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J.D. Power 2022 U.S. Mobility Confidence Index (MCI) Study℠

In collaboration with Partners for Automated Vehicle Education and MIT Advanced Vehicle Technology Consortium

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J.D. Power 2022 U.S. Mobility Confidence Index (MCI) Study[SM]

The *J.D. Power 2022 U.S. Mobility Confidence Index (MCI) Study* brings together three organizations with an aligned mission to understand consumer knowledge and acceptance of fully automated, self-driving vehicles. Each contributing organization has extensive independent research experience providing consumers, government, and industry with a data-driven comprehension of consumer behaviors. In this collaboration, the partners leverage each other's experiences and data to develop insights that enhance the global conversation regarding consumer viewpoints on automated vehicle comfort level, willingness to purchase, and roadblocks/enablers to acceptance. The Mobility Confidence Index Study is now an annual offering in both the U.S. and Canada that provides a comprehensive measurement of consumer readiness for fully automated, self-driving vehicles.

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Low Consumer Readiness for Fully Automated, Self-Driving Vehicles

MCI measures consumer readiness for fully automated, self-driving vehicles based on six unique attributes of consumer comfort with fully automated, self-driving modalities and consumer purchase intent. The 2022 overall MCI Index score is 39 (on a 100-point scale). Consumers show low levels of readiness on all metrics and have the lowest level of comfort for riding in a fully automated, self-driving vehicle and using fully automated, self-driving public transit. Consumers are consistently citing higher levels of comfort with non-personal automated vehicle (AV) use, such as transporting goods or sharing the road with AVs, as opposed to applications that involve themselves. It is notable that ratings for riding in an AV increase when the consumer is asked to imagine that they are no longer able to drive due to age or injury. Successful mass adoption will necessitate the industry to convey more benefits for consumers' every day life.

MCI Index by Generation

Younger consumers show higher levels of AV readiness

Gen Z (1995-2004)	51
Gen Y (1977-1994)	48
Gen X (1965-1976)	37
Baby Boomers (1946-1964)	24
Pre-Boomers (born before 1946)	22

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Deficiencies in Consumer Understanding Persist

Consumer understanding of automated vehicles remains virtually unchanged from a year ago, as 65% of consumers possess inaccurate knowledge of the definition for fully automated, self-driving vehicles. The significant deficiencies remain with 56% of respondents classifying driver-assist technologies that are available today as being fully automated, self-driving technologies, when, in fact, drivers are still expected to be actively involved in the driving task.

The ability to accurately define a fully automated, self-driving vehicle is surprisingly lower for those with higher self-reported AV knowledge, indicating these consumers are overestimating their AV knowledge and may be overly confident. Study results continue to show consumers who self-report knowing "nothing at all" about AVs are more accurately (35%) defining fully automated, self-driving vehicles.

Technical Automation Descriptions Are Not Aligned With Consumer Understanding

The survey includes a series of questions aimed at identifying the terms consumers associate with vehicle automation. Respondents randomly viewed three different definitions, each describing varying levels of vehicle automation and were asked to select one word or phrase from the provided list which best fit the description.

The vehicle features help with speed control and steering at the same time, but the human driver must remain attentive to the forward roadway, and must be ready to take over control immediately, as needed.

The vehicle can drive itself under certain conditions, but the human driver/operator must remain able to take over control at any time if the vehicle notifies them that intervention is needed for certain weather or road conditions.

The vehicle performs all driving tasks for an entire trip. A human driver/operator is not expected to be available for control at any time during the trip. The vehicle would be able to travel from place to place both occupied and unoccupied.

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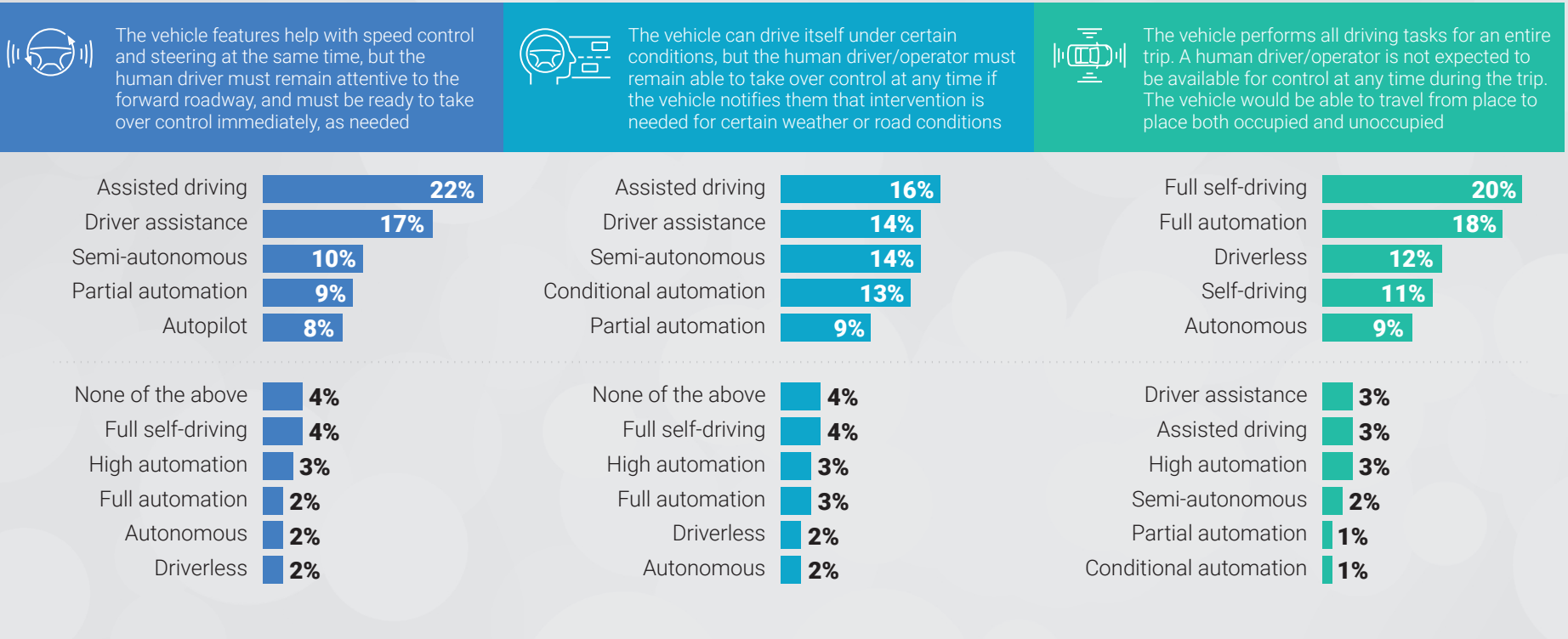
As illustrated below, the percentage of respondents selecting any one word or phrase ranges from 2% - 22% with no clear standouts, indicating consumers do not overwhelmingly associate current automation language with any of the descriptions. Furthermore, consumers prefer to use the same three terms (assisted driving, driver assistance and semi-autonomous) when describing multiple levels of automation, a sign that many consumers are not successfully differentiating between the lower levels of automation. **While the distinctive technical, engineering descriptions** (SAE Level 2™ and SAE Level 3™)[1] **may serve the industry, they do not align with consumer understanding**. The terminology that resonates with consumers to describe different levels of automation further illustrates the knowledge gap between industry stakeholders and consumers. Consumer-facing language should capture the automation capabilities and help create fact-based, realistic expectations in order to avoid further confusion.[2]

Automation Descriptions: Top and Bottom Consumer Choices



1 https://www.sae.org/blog/sae-j3016-update

2 Seppelt, B., Reimer, B., Russo, L., Mehler, B., Fisher, J., & Friedman, D. (2019, June). Consumer confusion with levels of vehicle automation. In Driving Assessment Conference (Vol. 10, No. 2019). University of Iowa.

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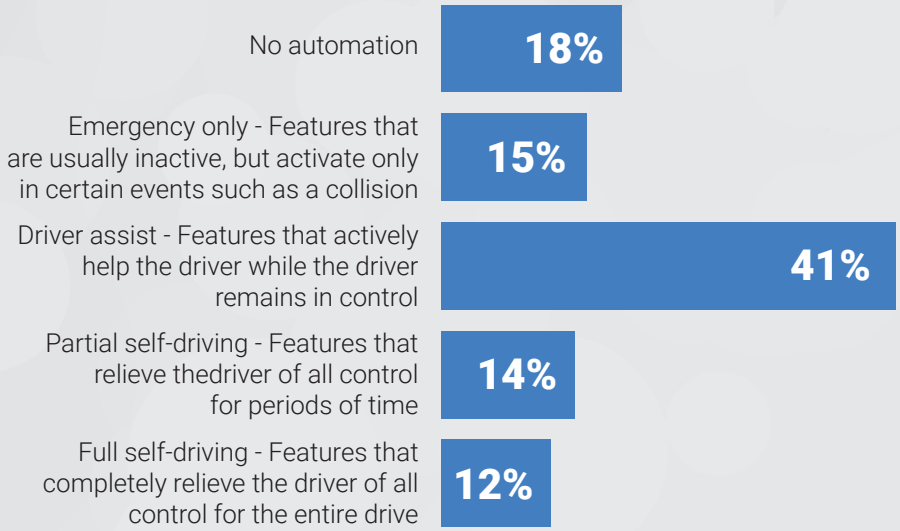
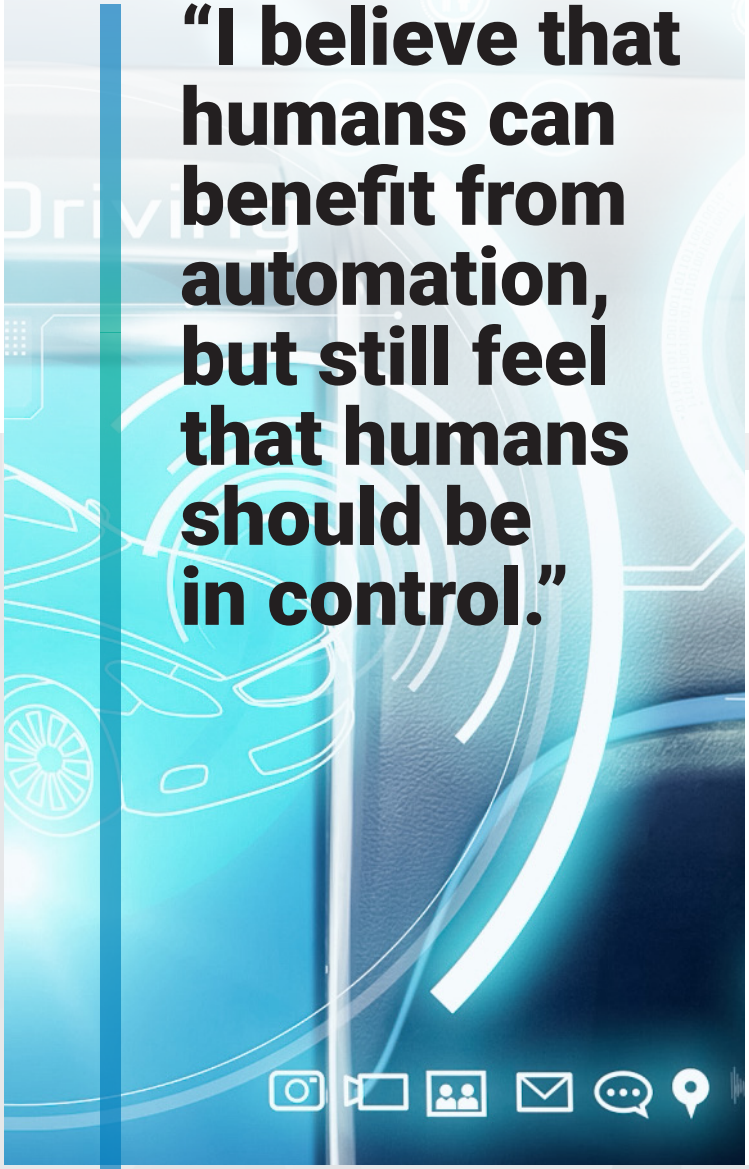
Consumer Comfort With Automation May Be Overstated

Consumers are most comfortable with the driver-assisted level of automation which is readily available today. The percentage of respondents who are comfortable with this being the maximum level of automation remains unchanged from 2021. At 41% lack of trust is a concern commonly expressed among all respondents and is mentioned across all levels of automation comfort. While 26% of consumers state they are comfortable with partial self-driving or full-self driving, many of these consumers also express a lack of trust and recognize that the technology is still developing. One respondent stated, "I am not ready to trust my life to a fully automated vehicle. Need time to trust the system's capabilities."

What is the maximum level of automation you would be comfortable with?





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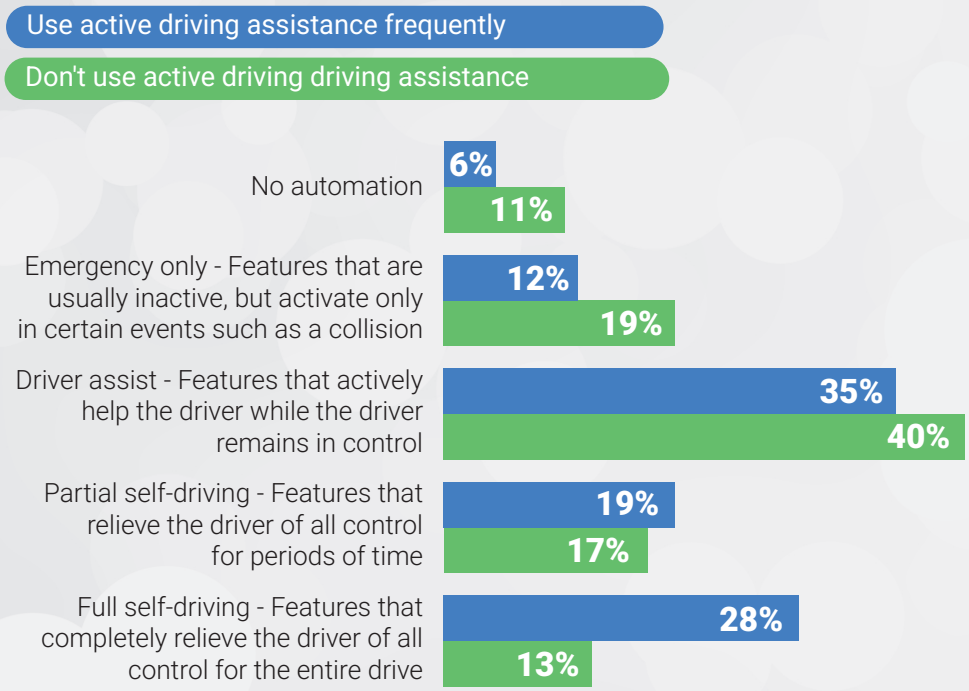
Current Advanced Driver Assistance Systems (ADAS) Usage Drives Future Intent

Approximately one-fourth (26%) of consumers say they use active driving assistance, and MCI study findings indicate repeated ADAS usage to be associated with higher ratings of comfort with automation.

Consumer Automation Comfort Level By Frequency of Active Driving Assistance Usage on Current Vehicle



Frequent usage = every time/more than half the time.
Don't use = never use/tried and stopped.

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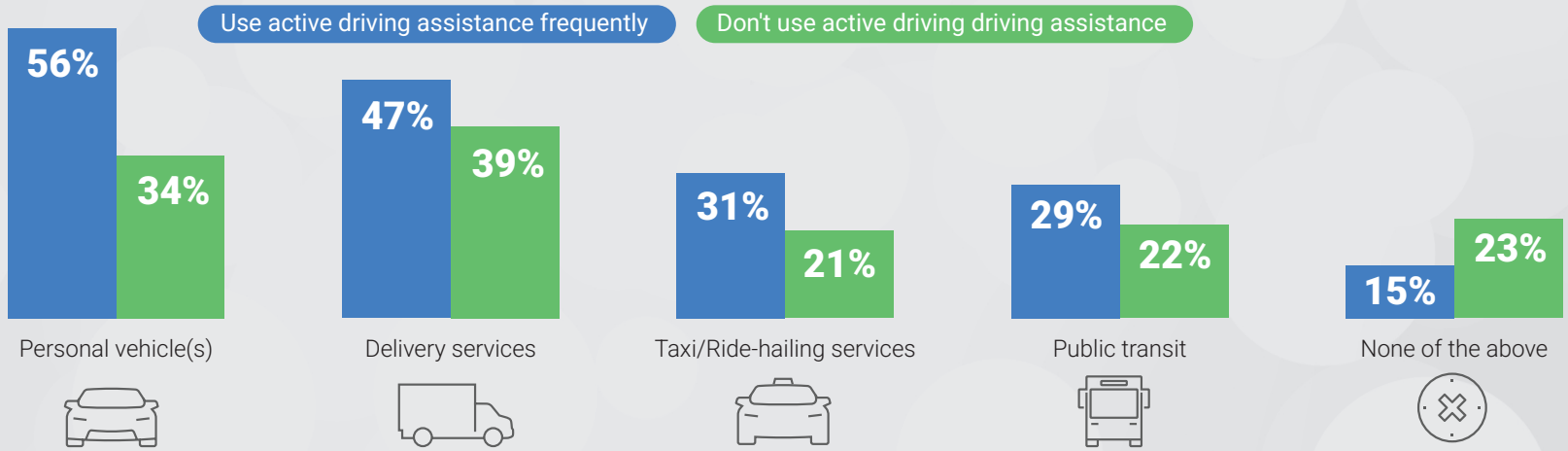
Consumers using active driving assistance frequently are more open to AV technology across all transportation modalities, especially for personal ownership.

AV Services Would Like to Use (If Available Today) By Frequency of Active Driving Assistance Feature Usage



Frequent usage = every time/more than half the time.
Don't use = never use/tried and stopped.

Frequent ADAS users consider themselves to be early adopters of new technology; this is especially true for those using active driving assistance technology where 39% state they try new technology as soon as possible. Furthermore, frequent active driving assistance usage has a significant effect on future intent, as 71% who frequently use the feature desire it on their next vehicle. Ensuring consumers understand and find value in current ADAS features provides the foundation for consumer trust and acceptance of future AV technology.

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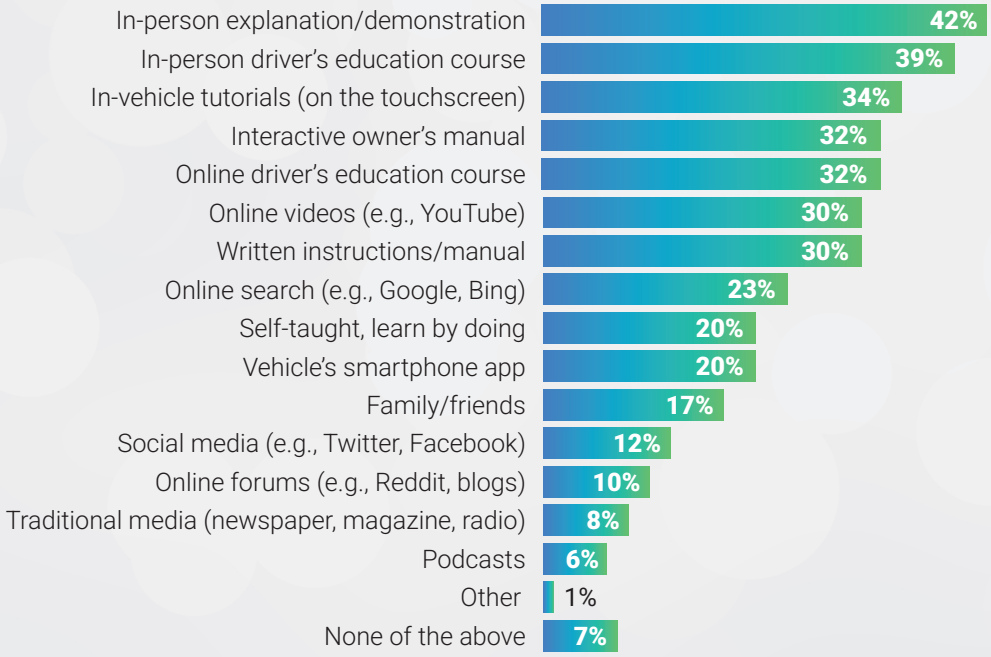
Opportunity for More Effective Learning Methods

Consumer education on lower levels of automation is critical to building consumer trust and AV acceptance. Consumers say the most utilized information sources to learn about advanced driver assistance systems on their current vehicle are the owner's manual (32%); online search (27%); and dealer explanation (26%). That being said, the data clearly shows that the current ADAS learning methods aren't hitting the mark. Traditional methods relying on the dealer relationship and written materials have proven to be inadequate for educating consumers about the complexity of ADAS and AV technologies. This unmet need presents an opportunity for industry and other stakeholders to create new, non-traditional learning methods. In particular, consumers express the desire for the expansion of learning preferences to include in-person and interactive learning.

56% of consumers have a positive willingness to complete additional training to operate an AV and 73% of respondents expect that additional training will be needed to own and operate an AV. This illustrates a tremendous opportunity for diverse and comprehensive AV education which can engage consumer interest and help close the gap between actual and perceived AV knowledge. The collaboration between industry and governmental stakeholders will drive success in educating consumers as no single source will be successful. Doing so will improve road safety and inspire the modern mobility movement.

Learning Preferences for Lower Automation Learning

Vehicles that don't require a human operator are not expected to be commercially available for some time. Until then, as vehicles become more automated, users will likely need to learn more about what new technologies can and cannot do. With that in mind, how would you prefer to learn how to utilize the vehicle safely and responsibly?



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Study Methodology

The **J.D. Power 2022 U.S. Mobility Confidence Index Study** was fielded in June 2022 and is based on six unique attributes of consumer comfort with fully automated, self-driving vehicles. The comprehensive metric measures consumer readiness for AV technology in several categories: personal vehicles; commercial vehicles; public transit; riding if unable to drive due to age or injury; sharing the road with other AVs; and consumer purchase intent. The study is based on responses from 4,000 vehicle owners, age 18 and older, who completed a 15-minute online survey. Recruitment occurred through a leading non-probability-based panel vendor. The study results were balanced to basic census demographics (age, region, gender) to be nationally representative. The sample is comprised of 51% male and 49% female. 84% of respondents have annual incomes less than $125,000 and the study is split between those with and those without university degrees as 42% stated they have a university degree or higher.

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About J.D. Power

J.D. Power is a global leader in consumer insights, advisory services and data and analytics. A pioneer in the use of big data, artificial intelligence (AI) and algorithmic modeling capabilities to understand consumer behavior, J.D. Power has been delivering incisive industry intelligence on customer interactions with brands and products for more than 50 years. The world's leading businesses across major industries rely on J.D. Power to guide their customer-facing strategies.

J.D. Power is headquartered in Troy, Mich., and has offices in North America, Europe and Asia Pacific. To learn more about the company's business offerings, visit JDPower.com/business.

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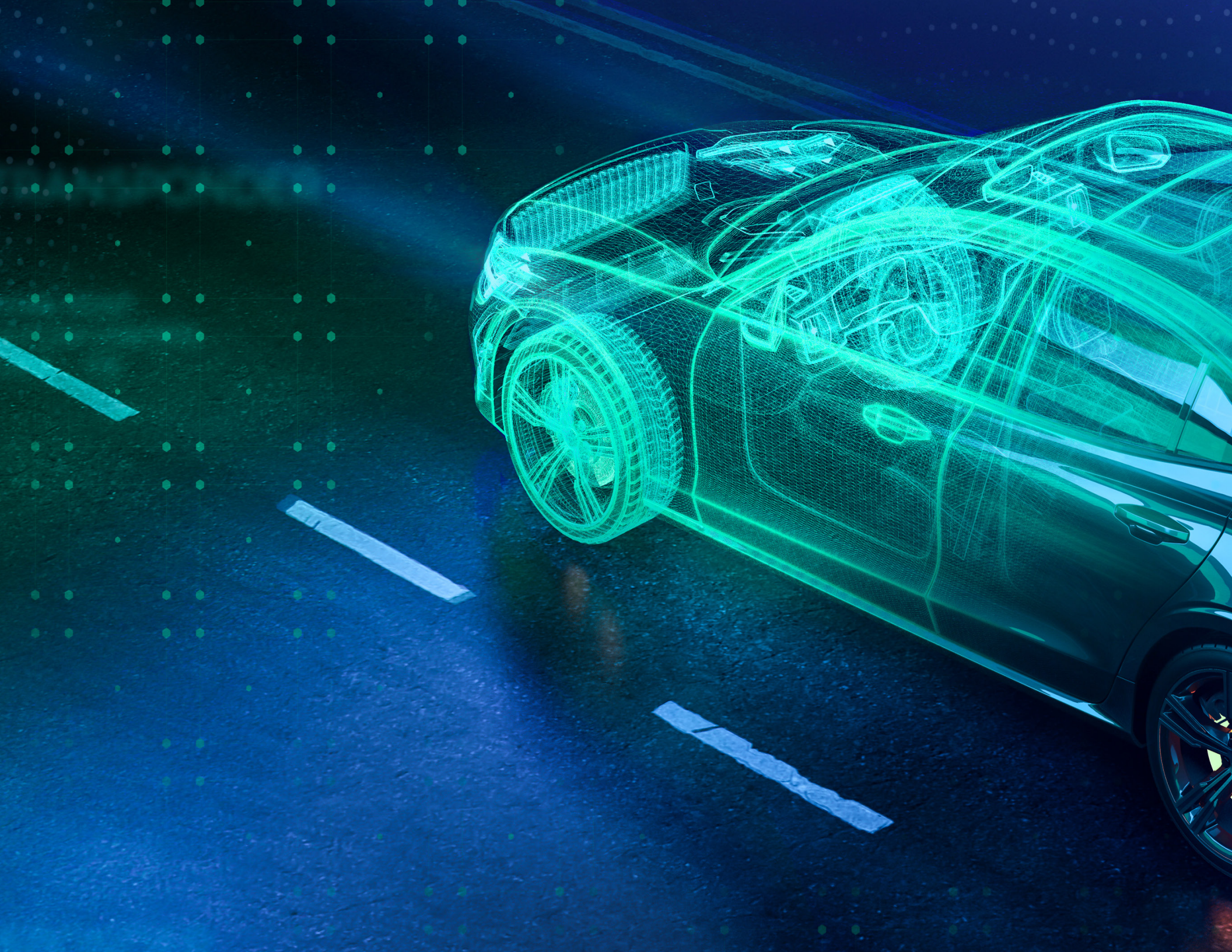


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