

The State of CATV in California

Introduction

California (CA) generally carries a restrictive policy regarding current Connected and Autonomous Vehicle (CAV) administration and regulation. According to the CA Vehicle Code (CVC) Section 38750 as of April 2, 2018 the California DMV has the authority to review and accept applications for permitted use of driverless vehicles. Title 13, Division I, Chapter I, Article 3.7 - Testing of Autonomous Vehicles outlines a series of terms, strategies, and conditions for best use and practice.

Legislation

Manufacturers are required to abide by baseline requirements, provide proof of secure operation, and report on various results directly to the Department on the Annual Report of Autonomous Vehicle Disengagements. In addition to basic self-insurance measures proving some ability to pay for damages, companies must submit the vehicle information (license number and registration), application (for review), and a \$3,600 processing fee.

Safety

Measures that the industry should account for include a two-way communication system between the vehicle and manufacturer, a training program for remote operators, and a data retention plan for detection of faulty or high-risk vehicles and situations. Prior to market deployment, an approval must be granted for use of CAVs on public roads and streets. Certifications must be designated on the basis of whether the technology is designed to appropriately as well as legally detect and respond to roadway situations. Information records like location, mapping, testing, safety, and cyber security should be accounted for and certified



Definitions

Autonomous Mode: Where technology performs the dynamic driving with or without a person actively supervising

Autonomous Test Vehicle: A vehicle equipped with technology performing the dynamic driving with a person actively supervising

Autonomous Vehicle Test Driver: Person in the driver's seat of an autonomous test vehicle

Conventional Mode: Vehicle status when operated by physical human control

Designee: Person identified as an authorized autonomous vehicle test driver

Driver: Person operating an autonomous vehicle with an inactive autonomous mode

Dynamic Driving Task: All real time functions required to operate within on-road traffic

Manufacturer: Producer of autonomous vehicle technology

Minimal Risk Condition: A last security and safety resort for autonomous vehicles when drivers fail to take appropriate manual action, handing over control of dynamic driving tasks to the vehicle itself

Operational Design Domain: the specific area by which automated systems are designed to properly function (weather, geography, day, night, etc.)

Passenger: occupant of a vehicle who has no role in operation of that vehicle with engaged autonomous technology

Personal Information: information/data that the autonomous vehicle collects and stores

Public Road: listed to be highways, off street public parking facilities, and streets

Remote Operator: person, not seated in vehicle, who monitors the autonomous functions

Testing: operation of autonomous vehicles on public roads for assessment and analysis

Regulation

Certain operation, industry, and commerce regulations have been enforced with the passing of this legislation. In regard to sales, manufacturers are restricted from selling AV test vehicles and parts into the marketplace as of right now. Prior to deployment in California public roads, manufactures are expected to detect, defend, and respond to cyber-attacks, leaks, or takeovers. In addition, to having a data recollection system to mitigate risk, manufactures are required to report on safety defects within the vehicles themselves. Finally, **Information Privacy**, a primary concern, will be handled through a written disclosure that outlines how consumer data and personal information will be securely used as well as a confirmation of anonymity regarding personal information unnecessary for the safe operation of these vehicles.

Stakeholders

CAV manufacturing corporations with vested interest in the United States are the main stakeholders impacted by this legislation. 46 corporations are working on research and development of autonomous vehicles. Initiatives and goals related to this technology can vary depending on what industries these companies associate themselves with. This report covers a portion of CAV industry leaders.

Amazon

Amazon has invested and at times filed for intellectual property rights on cargo jets/drones, multi-function autonomous vehicles, and autonomous lane-switching technologies. Projects like “Prime Air” and “e-Palette” have been applying AV technology to improve efficiency in its internal supply-chain and logistics sectors.

Waymo

Waymo, responsible for Google’s self-driving car project, has partnered and collaborated with Fiat Chrysler since 2016. Having already achieved 4 million self-driven miles by autonomous vehicles, Waymo has plans to increase its self-driving fleet by 100x.

Apple

Apple shifted their “Project Titan” from focusing on electric cars to autonomous self-driving cars. In addition to a total of 68 patents filed since 2009, Apple is also the owner of the third-largest autonomous test vehicle fleet in the state.

Microsoft

Microsoft has mainly provided software assistance related to cloud services for automobile companies. It partnered with the American Center for Mobility facility in Michigan as of 2018 and recently filed a high number of AV technology patents.

Uber

Uber has faced a series of legal troubles regarding its role in accidents and fatal crashes. Uber has recalled and removed all of its self-driving cars from the road and effectively ended its self-driving truck program. However, it recently partnered with Toyota to develop AV technology.

Toyota

Toyota, having established the Toyota Research Institute (TRI) for development and research of AV technology as well as three university partnerships in the United States, announced that it plans to release a car stocked with AI features by 2021. Each of its university partners carry a distinct responsibility related to AV development. The University of Michigan innovates fully autonomous cars, Stanford develops partially autonomous cars, and MIT focuses on machine learning. TRI also hopes to achieve level 4 and level 5 autonomy. Lastly, the Toyota Research Institute-Advanced Development is solely concerned with creating autonomous, electric cars.

Tesla

Tesla, due to a series of fatal AV technology related crashes, has been cautious with rolling out software updates that could make self-driving technology available in all its vehicles. Following complaints regarding the self-driving features malfunctioning in his car, a California man died in 2018 while riding a Tesla self-driving vehicle. The U.S. National Transportation Safety Board launched an investigation of the incident while also stripping Tesla of its role in the investigation. In any case, Tesla is projected to now reach level 4 autonomy in its vehicles by 2020 at the earliest.

General Motors (GM)

GM in 2016 bought Sidecar’s assets, invested \$500 million into Lyft, and acquired the autonomous tech startup Cruise Automation. In addition to these proactive steps, GM launched its semi-autonomous Super Cruise Cadillac CT6 in 2018. The company filed a petition with the U.S. Department of Transportation in January of 2018 for its commercial ride sharing business. Finally, SoftBank invested \$2.25 billion to GM’s AV technology research and development.

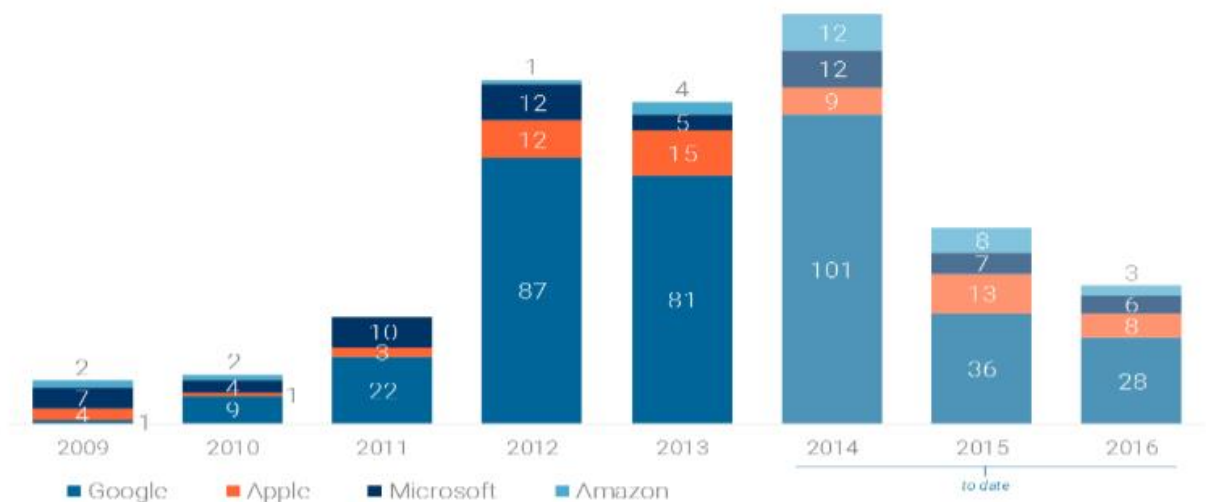
Partnerships

DAF, Daimler, Iveco, MAN, Scania, and Volvo established a partnership focused on the concept of platooning (linking two or more vehicles in convoy with automated driving systems) for self-driving trucks. Tests for these studies include multiple trucks following a lead truck in a line. Wireless signals allow for more of these trucks to be controlled by fewer people.



VEHICLE TECH PATENT APPLICATION ACTIVITY

By date of application, 2009 - 2016 YTD (12/12/16)



Analysis filters patent titles and abstracts for select relevant keywords, e.g. autonomous driving, self-driving vehicle, etc.
Does not include pre-acquisition patent activity of purchased companies

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