill are within the Michigan delegation.

Representative Debbie Dingell, who co-chairs the Autonomous Vehicle Caucus and leads many ongoing House of Representatives efforts on AVs, is actively reviewing proposals and developing a framework for a larger piece of legislation. In February 2023, Representative Dingell, along with

1 Autonomous Vehicle Legislation: Integration Of Self-Driving Cars For States.
2 Congress has stalled on autonomous vehicles, and that's hurting the US.

Senators Debbie Stabenow and Gary Peters, helped bring $3 million in federal funding for the University of Michigan Center for Connected and Automated Transportation (CCAT) to help advance research in connected infrastructure and autonomous vehicles.

The executive branch continues to serve an important role in the national AV discussion. President Trump's first administration published three advanced notices of proposed rulemaking relating to AVs, but moved only one to rulemaking – the National Highway Traffic Safety Administration (NHTSA) Notice of Proposed Rulemaking on Occupant Protection for Automated Driving Systems. The Biden Administration moved this proceeding to a final rule, which was published on March 30, 2022 – the first DOT rule on AVs. The Biden Administration also took steps toward crafting an AV strategy, issuing a Standing General Order for AV companies to follow. While the DOT and NHTSA did not openly address changing the nation's entire regulatory approach, the agencies were at least moving the ball forward. NHTSA, for example, amended its reporting requirement for crashes involving AVs in April 2023.

The new Trump Administration has taken even more steps forward. Secretary of the Department of Transportation recently introduced the AV Policy 5.0, an update to previous federal guidance, emphasizing flexibility, innovation, and safety. Key highlights from the framework include: (i) voluntary safety self-assessments to replace mandatory regulatory regimes that could stifle innovation; (ii) state and local coordination to ensure that the federal government focuses on vehicle performance and design while states manage licensing, insurance, and traffic safety; (iii) a focus on competition with nations like China; and (iv) public education.

Connectivity and communication has also been a hot topic at the US federal level. One of the most significant developments in the AV space happened in November 2023 when NHTSA withdrew its vehicle-back to-vehicle (V2V) communications rule.[3] This rule dates to 2017 and, if not withdrawn, would have required V2V communications technology in all new light vehicles. While the rule is officially dead, many automakers are still rolling out this technology. The reason behind the change is that the old rule relied on dedicated short-range communication, a now obsolete technology. This has been replaced by cellular vehicle-to-everything technology (C-V2X). DOT has affirmed its commitment to this new technology and unveiled a plan to accelerate its deployment along with $40 million in grants to help its deploy.

Investment in the AV space continues to develop federally as well. Historically, the DOT has invested significantly in the space, previously announcing $94 million in funding related to AV technology development for states and local governments to improve transportation technology and systems through its Strengthening Mobility and Revolutionizing Transportation (SMART) Grant Program and a $25 million funding opportunity for its new Rural Autonomous Vehicle Research Program.[4] The hope for the Rural Autonomous Vehicle Research Program is that it will lay a foundation for bringing the potential benefits of AVs to rural communities across the US. Accredited universities are eligible to apply for this award. One $15 million award will focus on passenger transportation and a separate $10 million award will focus on movement of freight.

A conversation about the federal approach to AVs would not be complete without mentioning the ongoing federal struggle to comprehensively regulate the development and deployment of AI – the backbone to many AVs and their systems. The Trump Administration is actively pursuing a new AI national strategy, having withdrawn many of the Biden Administration executive orders on the topic. State and local regulation of AI continues to develop and complicate the space for AV manufacturers and ecosystem players.

3 Federal Motor Vehicle Safety Standards; V2V Communications.
4 U.S. Department of Transportation Announces New Rural Autonomous Vehicle Research Program.

State Overview

Alabama

Alabama has been active in regulating AVs since it first formed a committee on the subject in 2016. The Alabama Department of Transportation has sole and exclusive jurisdiction over automated driving systems, AVs and teleoperation systems. At present, commercial vehicles are authorized to operate autonomously either with or without a physical driver, as long as a remote driver is capable of operating the vehicle.

Since 2017, numerous bills have been considered in the Alabama legislature to regulate AVs. In 2019, Senate Bill 47 was passed and signed into law, which created a framework and codified the rules for commercial AVs to operate in the state. State Senator Gerald Allen has been a strong supporter of AVs and recently introduced and passed Senate Bill 226, which provides requirements for the authorization and use of motor vehicles equipped with an automated driving system. Senate Bill 226 states that an AV can operate in the state if a person submits proof to the Department of Revenue of financial responsibility that the fully autonomous vehicle has a minimum of $100,000 in liability insurance, roughly the same as ordinary cars.

Universities in the state have also taken great interest in autonomous technology, with the two largest institutions, Auburn University and the University of Alabama, competing in the Indy Autonomous Challenge. The University of Alabama won in 2021 and 2022. In 2024, the University of Alabama was awarded a $3 million grant to fund a project for a new automated system for school buses. While not fully autonomous, the buses will be equipped with automated acceleration and deceleration, pedestrian detection, emergency braking and assisted driving capabilities.

Auto manufacturing in Alabama has also ramped up operations in recent years due to the rise in popularity of electric vehicles – an investment that will directly impact the AV industry in coming years. In 2022, Mercedes-Benz began production of its all-electric EQE SUV in Alabama. In 2023, Hyundai began manufacturing its new EV, Genesis Electrified GV70 - first Genesis model to be assembled in the US. To help with building this new vehicle, $300 million was invested in the facility, creating about 200 new jobs. Since AVs and EVs are fundamentally connected, these developments may be a precursor of things to come in the industry.

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: Senate Bill 311

Bills Passed in 2023: N/A

Bills Introduced in 2024: Senate Bill 226

Bills Passed in 2024: N/A

Alaska

Although Alaska has yet to pass significant legislation regarding AVs, the state continues to move forward with efforts to harness the emerging technology. In 2021, the Alaska Connected and Automated Vehicle Working Group released a strategic plan for connected and autonomous vehicles in Alaska. The working group, housed in the Alaska Department of Transportation and Public Facilities, laid out a near-term, mid-term and long-term focus for the state's adoption of AV technology.

The state's focus on connected AV technology is logical considering Alaska's challenging geography and environment. While that environment may prove difficult for autonomous robotaxis and delivery vehicles based on the current state-of-the-art, the communication between infrastructure, a vehicle and other systems would likely provide more efficient and safe transportation in Alaska. However, this challenging environment also generates opportunities in this space. In 2023, the world's first autonomous ocean mapping mission of Alaska was completed. The Saildrone Surveyor SD 1200 mapped 4,739 nautical miles of unknown seafloor around Alaska's Aleutian Islands. This region is notorious for severe weather that prevents most crewed survey vessels from entering. The state also began trials in 2023 of an unmanned aircraft developed by Merlin to deliver goods to underserved communities around the state. The company was awarded a $1 million contract from the FAA to demonstrate this technology in the state. In 2025, Alaska will also host the Global Autonomous Systems Conference. This event will showcase how Alaska is forging the future of advanced technologies.

Finally, although electric vehicles have experienced some issues in Alaska due to the cold and harsh environment, that is not stopping municipalities from adding electric vehicles to their suite of vehicles. For example, the state's capital, Juneau, has bought seven new electric buses for the city.

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Arizona

Arizona has long been one of the nation's leaders in AV research, deployment and acceptance. The historically welcoming nature of Arizona's AV regulatory structure has now solidified the state's standing as a hotbed of AV innovation. In 2024, the Arizona Department of Transportation announced a public-private partnership to install 405 miles of fiber-optic infrastructure along key interstates, including I-40, I-19 and I-17. This infrastructure aims to enhance vehicle connectivity, improve traffic management systems, and support autonomous and connected vehicle technologies. The project also extends broadband connectivity to rural and tribal areas, fostering inclusivity in technological advancements.

In the same year, Aurora Innovation unveiled plans to expand its autonomous trucking operations into Phoenix, leveraging Arizona's AV-friendly policies. This expansion will transition Aurora's operations from testing to commercial services, with a focus on highway routes for driverless semi-trucks. Arizona's regulatory framework and infrastructure investments continue to attract major players in autonomous trucking and logistics. Waymo is expanding its robotaxi fleet, producing 2,000 new self-driving SUVs at a new factory in Arizona. These vehicles can begin service within 30 minutes of production, enhancing operational efficiency.[5]

Arizona's rise to prominence in the AV space began with a series of executive orders signed by former Governor Doug Ducey. These efforts led to the state legislature codifying an AV framework in 2021, which formally outlines the requirements for AVs to operate in the state. The framework provides operators and owners with guideposts concerning accidents, taxes, operational requirements and permitting processes. Under this framework, fully autonomous vehicles may operate with the system engaged on public roads, without submitting supporting documents, as long as there is a licensed driver ready to take over the driving task, where necessary.

In 2022, the Arizona legislature passed two bills addressing AVs. The first was House Bill 2273, which allowed transportation networks to use AVs, and the second was House Bill 1333, which outlined rules concerning "Neighborhood Occupantless Electric Vehicles," such as autonomous delivery devices. These bills provided certainty to autonomous technology companies looking to join Arizona's AV industry.

As AV technology evolves, Arizona will likely remain at the forefront of fostering innovation, cementing its status as a leader in this transformative transportation sector.

Bills Introduced in 2022: House Bill 2014,

House Bill 2187, House Bill 2263, House Bill 2273,

Senate Bill 1333

Bills Passed in 2022: House Bill 2273, Senate Bill 1333

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: Senate Bill 1500

Bills Passed in 2024: N/A

5 https://www.sfchronicle.com/bayarea/article/waymo-robotaxi-factory-20310951.php?utm_source=chatgpt.com

Arkansas

Arkansas first addressed the use of AVs in 2019 when it created an AV pilot program overseen by the State Highway Commission. Two years later, in 2021, the state legislature unanimously passed House Bill 1562, which transitioned the pilot program into a formal AV program. The law also introduced the concept of an On-Demand Driverless Vehicle Network, which would create the operation of a vehicle network that connects AVs to consumers for goods delivery or transportation. The State Highway Commission remains responsible for overseeing the implementation of this law.

The state also allowed Driver Assistive Truck Platooning (DATP) under legislation that took effect in 2017. This legislation permits vehicle-to-vehicle communication in order to sync with the vehicle's acceleration and braking systems, while leaving the steering to each individual driver. This process allows for quicker response times to an emergency braking event. House Bill 1321 amended this law in 2023 and now requires a human operator in only the lead vehicle of an autonomous trucking platoon. Previously, each truck in the autonomous trucking platoon needed a human operator. Tyson Foods is teaming up with autonomous vehicle maker Gatik to test a driverless truck route in the state. These trucks will be used to make short deliveries from a production plant to multiple cold storage facilities.

In 2024, Arkansas continued its proactive approach to autonomous vehicle development by implementing AV pilot programs under the framework of Arkansas Act 468. This law allows AV testing on public roads, including those operated by remote systems. Initially, programs require a human operator to be present, but applications can be submitted for fully autonomous operations after six months.

2024 also saw an expansion of commercial involvement in the state. Kodiak, along with several other autonomous trucking adopters, established an advisory council on autonomous trucking. Walmart, Werner and UPS joined the council. Former Kodiak COO and current Walmart VP of Transportation Development James Reed chair the group.

Arkansas is also improving STEM education and workforce readiness to support AV and EV growth in the state. 2024 initiatives included the development of an Institute for Advanced Mobility at the University of Arkansas and state legislation to attract advanced mobility projects.

Finally, Arkansas began collaborating with private companies and municipalities to accelerate smart inspection solutions using technologies such as drones and autonomous systems.

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: House Bill 1321

Bills Passed in 2023: House Bill 1321

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

California

California continues to be a national leader in AV development, combining innovation with a robust regulatory framework to balance safety and technological advancement. The past year saw significant milestones that underscore the state's commitment to advancing AV technology.

In 2024, California introduced and debated key pieces of legislation affecting the AV landscape. Senate Bill 915 was introduced and proposed requiring AV services to obtain explicit authorization from local ordinances before operating in any jurisdiction. Another law, Assembly Bill 1777, creates a process that will take effect in July 2026 and gives law enforcement the ability to cite vehicles via a notice of non-compliance sent to the AV company, which then has a duty to report such notice to the DMV within 72 hours. The new rule also standardizes communication and interaction with emergency crews by requiring a dedicated phone line to AV companies for first responders, as well as two-way interior and exterior communication systems so nearby first responders can communicate with the vehicle. Autonomous commercial vehicles with a gross vehicle weight exceeding 10,000 pounds are excluded from the rule.

California saw significant developments regarding autonomous commercial trucks in 2024. Governor Newsom vetoed a bill that would have prohibited the operation of an autonomous commercial truck over 10,000 pounds without a "human safety operator physically present" in the vehicle during operation through 2030. The California Department of Motor Vehicles also unveiled draft regulations in August 2024 that would offer the nation's first comprehensive standard for the operation of autonomous commercial vehicles over 10,000 pounds and update existing rules for the testing and deployment of light-duty AVs on California public roads. for autonomous trucking, targeting vehicles weighing more than 10,000 pounds. These rules mandate human oversight during initial testing phases, with the potential for fully autonomous operations in the future. This initiative aims to address supply chain efficiency and safety concerns, but has sparked debates around labor impacts.

California is also in the midst of reviewing its regulatory structure as it relates to the deployment of autonomous farming equipment. In November 2024, California's Division of Occupational Safety and Health (Cal / OSHA) established an advisory committee of stakeholders to examine agency regulations around the use of autonomous agricultural equipment, including autonomous tractors. Current Cal/OSHA regulations require that self-propelled equipment used in agriculture have an operator stationed at the controls.

Commercial expansion of autonomous robotaxis also continued in the state. Waymo expanded operations in San Francisco and Los Angeles. But this expansion did not come without further regulatory scrutiny as the California Public Utilities Commission (CPUC) introduced stricter incident reporting requirements in 2024, mandating detailed accounts of collisions, stoppages and traffic violations. These measures were prompted by high-profile incidents, including accidents involving robotaxis.

California remains a hub for AV innovation with the rollout of Level 3 autonomous systems such as Mercedes-Benz's Drive Pilot. Legally operable in California, this system allows limited self-driving functionality on certain freeways, representing a step forward in commercial AV deployment.

To support AV growth, California has continued investing in infrastructure. Public-private partnerships are advancing connectivity and safety measures on highways, including the integration of AV technology with existing road networks. These efforts aim to maintain California's position as a pioneer in the AV space.

Recent developments highlight California's leadership in fostering a balanced and forward-looking AV ecosystem, addressing challenges while promoting innovation.

Bills Introduced in 2021: Senate Bill 66,

Senate Bill 570, Senate Bill 500

Bills Passed in 2021: Senate Bill 500, Senate Bill 570.

Bills Introduced in 2022: Senate Bill 1398, Assembly Bill 2441

Bills Passed in 2022: Senate Bill 1398,

Assembly Bill 2441

Bills Introduced in 2023: Assembly Bill 96, Assembly Bill 316, Assembly Bill 1201

Bills Passed in 2023: Assembly Bill 96

Bills Introduced in 2024: Assembly Bill 1777, Assembly Bill 2286 – Vetoed, Assembly Bill 3061 – Vetoed, Senate Bill 915

Bills Passed in 2024: Assembly Bill 1777

Colorado

Colorado has welcomed AVs in the state since at least 2017, when legislation was passed that allows driverless vehicles to operate in the state so long as they comply with existing state and federal laws. Legislation passed in 2019 further authorized the Colorado Department of Transportation (CDOT) to convene a working group to examine the impact of technology, including autonomy, on transportation business models. The group made its recommendations to the legislature in 2019. The CDOT is supporting connected technology and has equipped miles of Colorado highways with roadside units that utilize both vehicle-to-vehicle and vehicle-to-infrastructure communication. In 2022, the CDOT partnered with a private firm to provide 150 roadside units and expand its connected vehicle program. There was no legislation brought forth by the Colorado legislature in 2023 regarding AVs; however, the US Department of Transportation increased funding for AV technology development through the Strengthening Mobility and Revolutionizing Transportation (SMART) grant program, and the CDOT was awarded part of $94 million in funding, along with several other states.

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Connecticut

Connecticut currently has a framework in place that permits the testing of AVs. To comply with Connecticut's regulatory framework, operators must undergo a multistage approval process, and testing is only allowed in select municipalities. Connecticut loosened its restrictive framework by allowing operators to not be in the driver's seat as long as they are physically inside the AV to engage the system. The state has also established a task force to study fully autonomous vehicles. In 2022, the state legislature passed a bill permitting and creating regulations for platooning. In 2021, the Connecticut Department of Transportation (CTDOT) released a "Strategic Plan" for the adoption of Connected Autonomous Vehicle Technology. CTDOT has made a strategic decision to focus its efforts on connected AV technology instead of pushing autonomous-only projects.

While 2023 did not bring any new legislation regarding AVs, Connecticut passed SB 1103, a bill concerning artificial intelligence. The bill prohibits the state from implementing any system that uses AI unless an impact assessment has been conducted to make sure the system will not result in any unlawful discrimination and established a 21-member working group to make recommendations to the General Law Committee.

In 2024, The University of Connecticut (UConn) was pivotal in advancing autonomous vehicle technology within the state. According to a recent report from CT Insider, UConn is developing a dedicated smart car track at its Depot Campus. This facility aims to support research, testing and development of AV technologies in a controlled environment. The track is part of the university's broader commitment to fostering innovation in transportation and mobility systems, complementing Connecticut's regulatory and strategic focus on connected AV technologies.

Bills Introduced in 2022: House Bill 5255

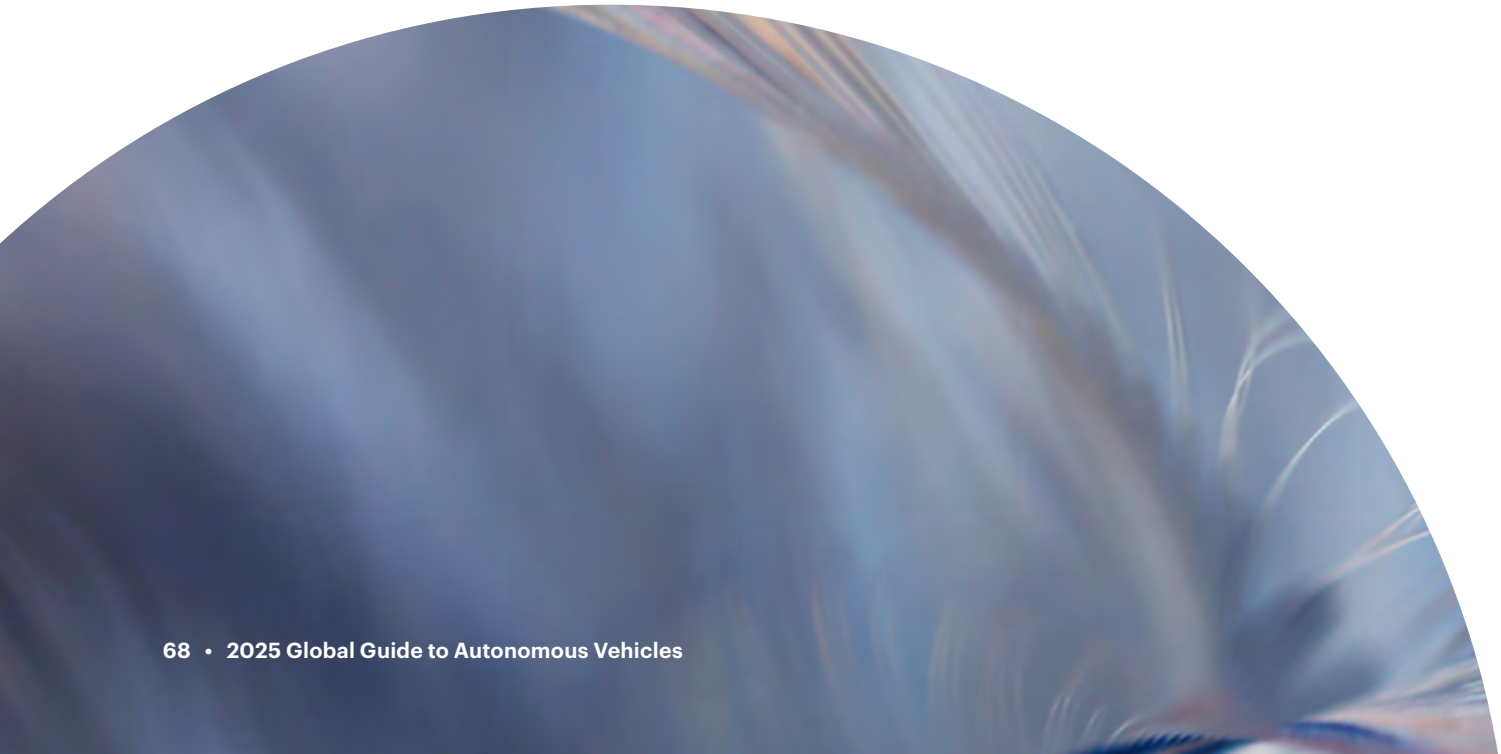
Bills Passed in 2022: House Bill 5255

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A



Delaware

Delaware has yet to pass any major AV legislation or see any significant public investment from the AV industry. In 2017, Governor John Carney signed an executive order to establish an Advisory Council on Connected and Autonomous Vehicles. The Advisory Council was tasked with developing recommendations for innovative tools and strategies that can be used to prepare Delaware's transportation network for connected and autonomous vehicles. The Advisory Council's final report was submitted a year later in 2018, but it did not spur any successful legislation.

Delaware is in the process of adding artificial intelligence to the operation of all traffic signals in the state. The system involves traffic lights, cameras and sensors, along with data obtained from weather stations and emergency responder channels. Artificial intelligence will ultimately make traffic management decisions based on the data collected and processed. In 2024, Delaware took significant steps in regulating AVs, particularly focusing on large AVs. The Delaware General Assembly introduced Senate Bill 258, which aims to prohibit the operation of autonomous vehicles weighing more than 10,001 pounds on state highways without a human safety operator physically present within the vehicle. This legislation targeted the testing, transportation of goods and passenger services involving such heavy AVs. However, the bill failed in the Delaware House. This legislation reflects Delaware's cautious approach to integrating autonomous vehicle technology, emphasizing safety and thorough evaluation before broader deployment.

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: Senate Bill 258

Bills Passed in 2024: N/A

Florida

In 2019, Florida began allowing AV testing on public roads without a human operator in the vehicle. Soon after, autonomous trucking took off in the state, with several companies expanding their service. In 2022, Kodiak Robotics, a leader in autonomous trucking, expanded service along the I-10 corridor to Jacksonville, Florida. After beginning service, Kodiak carried freight nearly 5,600 miles from San Antonio, Texas, to the San Francisco Bay Area, to Jacksonville, Florida, and then back to San Antonio.

In 2021, The Florida legislature passed House Bill 1289, which legalized and developed a framework for autonomous delivery vehicles. At the University of Florida, two driverless shuttles are operating with Yunex on-board units that communicate with roadside units to create a connected AV network.

Orlando, Florida debuted a self-driving shuttle in 2023 that takes passengers around a one-mile loop in the downtown area. This autonomous shuttle service is operated by Beep Inc. The company operates self-driving routes in several cities across the US, but is based in Orlando. Also in 2023, the Suntrax test facility opened in Florida. It sits on 475 acres and has a 2.25-mile-long track. This multi-lane track is the only high-speed autonomous vehicle testing facility in the Southeast United States. Later that year, Waymo, an autonomous robotaxi company, began testing its vehicles on Miami streets. These rides are in autonomous mode, but have an operator inside at all times. The tests are intended to improve autonomous driving in wet conditions.

In 2024, Senate Bill 1580 sought to mandate that a licensed human operator be physically present in fully autonomous vehicles exceeding a certain gross vehicle weight when operating on public roads for specific purposes. It also required manufacturers of these AVs to report pertinent information to the Department of Highway Safety and Motor Vehicles at designated intervals. However, the bill did not advance past the Transportation Committee.

An important AV development in 2024 included the establishment of Florida's first autonomous vehicle manufacturer Holon, which broke ground in October on a factory that could employ more than 1,000 people. In addition, Waymo is now operating its robotaxi program in Miami's Downtown, Brickell, Edgewater, and other suburbs of Miami.

Bills Introduced in 2022: Senate Bill 150, House Bill 1525

Bills Passed in 2022: N/A

Bills Introduced in 2023: House Bill 425, Senate Bill 586

Bills Passed in 2023: House Bill 425

Bills Introduced in 2024: Senate Bill 1580

Bills Passed in 2024: N/A

Georgia

Georgia allows the operation of both AVs and trucks under legislation passed in 2017. Driverless vehicles are free to operate in the state, so long as they are fully insured and lawfully registered. In Northwest Atlanta, the Cumberland Community Improvement District (CID) began an autonomous shuttle service, transporting riders to popular locations in the area, including Truist Park, where the Atlanta Braves play. There are several other autonomous shuttle routes in the surrounding Atlanta area, including a shuttle that traverses a 1.5-mile track in Peachtree Corners and another airport project that will begin testing in the near future

During the 2022 legislative session, Georgia lawmakers passed House Bill 1009, which permits the introduction of autonomous delivery vehicles in the state. 2023 brought autonomous robotaxi testing to the state, as well as a new autonomous shuttle in an Atlanta suburb. It also attracted several EV auto manufacturers to the area, which has been a focal point for Governor Brian Kemp during his second term as governor. Companies including Hyundai, Rivian and SK Innovation, along with many suppliers, have all broken ground on new facilities, with Hyundai's Metaplant projected to be one of the largest EV plants in the country.

In 2024, Waymo, Alphabet's self-driving unit, expanded its partnership with Uber to include Atlanta. Starting in early 2025, Waymo's autonomous vehicles will be available exclusively in the city through the Uber app. Uber will manage fleet maintenance and operations, while Waymo will provide the autonomous vehicles and handle roadside assistance and customer service. Waymo also announced a multiyear strategic partnership with Hyundai to integrate the Hyundai Ioniq 5 into Waymo's robotaxi fleet. The vehicles will be produced at Hyundai's Metaplant factory in Georgia, with on-road testing of Waymo's self-driving technology slated to begin in late 2025. Lastly, In September 2024, May Mobility, in partnership with T-Mobile, launched an autonomous shuttle service in Peachtree Corners, Georgia. This service operates along Technology Parkway, offering on-demand

rides to residents and visitors, and is powered by T-Mobile's 5G network to enhance real-time connectivity and performance.

Bills Introduced in 2022: House Bill 249, House Bill 1009

Bills Passed in 2022: House Bill 1009

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2023: N/A

Hawai'i

In 2020, Governor David Ige signed House Bill 2590 into law, creating a pilot program within the Hawai'i Department of Transportation (HDOT) to allow for AV testing on Hawai'i public roads. The law requires that a conventional human driver be physically present in the vehicle at all times to supervise the vehicle and prevent collisions, if possible. The passage of the law was due to the efforts of the Hawai'i Autonomous Vehicle Task Force, which included Dentons Partner Bill Kaneko. Hawai'i represents a unique environment for AV testing and deployment. The combination of an insulated traffic environment, relatively short commuting routes, a smaller population and a limited number of weather and road variables should make Hawai'i an attractive AV testing environment. In 2023, the Hawai'i Department of Transportation, in collaboration with the University of Hawai'i, launched its first autonomous shuttle. The shuttle runs every 30 minutes and makes 11 stops throughout the University of Hawai'i campus .

In 2024, The Hawai`i Department of Transportation launched its first autonomous electric shuttle at the Daniel K. Inouye International Airport. The shuttle can hold 11 passengers, including a shuttle attendant. During the 18-month pilot project, HDOT and its partners will evaluate ways to increase overall efficiency of the intra-airport transportation service.

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Idaho

In 2018, Idaho Governor C.L. "Butch" Otter signed Executive Order 2018-01, creating the Autonomous and Connected Vehicle Testing and Deployment Committee. The Committee's charge is to identify relevant state agencies to support the testing and deployment of autonomous and connected vehicles within the state. The Committee submitted its report in November 2018. However, the report has yet to spur any successful legislation or additional executive action relating to autonomous or connected vehicles.

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

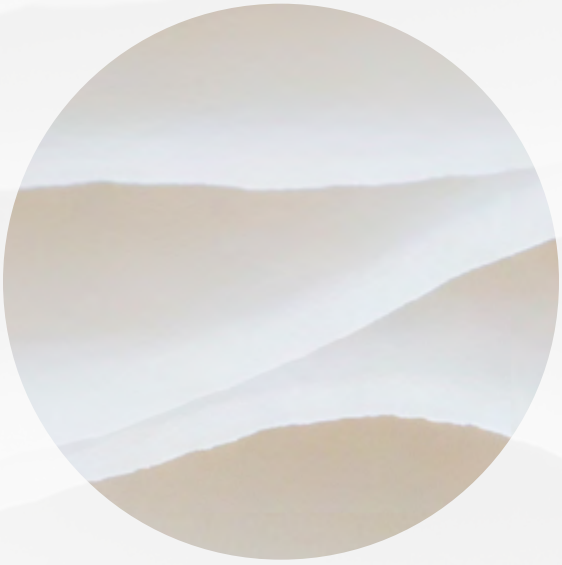
Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Passed in 2024: N/A

Illinois

The state's AV history began with an executive order signed October 25, 2018 by former Governor Bruce Rauner, which allowed AVs to operate in the state. The order established the Autonomous Illinois Testing Program, overseen by the Illinois Department of Transportation. This order permits AVs to operate within Illinois with an employee of the manufacturer behind the wheel. In 2023, four bills were proposed to define AVs and set safety standards. The first, SB306, would allow AVs to operate if a human is physically present and has the ability to monitor the vehicle's performance and intervene if necessary. The second bill, SB1471, would create an Automated Driving Systems Review Committee and allow Level 2 AVs to be sold, but prohibit the sale or operation of AVs classified as Levels 3, 4 or 5. The third proposed bill, HB2913, would make the manufacturer liable for incidents where the AV is at fault for that incident. The last proposed bill, HB3245, would require that a dealer or manufacturer not sell any new passenger vehicle that is equipped with any partial driving automation feature without giving notice of the functions and limitations of the features. All four of these bills are still pending in the Illinois legislature.



There continues to be stakeholder movement in the AV space as well. The Illinois Autonomous Vehicle Association (IAVA), a group of stakeholders and interested parties, has partnered with the Smart Transportation Infrastructure Initiative at the University of Illinois Urbana-Champaign in announcing plans to build the Illinois Autonomous and Connected Track (I-ACT). The I-ACT will cover 430 acres of the former Chanute Air Force Base in Rantoul, Illinois. The project has already received support from the city, the university community and the Illinois Department of Transportation.

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: Senate Bill 306, House Bill 1403, Senate Bill 1471, House Bill 2053, House Bill 2913, House Bill 3245

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

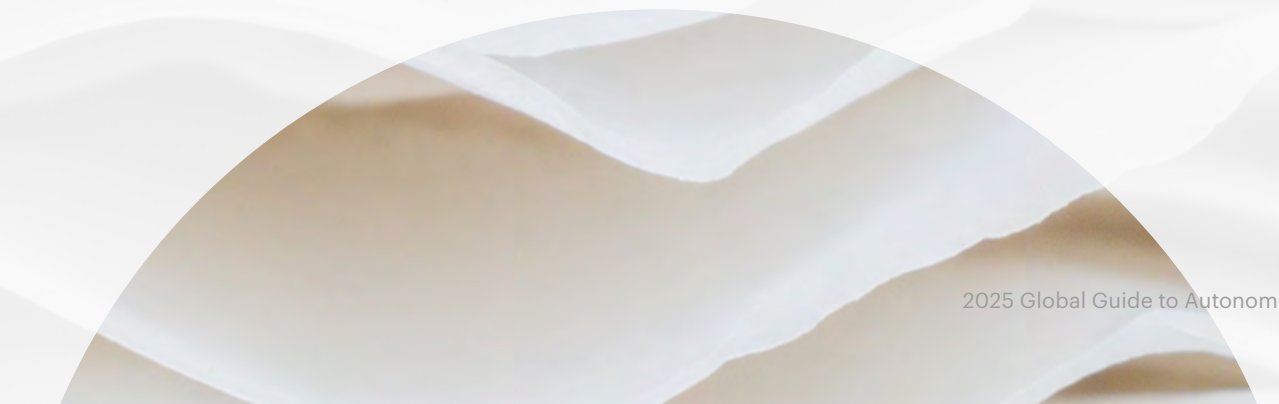
Bills Passed in 2024: N/A

Indiana

While Indiana does not have any current laws or regulations regarding autonomous passenger vehicles, truck platooning has been regulated in the state since 2017. There have been efforts in the past to create an autonomous task force with the power to approve the operation of fully driverless vehicles in the state, but all have failed to garner enough support to pass into law.

The Indianapolis Motor Speedway, the Energy Systems Network and multiple other stakeholders have worked together to introduce the Indy Autonomous Challenge (IAC). This challenge features college and university teams from around the world in an autonomous race around the Indianapolis Motor Speedway. All teams utilize the same Dallara-produced AV-21 retrofitted for autonomation. The teams are responsible for loading software capable of putting cars across the finish line first over 20 miles, averaging at least 120 miles per hour. In 2024, the IAC introduced the IAC AV-24 at the Consumer Electronics Show in Las Vegas. This advanced platform features 360-degree long-range lidar vision, 4D radar perception and a high-fidelity "digital twin" simulation environment, enabling AI drivers to operate vehicles safely at speeds exceeding 190 mph. In September, the IAC hosted a head-to-head autonomous race at the historic Indianapolis Motor Speedway. The event featured teams from 18 universities across five countries, showcasing the latest in high-speed autonomous racing technology.

Senate Bill 57, was introduced in 2024, but ultimately failed. The bill would have mandated that an automated commercial motor vehicle may not be operated on a highway to transport passengers or goods unless a human operator is physically present.



Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: Senate Bill 141

Bills Passed in 2023: N/A

Bills Introduced in 2024: Senate Bill 57

Bills Passed in 2024: N/A

Iowa

Iowa allows driverless vehicles to operate on public highways without a conventional human driver physically in the vehicle if they meet a set of conditions, including that the vehicle is capable of achieving a minimal risk condition in the event of a malfunction and that the vehicle is capable of operating in compliance with the applicable traffic and motor vehicle safety laws and regulations. In 2019, Iowa passed Senate File 302, establishing more regulation for autonomous vehicles, including terms for insurance, liability and penalties. Iowa also authorizes on-demand driverless-capable vehicle networks to facilitate the transportation of persons or goods, including transportation for hire. In 2021, the Iowa Transportation Department issued rules that guided the implementation of Senate File 302.

The John Deere factory assembly line in Waterloo, Iowa, has been producing autonomous tractors for several years. Autonomous tractors bring the technology to corners of the country where consumers may not expect to find it.

A team at the University of Iowa is one of the few research institutions to study automated vehicles on gravel. The project is called Automated Driving Systems (ADS) for Rural America. The team is testing the use of automated driving technologies on rural roadways to examine and understand the unique needs of rural environments. The University of Iowa is one of the only places testing self-driving vehicles on rural roads. In October 2024, the National Science Foundation awarded $600,000 to the University of Iowa for pioneering research aimed at enhancing AV safety. This project focuses on developing advanced algorithms to improve vehicle perception and decision-making processes, thereby increasing the reliability of AVs in complex driving environments.

During 2024, Senate Bill 2218 was introduced and failed. The bill would have required human drivers to be physically present in certain driverless-capable vehicles.

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: Senate Bill 141

Bills Passed in 2023: N/A

Bills Introduced in 2024: Senate Bill 2218

Bills Passed in 2024: N/A

Kansas

In 2018, the Kansas Department of Transportation created the Statewide Connected and Autonomous Vehicle Task Force to increase awareness and educate state agencies about the process of deploying connected AV systems in Kansas. In 2019, the task force released a strategic plan to introduce connected AV technology in Kansas.

In 2022, Kansas adopted a full legal framework surrounding the operation of AVs within the state with the passage of SB 313. "Driverless-capable vehicles" are now allowed to operate on public roads if they can reach a minimal safety condition, comply with state and federal laws and regulations, do not exceed a weight limit of 34,000 lbs. on tandem axles and have a human driver in the vehicle for the first 12 consecutive months the vehicles operate in the state. Vehicles are exempt from the human-driver requirement if they lack controls or are not designed for human occupancy. Driverless-capable vehicle owners must submit an interaction plan to the Kansas Highway Patrol before the vehicles operate on public roads in Kansas.

Kansas is already seeing an investment in the industry. Autonomous truck provider Gatik is deploying AVs alongside Walmart and other key stakeholders in the state, including the Kansas Department of Transportation, the House and Senate and the Kansas Sheriffs Association. Additionally, Panasonic announced it will start building a new battery plant in Kansas and aims to begin mass production by March 2025.

Bills Introduced in 2022: Senate Bill 313,

Senate Bill 379, Senate Bill 546

Bills Passed in 2022: Senate Bill 313

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Kentucky

Kentucky passed legislation in 2018 permitting commercial vehicles to operate in a platoon so long as there is a licensed driver behind the wheel and a marker designating that the vehicle is part of a platoon.

In 2023, the state voted on HB 135, which would have established a regulatory framework for the operation of fully autonomous vehicles on public highways. The bill also established requirements for AVs. The bill passed the Kentucky House and Senate, but was vetoed by Governor Andy Beshear. The governor thought the bill did not address safety concerns and explained that the state needed more time to carefully study the technology.

The 2024 Kentucky legislative session brought a new focus on autonomous vehicles. The Kentucky legislature passed HB 7, which established a regulatory framework for the operation of fully autonomous vehicles on public highways. The bill also established requirements for AVs. The legislature overrode Governor Andy Beshear's veto, and now the state has legally paved the way for autonomous vehicles on its roadways. Another piece of legislation debated in the Kentucky House was House Resolution 36, but this legislation failed. The bill would have established an Autonomous Vehicle Task Force.

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: House Bill 135

Bills Passed in 2023: N/A

Bills Introduced in 2024: House Bill 7,

House Resolution 36

Bills Passed in 2024: House Bill 7

Louisiana

Louisiana passed legislation in 2019 governing the operation of autonomous freight carriers and other autonomous commercial vehicles. This law permits the operation of autonomous truck platoons and specifically authorizes autonomous commercial motor vehicles to operate without a conventional driver physically present in the vehicle if the autonomous commercial motor vehicle meets a set of criteria, including that the vehicle is capable of operating in compliance with applicable law and is capable of achieving a minimal risk condition in the event of an emergency.

Louisiana passed further legislation in 2021 permitting the operation of autonomous personal delivery devices within the state, limiting such devices to 20 miles per hour at most, requiring that an employee be able to monitor and control the device and requiring that any business operating such a device maintain an insurance policy with coverage not less than $100,000. The law also allows local governments to further restrict delivery devices in their jurisdictions.

Louisiana passed additional legislation in 2022 exempting vehicles intended to be operated exclusively by an autonomous driving system from requirements that are not applicable to those vehicles.

Bills Introduced in 2022: Senate Bill 453

Bills Passed in 2022: Senate Bill 453

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Maine

Maine does not have any laws or regulations pertaining to AVs. Legislation authorized in 2018 created a Commission on Autonomous Vehicles to coordinate efforts among state agencies and knowledgeable stakeholders to develop a process for testing automated driving systems on public roads. The law requires that the Commission issue a final report containing findings and recommendations, including suggested legislation. Additionally, Governor Paul LePage signed an executive order creating the Maine Highly Automated Vehicles Advisory Committee to oversee the introduction of highly automated vehicles.

While there have been pushes for AV legislation in recent years, none have succeeded. Maine still has no standards for the registration of AVs, nor for the licensure of AV operators. In 2024, The University of Maine's VEMI Lab was featured for its research into further integrating human needs into autonomous vehicle technology. Much of the research is based on the idea that the technology and safety improvements associated with autonomous vehicles are great, but are developed without a sense of what a real human might need. VEMI's Autonomous Vehicle Research group focuses on applications in rural communities, which make up most of Maine, for users with limited to no vision and with limited mobility, such as older adults.

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Maryland

The Maryland Connected Autonomous Vehicles Working Group was formed in 2015 as the central point for coordinating statewide connective and autonomous vehicle efforts. In 2017, the Maryland Department of Transportation adopted regulations for AV testing, including an approval process for all testing on public roads.

The state released its Connected and Autonomous Vehicles Strategic Framework in 2020. This report established the state's thinking about connected and autonomous vehicles and the ways in which partners can support the state's goals and overarching focus areas for resources. Its framework invited public and private partners to consider connected and autonomous vehicle systems and evaluate how emerging technology can be integrated into and change their future objectives and plans.

The state passed AV-adjacent legislation in 2021 that allowed for truck platooning and empowered the state to create regulations to carry out the law. In the private space, the Maryland Autonomous Technologies Research Innovations and eXploration lab (MATRIX) is sponsored by the University of Maryland and gives students a personal look at the future of autonomy. These students work alongside several AV companies that utilize the space.

House Bill 1447 was introduced in 2024 and backed by the Maryland teamsters, but failed. The bill would have required a human operator in large commercial vehicles.

2024 also brought increased testing for AVs in the region. Waymo began testing self-driving cars in the Washington, DC area, and while this is not in Maryland, it represents broader regional interest in autonomous vehicles.

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: Senate Bill 685, House Bill 806

Bills Passed in 2023: Senate Bill 685, House Bill 806

Bills Introduced in 2024: House Bill 1447

Bills Passed in 2024: N/A

Massachusetts

While the State of Massachusetts has yet to pass a comprehensive framework concerning AVs, prior executive orders issued by Governor Charlie Baker established a process for testing AVs within the state. An additional executive order established an Autonomous Vehicles Working Group. In the past two years, multiple bills have been introduced in the legislature to regulate AVs on a more comprehensive basis, but none have passed.

Despite a lack of public movement on AV regulation, within the private space, Massachusetts could become a hotbed for AV research and testing, as researchers and students at the Massachusetts Institute of Technology, among other educational institutions, are closely studying AVs and their related technologies.

The Massachusetts state legislature introduced a series of bills in 2023 that would have regulated autonomous vehicles and collectively provided a regulatory framework. The bills would have allowed autonomous vehicles to operate on Massachusetts roads, but only if they are electric and produce net-zero carbon emissions. There is some information missing in the next sentence. Last year's edition said "These bills are currently pending in the Joint Committee on Transportation." So an update on their status is required.

Bills Introduced in 2022: House Bill 3595, House Bill 4618

Bills Passed in 2022: N/A

Bills Introduced in 2023: Senate Bill 2257, House Bill 3298, House Bill 3430

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Michigan

Michigan approved legislation in 2016 permitting pilot testing of AVs. The state is also home to several large testing facilities, including the University of Michigan-owned Mcity. These projects were funded in part by the $60 million federal grant allocation for automated driving systems research for its Michigan Mobility Collaborative.

By investing in an autonomous future, Michigan is preparing itself for the coming transformation to AV manufacturing. Several major brands have announced plans to manufacture their vehicles in Michigan, including GM, Google and Ford.

Michigan passed legislation in 2022 clearing the way for the state's Department of Transportation and key collaborators to construct a Connected and Autonomous Vehicle Corridor. This corridor is currently slated to be a dedicated roadway alongside I-94, from Detroit to Ann Arbor, fitted with new technology and key safety measures. The state claims this stretch of I-94 will be "the world's most sophisticated roadway."

In 2024, The University of Michigan AV test facility launched the AV Challenge, inviting researchers from academia and industry to test their decision-making algorithms in a realistic simulated environment. The competition focuses on evaluating AV performance in complex, city-scale traffic scenarios to promote innovation and safety in autonomous driving technologies.

Bills Introduced in 2022: House Bill 5601, House Bill 6369, Senate Bill 706, Senate Bill 1168

Bills Passed in 2022: Senate Bill 706

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Minnesota

Although Minnesota has no laws or regulations specifically addressing the testing or operation of AVs, the state's Department of Transportation (MNDOT) is actively promoting and preparing for widespread autonomous technology deployment within the state following an executive order signed in 2018 by Governor Mark Dayton creating a Governor's Advisory Council on Connected and Automated Vehicles to recommend a path forward within the state. The resulting 66-page report delivered a rosy outlook on automated cars and included draft legislation setting up a permit system and giving MNDOT wide latitude to decide whether to allow a business to test, based on its history with self-driving technology. The Minnesota legislature has yet to pass legislation addressing AVs.

Two bills proposed in 2021 concerned autonomous vehicles, but both stalled in the legislature. Senate Bill 214 sought to prohibit Level 4 or 5 automated driving systems from operating in the state. House Bill 230 encouraged the state to investigate using autonomous vehicles for mass transit through a micro transit rideshare pilot program. Despite the legislature's unwillingness to pass legislation, the state has helped launch several driverless shuttle projects during the past several years. This includes one in Grand Rapids through goMARTI, Minnesota's Autonomous Rural Transit Initiative. The goMARTI shuttle project utilizes several partners, with the majority of funding coming from MNDOT, to launch five driverless shuttles provided by May Mobility, three that are ADA-compliant and able to be requested for pickup from a mobile phone app. May Mobility and SouthWest Transit partnered to provide autonomous micro transit services in Eden Prairie. This collaboration marks the first autonomous micro transit deployment in the Twin Cities, aiming to enhance public transportation options.

Important projects such as goMARTI are encouraged and supported by MNDOT's focus on connected and autonomous vehicles. In particular, the state sponsors a CAV Challenge, which encourages people to submit ideas for possible funding from MNDOT.

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Mississippi

Although there is no widespread adoption or deployment of autonomous vehicles in the state, one of its educational institutions is supporting the technology's development through the Mississippi State University Center for Advanced Vehicular Systems (CAVS). MSU CAVS has spent time focusing on how autonomous technology might operate in an off-road setting. In addition to its physical "proving grounds," it is developing an open-source simulator that will allow autonomous software to be tested in a virtual environment before it hits the open road (or off-road). In 2022, MSU CAVS announced a partnership with Quantum Corporation to help store and process the large amounts of data needed to develop autonomous technology.

In 2023, the Mississippi legislature passed HB 1003, the Fully Autonomous Vehicle Enabling Act of 2023. The bill authorized the operation of fully autonomous vehicles on public roads within the state without a human driver, provided that certain conditions are met.

In 2024, Mississippi State University, in collaboration with Beep, a provider of autonomous mobility solutions, launched the state's first autonomous shuttle service. The pilot program, running from September 1 to November 30, aimed to assess the viability of autonomous shuttles in a campus setting and gather data to inform transportation planning in rural-urban environments. The shuttle operated daily from noon to 8 p.m. along a 2.4-mile route with five key stops, including Old Main Academic Center and Humphrey Coliseum.

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: House Bill 1003, Senate Bill 2569

Bills Passed in 2023: House Bill 1003

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Missouri

Missouri does not have any laws regarding the registration, testing or deployment of autonomous vehicles. In past legislative sessions, lawmakers have proposed legalization to prohibit the use of autonomous vehicles. In 2021, legislators introduced Senate Bill 452, which would have codified autonomous vehicles and laid ground rules for their operation. This bill did not generate momentum and failed. Senate Bill 176, which sets regulations for delivery robots, passed in 2021 and became law.

In 2022, lawmakers failed to pass Senate Bill 1038, a bill that would have legalized platooning in Missouri. In 2023, a set of bills (Senate Bill 188, House Bill 624) relating to platooning was introduced. Neither bill passed. While the state has been reticent thus far to engage with autonomous vehicle legislation, perhaps the new developments in its neighbor states, Arkansas, Oklahoma and Kansas, will help Missouri feel more comfortable opening up the state to the autonomous vehicle industry.

Bills Introduced in 2022: Senate Bill 1038

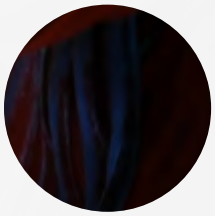
Bills Passed in 2022: N/A

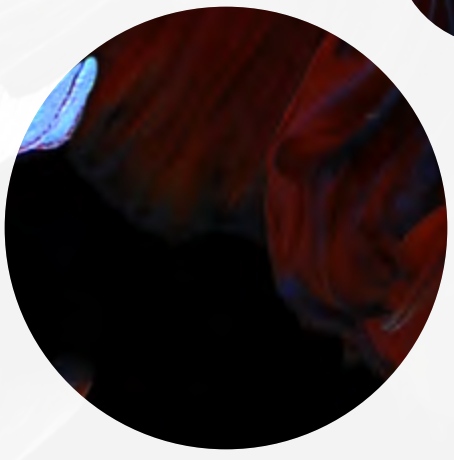
Bills Introduced in 2023: Senate Bill 188, House Bill 624

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A





Montana

Montana currently has no laws or executive orders governing AVs; however, the legislature did introduce, albeit fail to pass, a 2023 bill (House Bill 339) relating to the use of AVs in connection with platooning and passed House Joint Resolution 10 establishing a study committee on autonomous vehicles in 2021. The committee will include people from the state's department of transportation, department of justice, highway patrol and automobile and insurance community, among others.

Following the 2023 session, the Transportation Interim Committee continued to explore appropriate regulatory frameworks for AVs. In May 2024, the committee reviewed reports comparing Montana's legislative approaches to those of other states, such as South Dakota, which allow fully autonomous vehicles under certain conditions. The committee's discussions highlighted the need for comprehensive rulemaking to address the deployment of higher-level automated driving systems. Throughout the year, state legislators continued their research on how to regulate autonomous vehicles

In December 2024, Aurora Innovation, Inc., a leader in autonomous trucking technology, announced the opening of a new 78,000-square-foot office and testing facility in Bozeman, Montana. Located on Montana State University's Innovation Campus, this facility is dedicated to advanced lidar research and testing, underscoring Montana's growing role in the AV industry.

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: House Bill 339

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Nebraska

In 2018, Nebraska lawmakers cleared the way for companies to test self-driving vehicles, as long as the vehicle is capable of operating in compliance with traffic and motor vehicle safety laws. The AV may or may not contain a human driver, but if a human driver is present, he or she must be a licensed driver and covered by insurance. The law also authorizes the operation of an on-demand AV network for transporting persons or goods, including for-hire transportation or public transportation.

While there has been limited deployment and testing across Nebraska, the state has not yet seen widespread deployment. Except for a bill (LB625) introduced in January 2023 to establish a comprehensive regulatory framework for AVs in Nebraska, which appears to have stalled in committee/been postponed indefinitely, there has been no momentum for further legislation. In recent years, a proposal to study autonomous vehicles as they relate to a variety of unconsidered issues did not pass.

Bills Introduced in 2021: LR155

Bills Passed in 2021: N/A

Bills Introduced in 2022: LR 155

Bills Passed in 2022: N/A

Bills Introduced in 2023: LB625

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Nevada

Since Nevada passed AV legislation in 2012, the state has been at the forefront of driverless vehicle innovation. In 2017, with the passage of Assembly Bill 69, Nevada permitted the testing and commercial public deployment of AVs—later that year, Las Vegas had its first completely autonomous electric shuttle deployed for public use. In 2019, AV startup Zoox received permission from the Nevada Department of Motor Vehicles to deploy AVs on state roads.

In 2021, the Nevada State Legislature passed two new bills that updated the state's code and kept it at the forefront of autonomous technology. Assembly Bill 412 codified requirements and exceptions for "neighborhood occupantless vehicle[s]" such as the autonomous delivery vehicles beginning to roll out across the country. These vehicles, such as Nuro, are introducing consumers to autonomous vehicles and commercializing the technology.

Senate Bill 288 permits an autonomous technology company to enter into an agreement with a transportation network in the state. This bill will clearly benefit rideshare companies looking to partner with autonomous vehicle companies.

From 2021 to 2022, Motional has launched rides in autonomous vehicles on the Las Vegas strip on three separate transportation networks: Via, Lyft and Uber. Motional has partnered with the State of Nevada to bring high-paying jobs to the state and cutting-edge technology to Las Vegas. Instead of trying to build its own operation entirely from the ground up, Motional has partnered with three established players in the space who can focus on deployment. Motional, therefore, has the luxury of giving the technology its complete attention. For now, these rides are non-commercial and include safety drivers in the front seat.[6]

In 2023, a bill (Senate Bill 182) to impose heightened proof of ownership requirements on autonomous vehicle owners was introduced and passed. The law appears to exempt manufacturers of fully autonomous vehicles in Nevada from some franchise and repair regulations. Also, the Nevada Department of Motor Vehicles posted forms on its website enabling AV manufacturers and developers interested in testing their vehicles in Nevada to self-certify that their vehicles meet Nevada vehicle safety standards.

In March 2024, Amazon's Zoox expanded its autonomous vehicle testing in Nevada, allowing its custom-built robotaxis to operate at higher speeds (up to 45 mph instead of 35 mph), cover more ground (five miles instead of one mile) in Las Vegas and drive at night and in light-rain conditions.

Bills Enrolled in 2021: Assembly Bill 412,

Senate Bill 288

Bills Passed in 2021: Assembly Bill 412, Senate Bill 288

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: Senate Bill 182

Bills Passed in 2023: Senate Bill 182

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

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6 Motional opens Las Vegas robotaxis service to nighttime hours.

New Hampshire

After previously vetoing a bill to permit autonomous vehicle testing in New Hampshire, in 2019 Governor Chris Sununu signed into law a bill that created an automated vehicle testing pilot program. The new law created an autonomous vehicle advisory commission, a testing pilot program and set requirements for vehicle deployment. The pilot program permits testing on public roads. House Bill 116, which did not pass the state legislature, would have codified delivery robots. Other efforts in the state are underway with respect to the use of autonomous technology, including in connection with maritime-related activities. In 2023, the University of New Hampshire entered into a partnership with Exail to launch an innovation hub to engage in all aspects of marine autonomous operations, including surface vehicles for exploration and ocean mapping, to "help meet the challenges of the growing blue economy.[7]"

Bills Introduced in 2021: House Bill 116

Bills Passed in 2021: N/A

Bills Introduced in 2022: N/A

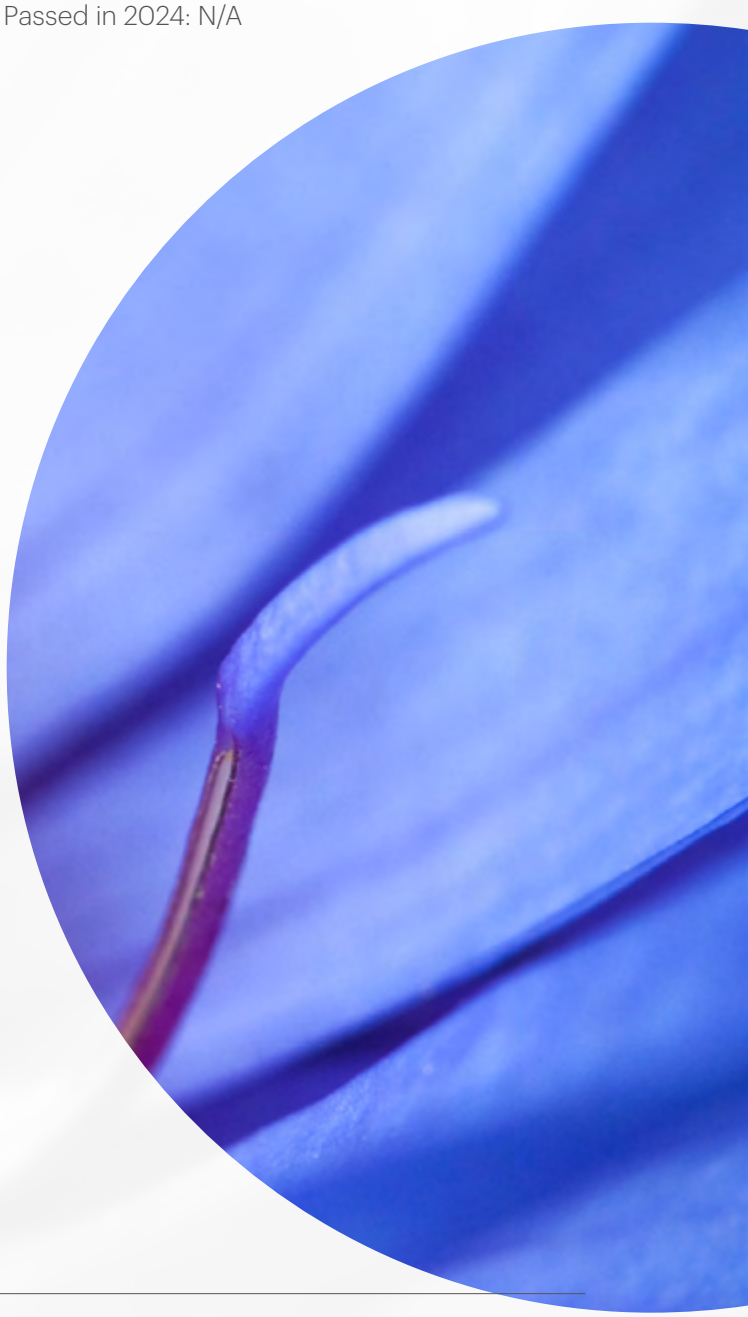
Bills Passed in 2022: N/A

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A



7 UNH and Exail Open New Maritime Autonomy Innovation Hub.

New Jersey

In 2019, New Jersey established an 11-member task force called the New Jersey Advanced Autonomous Vehicle Task Force to study autonomous vehicles and recommend laws, rules and regulations that New Jersey may enact to integrate autonomous transportation into the state's transportation system. However, since then, New Jersey has not passed any major legislation around AVs. Year after year, bills are introduced to create a legal framework for AVs, but they never come to fruition.

However, after years of inactivity, things are beginning to change. In December 2021, Governor Phil Murphy announced that his office would partner with the New Jersey Department of Transportation, the City of Trenton and Princeton University to launch Trenton MOVES. Trenton MOVES will be the first autonomous vehicle-based urban transit system in the US. Companies are invited to share their interest in building an on-demand transit system that features 100 autonomous vehicles and serves the 90,000 residents of New Jersey's capital city. In February 2022, Trenton MOVES received a $5 million grant from the state's Department of Transportation to help support the project. Trenton MOVES says it has received interest from 20 different autonomous vehicle companies who want to participate in the project and has held a demo with May Mobility. The project won a state transportation award for its planning as it continues to move toward actuality.

Elsewhere in New Jersey, the Port Authority of New York and New Jersey (PANYNJ) ran a test period for two platooning autonomous shuttles from Navya that could be used to assist with first/last mile transport in crowded places of interest. The shuttles received rave reviews and were featured in a daily *New York Times* newsletter, where reporter James Barron described his experience stepping out in front of the shuttle to test its capabilities.[8] In Monmouth County, New Jersey, NJ Transit, in partnership with Rutgers University and Infratek Solutions, launched the AVATAR Pilot (Autonomous Vehicle Assessment, Testing and Research, Pilot). The pilot tested two 15-passenger AV shuttle vehicles on a closed course separate from public roads at the former Marlboro Airport.[9]

In 2024, New Jersey lawmakers have introduced Assembly Bill 1589, which would permit testing and use of autonomous vehicles on state roadways under certain circumstances. Also introduced was Assembly Bill 1591, which clarifies that owners of self-driving vehicles must comply with existing insurance requirements.

New Jersey legislators are also exploring how autonomous vehicles can specifically benefit vulnerable populations. Assembly Joint Resolution 109 (2024) proposes to establish a task force to examine several aspects of transportation services for persons with disabilities and senior citizens, including how automated and connected vehicle technology could improve accessibility for these groups. While not exclusively focused on AVs, this task force initiative could help shape future New Jersey policy around deploying autonomous vehicles in ways that specifically address the mobility needs of elderly and disabled residents. This resolution has yet to be issued.

8 The Day I Stood in the Path of a Driverless Bus.
9 Can Autonomous Vehicles address the First-mile, Last-mile Problem?.

New Jersey Assembly Bill 3757 (2024), introduced in February 2024, would require the Attorney General to develop and implement mandatory training for law enforcement officers on safely interacting with autonomous vehicles during emergency and traffic enforcement situations.

Bills Introduced in 2021: SJR 17, AJR 138, A 1187, A 1189, A 1607, Senate 2129, A 2807

Bills Passed in 2021: N/A

Bills Introduced in 2022: Assembly Bill 1810, Assembly Bill 1812, Assembly Bill 2030, Assembly Bill 2031, Assembly Bill 2038, Assembly Bill 2495, Assembly Joint Resolution 43, Senate Joint Resolution 20

Bills Passed in 2022: N/A

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: Assembly Bill 1589, Assembly Bill 1591; Assembly Joint Resolution 109; Assembly Bill 3757

Bills Passed in 2024: N/A

New Mexico

New Mexico has historically seen a fair amount of autonomous vehicle investment, especially concerning autonomous trucks. However, until 2022, the state had no formalized framework for autonomous vehicles or autonomous vehicle testing. House Bill 270 defines autonomous vehicles as those with Level 3, 4 or 5 systems, regulates autonomous vehicles and autonomous vehicle testing, and allows for platooning. A bill was introduced in 2023 (House Bill 378) to prohibit an autonomous vehicle from transporting goods or passengers without a human operator physically present, but the bill appears to have been effectively rejected by the New Mexico legislature.

Already, New Mexico has seen this new legal framework pay dividends. Torc Robotics operates a testing center in Albuquerque.[10] Through its recent legislation, New Mexico has joined other Southwestern states such as Nevada, Arizona and Texas to create a sizable surface area of autonomous vehicle-supporting jurisdictions. This collaboration provides a solid testing area for autonomous trucks in particular, as they travel longer routes.

Moving forward, autonomous vehicle supporters are already expressing the need to invest in broadband access to fully realize the potential of CAV technology.

10 Autonomous trucks prove their mettle on historic Route 66.

In March 2024, New Mexico initiated its first autonomous vehicle study focused on public transportation, with the North Central Regional Transit District (NCRTD) partnering with the Community Transportation Association of America. The study will examine the feasibility, benefits and risks of implementing AV technology in public transit to address driver shortages throughout northern New Mexico, with findings expected by June 2025.

Bill Introduced in 2021: House Bill 270

Bills Passed in 2021: House Bill 270

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: House Bill 378

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

New York

New York has highly restrictive regulations on AV testing. Under legislation approved in 2017, any testing must be approved by the commissioner of the Department of Motor Vehicles, supervised by the New York State Police and levied with significant hourly and per mile rates. Some autonomous companies have tested their technology in private areas away from New York's regulations, but there have not been any sustained large-scale testing efforts.

From 2021 through 2022, there were reports that Mobileye, the Intel-backed autonomous vehicle company, tested at least two vehicles in New York City for a period of time. The rollout was not highly publicized, but was conducted in alignment with New York regulations.

In 2023, one Assembly bill (A00539A), and its Senate companion (S1012), were introduced to allow fully autonomous vehicles to operate on New York roads without a driver. However, neither bill appears to have gained any traction and may have been effectively discarded. The same fate appears to have befallen two other bills introduced in 2023: A00525, a bill to establish a task force on automated vehicle technology to study and assess the future of automated vehicle technology, and A2598, a bill to establish a task force to study autonomous vehicle usage on the roads located within the State of New York. Lastly, the Port Authority of New York and New Jersey partnered with Navya to launch two platooning autonomous shuttles as a limited project at John F. Kennedy International Airport.[11]

In early 2024, New York legislators introduced Assembly Bill A8621 and its Senate counterpart (S07758), which would require human safety operators to be present in autonomous vehicles weighing more than 10,001 pounds. This proposal is focused on regulating the trucking industry, creating a weight-based distinction and representing a shift toward more targeted regulation of autonomous commercial vehicles.

11 PANYNJ to Host Second Platooning Demonstration of Autonomous Vehicles at JFK Airport.

2024 brought a welcome change to New York City. New Yorkers will soon see robotaxis fill their streets. Mayor Eric Adams signed off on allowing several autonomous vehicle companies to begin the testing phase.[12]"This technology is coming whether we like it or not, so we're going to make sure that we get it right."

Adams said in a statement. "If we do, our streets can be safer, and our air could be cleaner." The main requirement during the testing phase is that all robotaxis will have a human operator if the car needs to be taken over manually. The city will also require companies that seek a permit to undergo a testing procedure and submit a safety plan to the DOT.

Bills Introduced in 2021: A639, A3743, A4280, A7744, S3909, S6993

Bills Passed in 2021: N/A

Bills Introduced in 2022: A9485, A9705, S8468

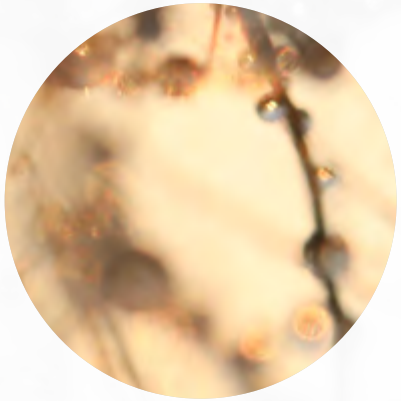
Bills Passed in 2022: N/A

Bills Introduced in 2023: A00539A, A00525, S1012, A2598

Bills Passed in 2023: N/A

Bills Introduced in 2024: A8621, S07758

Bills Passed in 2024: N/A



North Carolina

In 2020, Governor Cooper signed Senate Bill 739 into law, allowing autonomous delivery devices in pedestrian areas and on highways. In 2022, the state legislature followed by passing Senate Bill 814, which codified and regulated "neighborhood occupantless vehicles." In contrast to SB 739, neighborhood occupantless vehicles are fully autonomous and do not require an operator.

The State of North Carolina has done more than pass legislation supporting autonomous vehicle technology and the autonomous vehicle industry. In 2023, the North Carolina Department of Transportation and the City of Cary, North Carolina, launched an experiment relating to autonomous vehicles involving the use of an all-electric, driverless shuttle pilot known as CASSI (Connected Autonomous Shuttle Supporting Innovation).[13] The experiment included a four-stop route from the Cary Senior Center to Bond Park Community Center.

North Carolina's esteemed universities have created a culture of excitement throughout the state at the thought of future technologies and mobility options. Researchers at NC State University have developed a technique that allows AVs to make important calculations more quickly through a cooperative distributed algorithm that breaks problems down into sub-parts that are solved in parallel.[14]

At North Carolina AT&T, university leaders are investing in autonomous vehicles and growing the school's fleet. Now, they have unveiled a two-mile test track that allows researchers to test vehicles in real-world conditions.[15] Faculty believe these autonomous shuttles could create more equitable transportation solutions in low-demand rural areas that need flexible solutions. When these shuttles are launched, City of Greensboro officials have discussed integrating their operations into the wider city-wide transportation equation.

12 Eric Adams green-lights robotaxis in NYC.
13 NCDOT releases data on CASSI autonomous shuttle pilot program.
14 Connected and Autonomous Vehicles.
15 N.C A&T UNVEILS AUTONOMOUS SHUTTLE ROUTE TO DOWNTOWN GREENSBORO.

Researchers at NC State University found that adding a fourth traffic light to traditional traffic lights at intersections would help autonomous vehicles control traffic flow while also creating a safer environment for human drivers around them. This fourth "white light" would indicate to other AVs when there are enough other AVs around them, while simultaneously alerting human drivers to follow the AV in front of them, reducing traffic flow and potential crashes.

In August 2023, North Carolina enacted House Bill 447, with Governor Roy Cooper signing it into law. This law classifies all AVs (SAE Levels 0-5) as motor vehicles subject to the state's existing motor vehicle dealer laws, integrating AVs into existing vehicle regulations rather than creating separate standards. It specifically addresses how existing dealer protections apply to autonomous vehicles addressing key relationships between manufacturers and dealers rather than focusing on operational aspects such as permits, safety requirements or road rules.

Bills Introduced in 2021: House Bill 814

Bills Passed in 2021: House Bill 814

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: House Bill 447

Bills Passed in 2023: House Bill 447

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

North Dakota

North Dakota permits autonomous vehicle operation, as long as the vehicle is capable of operating in compliance with all applicable federal and state laws. State law does not require a human driver to operate on the public highway if the autonomous vehicle is capable of achieving a minimal risk condition in case of a system failure. The law permits on-demand autonomous vehicle networks to provide transportation of persons or goods.

North Dakota also allows for truck platooning, subject to the Department of Transportation, in coordination with the State Highway Patrol superintendent, developing an operational plan that provides guidelines for operation. The plan must include operational information that is provided by a platoon technology provider or commercial motor vehicle operator.

In North Dakota, the agriculture industry is focused on utilizing autonomous technology to increase efficiency and production. The University of North Dakota received a $1 million grant from the Economic Development Administration (EDA) to study the economic impact of the state's uncrewed aerial systems network. Grand Farm, an initiative dedicated to improvements in farming, hosted an event bringing together growers, stakeholders and autonomous industry experts to focus on possible opportunities to collaborate. Relatedly, the State of North Dakota recently introduced and passed a law (ND H 1519) providing appropriations to the Department of Career and Technical Education and the Agriculture Commissioner for autonomous vehicle-related and other autonomous technology grants.

Bills Introduced in 2021: N/A

Bills Passed in 2021: N/A

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: House Bill 1519

Bills Passed in 2023: House Bill 1519

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Ohio

There are no laws in Ohio governing AVs, but there are relevant executive orders (EO) signed by former Governor John Kasich in 2018. The first EO created DriveOhio, a new division of the state Department of Transportation, which allows any company to test AVs in the state, so long as it registers with DriveOhio and a human operator is behind the wheel. Four cities—Columbus, Dublin, Athens and Marysville—have already signed agreements with DriveOhio to test AVs on their streets, and the state has designated a 35-mile stretch of US Route 33 as a "Smart Mobility Corridor" for the deployment of connected vehicle technologies. A $45 million SMART Testing Center opened in Logan County is funded by a partnership between The Ohio State University and the State of Ohio and includes an indoor highway track capable of simulating ice and snow year-round. The second EO created regulations for testing self-driving vehicles in the state.

DriveOhio previously deployed its Rural Automated Driving Systems project after two autonomous semi-trucks completed their controlled testing and, in partnership with the Indiana Department of Transportation and the Transportation Research Center, will build an I-79 Truck Automation Corridor.[16] The Corridor will be a lane for autonomous trucking between Columbus, Ohio, and Indianapolis, Indiana. DriveOhio continues to focus on long-term deployment of autonomous technology across the state.

Bills Introduced in 2021: N/A

Bills Passed in 2021: N/A

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

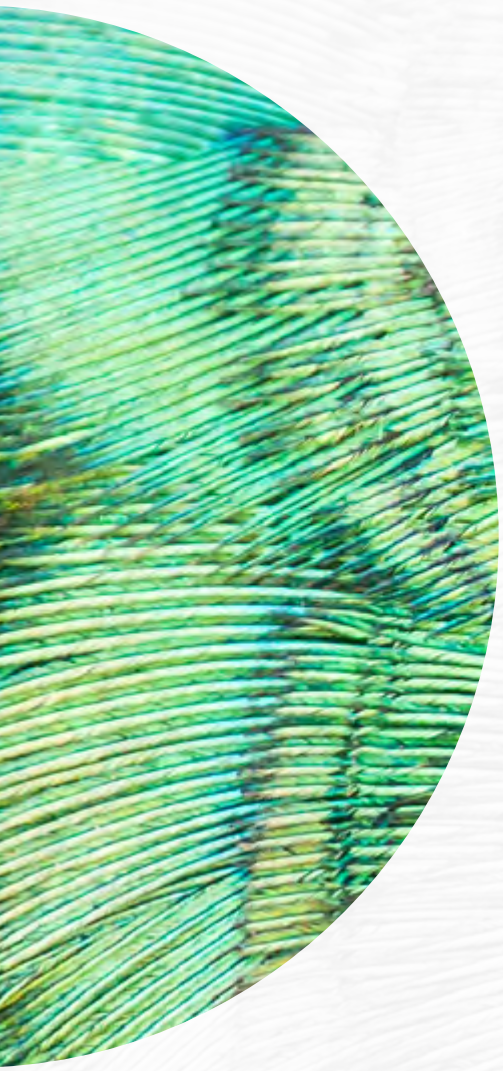
Bills Introduced in 2023: N/A

16 DriveOhio Deploys Automated Vehicles on Ohio Roadways.

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A



Oklahoma

Historically, Oklahoma has not prioritized autonomous vehicles or constructed any type of regulatory or legal framework. However, Governor Kevin Stitt has continued to sign autonomous vehicle legislation, including platooning laws, and the creation of the Oklahoma Advanced Mobility Pilot Program, which focuses on autonomous vehicle adoption. In the 2022 session, Oklahoma passed a law approving autonomous delivery vehicles. Notably, Oklahoma law makes clear that "Only the State of Oklahoma may enact a law or take any other action to regulate the operation of motor vehicles equipped with driving automation systems in Oklahoma" and state law "preempts county or municipality authority and supersedes county or municipality laws or ordinances."

In 2022, Governor Stitt partnered with outgoing Arkansas Governor Asa Hutchinson to create an innovative partnership for the states to collaborate on autonomous vehicle and future mobility work. Together, Arkansas and Oklahoma are paving a new path forward for states that want to attract the AV industry. While they may not possess the same natural advantages as California or Arizona, Arkansas and Oklahoma are encouraging their public educational institutions, economic development organizations and industry leaders to work together in creating an environment that advances current work while encouraging new investment from companies involved in future mobility work.

By creating out-of-the-box solutions, Governors Stitt and Hutchinson have ensured that their states will not fall behind others, but still gain the full benefits of autonomous technology. An example is the fall 2023 launch of the first commercial autonomous trucking lane between Houston and Oklahoma City involving A.P. Moller - Maersk and Kodiak Robotics, Inc.[17]

Starting in spring 2026, four self-driving vans will hit the streets of North Tulsa (considered both a transportation and food desert) as part of a

17 Maersk and Kodiak Robotics Launch the First Commercial Autonomous Trucking Lane Between Houston and Oklahoma City.

program funded by a $3.4 million grant from the Department of Energy to help residents access work, school, grocery stores, gyms and other forms of entertainment. MetroLink Tulsa will operate these Ford E-Transit vans, which will be integrated into their existing ride-share service.

Bills Passed in 2020: Senate Bill 1688

Bills Introduced in 2021: N/A

Bills Passed in 2021: Senate Bill 706

Bills Introduced in 2022: House Bill 3317, House Bill 3483, Senate Bill 1541

Bills Passed in 2022: Senate Bill 1541

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Oregon

Oregon has no current regulations in place concerning autonomous vehicles. However, House Bill 4063, signed by Governor Kate Brown on April 10, 2018, named the Oregon Department of Transportation (ODOT) the state's lead agency on automated vehicle policy and directed ODOT to facilitate a task force on automated vehicles. The task force submitted its first report to the legislature on September 10, 2018 and its second on September 9, 2019. The task force voted to continue meeting on an ad hoc basis in response to significant developments in automated vehicle technology and policy. The task force dissolved on January 2, 2021. Meanwhile, ODOT's Office of Innovative Funding continues to provide a voluntary testing notification form to initiate the exchange of information between AV manufacturers and the agency. This voluntary notification process allows ODOT to provide safety information to interested companies, solicit feedback from AV system developers and track AV testing in the state.

In the past, different agricultural producers have utilized autonomous technology in Oregon and more integration in this space is anticipated in the future.

In 2024, Oregon faced its first major AV lawsuit after a Tesla in self-driving mode ran a stop sign, causing serious injuries to the passenger of another car. Level 2 autonomous features remain legal in Oregon, but the Department of Transportation relies on voluntary manufacturer reporting since the state doesn't track autonomous vehicle numbers or crashes.

Bills Introduced in 2021: N/A

Bills Passed in 2021: N/A

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Pennsylvania

After years at the forefront of autonomous vehicle research, due in part to Carnegie Mellon University's history in the space, Pennsylvania has finally passed a comprehensive legal framework for autonomous vehicles via House Bill 2398, which took effect in July 2023. The law has successfully spurred autonomous vehicle-related initiatives into action, including a project funded by the Delaware Valley Regional Planning Commission's "Travel Options Program" that is designed to enhance access to the Navy Yard in South Philadelphia involving Drexel University and a mid-sized self-driving transit shuttle.[18] Consequently, Pennsylvania will be able to join in the investments from an industry that it helped incubate for years.

Now that autonomous vehicles can operate on public roads, many of the state's AV companies are looking forward to quickly moving toward commercialization. Even still, the state's autonomous technology industry has experienced some consolidation while major players in the space dissolve and send their expertise to other players in the field. This consolidation can benefit the industry in the long run as key experts collaborate and amplify each others' development efforts.

Pennsylvania is moving toward allowing autonomous vehicles to operate without a safety driver present, contingent on meeting specific criteria outlined in an 11-page draft of proposed guidelines. These guidelines, developed by the state's Highly Automated Vehicle Advisory Committee and following Act 130 of 2022, are currently under review and will take effect immediately upon approval. This move builds upon Pennsylvania's history as a hub for AV development and testing, particularly in the Pittsburgh area.

Bills Introduced in 2021: N/A

Bills Passed in 2021: N/A

Bills Introduced in 2022: House Bill 2398, Senate Bill 965

Bills Passed in 2022: House Bill 2398

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

18 Philadelphia navy yard embraces innovation with automated shuttle launch.

Rhode Island

Rhode Island has yet to pass legislation that affects autonomous vehicles. The Rhode Island Department of Transportation started the Rhode Island Transportation Innovation Partnership (TRIP) in 2017 to encourage autonomous vehicle testing and usage. Multiple autonomous shuttles, including those relating to the "Little Roady" Pilot Project (which offered free rides on an autonomous shuttle along a 12-stop, 5.3-mile fixed route between Olneyville Square and the Providence Train Station), have conducted limited runs in the state.

Researchers at the University of Rhode Island continue to find innovative uses for automated technology and plan on including it in their new project, alongside the University of Hawai'i, to research "the shape, size and drifting speed of the icebergs, and the properties of the surrounding water."

Bills Introduced in 2021: N/A

Bills Passed in 2021: N/A

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

South Carolina

South Carolina has yet to pass legislation that affects autonomous passenger vehicles, but it has exempted platoons from certain traffic laws.

As a major automotive manufacturing state, South Carolina will likely play a large role in producing the next generation of automobiles. BMW Manufacturing opened a new logistics center on Freeman Farm Road in Spartanburg, South Carolina, that utilizes autonomous vehicles to transport goods across two public bridges that lead to I-85. Additionally, Latitude AI, Ford's new wholly owned subsidiary whose mission is to develop a hands-free, eyes-off-the-road, automated driving system, will operate a highway-speed test track facility in Greenville, South Carolina.

Bills Introduced in 2021: N/A

Bills Passed in 2021: N/A

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

South Dakota

South Dakota has directed the Transportation Commission to promulgate rules to authorize the testing and operation of platooning at electronically coordinated speed and distance intervals that are closer than otherwise allowed under the "following too closely" laws in the state. Further, in January 2023, South Dakota introduced House Bill 1120, a bill designed to set up parameters for using autonomous vehicles in the state. However, the bill appears to have been, at least temporarily, discarded through an obscure legislative technicality known as a "Deferral to the 41st legislative day."

Raven Industries, a South Dakota-based company, is continuing to lead the way in integrating autonomous technology with agriculture, a process it calls "autonomous farming.[19]"

In 2024, South Dakota enacted House Bill 1095, permitting Level 4 and 5 autonomous vehicles to operate on public roads without a human driver if the vehicle maintains a "minimal risk condition" during system failures and complies with traffic laws. The law designates the automated driving system as the legal driver, requires crash reporting and financial responsibility coverage, and establishes state-level regulation while preventing local governments from enacting additional AV-specific requirements.

Bills Introduced in 2021: N/A

Bills Passed in 2021: N/A

Bills Introduced in 2022: N/A

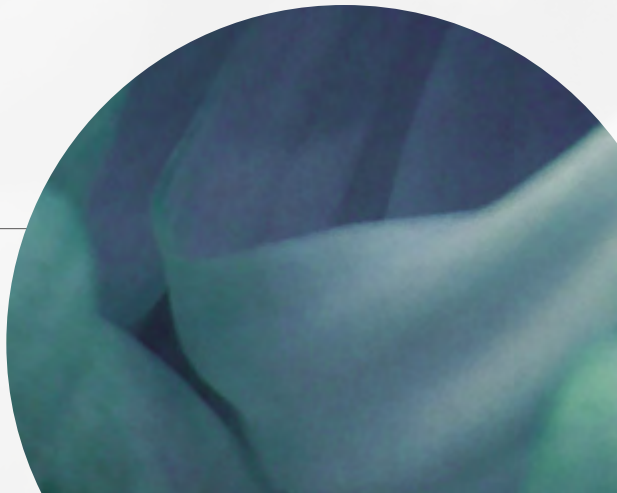
Bills Passed in 2022: N/A

Bills Introduced in 2023: House Bill 1120

Bills Passed in 2023: N/A

Bills Introduced in 2024: HB 1095

Bills Passed in 2024: HB 1095

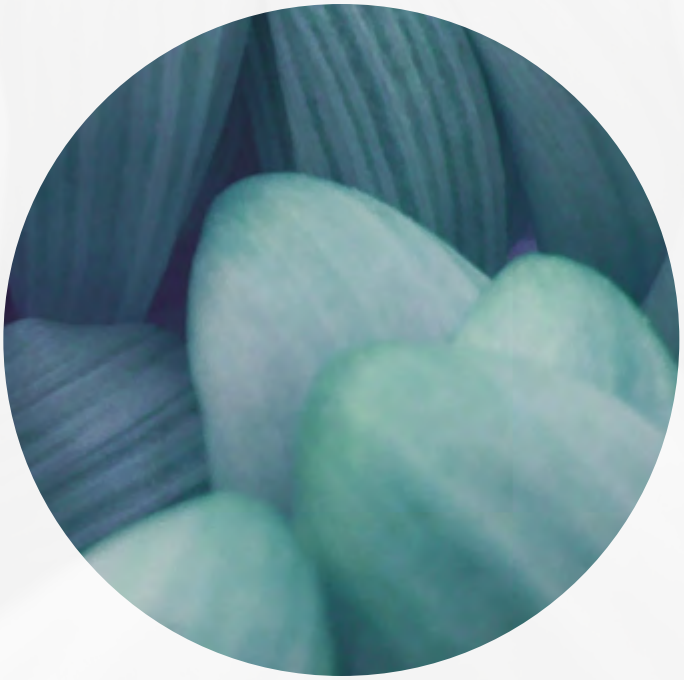


19 Driverless and Driver Assist Ag Solutions.

Tennessee

Legislation passed in 2017 allows certified autonomous vehicles to operate in the state, provided they contain automatic crash recording and notification technology. The law also preempts local regulation of ADS-operated vehicles and specifies that the ADS shall be considered a driver for liability purposes when it is fully engaged and operated properly. Legislation introduced in 2023 (House Bill 0139 and Senate Bill 0083) appears to build on the 2017 legislation by eliminating regulatory requirements relating to the platooning of commercial vehicles and thus allowing, if not promoting, the use of autonomous commercial vehicles in platoons.

The TennSmart consortium, made up of government agencies, universities and companies with ties to the state, hopes to encourage collaboration and innovation in the AV area.[20]



Vanderbilt University and the Tennessee Department of Transportation announced a partnership to conduct a road study on I-24 that examines how autonomous vehicles impact traffic. By recording traffic data and analyzing the videos, researchers will be able to identify where "phantom traffic" originates.[21] Phantom traffic is slowdowns created by human reactions to traffic conditions instead of wrecks or emergencies. In addition to analyzing video tape, researchers will introduce 100 autonomous vehicles onto the road to see if they can help mitigate the causes of phantom traffic. Researchers from the CIRCLES Consortium, which includes the previously stated members plus Nissan, Toyota and GM, launched this project in full. Now, selected testers are travelling along I-24, equipped with collection devices, each morning to gather data about traffic.

These vehicles utilize adaptive cruise control and communication technology working in sequence to eliminate the stop-and-go traffic that clogs up morning commutes. If this project is successful, it could go a long way to eliminating "phantom traffic" as we know it.

20 TennSMART SHAPING THE FUTURE OF INTELLIGENT MOBILITY IN TENNESSEE.
21 Vanderbilt University conducts groundbreaking study to uncover cause of phantom traffic jams.

In December 2024, the University of Tennessee established an academic partnership with the Alliance for Automotive Innovation, the auto industry's leading trade association. This collaboration aims to advance auto-industry related policy research and develop workforce initiatives across Tennessee's automotive industry, which produced 670,000 vehicles and supported 225,000 jobs in 2023. This partnership is especially significant given Tennessee's $12.5 billion investment in electric vehicle and battery manufacturing.

Bills Introduced in 2021: N/A

Bills Passed in 2021: N/A

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023:

House Bill 0139, Senate Bill 0083

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Texas

Texas' geography and friendly regulatory climate have made it a magnet for autonomous vehicle testing for some time. However, in recent years, it seems almost every major autonomous vehicle company has launched a project across Texas' wide plains. Texas is commanding a California-like status in the AV industry, with new projects from several leading players in the AV space. The I-45 corridor, in particular, has become a hotspot for autonomous truck testing. State law allows an automated motor vehicle to operate in the state, regardless of whether a human operator is present in the vehicle, as long as certain requirements are met. Texas also preempts local regulation of automated motor vehicles and automated driving systems. During their 2021 legislative session, Texas lawmakers passed two autonomous vehicle laws. Senate Bill 1308 instructs the legislature to study autonomous and connected vehicles and House Bill 3026 exempts autonomous vehicles from irrelevant regulations. Texas provides the AV industry with interesting opportunities, as it encompasses both the idyllic college town-like setting of Austin, perfect for robotaxis, with major economic powerhouses, including Dallas-Fort Worth, and a strong trucking industry.

While Texas may be positioned for maximum growth in the AV sector as an autonomous future moves forward, there appears to be some backlash to the rapid implementation of AV technology in the state. In 2023, of the bills introduced, two (Senate Bill 2024, Senate Bill 2156) may pose particular obstacles to the growth of AV in the state. Senate Bill 2024 would prevent the state from requiring the use of autonomous vehicles (and thus preclude a future where autonomous vehicles are required by the state), while Senate Bill 2156 would require human operators of autonomous vehicles to hold a valid divers' license (and thus exclude certain segments of the population with unique transportation needs, such as the elderly or disabled, from operating an autonomous vehicle).

In 2024, Tesla entered into discussions with Austin authorities regarding its autonomous

vehicle technology, focusing on establishing safety expectations for its vehicles. Waymo is also expanding its presence in Austin, planning to launch a fleet of fully autonomous, electric Jaguar I-PAC vehicles in early 2025 through a partnership with Uber, where Uber will handle fleet management services while Waymo maintains oversight of testing and operations.

Recent testing by Kodiak Robotics and Aurora Innovation in Texas has demonstrated great success for AVs in terms of safety and technological capabilities, with Kodiak recording three million miles of real-world operations and reporting only three minor incidents (all in manual mode), while Aurora's advanced lidar technology has shown the ability to detect objects more than 400 meters away and navigate through challenging weather conditions, including fog and rain. Aurora Innovation launched the US's first commercial self-driving trucking services using class 8 heavy-duty trucks on Interstate 45 between Houston and Dallas.

Bills Enrolled in 2021: House Bill 3026,

Senate Bill 1308

Bills Passed in 2021: House Bill 3026, Senate Bill 1308

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: House Bill 3274,

House Bill 4435, Senate Bill 2024, Senate Bill 2156

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Utah

Driverless vehicles are regulated on Utah roads under legislation approved in 2019. While all properly insured autonomous vehicles are allowed to operate, autonomous networks must be registered with the state. Vehicles must be operated in compliance with all applicable traffic and safety laws and must be able to achieve a minimal risk condition or make a request to intervene if a system failure occurs. Finally, Utah permits the Department of Transportation to obtain, collect and utilize anonymized location data of connected vehicles. In 2022, the state legislature passed House Bill 137, which clarified that a "human driver" operating an autonomous vehicle is still subject to traffic laws, including a prohibition against driving under the influence. Unlike some other Southwestern states, Utah has not seen widespread autonomous vehicle testing and acceptance. However, Utah is leading the way out West by partnering with the surrounding states of Montana, Idaho, Wyoming, Utah, Nevada, Colorado, New Mexico and Arizona to create ChargeWest. ChargeWest is committed to improving electric vehicle charger availability throughout the region. At the same time, the US Department of Transportation in 2023 increased funding for AV technology development, and the Utah Department of Transportation was one of the recipients of these funds. Altogether, these efforts will assist the AV movement by laying the groundwork for mass EV deployment and adoption.

In 2024, Utah was awarded a $20 million federal grant to expand its connected vehicle infrastructure across state lines, partnering with Wyoming and Colorado to create a seamless Western Transportation Network. The Salt Lake City metropolitan area has already equipped 20% of its signalized intersections with V2X (vehicle-to-everything) technology, with construction underway to reach 25% by the end of 2024, supported by the state's extensive 2,700-mile fiber optic network that connects 96% of Utah's traffic signals. This expansion builds upon Utah's implementation of the nation's first operational connected vehicle corridor, where buses communicate with traffic signals to optimize transit timing, demonstrating the state's willingness to support future autonomous vehicle infrastructure.

Bills Introduced in 2021: House Bill 31

Bills Passed in 2021: N/A

Bills Introduced in 2022: House Bill 137

Bills Passed in 2022: House Bill 137

Bills Introduced in 2023: Senate Bill 264

Bills Passed in 2023: Senate Bill 264

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Vermont

Vermont has established an automated vehicle testing program and granted authority to the Agency of Transportation to adopt specific rules. State law (Vt. Stat. Ann. tit. 23, § 4203 et seq.) requires that during a test, an operator is seated in the driver's seat of the automated vehicle monitoring the operation of the vehicle and is capable of taking immediate control, if necessary. Although the state may not be at the forefront of the autonomous vehicle industry, Vermont has spent significant effort ensuring that electric vehicle operators are able to secure a charger in the state when they need one.

Bills Introduced in 2021: N/A

Bills Passed in 2021: N/A

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Virginia

Although Virginia has no laws or regulations specifically pertaining to autonomous vehicles, the state has taken an active role in encouraging testing and deployment. Seventy miles of Virginia highways have been designated "automated corridors"[22] and outfitted with high-definition mapping and data acquisition systems to support automated-vehicle testing. Virginia has become a hotbed of autonomous vehicle activity and demonstrates that autonomous vehicles can operate in regulation-less states, as long as the operator adheres to state and federal laws.

Virginia's universities and institutions of higher learning are researching autonomous technology and continue contributing to the autonomous sector. Virginia Tech has worked with Ford to research signals and communication systems for autonomous vehicles. Virginia Tech is home to the Virginia Tech Transportation Institute, which has partnered with the Governors Highway Safety Association (GHSA) to research how first responders can best interact with autonomous technology.[23] The University of Virginia is also making a name for itself in the autonomous space. UVA's Autonomous Racing Team participated in the Indy Autonomous Challenge and earned a spot as the fastest American car in the race. In 2022, Virginia Tech (confirm, but this missing verbiage is from the 2024 edition) launched a new open-access tool that allows autonomous vehicle companies to examine and compare different cities and their conditions for autonomous driving.

At the beginning of 2022, Governor Glenn Youngkin appointed W. Sheppard "Shep" Miller III as Virginia's new Secretary of Transportation. Secretary Miller was the former chairman of Virginia Beach-based defense contractor KITCO Fiber Optics and a member of the Commonwealth Transportation Board. Miller has said he wants to position Virginia for success when future mobility options become more widespread.

To that end, Iteris Inc, a company focused on smart mobility infrastructure management, signed a contract to provide the Virginia Department of Transportation with connected and automated vehicle-related planning services.[24]

In 2024, Virginia continued to show its strength as a leader in autonomous vehicle initiatives. At Virginia Tech's Transportation Institute, its Smart Road facility - which has generated nearly $1 billion in research since its 2001 dedication - continued testing autonomous vehicles, including a recent demonstration of an autonomous Ford F-150 that successfully navigated highway emergency scenarios and police stops in the Washington, DC, metropolitan area. Meanwhile, the University of Virginia's Cavalier Autonomous Racing team set world records at the September 2024 Indy Autonomous Challenge, with its autonomous race car reaching a top speed of 184 mph and averaging 171 mph around the Indianapolis Motor Speedway. Additionally, Virginia Western Community College announced a pioneering educational program in autonomous vehicle technology, becoming the first such program in the Virginia Community College System.

Bills Introduced in 2021: N/A

Bills Passed in 2021: N/A

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: House 6001, Senate 6001

Bills Passed in 2023: House Bill 6001

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

22 Virginia Automated Corridors.
23 ADVANCING TRANSPORTATION THROUGH INNOVATION.
24 Iteris Selected By Virginia Department Of Transportation For Statewide Traffic Operation Center Services.

Washington, DC

In 2012, the District of Columbia became one of the first jurisdictions to pass legislation regarding the testing of autonomous vehicles. On November 2, 2020, Mayor Muriel Bowser signed the Autonomous Vehicles Testing Program bill, which was approved by Congress just a few days later. The Act regulates the testing of autonomous vehicles on District roads through a testing program at the District Department of Transportation (DDOT). To test an autonomous vehicle on public roads, an autonomous vehicle-testing entity must submit certain information to the DDOT for approval, including vehicle information for each vehicle tested; a safety and risk mitigation plan; and a description of the area and conditions under which an autonomous vehicle can function while being tested autonomously. Among other things, the bill requires crash and data reporting, including any crash of its vehicles while under autonomous operation that results in property damage, bodily injury or death.

In early 2022, Bill 24-134 was introduced in the DC City Council to modernize the city's autonomous vehicle framework. The bill has been unable to gain traction and has languished in committee.

In fall 2022, Mayor Bowser announced the city's first Mobility Innovation District (The MID) anchored in Southwest DC along the waterfront. The MID will include partnerships with the Office of the Deputy Mayor for Planning and Economic Development (DMPED), the Southwest Business Improvement District (Southwest BID) and community leaders. The district will focus on equitable access to transportation, Universal Basic Mobility (UBM) and electrification. Through the MID, DC has an opportunity to establish itself as a global hub for innovative transportation solutions.

In March 2024, after adopting Emergency Resolution 669, the Council enacted both an Emergency Amendment Act (Act A25-0420) and Temporary Amendment Act (Act L25-0168) to modify the city's 2012 Autonomous Vehicle Act. The new requirements mandate human operators be physically present in all test vehicles and require companies to provide DDOT with 10-day advance notice before testing, including details on vehicle numbers and types, operator qualifications, testing locations and duration. The emergency act provides 90-day coverage, while the temporary act extends these rules for 225 days after congressional review, effectively banning fully driverless testing until DDOT implements its formal permitting process.

According to DDOT, Waymo received permission under the new emergency legislation to conduct data collection activities across DC during spring and summer 2024. Its operations were limited to fewer than 10 vehicles, all with safety operators manually driving the AVs.

Bills Passed in 2020: Bill 23-232

(Autonomous Vehicles Testing Program Bill)

Bills Introduced in 2021: Bill 134

Bills Passed in 2021: Bill 285

Bills Introduced in 2022: Bill 24-134

Bills Passed in 2022: N/A

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: Act A25-0420, Act L25-0168, DC B 710

Bills Passed in 2024: Act A25-0420, Act L25-0168

Washington

While Washington State has a legal framework for autonomous vehicles, its regulations are not overbearing. Governor Jay Inslee signed an executive order in 2017 requiring that state agencies with pertinent regulatory jurisdiction "support the safe testing and operation of autonomous vehicles on Washington's public roads." The executive order established an interagency workgroup and enabled pilot programs throughout the state. The order specifies certain requirements for vehicles operated with human operators present in the vehicle and for vehicles operated without human operators in the vehicle. In 2020, Washington passed House Bill 2676, which established minimum requirements for testing AVs, necessitating the reporting of planned local testing and any collision accidents. In 2021, Senate Bill 5460 defined autonomous vehicles as Levels 4 through 5, clarifying that Level 3 was not considered autonomous in Washington. The bill also gave the Department of Licensing additional rulemaking authority. In 2022, the state legislature considered multiple bills to change the reporting requirements for autonomous vehicles and autonomous vehicle testing. None of these bills were passed.

Multiple companies are self-certified to operate autonomous vehicles in Washington. Seattle, in particular, provides autonomous vehicle companies with an interesting test environment due to its unique streets, weather and diversity of transportation modes. However, in late 2022, Seattle passed new regulations for AV companies wishing to test their vehicles in the city. Now, AV operators must obtain a permit from the city, have a human driver in the vehicle ready to take control, notify the city before testing and prominently display company logos on self-driving vehicles. The regulations also include an interesting requirement that companies notify the public through two community events before they launch a pilot program in order to receive a permit. These new regulations from Seattle, as well as an AV strategic plan published by Seattle and Bellevue in February 2023, show how cities can be active participants in the autonomous vehicle industry. Instead of relying on states to regulate, cities can make sure that the industry reflects their wishes and vision. It is possible, however, that such active participation by cities may come to an end should Senate Bill 5594, introduced in January 2023, come to pass.

In 2024, the State of Washington released its annual Autonomous Vehicle Self-Certification Testing Program report, revealing that three companies - NVIDIA, Waymo, and Zoox - were actively testing SAE Level 4 and 5 vehicles in the state, with no reported collisions or moving violations during 2023. The program, administered by the Department of Licensing, requires companies to maintain $5 million in liability coverage, notify law enforcement before testing and report testing jurisdictions, with specific requirements for testing both with and without human operators present.

Bills Passed in 2020: House Bill 2676

Bills Passed in 2021: Senate Bill 5460

Bills Introduced in 2022: House Bill 1731,

House Bill 2070, House Bill 2100, Senate Bill 5828

Bills Passed in 2022: N/A

Bills Introduced in 2023: Senate Bill 5594

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

West Virginia

After years of inaction, West Virginia finally passed major autonomous vehicle legislation. In 2021, it approved legislation offering tax credits for autonomous vehicle companies. In 2022, the state legislature passed two bills concerning autonomous vehicles. House Bill 4675 codifies, regulates and defines autonomous and semi-autonomous delivery robots. House Bill 4787 is a comprehensive legal framework that defines autonomous vehicles as Level 4 and Level 5 systems, regulates autonomous vehicles and permits all manners of operation, including commercial and non-commercial, with a driver and without a driver present and platooning. This legislation gives autonomous technology companies security and certainty as they begin to deploy in West Virginia. West Virginia is clearly taking steps to make itself a home for autonomous vehicle activity.

Bills Introduced in 2021: House Bill 2760

Bills Passed in 2021: House Bill 2760

Bills Introduced in 2022: House Bill 4675,

House Bill 4787

Bills Passed in 2022: House Bill 4675,

House Bill 4787

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Wisconsin

Former Governor Scott Walker signed an executive order in 2017 creating the Governor's Steering Committee on Autonomous and Connected Vehicle Testing and Deployment within the state's Department of Transportation. The committee was tasked with advising the governor "on how best to advance the testing and operation of autonomous and connected vehicles in the State of Wisconsin." The Committee submitted its report in 2018 and made several recommendations, including requiring municipal oversight, an application process and backup drivers. While these have yet to be enacted, the committee also noted that it believes current state law "does not prohibit the operation of autonomous vehicles." This position is reflected by official statements by the State of Wisconsin Department of Transportation.

Despite the lack of any legal framework, Wisconsin regularly sees autonomous vehicle activity in the state. In 2017, the USDOT named University of Wisconsin-Madison one of 10 "proving ground pilot sites" for autonomous vehicles. Since then, UW-Madison has helped create the Wisconsin Connected and Automated Transportation Consortium alongside multiple partners, including engineering firms, the city of Madison and even the Road American race course. Together, these partners provide support and designated testing facilities for autonomous vehicles. More recently, the City of Racine announced the launch of its own driverless shuttle, the "Badger." Painted to resemble the University of Wisconsin mascot, this driverless shuttle was built in partnership with Perrone Robotics in Virginia, and help's the City of Racine live up to its "smart city" moniker.

The Wisconsin Department of Transportation partnered with Racine, Gateway Technical College and UW-Madison to use the "Badger" to train local law enforcement officials on how to interact with autonomous vehicles. Now that AVs are part of the city's transportation infrastructure, officials wanted to ensure they are able to safely adapt to vehicles without a driver to deal with directly. Projects like these reinforce how important it is that the public

be introduced to AVs in a safe and moderated environment where they can learn without any unnecessary fear or misunderstanding.

Bills Passed in 2019: N/A

Bills Introduced in 2020: N/A

Bills Passed in 2020: N/A

Bills Introduced in 2021: N/A

Bills Passed in 2021: N/A

Bills Introduced in 2022: N/A

Bills Passed in 2022: N/A

Bills Introduced in 2023: N/A

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Wyoming

In 2018, the Wyoming Department of Transportation director argued for the need to prepare for driverless vehicles. Wyoming is one of three states that received a grant from the USDOT in 2015 to participate in a connected vehicle pilot program tested along I-80. While Wyoming has established a voluntary reporting system for manufacturers conducting automated driving system vehicle testing within the state, there are still no laws or executive orders governing AV use in Wyoming, although self-driving vehicles are not specifically prohibited by law. In 2021, Yellowstone National Park launched autonomous shuttles named TEDDY (The Electric Driverless Demonstration in Yellowstone). These shuttles, provided by Beep, helped alleviate the summer crowds. In 2022, Senate File 16 sought to institute a comprehensive regulatory framework for autonomous vehicles in Wyoming, but failed in committee. The bill would have created requirements for markings, insurance and reporting, and would have given authority to the Wyoming Department of Transportation to create further rules or regulations.

Bills Introduced in 2021: Senate Bill 7

Bills Passed in 2021: N/A

Bills Introduced in 2022: Senate Bill 16

Bills Passed in 2022: N/A

Bills Introduced in 2023: Senate Bill 1

Bills Passed in 2023: N/A

Bills Introduced in 2024: N/A

Bills Passed in 2024: N/A

Authors

Eric Tanenblatt
Co-leader, Global Autonomous Vehicles and Principal,
Washington DC and Atlanta
eric.tanenblatt@dentons.com

Peter Stockburger
Co-leader, Global Autonomous Vehicles and Partner,
San Diego
peter.stockburger@dentons.com

Walker Boothe
Associate Managing Director,
Atlanta
walker.boothe@dentons.com

Josh Benzadon
Law Clerk,
New York
josh.benzadon@dentons.com

Todd Daubert
Partner,
Washington DC
todd.daubert@dentons.com

Jeff Denham
Senior Policy Director
Washington DC
jeff.denham@dentons.com

Jordan Cooper
Managing Director
Washington DC
jordan.cooper@dentons.com

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