House Transportation and Public Safety Committee
Autonomous & Connected Vehicles Study
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Good morning, Chairman Green, Vice Chairman Greenspan, Ranking Member Sheehy, and members of the House Transportation and Public Safety Committee. I'm pleased to appear before the Committee today as the Senior Managing Director for Automotive with JobsOhio. In this role, it's my objective to help our existing automotive companies expand while also attracting new companies to the state that bring new capital investment and new jobs for Ohioans.

Some of JobsOhio's more notable automotive projects include Fuyao Automotive Glass, which employs over 2,000 people in a former General Motors assembly plant in Moraine; Ford's new medium-duty and super-duty trucks built in Avon Lake, investing over a half billion dollars; Honda's Heritage Center and training facility in Marysville; and Dana Corporation's new manufacturing facility in Toledo where they've invested $70 million and hired over 300 people.

In addition to business retention, expansion and attraction, I also focus on strategies to ensure the continued growth of the automotive industry in Ohio. There couldn't be a more exciting time as we witness an industry that has largely gone unchanged for the last 100 years now on the brink of what will be one of the most transformational disruptions of our time – the widespread use of connected and self-driving vehicles (CAV's).

I like to think of this transformation as the current generation's space race. Except, instead of being a competition between two countries, the competition is between the traditional automakers and their tech company rivals. It's the investments they'll make and alliances they'll form that will ultimately bring us to Level 5 autonomy, where CAV's can navigate every scenario that humans manage today. The question is, where will they make those investments?

When we first started attending the North American International Auto Show in Detroit seven years ago there was hardly a mention of self-driving vehicles. This year, talk of CAV's dominated the show.

As we met with automakers we heard that legislation and executive orders in other states have provided much needed clarity in anticipation of their next level of testing for CAV's, when only a few months earlier the message was to not make any legislative changes. Two factors have contributed to this change in their message: First is progress in their testing of autonomous vehicles. In fact, Waymo is already testing its self-driving Chrysler Pacifica in Arizona without a driver. Second is the clarity it provides companies on legal definitions and important issues such as liability. This shift has created rapid action across the country. In the last 18 months, the number of states that have either enacted legislation or an executive order has more than tripled. Today, twenty-one states have passed legislation and six others have executive orders.

So, who's leading the race? It depends on who you ask and views of different business model. Some companies are focused solely on CAV technology while others are building ride-hailing, rideshare and shuttle-based services. Several companies are focused on both models. Take Ford for example, they just launched the Ford Chariot commuter shuttle as part of the Smart Columbus initiative. And Cincinnati is working with Uber Movement on a new Cincinnati Mobility Lab that will use data to improve commuting and congestion.

When it comes to autonomous vehicles, Navigant Research sited General Motors and Waymo as leaders among their peers. This research, included as an attachment, is based on multiple factors, including their technology, strategy, and ability to execute. We've been talking with these companies, along with many others, about Ohio, asking them to visit our state and see what we have to offer. Maybe they'll start with R&D or testing, and eventually manufacturing. To encourage companies to conduct their R&D in Ohio, JobsOhio created a new R&D Center Grant program, offering support to help companies establish R&D centers.

We also share with those companies that Ohio has a long history as an automotive powerhouse, credited with many of the early advances in the industry. Today, we are the second largest automotive state in the country in terms of production, supply chain and number of automotive assembly plants. We have six original equipment manufacturers, including Honda, Ford, General Motors, Fiat Chrysler, Navistar and Kenworth.

We have an opportunity to emerge as a leader in the development, testing, manufacturing of CAV's. But the auto industry and its supply chain is not only being impacted by self-driving vehicles. The shift to hybrid drivetrains, electric vehicles and eventually fuel cells that run on hydrogen is also changing the landscape. These new, alternative powertrains threaten to eliminate the internal combustion engine altogether, or at best greatly change the size and type of gasoline engines that are used. As the number one state for the production of engines and transmissions, we must pay attention to this shift as the industry evolves. Alternative powertrains and autonomous vehicles are separate technologies but are moving quickly down parallel paths. That's why both of these technological advancements are at the forefront of JobsOhio's strategy for the auto industry. We must secure more than our fair share of businesses involved in this space in Ohio in order to successfully transition our auto industry.

Thankfully, we have a strong foundation from which to build. With exceptional talent and resources in engineering, manufacturing and IT, we are well-positioned to take a leading role in the next generation of automotive innovation. Ohio offers an unparalleled mix of physical assets, research partners, controlled and open-road test facilities, smart city initiatives and funding opportunities that can't be found elsewhere.

In Ohio, controlled testing can take place at the Transportation Research Center (TRC), the largest independent automotive proving ground in the country. Their new Smart Mobility Advanced Research and Test (SMART) Center will be completed this year. Once controlled testing is complete, innovators can take their products onto the open road for real world testing along several routes, including the U.S. Rt. 33 Smart Mobility Corridor between East Liberty and Dublin. This corridor leads to the connected vehicle pilot in Marysville and to Smart Columbus, where we have the only federally designated smart city in the country.

Companies are also forming partnerships with teams at The Ohio State University's Center for Automotive Research and using OSU's driving simulator to test how people will respond to new infotainment systems. We have smart infrastructure projects across the state led by the Ohio Turnpike and the Ohio Department

of Transportation. And conversations with Michigan and Pennsylvania have led to the Smart Belt Coalition, a partnership that will help make the Midwest the best place to deploy truck platooning for the logistics industry, an area of strength and great importance for the state of Ohio.

Ohio boasts plenty of other assets. We have 14 engineering programs at universities that are more than willing to partner with private industry to create and test new technologies. The Dayton region offers a wealth of expertise in sensors and radar systems in partnership with the Air Force Research Lab. The Unmanned Aerial Systems Center in Springfield is leading the way in UAS technology. Their work with unmanned systems and remotely piloted aircraft have many parallels to self-driving vehicles and remotely controlled trucks. What we learn in one may easily apply to the other. Who knows – the home of the Wright Brothers could someday be the home of the first flying car.

Becoming a leader in smart mobility is critical to our state's economy. We have more than 180,000 people who work in the automotive industry across Ohio today. As the industry evolves, we must be able to transition the workforce into the automotive jobs of the future. We also know that Ohio's transportation infrastructure must be able to accommodate CAV technologies to keep the state's logistics and distribution industry competitive.

But perhaps even more important is what the emerging technology will bring to Ohio. Yes, it will bring new jobs and capital investment in the short term, and that's good. But it will bring additional value in ways that aren't so apparent.

Companies will develop, test, make and deploy CAV technologies. That innovation will be a catalyst for more innovation, creating a place where early adopters want to live and where pioneering companies want to locate and invest. Our cities will attract millennials and other groups who want to live and work in cool places with safer roads, less congestion and easily accessible on-demand vehicles. In turn, more companies will choose to invest in Ohio for its workforce and ease of transportation. But companies will make their investment decisions in the early years of deployment and commercialization. That's why it's imperative that we position Ohio as the leader for companies involved in this space.

Earlier this month, Gov. Kasich signed an executive order launching DriveOhio, the state's new center for smart mobility. That announcement sent a clear message that Ohio is open and ready to support this emerging industry. We're ready with well-maintained infrastructure, a network of public and private partners ready to collaborate and learn together and a workforce that combines an innovative spirit with mechanical know-how.

Now is the time to harness the resources we have in Ohio and combine it with the opportunity of disruption to catapult us forward. We want to build the future of transportation and smart mobility, and there's no better place to do that than Ohio.

Thank you for holding these hearings and for your interest in learning more about the industry. It's critical we all work together to make sure Ohio is positioned as a leader in smart mobility. Companies are watching what we do.

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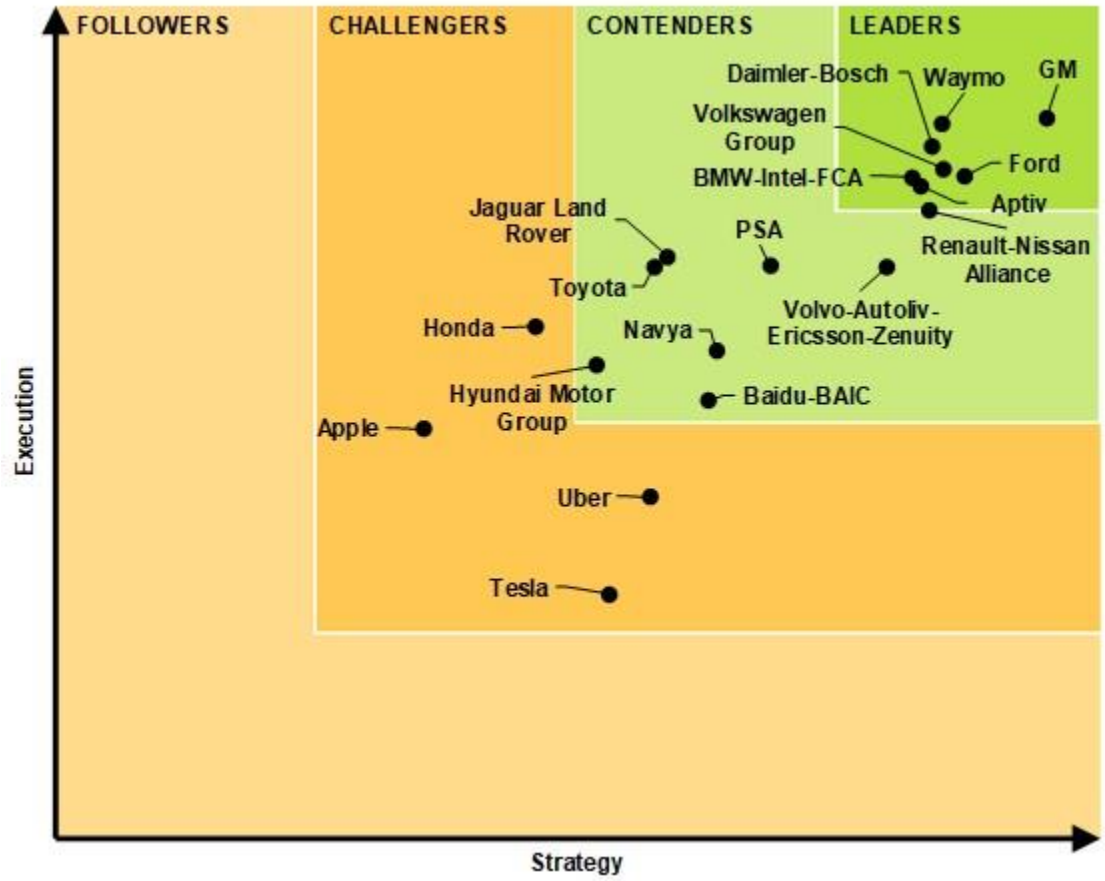
Navigant Research Leaderboard: Automated Driving Vehicles



Navigant Research Leaderboard: Automated Driving Vehicles

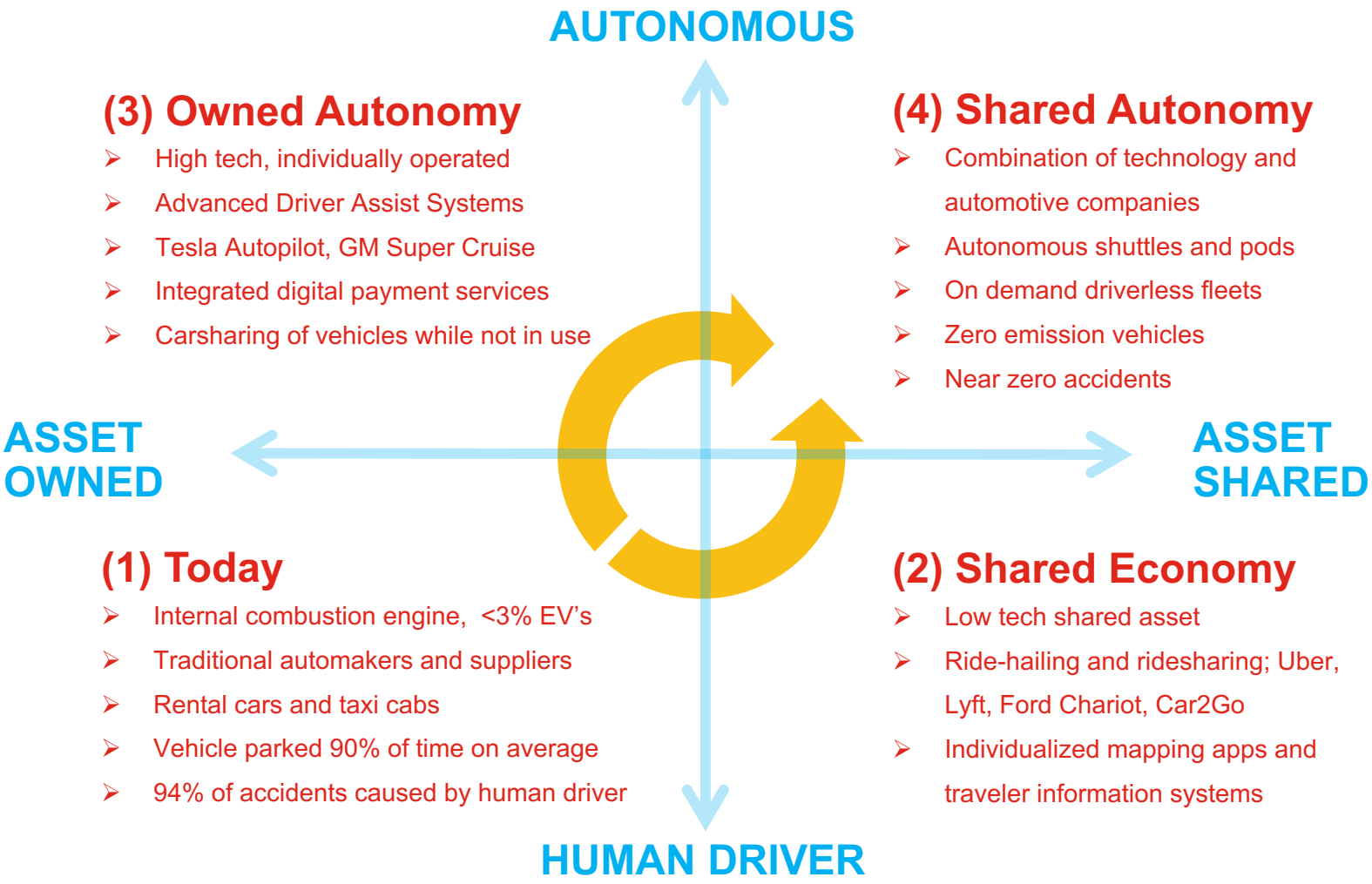
Assessment of Strategy and Execution for 19 Companies Developing Automated Driving Systems

2017 saw a continuing acceleration of the pace of development in the automated driving sector, as many of the companies involved have shifted from a R&D stance to production engineering. With concerns about driver distraction mounting, automated driving is increasingly seen by many as the best solution to eliminating this dangerous trend on the world's roadways. The number of automated ride-hailing pilot programs has also increased since it has become increasingly clear that mobility as a service will be the primary means of deploying automated vehicles, particularly in the early years of commercialization.

As the technology for taking the human driver out of the control loop matures, the business landscape continues to shift. The cost and complexity of developing and deploying automated driving technologies have driven numerous new partnerships and acquisitions to help achieve scale more rapidly. OEMs and suppliers have recognized the threats to their traditional business models and are working aggressively to leverage the strengths they have to develop new revenue streams. New entrants into the field are recognizing the challenges of establishing manufacturing and distribution infrastructure and are increasingly forming partnerships with incumbents to leverage the strengths that each bring to the challenge.

This *Navigant Research Leaderboard* evaluates 19 companies developing automated driving systems. These players are rated on 10 criteria: vision; go-to market strategy; partners; production strategy; technology; sales, marketing, and distribution; product capability; product quality and reliability; product portfolio; and staying power. Using Navigant Research's proprietary *Leaderboard* methodology, vendors are profiled, rated, and ranked with the goal of providing an objective assessment of their relative strengths and weaknesses in the development and deployment of automated driving technology.

Transformation of the Automotive Industry



Concept source: Morgan Stanley (2015) with modifications
www.driverless-future.com