

Robo-Taxi Race: Deployments Picking Up In Spite of COVID

By Katelyn Magney

Last month robo-taxi company Waymo announced it would be [relaunching and revamping](#) its fully automated ride-hailing service in Phoenix, AZ, representing a significant step toward commercializing AV technology. This announcement made waves throughout the industry, considering driverless technology has failed to live up to the hype it once had.

Now owned by Google's parent company, Alphabet, Waymo began as Project Chauffeur, operating as an experimental project under Google's X lab for nearly 10 years. In 2016, Waymo spun out into a stand-alone company. Today, Waymo is largely regarded as an AV industry leader, -particularly with regard to robo-taxis. Earlier this year, the company announced it had driven over [20 million miles](#) on public roads since the company's inception. Their announcement to expand service using unattended vehicles puts it ahead of rival robo-taxi companies in deploying a revenue-generating service in the US.

This article will examine Waymo's activities in the robo-taxi space, discuss other competitors in the market and review other considerations affecting robo-taxi companies.

Dissecting Waymo's New Service

Waymo has been testing its driverless technology on public roads since 2017. The following year, they started taking passengers in a program called Waymo One, but it was limited to individuals that had been [vetted by Waymo](#), which meant signing an NDA preventing them from sharing any details about their trips. With the launch of their new service, Waymo is now allowing any member of the Phoenix-area public to ride in their vehicles.





Youtube user JJRicks Studios shares footage of a ride in Waymo's driverless car ([source](#))

Waymo's service will operate initially in a [50 square mile area](#) in the Phoenix suburbs. It is unknown how quickly the company will be able to scale this service to the entire United States. Doing so will require Waymo to develop maps of new service areas and test these maps extensively with safety drivers to ensure the software can perform.

While the launch of Waymo's fully driverless service means no safety driver will be on board, the vehicles will still be monitored remotely by Waymo staff. The company says most driving decisions will be made by the vehicle.

Close Competitors

Tesla

Tesla is another important company to consider in the robo-taxi race. CEO Elon Musk has a reputation for being aggressively optimistic about the rollout of a fully driverless car, but the company's current Autopilot technology is still considered L2 on SAE's 5-level scale. One advantage Tesla has over others is its nearly one million vehicles driven by customers. These customers feed Tesla algorithms with substantial data; likely more than any other competitor has.

Though his company is arguably lagging behind Waymo in the race to autonomy, Musk has been critical of the company's recent launch. [In a tweet from October 8](#), Musk agreed with another Twitter user who called Waymo's system "Fragile" due to their reliance on digital maps and went on to tout Tesla's full self-driving system.

In a well-timed move, Tesla announced a rollout of their "Full Self-Driving" system just two weeks after Waymo's announcement. Musk says the debut will be "extremely slow and cautious to start". The system will operate in beta for the foreseeable future and

was released only to a handful of experienced Tesla drivers. It is unclear exactly what features their Full Self-Driving suite will include, but drivers will still be required to keep their hands on the wheel and monitor the vehicle.

While limited details are available, this announcement, combined with Musk's [repeated comments](#) about deploying a robo-taxi service this year, make Tesla one of Waymo's closest competitors in the robo-taxi race.

Uber

According to [The Information](#), Uber has spent \$2.5 billion on its self-driving car technology over the last five years. In spite of their investments, they have faced some [major hurdles](#) during this time. In 2017, head of the project, Anthony Levandowski, was fired while fielding accusations that he stole proprietary data from Google's self-driving car project. In 2018, one of the company's AV prototypes fatally struck a pedestrian in Arizona during a test drive.

While Uber did raise \$1 billion in financing last year from [Softbank, Toyota and Denso](#), that money could soon run out. Allegedly, [in an email to Uber's CEO](#), a staff manager said that the vehicle can't drive more than half a mile without encountering a problem, stating that the car "doesn't drive well" and "struggles with simple routes and simple maneuvers." All things considered, it's unsurprising that many analysts are wondering if Uber's Advanced Technologies Group (ATG) may [pull the plug altogether](#) on their AV endeavors.

Cruise

Cruise, the subsidiary of GM that has been working on driverless technology for the past 6 years, made news of their own last month when they [announced plans](#) to test unmanned AVs by the end of the year in San Francisco. The company said it had received a permit from the California DMV to remove human backup drivers from their test vehicles. This comes a year after they delayed the launch of their commercial self-driving vehicle service, citing a need for further testing. CEO Dan Ammann said of the update, "We're not the first company to receive this permit, but we're going to be the first to put it to use on the streets of a major U.S. city," on the [company's blog](#).

Cruise currently has the world's [second-biggest fleet](#) of autonomous testing vehicles totaling 180, with more than 1 million miles tested. Last year they introduced [the Origin](#), a futuristic self-driving prototype without pedals or a steering wheel. Cruise is in the process of applying for permission from the government to mass-produce the Origin. Because the vehicle lacks traditional human controls, they will need an exemption from [the government's vehicle safety standards](#), which require vehicles to have a steering wheel and pedals.



Though Cruise has not officially launched a robo-taxi service, nor has it shared a working version of the Origin, the company is making a statement that they're forging ahead in the robo-taxi race and are capable of keeping up with the competition.

Zoox

Now owned by Amazon after a [billion-dollar deal](#) closed earlier in 2020, Zoox has been developing a bi-directional vehicle with unusual features that sets it apart. The vehicle has no steering wheel, nor does it have a discernible front or back end, which allows it to travel in either direction.

In December 2018, Zoox became [the first company to gain approval](#) for providing self-driving transport services to the public in California. More recently, Zoox was testing its self-driving technology in a fleet of retrofitted Toyotas in San Francisco and Las Vegas in early 2020. Unfortunately, like many others, COVID-19 largely shuttered the testing operations, and in April, Zoox laid off most of its contract workers.

Backed by Amazon, Zoox is currently well-positioned to compete in the robo-taxi race. In September, Zoox [received a permit](#) from the California DMV to test AVs on public roads without a safety driver. This allows the company to operate two vehicles without a driver on public roads near their headquarters in San Mateo.

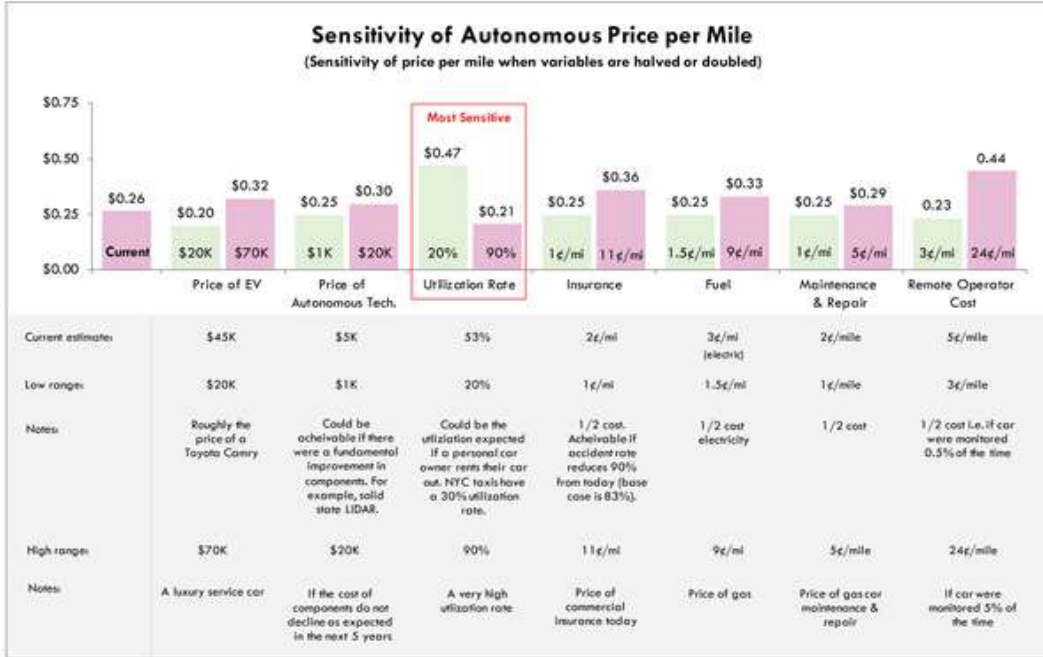
Robo-Taxi Considerations

Profitability

One of the biggest considerations in the robo-taxi race is profitability. One might assume that removing drivers from the ride-hailing equation would reduce the operational costs significantly, but according to a [study published by MIT last year](#), robo-taxis could cost over twice as much as regular human-driven taxis. There are several reasons for the higher price tag according to [this article by Seeking Alpha](#): "A driverless robo-taxi would likely have to be licensed, be supervised by a remote centralized operator that would help the car out of an otherwise unresolvable pickle, and the kind of skyrocketing insurance cost the robo-taxi would likely require." Of course, this all depends on the usage of these autonomous ride-hailing services. If usage is high and people quickly adopt newer technology over more traditional options, these costs are amortized over the life of the vehicle.

Conversely, [ARK Invest estimates](#) that autonomous taxis will cost less than half the that of a personal car and less than one-tenth the cost of a manually driven taxi. Factors contributing to the significant price decrease include a projected high utilization, a decrease in the cost of electric vehicle battery pack systems, removing gasoline from the system, and an expected lower insurance costs due to fewer accidents.





ARK Autonomous Vehicle Price Per Mile Chart ([source](#))

Above all, it remains to be seen how profitable the market will be, but the winner of the robo-taxi race will no doubt have to figure out how to make their systems profitable.

COVID-19

As it has done to most industries, the COVID-19 pandemic has greatly impacted the robo-taxi outlook. Some companies, like GM's Cruise, are making robo-taxis an attractive alternative to public transportation. With more space in the main cabin, Cruise has installed clear barriers in each of their Origin vehicles. They have also enhanced air circulation, equipped their vehicles with sanitizer and wipes, and of course mandated masks inside their vehicles.

Waymo is also taking safety very seriously as they relaunch their service in the midst of COVID-19. As a precaution, the company is limiting its rides to individuals or families. Vehicles will be professionally cleaned more frequently, and will also be equipped with hand sanitizer, disinfecting wipes, and an improved air purification system.

Considering a robo-taxi eliminates contact with a human driver, it's likely that the public will be attracted to autonomous ride-hailing and may help boost overall interest in the service as it becomes more available.

Conclusion



All things considered; it seems that Waymo is currently secure in the lead of the robo-taxi race. Given how much competitors Cruise and Tesla are working to advance their systems, however, it would not be surprising if one of them ousted Waymo from the top spot. All of this remains to be seen, especially considering the lack of clarity around profitability, and the economic uncertainty brought about by COVID-19.

About VSI Labs

Established in 2014 by Phil Magney, VSI Labs is one of the industry's top advisors on AV technologies, supporting major automotive companies and suppliers worldwide. VSI's research and lab activities have fostered a comprehensive breakdown of the AV ecosystem through hands-on development of its own automated vehicle platform. VSI also conducts functional validation of critical enablers including sensors, domain controllers, and AV software development kits. Learn more about VSI Labs at <https://vsi-labs.com/>.

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