

THE ARRIVAL OF AUTONOMOUS VEHICLES

A LOOK AT WHERE WE ARE TODAY AND AN ANALYSIS OF
WHERE WE ARE HEADED TOMORROW

August 2020



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Introduction to Autonomous Vehicles

The term “autonomous vehicles” can refer to a wide range of vehicles that utilize features to either assist or control the driving function. In order to break up this rather broad term, **SAE International** (formerly the Society of Automotive Engineers) developed a level system to categorize different forms of autonomous driving. The system distributes various driving features into 6 different categories to help define the various tiers. As seen in **Figure 1**, the cut off between levels 2 and 3 dictates the difference between “driver support” and “automated driving” features, with “automated driving” features having the ability to completely control the vehicle without assistance from the driver.

Current consensus would rate cars that are publicly available to consumers, such as modern **Tesla’s**, at level 2 with perhaps some elements of level 3 features appearing in the most recent models. Test cars, such as those developed by Alphabet Inc.’s autonomous driving technology company, **Waymo**, have been running level 4 self-driving cars without a driver since October of 2017. As **Figure 1** shows, Levels 4 and 5 are defined as vehicles that would not require a driver to take over.

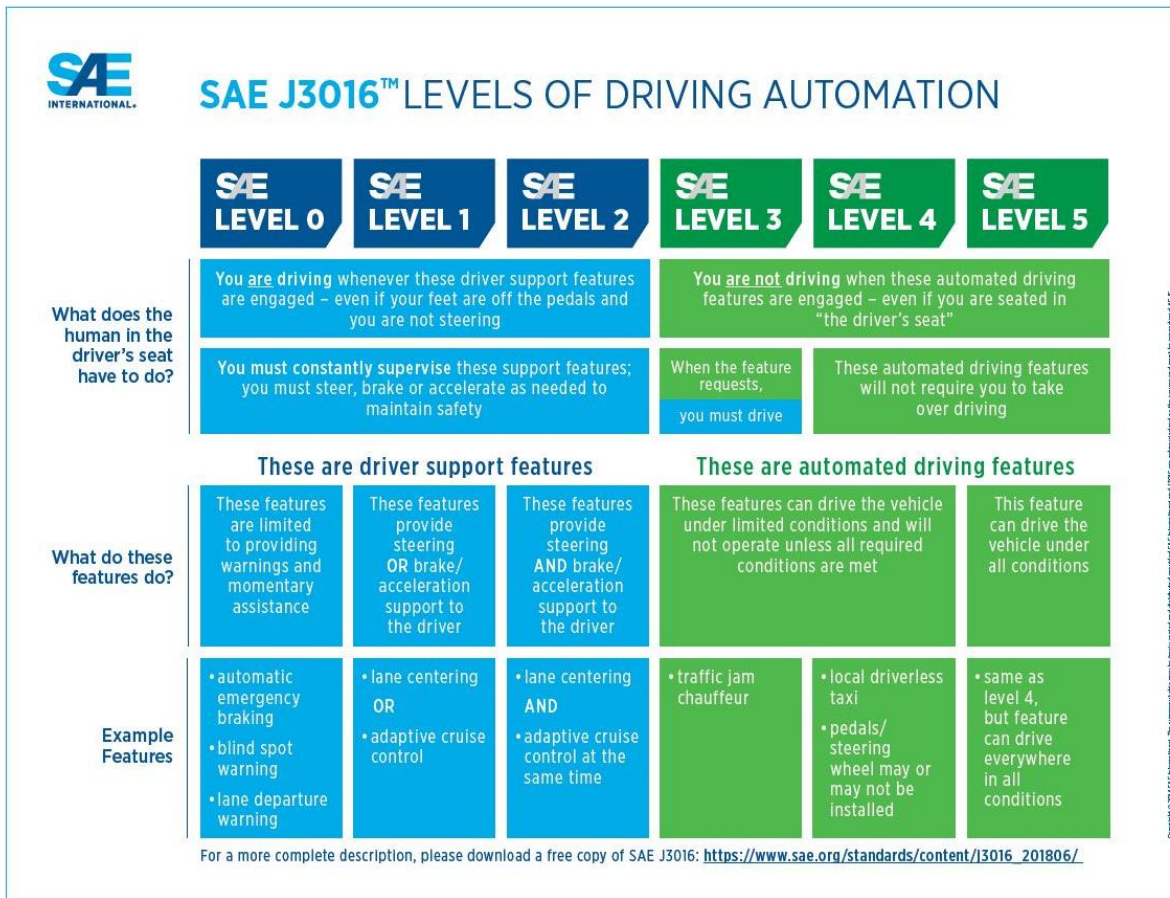


Figure 1: SAE International Levels of Driving Automation. Source: <https://www.sae.org/news/press-room/2018/12/sae-international-releases-updated-visual-chart-for-its-%E2%80%9Clevels-of-driving-automation%E2%80%9D-standard-for-self-driving-vehicles>

Waymo's CEO, John Krafcik, stated at a Wall Street Journal conference that level 5 autonomous vehicles may never exist. In order to reach level 5, a vehicle would need to be able to drive itself under any conditions including run down infrastructure or excessive rain/snow fall. So while autonomous vehicles seem to be decades away from reaching even level 4 in a widespread manner, Krafcik does highlight that we are seeing a shortage of truckers to support our supply chain requirements, and that "Moving goods on freeways to hub to hub is fairly straightforward" hinting at autonomous trucks becoming more mainstream in a shorter time frame than cars. See **Figure 2** for the American Trucking Associations projections for truck driver shortages.

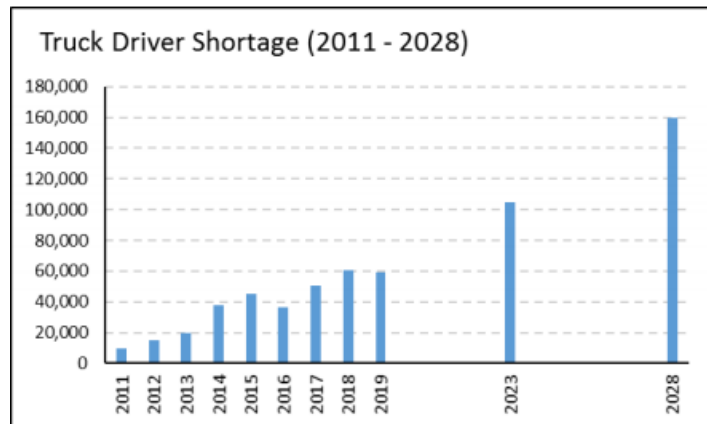


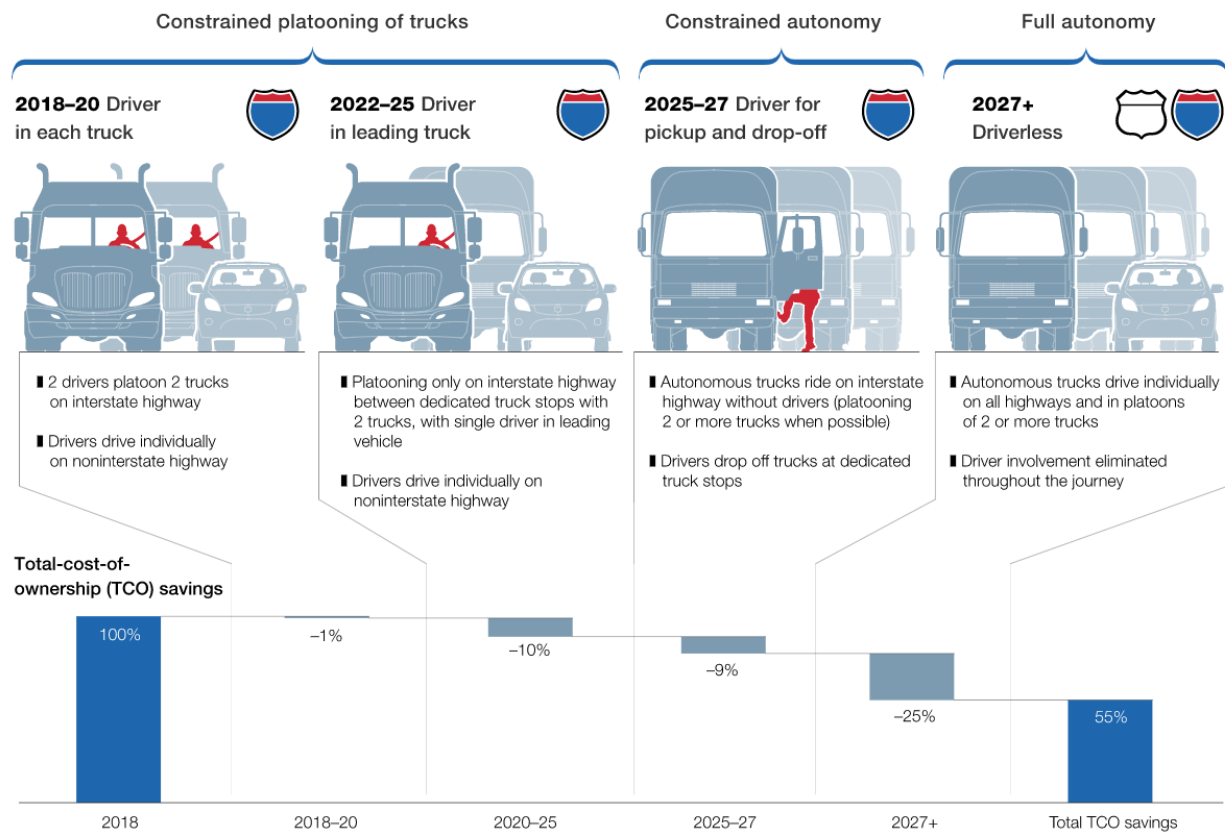
Figure 2: ATA Truck Driver Shortage Projections. Source: <https://www.trucking.org/sites/default/files/2020-01/ATAs%20Driver%20Shortage%20Report%202019%20with%20cover.pdf>

As shown in the graph, shortages of professional drivers are slated to increase in the coming years. Without some sort of incentive (i.e. increased compensation), it is unlikely to see this trend reversing "naturally". Having an option to fill in the gaps in the labor market with autonomous vehicles would be an ideal situation for companies that heavily rely on transporting physical goods to stores or directly to consumers. It would allow pay to remain level for their current drivers, and likely reduce costs substantially in the long run.

Implementation of Autonomous Vehicles

Logistics

With a current shortage of truckers that is set to expand even further in the coming years, autonomous trucks will not only be able to make up for the shortage but begin to eliminate jobs altogether. McKinsey predicts that with fully autonomous trucks, the industry would save 45% of costs, or between \$85 and \$125 billion dollars. In **Figure 3**, McKinsey shows how they believe the progression of driverless trucks will unfold along with how the 45% savings will be realized. As early as 2022, we could be seeing a 10% savings from cutting back on the number of drivers required. Full savings would eventually be realized as we approach the second half of the decade and level 4 autonomous trucks become mainstream.



Source: Route 2030: The fast track to the future of the commercial vehicle industry, September 2018, McKinsey.com

McKinsey&Company

Figure 3: McKinsey Autonomous Trucking Rollout. Source: <https://www.mckinsey.com/industries/travel-logistics-and-transport-infrastructure/our-insights/distraction-or-disruption-autonomous-trucks-gain-ground-in-us-logistics>

While the McKinsey Figure shows level 5 autonomous trucks taking over at the end of the decade, that may prove to be further down the road than they are currently projecting. As we have heard from leaders in the autonomous vehicle development industry, a true level 5 autonomous vehicle may be multiple decades down the road even if the majority of the driving done by these vehicles occurs on highways. Demand for packages during winter months around Black Friday, Cyber Monday, and Christmas all face potential inclement weather concerns that may increase the liability of autonomous vehicles to the point where human drivers would still be preferable. Even if level 5 trucks are currently a pipe dream, reaching level 4 autonomous trucks by 2025 could still provide 20% in cost cuts, or as much as \$55 billion in savings.

The demand for these vehicles will be massive as we see companies that are reliant on trucking for delivery rush to implement autonomous delivery vehicles. Companies such as **Wal-Mart**, **PepsiCo**, **Amazon**, and more that have, individually, tens of thousands of tractors and trailers will be spending large amounts of money shifting over to level 4 trucks. As shipping costs decrease, and margins begin to grow amongst companies such as Amazon that are pushing delivery speed to gain a competitive advantage, it will be interesting to see whether the savings are able to be completely captured by the companies, or whether the savings will be passed down

to the consumers in the form of discounts or free quick delivery options such as same-day delivery.

Ride Services and Food Delivery

As companies such as **Uber**, **Lyft**, and **DoorDash** struggle to find profitability, analysts are looking ahead to autonomous vehicles as a potential light at the end of the tunnel for these services to start raking in profits. However, Business Insider reported on an MIT study that found operating a fleet of autonomous vehicles could be up to 3 times as expensive as paying individuals to drive their own cars for them (\$6 per mile for AV, vs \$2 per mile as compensation for drivers in the most expensive cities).

Another concern for ride sharing services companies would be increased competition. Currently, companies such as Uber and Lyft are able to avoid the same regulations that taxi companies face and maintain a pricing advantage along with limited, if any, restrictions on where they can operate. Even if autonomous vehicles are able to be implemented in a cost-effective manner, as is projected for the trucking industry, ride sharing companies may begin to face stiffer competition. Not only could there be a revolution in how taxi companies are regulated, freeing them of restrictions and thus allowing them to compete evenly, we could also see new entrants into the industry. Rental car companies such as **Enterprise**, **Avis**, **Budget**, and more could look to leverage their economies of scale to offer rides with any un-rented inventory they currently have.

The markets for both rides and food delivery could become saturated very quickly in the event they find a way to make autonomous cars profitable for their businesses. Unlike the trucking industry that utilizes their own vehicles and/or trailers within their supply chain, companies like Uber, Lyft, and Door Dash rely on their employees to have transportation and have already cut costs to the bone in order to minimize their losses. While these industries have been traditionally looked at as big beneficiaries of the autonomous revolution, it may be wise to hesitate on popping the cork until these companies are able to provide a sustainable business plan that can address the previously mentioned drawbacks they will face from employing autonomous vehicles.

Health Care

The world of health care is shaping up to be a large beneficiary of self-driving vehicles in the coming years. Similar to the PepsiCo's and Amazon's of the world, the health care industry also relies heavily on having timely transportation. **Cardinal Health**, a health care logistics company, has more than 17 million shipments per year. Volume also picks up toward the end of the calendar year, as consumers have paid off their deductibles and are able to have more affordable access to the medical supplies they need.

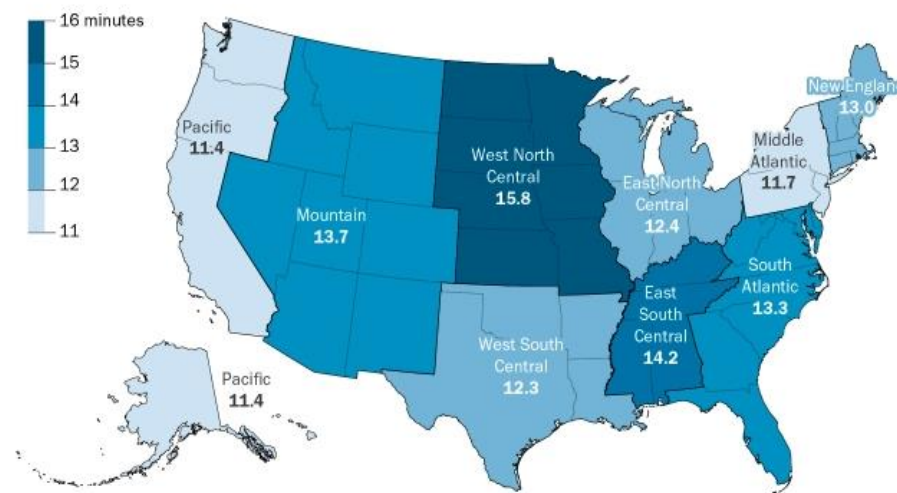
With autonomous trucking, companies like **Cardinal Health** or **McKesson** would be able to shift how their warehouses operate as trucks could leave 24/7. Savings would come not only in the form of lower transportation costs, but also in being able to cut back the paid over-time costs that come along with workers arriving early and struggling to pick and pack all 20,000+ daily orders by the time the truck shows up in the afternoon. Having a night crew to alleviate the 12 hour days traditionally seen in these industries around peak season would save both money for the company in the form of salary, but also potentially prevent injuries from overwork, accidents due to fatigue, and mis-picked orders that could be detrimental to customers and require healthcare companies to reship items in the future.

Hospitals may begin to see an uptick in competition as commutes become less of an issue. Health care organizations that provide higher quality care will be able to draw in larger crowds as transportation barriers begin to evaporate. Both the elderly and disabled will have more reliable means of transportation rather than being forced to rely on friends, family, or government provided transportation to appointments. According to a study published on **HHS.gov**, some samples of the population had respondents reporting as high as 67% listing transportation as being a barrier to health care.

Uber and Lyft are also getting involved with medical transportation. Uber is engaged in nonemergency medical transportation that incorporates designated pick-up spots which can allow patients to utilize the service even if they do not have access to a smartphone or have a disability that would prevent them from utilizing one. Lyft has joined forces with Unite Us to help with social care transportation. Unite Us connects health and social care providers. This partnership would allow Lyft to help people get transportation to job interviews, food pantries, or other social care focused institutions. These forms of transportation could, potentially, be one way Uber and Lyft take advantage of AV technology to access a wider customer base without the need to expand their work force and turn AV technology into an advantage for their businesses.

People living in northern Plains states have the longest travel times to the nearest hospital

Average minutes of car travel time to nearest hospital by census region



Source: Survey of U.S. adults conducted Sept. 24-Oct. 7, 2018, and Homeland Infrastructure Foundation-Level data.

PEW RESEARCH CENTER

Figure 4: Pew Research Hospital Distances. Source: <https://www.pewresearch.org/fact-tank/2018/12/12/how-far-americans-live-from-the-closest-hospital-differs-by-community-type/>

by avoiding road rage, or just an overall less stressful commute where they can catch up on their Netflix backlog while they are moved to their destination. This could be particularly beneficial to individuals living in more rural areas that tend to see longer hospital commute times such as in the Northern Plains states as seen in **Figure 4**.

Autonomous vehicles may also incentivize individuals to be more selective with their care options. While many people may currently simply go to the hospital closest to them, self-driving cars could open up options to seek out highly ranked medical centers that can provide better care than what is locally available. Autonomous vehicles allow individuals options such as “working-on-the-road” to save vacation days, the ability to keep their mental health in-tact

Hospitals, Hospitality, and Beyond



Picture 1: TUG Robot by Aethon. Image Source:
https://aethon.com/wp-content/uploads/2018/03/T2.5White_Left.png

Hospitals themselves may also begin to see changes to how they operate *internally* from AV technology. Autonomous mobile robots (commonly referred to as AMR's), such as the **Aethon TUG**, transport materials inside of hospitals in order to help improve the operational efficiency of these facilities. It utilizes built in sensors to navigate its way around hospitals to deliver items such as medications, bedding, lab samples, meals, and more to save staff potentially hundreds of miles of walking each week.

While robots like TUG have existed for over a decade, their functionality continues to evolve and add value to the companies that utilize them. As AV technology becomes more advanced in the automobile industry, these innovations will quickly be translated into other sectors that can benefit from their use.

Currently, robots such as **Intuitive Surgical's** da Vinci Surgical System assist surgeons in performing their job completing minimally invasive surgeries. With advances in AI, these robots may be able to one day perform surgeries under simple supervision as opposed to being utilized as a tool like they are

currently. With over 4000 surgical errors occurring each year in the U.S., advances in this technology could easily translate into saved lives.

Along with internal operational and performance benefits gained from AMR's or surgical robots, hospitals are also beginning to leverage autonomous drones to speed up their delivery and exchange process for items such as blood work or other materials that may need to be tested at a different location.

One such company, UPS partner-**Matternet**, offers a service where they have stations set up nearby hospitals that allows for doctors or staff to place samples inside of the terminal and program the drone resting inside the station to deliver the samples to a specified location. While the drones operate autonomously and can be sent out 24/7, there are also flight directors managing operations to ensure there are no complications. Matternet has raised roughly 30mm since its inception in 2011. During their most recent fund raise in January 2020, the company received a \$90mm pre-money evaluation.

In other industries, such as hospitality, luggage and linen transportation could be automatized in short order to improve workflow. Warehouses can utilize autonomous robots to fill orders, unload trucks, and store goods more efficiently. The construction industry, which has seen upwards of over 1,000 deaths in the U.S. in some recent years, can benefit from automated machinery to both tear down and put up infrastructure in a safer fashion. It may be a quicker endeavor to list industries that won't benefit from the technology currently being developed in the AV space.

Current State of Legislation

There has yet to be any uniform laws passed in the United States regarding AV's, and the regulation of such vehicles has been left up to the individual states. As of the writing of this paper, 96 Bills have been passed in 26 different states in 2020 alone with varying regulations on how these vehicles can be operated. As seen in **Figure 5**, the method for handling AV's varies widely by state and what is required of users could change drastically if individuals cross over state lines. It goes without saying, there would need to be an increase in standardization over the coming years to ensure that companies are able to efficiently operate AV's when transporting goods over state lines.

The **National Conference of State Legislatures** (NCSL) has a database that tracks up to date changes in AV legislation on their website ([ncsl.org](https://www.ncsl.org)). It is very malleable and allows the user to track changes by both topic and state, along with a variety of other filters such as keywords, year, and bill number. For now, this appears to be the best option for sourcing information on the impacts of AV regulation within states that concern you. In the future, it would be reasonable to expect

there to be more guidance provided by the federal government as we approach the release of level 4 AV's to the general public.

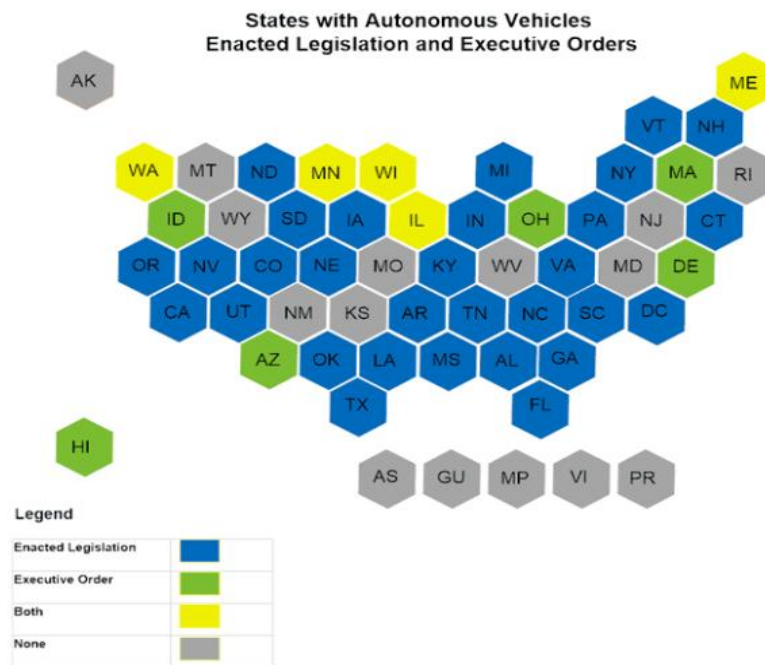


Figure 5: AV Legislation by State. Source: <https://www.ncsl.org/research/transportation/autonomous-vehicles-self-driving-vehicles-enacted-legislation.aspx>

Where is the Money Headed?

The amount of capital invested into the Autonomous Transportation industry overall has been strong since 2015. In 2018 we saw a record 317 deals in the industry overall, with over \$11 billion in capital invested. For 2019 and 2020, there has been a slight drop off in deal count to 270 and 107, respectively (**2020 numbers through mid-august**). Despite the total deal count dropping in 2019, there was an increase in invested capital to around 19 billion. 2020 has seen almost 9 billion in invested capital thus far and is on pace to outperform 2018, despite 2020's numbers seemingly being out of reach for the moment.

Looking at the exhibits in the **Appendix**, which show information for both the industry overall, as well as what has been specifically happening in the trucking and logistics side of AV's, it is not too surprising that we see drastic changes in invested capital from year to year. There are a few highly capitalized firms that are developing cars and wide ranging technology, while others are smaller companies looking for niche areas where they can contribute to the industry through specific technology additions or gadgets that may be useful for AV's in the future.

The industry is also subject to outside forces that could make or break advancements. The current capabilities of AI, along with concerns about whether or not current infrastructure could support the wide use of autonomous vehicles can have wide ranging impacts on how quickly this technology develops.

Currently, **California** and **China** are leading the way in development of logistics focused AV's. With the exception of **Locomotion** in **Pennsylvania**, all of the other 9 companies in the top 10 funded trucking and logistics firms are based in either California or China. In the industry as a whole, one of the only other major companies outside of the U.S. and China is **Mobileye**, which operates out of **Israel** working on collision avoidance systems. There are a few European firms scattered throughout the top 100 funded companies, but they tend to focus on more ancillary products rather than on AV's themselves.

The three biggest players investing in these companies include: **Plug and Play Tech Center**, **Y Combinator**, and **Trucks Venture Capital**. These three firms have combined for over 100 deals in the past 5-6 years. Given the amount of upside within the AV industry, we have seen close to 1800 unique investors enter the fray since the start of 2015.

Power Struggle: Battery v Hydrogen

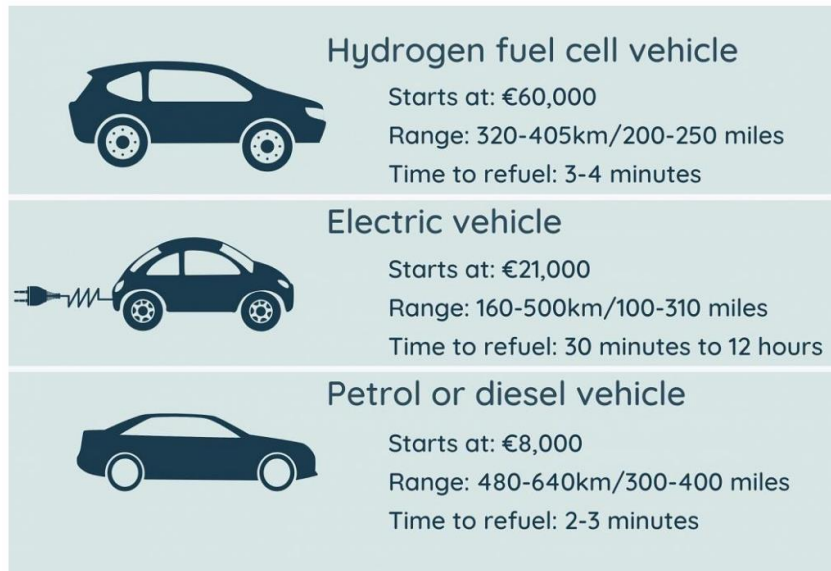


Figure 6: Battery and Hydrogen Car Comparison. Source: <https://www.euronews.com/living/2020/02/13/hydrogen-fuel-cell-vs-electric-cars-what-you-need-to-know-but-couldn-t-ask>

While there are companies battling over who will be the first to release a true level 3 or level 4 AV, another battle is raging on in an adjacent arena. Along with the means of transportation changing, there will soon be sweeping change in how that transportation is powered. The two key contenders are the **lithium-ion battery** electric powered vehicles and vehicles that are powered by **hydrogen fuel cells**.

The battery fueled vehicles are fairly self-explanatory, with the car relying on a “super” battery to power its

functions. Hydrogen fuel cells, on the other hand, are a slightly different version of the battery powered vehicles we have seen released over the past few years. Fuel cells operate in a manner similar to batteries, but do not need to be recharged. Rather than being recharged, they are supplied a form fuel (in this case, hydrogen) that allows the fuel cells to produce electricity through the reactions that take place and ultimately power the vehicle.

As seen in **Figure 6**, the hydrogen fuel cell vehicle has proven to be much more expensive than a battery powered electric vehicle. The case for the hydrogen fuel cell vehicle is that its range is consistently high, and it is able to charge in a mere tenth of the time it takes to recharge an electric vehicle, even accounting for “quick charge” options that electric vehicle drivers have at their disposal.

In terms of where we stand technologically, companies have focused on making greater strides in battery powered vehicles, and as a result we have seen much more in the way of battery centric charging stations within cities along with many more battery powered vehicles purchased amongst the general public. While in the future, it may be more efficient to operate on hydrogen fuel cells, the technology is currently far enough behind that the focus may remain on batteries for at least a few more years. As we have seen in the past with technologies such as Betamax and VHS, the theoretically superior technology does not always win out, so it will be interesting to see if fuel cells can develop enough of an edge to overtake battery powered cars in a later round, given their current disadvantage in popularity.

Regardless of which technology wins out in the end, it would appear that many of these “green focused” vehicles will be designed to allow integration with AV driving software. In **Nikola’s** (**both** an electric and hydrogen powered vehicle company focused on trucks) S-1, for example, they note that they would “consider a partnership with one of the autonomous software leaders to deploy its technology on our vehicles”.

It would not be surprising to see more companies take Nikola's approach to hedging their bets on which technology wins out in the end, so they are able to quickly adapt to any environment. Not personally manufacturing the AV technology in house allows companies to focus on producing the cars themselves, but of course would then limit their upside if they are required to spend money to implement another companies' software. While some more established auto manufacturers such as **BMW**, **Audi**, and **Toyota** are working to develop their own technology, newcomers, such as Nikola, may end up being more profitable by simply staying adaptable and looking to implement whichever technology wins out.

Future Industry Outlook

The future for autonomous vehicles appears bright, as a plethora of companies invest in its success with the hope that they will be able to see high returns and increased margins. While some industries, such as ride sharing and food delivery, still have speculative uses for the technology, there is potentially real money to be made in the transportation and logistics industry for early adopters.

Money has been pouring into AV companies for the past half-decade, and with constant breakthroughs in the AI space, we could see level 4 AVs hitting highways as soon as the mid to late 20's. Companies like Amazon, PepsiCo, and Coca-Cola will likely see their margins increase as they replace their manual trucking fleets with machines that can drop costs by significant margins. Health care companies, like Cardinal Health and McKesson, will have similar gains as they can better manage their workforce through decreased over-time hours and better divided shifts to minimize human errors in shipping.

AMR's and other smart robotics that utilize technology similar to what is found in AV's will continue to increase in both their functionality and usage. Industries such as health care and construction, where we see mistakes and oversights leading to loss of life, could give way to automated robots taking over positions that are deemed too difficult or dangerous for humans to perform consistently. Other jobs, from bellhops to pilots, may be on the chopping block as well as we see AV and A.I. technology march forward.

There are sure to be many other winners and losers as AV technology continues to close in on mainstream use. Rental car companies may have access to other streams of income, cutting into Uber and Lyft style companies' revenues. Insurance and liability will have to be rethought as car and truck manufacturers seek a way to minimize their risk post sale. Additionally, we may even see housing trends change as people become less averse to long commutes and morning/evening traffic jams decrease in severity.

With much up for grabs, and limited time left before the technology arrives in our parking lots, hospitals, and warehouses, now should be the time to look into autonomous vehicle companies. With a projected 5-year time horizon before autonomous trucks get implemented, it should not be long before prudent investors start seeing returns. All that remains to be seen is which firms will fail to adapt to the future of transportation and be swallowed up, and which will take advantage of the changing environment in order to pull in cash... by the truckload.

Appendix:

Trucking and Logistics Autonomous Vehicle Industry Exhibits

Capital Invested by Primary Industry Sector

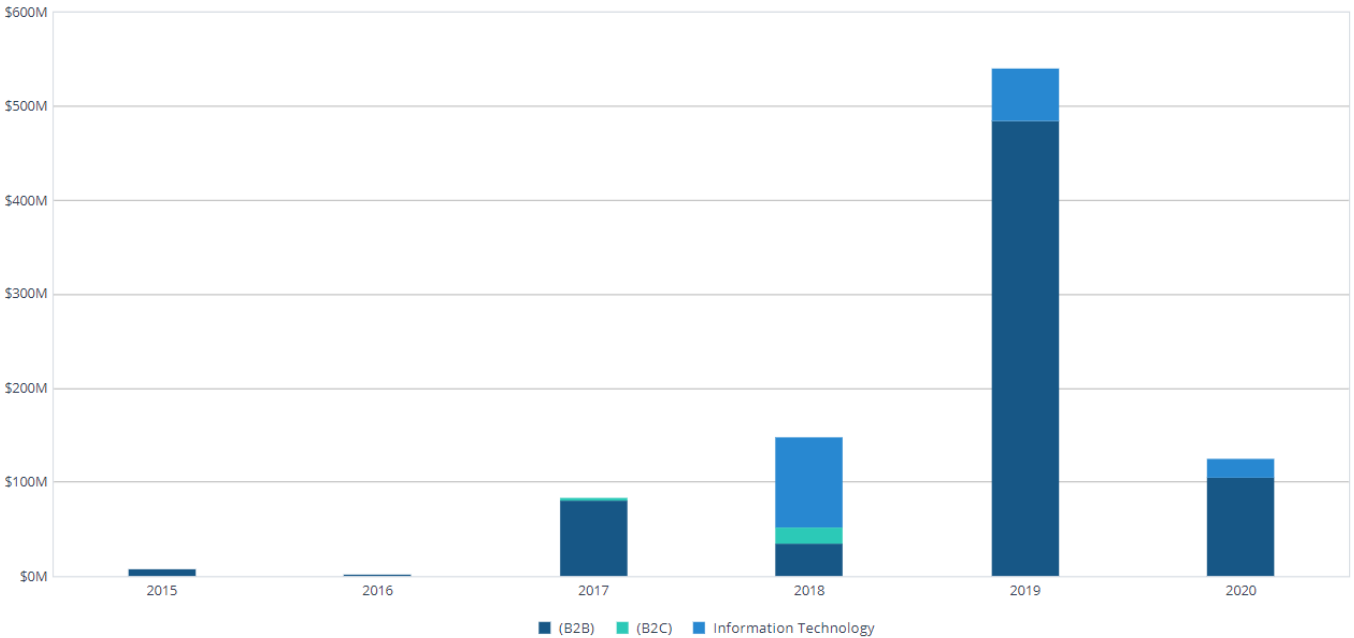


Exhibit 1: Trucking and Logistics AV Capital Investment from 2015-2020. Source: Created using pitchbook.com

Deal Count by Primary Industry Sector

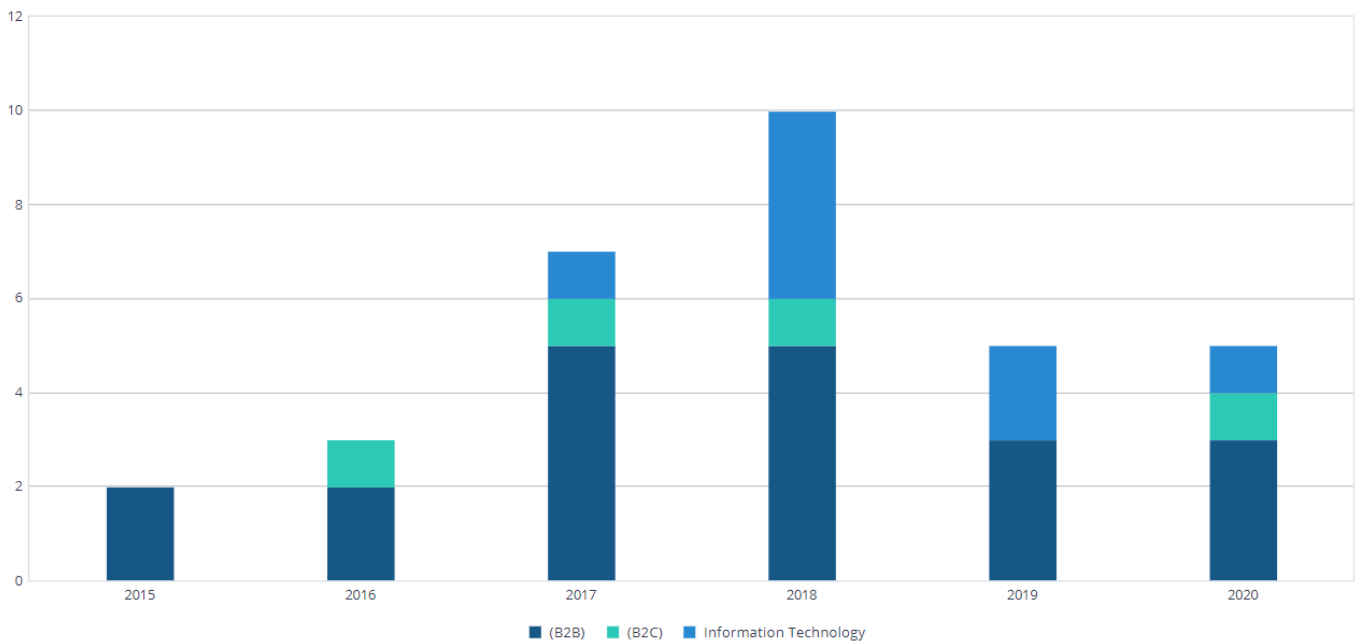


Exhibit 2: Deal Count for Trucking and Logistics AV companies from 2015-2020. Source: Created using pitchbook.com

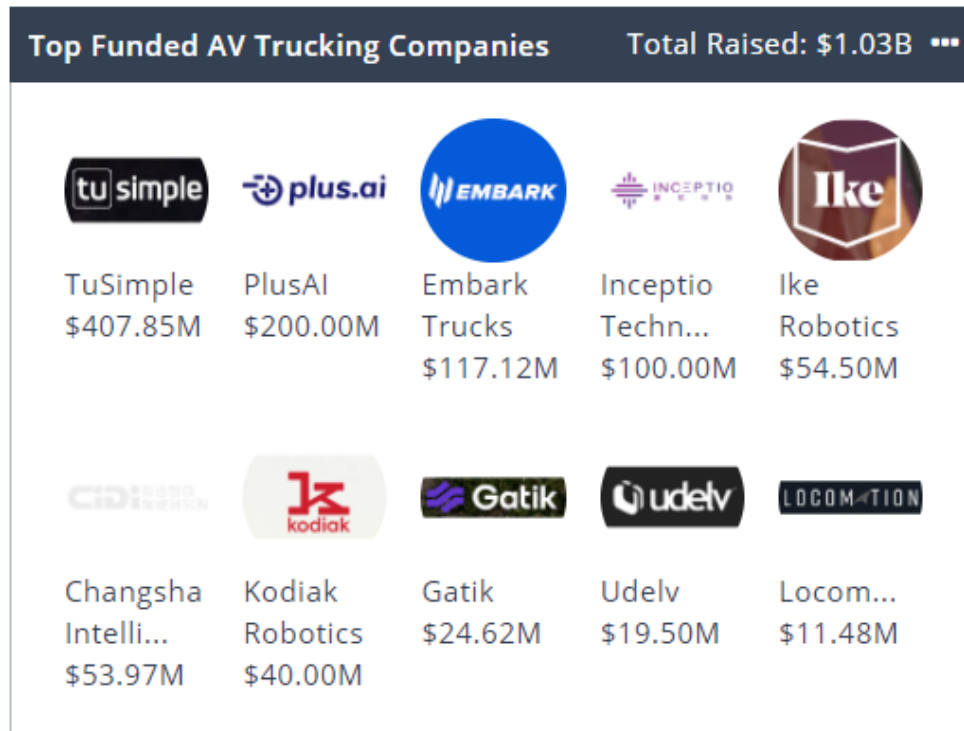


Exhibit 3: Top Funded Trucking and Logistics AV Companies. Source: Created using pitchbook.com

Top Players

Investors

Private Companies



Exhibit 4: Top Investors into Trucking and Logistics AV Companies. Source: Created using pitchbook.com

Trucking and Logistics Individual Companies Outline

#	Company Name	Total Financing (\$mm)	Last Financing Date	Last Financing Type	Investors	Description
1	TuSimple	407.85	16-Jul-2020	Corporate	Navistar, Sina, Mando, NVIDIA GPU Ventures	Developer of self-driving technology intended to improve the safety and efficiency of the trucking industry.
2	Locomotion	11.48	8-Jun-2020	Seed Round	Plug and Play Tech Center, SaaS Ventures, AV8 Ventures, 10X Capital, +more	Developer of autonomous driving technology designed to make trucking safer, faster and affordable.
3	Inceptio Technology	100.00	26-Apr-2020	Early Stage VC	G7, GLP, NIO Capital	Developer of autonomous driving trucks in China.
4	Gatik	24.62	25-Feb-2020	Early Stage VC	Plug and Play Tech Center, Trucks Venture Capital, Wittington Ventures, Fraser McCombs Capital, +more	Developer of autonomous vehicles software intended to revolutionize city logistics and power the next generation of self-driving commercial fleets.
5	Udelv	19.50	1-Dec-2019	Early Stage VC	Breega Capital, Marubeni, Urban Innovation Fund, +more	Manufacturer of an electric delivery vehicle designed to offer autonomous, clean and affordable deliveries of packages.
6	Embark Trucks	117.12	25-Sep-2019	Later Stage VC	Sequoia Capital, Data Collective, Y combinator, +more	Developer of self-driving vehicles created to provide effective commercial transportation.
7	PlusAI	200.00	21-Aug-2019	Early Stage VC	Plug and Play Tech Center, Manbang Group, Mayfield Fund, +more	Developer of self-driving technology intended to offer large scale autonomous commercial fleets.
8	Ike Robotics	54.50	5-Feb-2019	Early Stage VC	Bain Capital Ventures, Nuro, Redpoint Ventures, +more	Developer of automation technology built to help improve the trucking industry.
9	Kodiak Robotics	40.00	7-Aug-2018	Early Stage VC	Battery Ventures, CRV, Lightspeed Venture Partners, Tusk Ventures	Developer of self-driving technology designed for long-haul trucking.
10	Changsha Intelligent Driving Institute	53.97	30-Jun-2018	Early Stage VC	Baidu Ventures, Clearwater Capital Partners, Legend Star, +more	Developer of autonomous vehicle technology focused on logistics vehicles.

Exhibit 5: Trucking and Logistics Table. Source: Information and descriptions pulled from pitchbook.com

Autonomous Vehicle Complete Industry Exhibits

Capital Invested by Primary Industry Sector

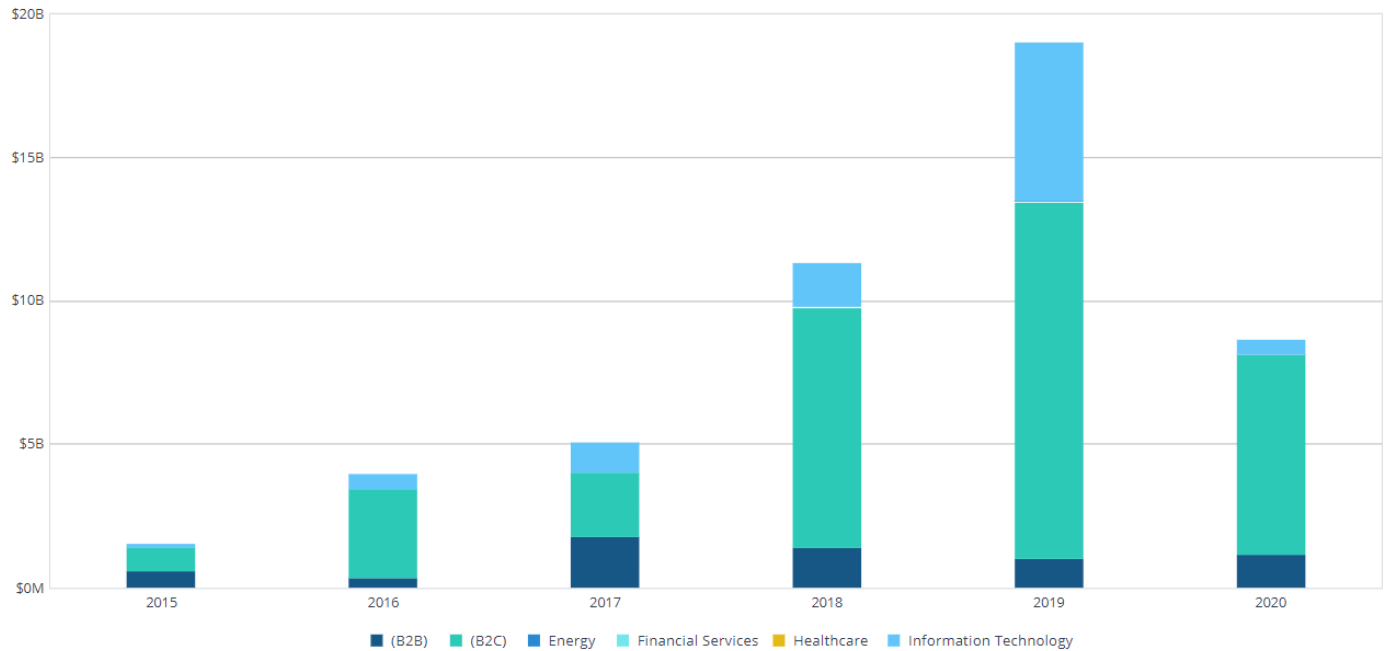


Exhibit 6: AV Industry Capital Investment from 2015-2020. Source: Created using pitchbook.com

Deal Count by Primary Industry Sector

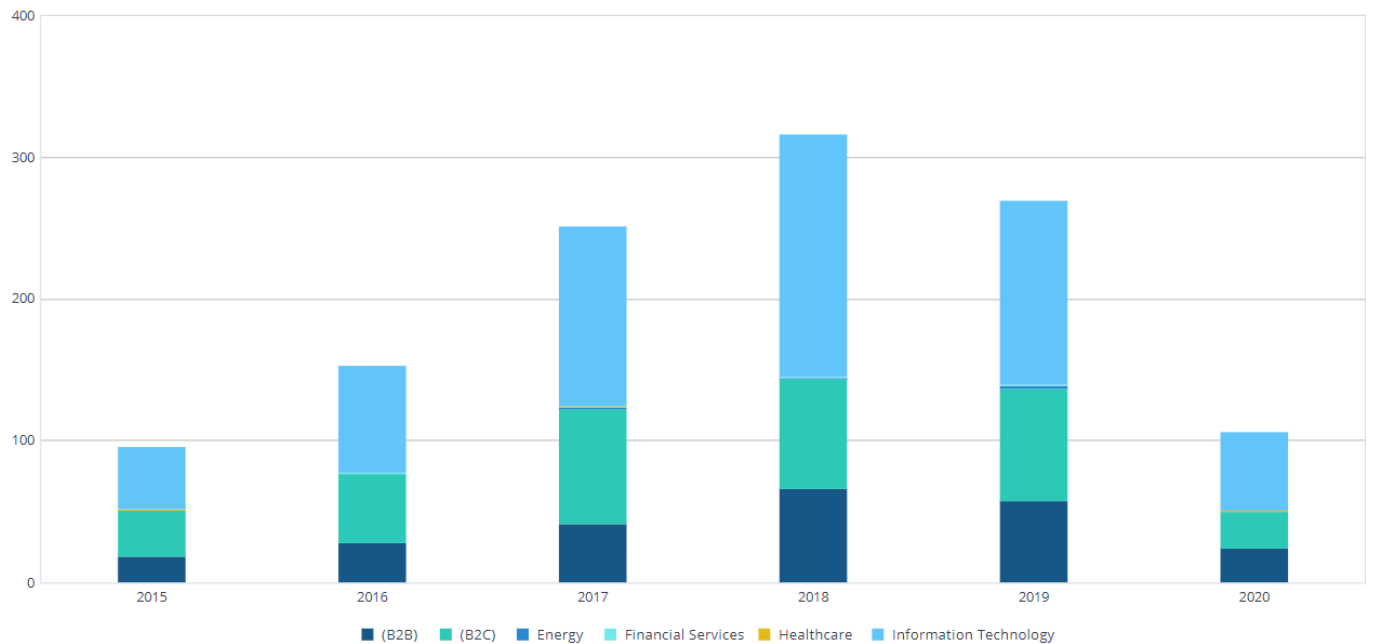


Exhibit 7: AV Industry Deal Count from 2015-2020. Source: Created using pitchbook.com



Exhibit 8: Top Funded AV Companies. Source: Created using pitchbook.com

Top Players

Investors Acquirers Public Companies Private Companies

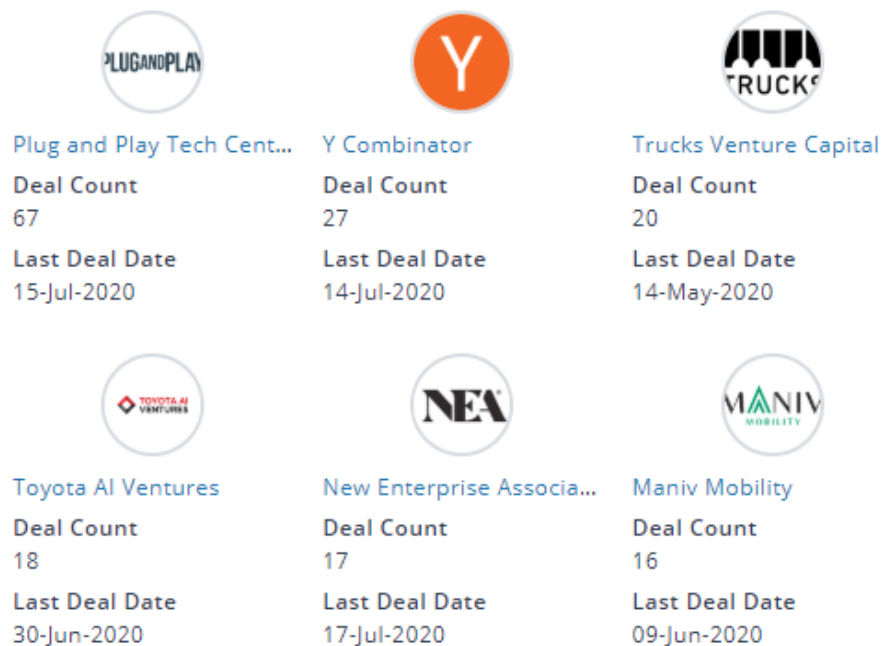


Exhibit 9: Top Investors in AV Industry. Source: Created using pitchbook.com

Autonomous Vehicle Individual Companies Outline














#	Company Name	Total Financing (\$mm)	Last Financing Date	Last Financing Type	Investors	Description
1	Rivian Automotive	6,000.00	11-Jul-2020	PE Growth/Expansion	Ford, BlackRock, Amazon, +more	Manufacturer of autonomous electric vehicles intended to offer comfortable and eco-friendly drive
2	Zoox	990.00	28-Jun-2020	Merger/Acquisition	Amazon, Lux Capital Management, Grok Ventures, +more	Developer of an autonomous mobility ecosystem that includes self driving cars.
3	Waymo	3,000.00	12-May-2020	Later Stage VC	Silver Lake Management, T. Rowe Price, Alphabet, +more	Operator of a self-driving technology company intended to offer on-demand riding services that make it safe and easy for people and things
4	Quanergy	325.10	1-Apr-2020	Later Stage VC	Samsung Venture Investment, Motus Ventures, Newbury Ventures, +more	Developer of solid state sensors designed to offer smart sensing services for self-driving cars.
5	Pony.ai	726.00	25-Feb-2020	Early Stage VC	Toyota Motor, Morningside Venture Capital, ClearVue Partners, +more	Developer of an autonomous driving technology intended for the manufacturing of automated
6	Aurora (Automotive)	765.62	9-Sep-2019	Early Stage VC	Greylock Partners, Index Ventures, Sequoia Capital, Shell Ventures	Developer of an autonomous car technology designed to create self driving cars.
7	Argo AI	2,600.00	12-Jul-2019	Corporate	Ford (Acquirer), Volkswagen	Developer of artificial intelligence software designed to offer self-driving technology.
8	Cruise	7,250.00	6-Jul-2019	PE Growth/Expansion	SoftBank Investment Advisers, T. Rowe Price, Honda Motor Company	Manufacturer of advanced self-driving vehicles.
9	Uber Advanced Technologies Group	1,000.00	18-Apr-2019	Early Stage VC	Toyota Motor, SoftBank Investment Advisers, Denso	Developer of automobile technology intended for self-driving cars.
10	Mobileye	2,310.00	1-Apr-2018	Merger/Acquisition	Intel (Acquirer), BlackRock Private Equity Partners, The Blackstone Group, +more	Developer of collision avoidance system designed to reduce vehicle injuries and fatalities.

Exhibit 10: AV Industry Companies Table. Source: Information and descriptions pulled from pitchbook.com

Founded in 2003, Lawrence, Evans & Co LLC is a boutique financial advisory and investment banking firm comprised of senior level professionals who provide lead advisory services to private companies, lenders, and other parties-in-interest that are executing financial and strategic transactions. The firm provides a wide array of services such as finance and capital raising, mergers and acquisitions, management consultancy services, turnaround management and restructuring, and real estate finance and development. The firm caters to transportation and logistics, select niche manufacturing sectors and healthcare companies. Transactions typically under \$250 million or \$10 million EBITDA.

INVESTMENT BANKING & CORPORATE FINANCE	<ul style="list-style-type: none"> • Private Company Sales • Division/Subsidiary Divestitures • Distressed Transaction Advisory 	<ul style="list-style-type: none"> • Acquisition Advisory Services • Private Market Financings • LBO's and Recapitalizations
CONSULTING	<ul style="list-style-type: none"> • Strategic Options Analysis • Valuations & Financial Assessments • Interim CEO/CFO 	<ul style="list-style-type: none"> • Strategic Planning • Organizational Reviews • Expert Testimony & Opinions
TURNAROUND & RESTRUCTURING	<ul style="list-style-type: none"> • Turnaround Management • Debt Restructuring/Refinancing • Orderly Liquidations 	<ul style="list-style-type: none"> • Chief Restructuring Officer (CRO) • Bankruptcy Planning / 363 Sales • Receivership / Trustee

Represented Transactions

 FLEET enterprises <small>Keeping You Rolling!</small> ACQUIRED BY  DICKINSON FLEET SERVICES  ACTED AS ADVISOR	\$70MM MIDWEST SPECIALTY WAREHOUSE, BROKERAGE, TRUCKING BUY-SIDE SEARCH  ACTED AS ADVISOR	 HYATT house 175 ROOM \$18,026,000 NON-RECOURSE HOTEL CONSTRUCTION LOAN  ACTED AS ADVISOR	ROBOTIC INTEGRATOR MIDWEST GROWTH CAPITAL TERM NOTE  ACTED AS ADVISOR
MIDWEST TRUCKING COMPANY BUY-SIDE, CAPITAL RAISE & CFO SERVICES  ACTED AS ADVISOR	PUBLICLY TRADED AMBULANCE PROVIDER MIDWEST BRIDGE FINANCING  ACTED AS ADVISOR	 Empire BUY-SIDE SEARCH FOR GEOGRAPHIC EXPANSION  ACTED AS ADVISOR	 Senior Healthcare <small>ASSOCIATES</small> HEALTHCARE MOBILE SERVICES BUSINESS ACQUIRED BY A STRATEGIC BUYER  ACTED AS ADVISOR

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