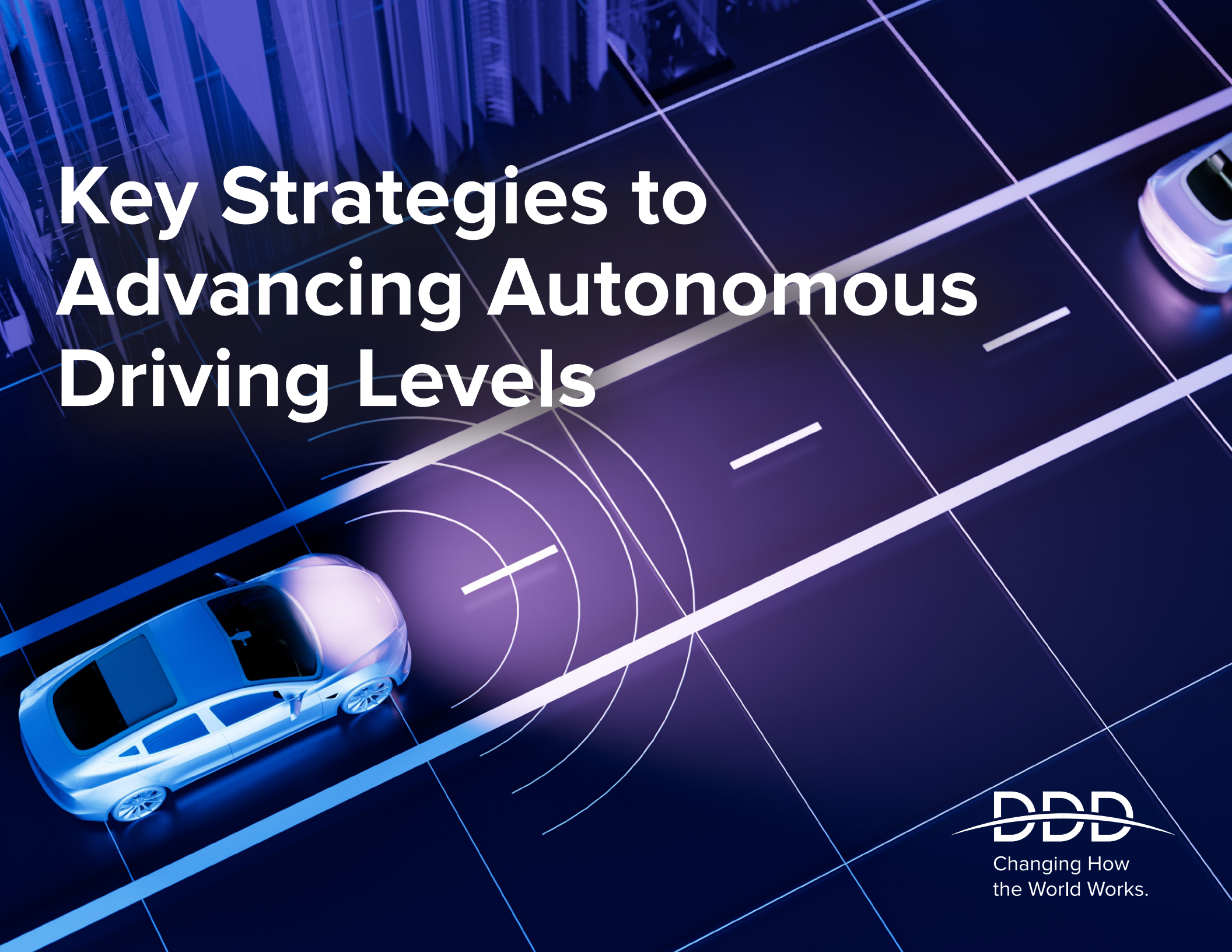
Key Strategies to Advancing Autonomous Driving Levels



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Changing How the World Works.

Automotive manufacturers and managed service providers (MSPs) pledged to provide full autonomy to vehicles - and they have made great strides in the last decade. What once was a mere pipe dream has made astounding leaps and bounds thanks to focused development and innovation. But how do developers and manufacturers continue moving toward full autonomy? Let's find out.

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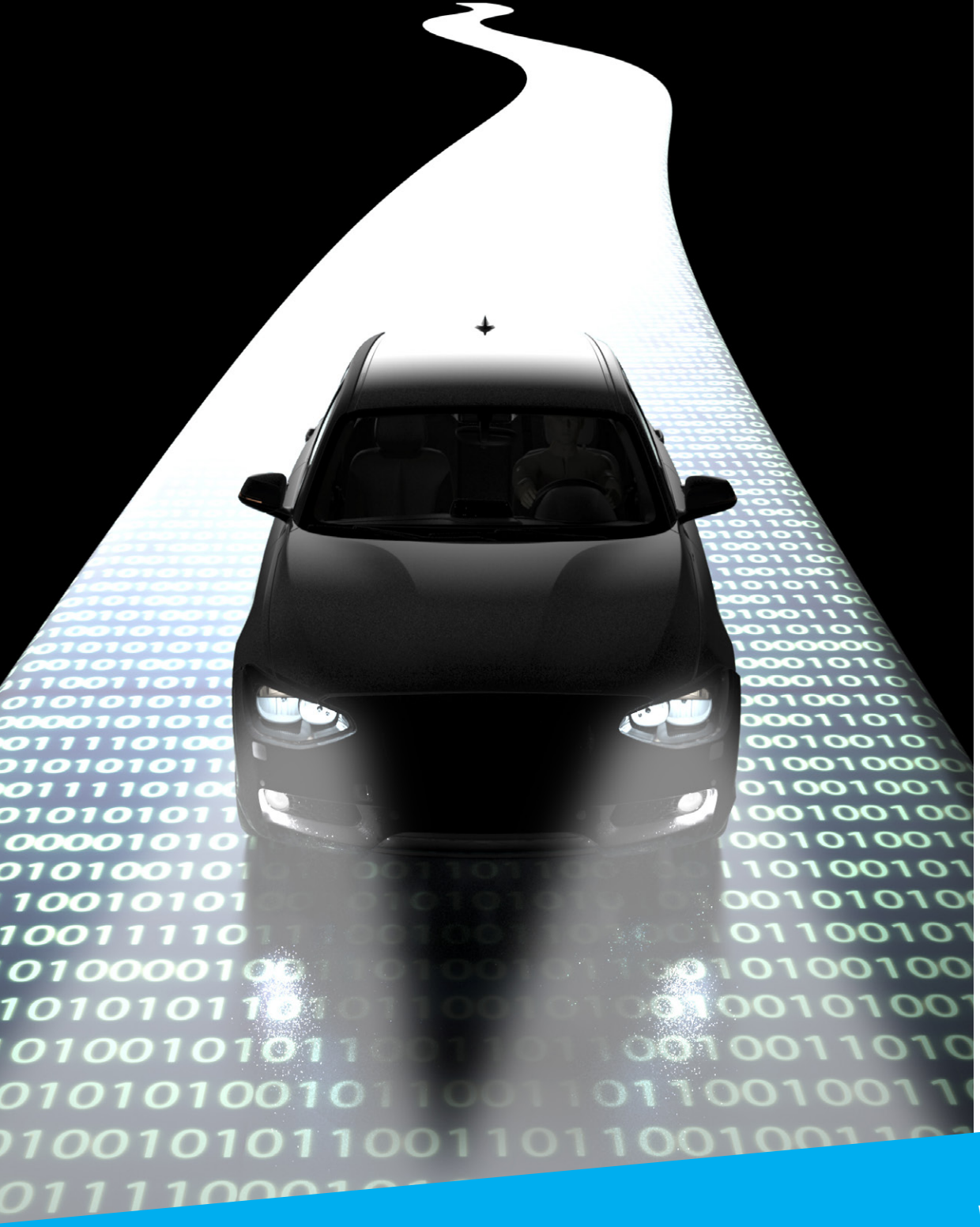
What Are Electric Carmakers Doing to Enable Higher SAE Levels?

Mercedes-Benz has steadfastly committed to developing EVs and pushing its vehicles toward higher SAE levels. It recently received approval to deploy SAE level 4 vehicles in Germany, which are cars that can make decisions independently.

This innovation requires a fairly basic implementation of higher SAE levels but shows great promise and progress toward full autonomy. A partnership between Mercedes-Benz and Bosch helped spur this progress, and their deployment of vital infrastructure could hint at the future of AD.

Companies like Mercedes-Benz and Bosch have caught on to the need for varied and detailed data sets coupled with geo-mapping. These SAE level 4 vehicles currently function in a sole parking garage in Stuttgart. It's meticulously mapped and allows vehicles to park and retrieve themselves with a simple tap on a smartphone screen. *This initiative shows great promise but is far smaller in scope than the target goal of AD developers.*



UK-based Oxbotica has likewise thrown its hat in the ring with its deployment of the Oxbotica Driver. This SAE Level 4 vehicle also utilizes a meticulously mapped nine-mile circuit to escort passengers to their destination. What is abundantly clear from both of these manufacturers is a need for robust audio and visual functionality. Rigorous object detection, geo-mapping, and high-quality data sets steer things toward reliable AD.

However, one thing Mercedes-Benz and Oxbotica share is the limited range of these pilot programs. While part of this can be attributed to safety concerns, having a fully autonomous vehicle requires accurate data sets. Confined limits help these pilot programs, as developers can effectively account for the variables in a controlled space.

Having a fully autonomous vehicle requires accurate data sets.

What Are the Major Challenges?

Training the model to accurately observe, detect objects, and predict potential movement is vital.

Driving is rarely a structured affair aside from the simple task of moving from point A to point B. Truly autonomous driving requires various factors to succeed, so developing better criticality metrics can help AD developers in many ways.

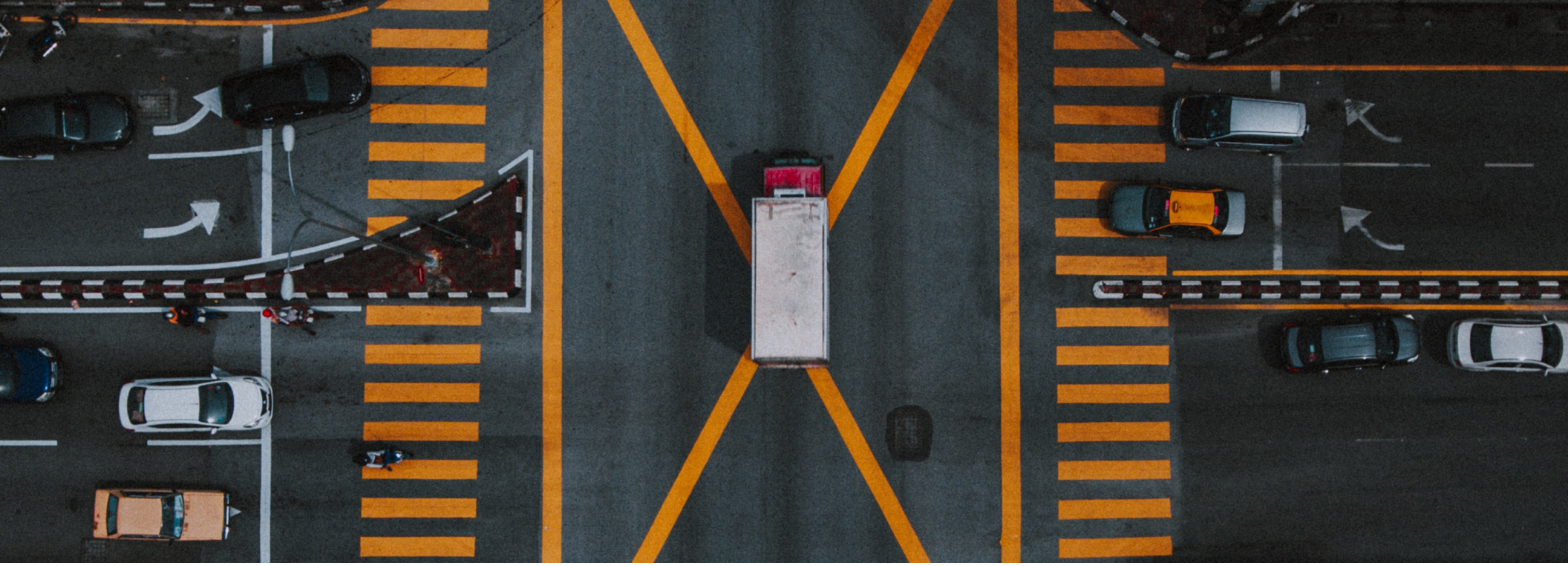
Mercedes-Benz and Oxbotica succeeded with their SAE Level 4 vehicles by restricting the operational space for the car, which allowed both manufacturers to develop accurate data sets in a confined environment. But this isn't really applicable to the various roads and highways you encounter while operating a vehicle.

What's Needed?

A primary concern when developing any autonomous driving platform is the quality and diversity of data sets. They are the backbone of any system, and training the model to accurately observe, detect objects, and predict potential movement is vital.

Criticality is also a concern, as it's the primary decision-making method for an autonomous driving platform. The system has to react and do so in a safe manner. Criticality interacts with edge computing to create something similar to a playbook for an average driver's on-the-fly decision-making while adapting to variable road conditions.

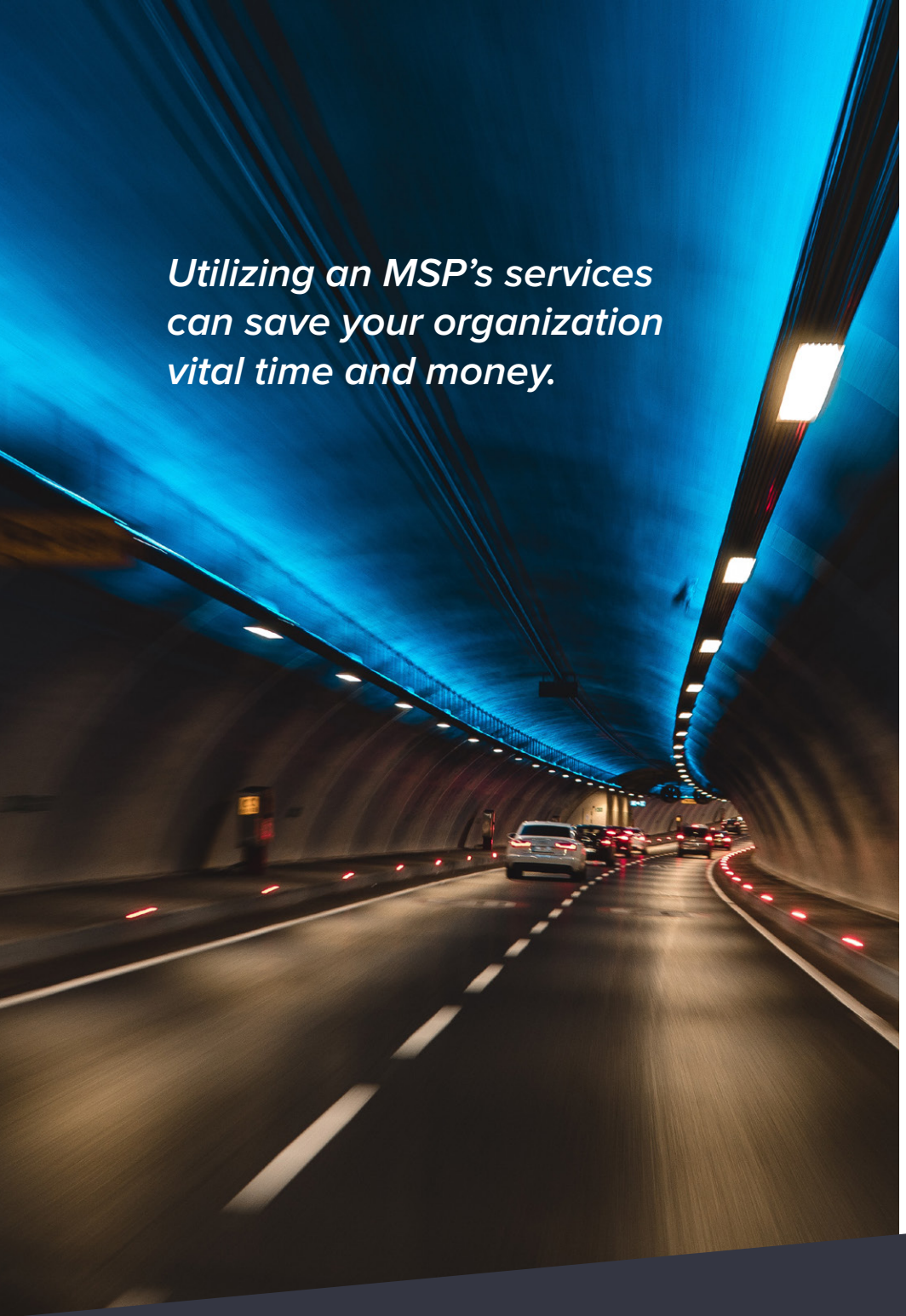
A final consideration for ADs seeking higher SAE Levels is controlling the latency inherent in any computerized system. While one system component can be quick on its own, intercommunication between components has some latency. Controlling latency can mean the difference between a safe operational vehicle and another tragedy.



What Are the Fundamental Tech Stack Solutions Fueling This Upgrade Cycle?

Solutions in play from developers are ably addressing the issue of detection and prediction. Robust visual processing and data annotation techniques like object detection, classification, and segmentation address the concerns needed to raise ADs to higher SAE levels. These techniques provide the means to more effectively separate visual data into easily defined categories to increase the speed at which an AD can make crucial decisions.

Vision annotation methods covering a wider breadth of techniques help develop reliable AD since the data sets are more comprehensive. They work with vision detection methods like bounding boxes, cuboids, polygons, key points, and polylines. This combination provides a means to thoroughly analyze objects, changing conditions, and the road.



Managed service providers can also help clean up and process the vast images gathered with these annotation methods, further increasing accuracy and reliability. Data clean-up and processing are intensely time-consuming processes. But MSPs with industry know-how, like Digital Divide Data (DDD), can reduce the time needed to refine and prepare data sets. And introducing targeted data structuring can further reduce the required time for those crucial decision-making processes to actually occur.

Better data structuring can improve how multiple operating systems communicate with each other and effectively solve problems. This is an area where MSPs excel. Utilizing an MSP's services can save your organization vital time and money. It has the added benefit of providing ideal structures for operating systems to access and quickly respond to external stimuli while in operation.

How to Elevate Your Organization

Where do you go to take your autonomous vehicles to the next level?

DDD provides a variety of computer vision and data-oriented services that directly address the challenges associated with advancing autonomous driving.

Developing fast and effective models is ultimately a slow and time-consuming process. DDD can reduce the time needed for data clean-up and structuring so you can focus on other critical development aspects. Plus, DDD has a robust suite of services covering computer vision. Various visual annotation methods allow for more accurate and varied visual data sets, leaving no stone left unturned regarding visual data processing.

Advancing ADs might not be the easiest path, but using DDD to help handle the visual and data side of things makes it a more manageable task.

Are you looking to take the next step for your organization? Contact DDD to see the many benefits of developing your autonomous driving platforms.

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