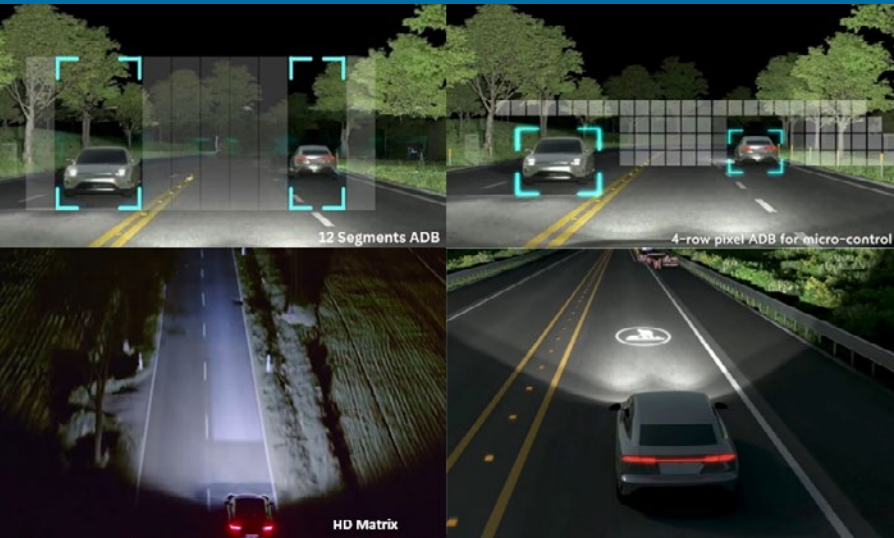


6TH DVN STUDY: ADB AND EXTENSION TO LIGHT PROJECTION



Available from November 1st, 2023.
Price: €5,000

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On November 1st, DVN will release its 6th Study:

“ ADB AND EXTENSION TO LIGHT PROJECTION ”

For the first time, a DVN study will give a view to the future of vehicle lighting concerning ADB and its extension to light projection, with numbers and figures based on market data from interviews with automakers, tier-1 and -2 suppliers, scientific institutes, and of course the expertise of DVN's in-house experts.

Study Summary

The study is describing in detail the different competing technologies: from mechanical solutions to few segments, rows of many LEDs; microLEDs, and DMD systems. It will evaluate the various performance factors, packaging, and power consumption. The study will show legal aspects in the different markets and covers the ability of road projection of these different systems, with their integration in the future electronics architecture and ADAS.

What are the benefits of the study?

The DVN Study is an independent market research project synthesizing information from many sources, interviews, and expert knowledge of DVN and DVN partners. It will bring you well-founded forecasts of revenue and volume for the different ADB systems, to help to make strategic decisions on investments and product development focal points—a great asset for shrewd business planning by suppliers and automakers, who will get a view of the market and the future perspectives from an external and neutral position.

Who is the study for?

This study is an additional source of information for the business plan of all tier 1 and tier 2 companies. OEMs will get a view of the market from an external and neutral position.

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I personally thank all the DVN team members who have contributed to this 2023 Study: Jean-Paul Ravier; Gerd Bahnmüller; Thomas Froelich; Wolfgang Huhn; Michael Hamm, and Hector Fratty. They have done a great job applying their long and broad experience in vehicular lighting and especially in adaptive driving beam. I thank Daniel Stern for his fine job in editing and enriching the report; Eve Taberna for producing the excellent layout, and Anne Ai for the Chinese translation of the study. And most of all, I am deeply grateful to you—the DVN community. You are the reason we do what we do. I wish you happy reading, and I hope in this study you will find guidance to navigate and make the right decisions in this complex world of vehicle lighting we all inhabit.

Sincerely yours,

A handwritten signature in blue ink, appearing to read 'pammum' or similar, written in a cursive style.

Paul-Henri Matha
DVN Chief Operating Officer and Lighting General Editor

Preface

Thirteen years on from its introduction, ADB qualifies as a mature concept. But the technology and technique are still actively evolving at a rapid pace, and the regulations are still shifting and drifting. There is great ongoing innovation in ADB, and a huge potential for growing equipment rate in the coming years. This is particularly the case as everybody is coming to see the substantial benefits to night-traffic safety and comfort of ADB and its extensions (e.g., road projections)—including road-safety advocacy groups and car-safety assessment entities.

We asked three influential prime-movers to share their perspective about ADB and their role in its development.

WOLFGANG HUHN

Wolfgang Huhn headed Audi's lighting department when his company launched the first matrix ADB system on the market:



“When I started working on lighting at the University of Darmstadt, it was all about improving the low beam. My first job was to help with the research project on the ellipsoid headlight with the H1 bulb. Later, the big improvement was the Xenon light: 3000 lumens from a single light source! The other side of the coin was that the limited range of the low beam was made even more visible by the now very visible cutoff line. Glare control also became very important. The dream of the lighting engineer was still a glare-free high beam. This dream came partially true with the fully mechanical Xenon high beam—a big step, but with too much movement of the whole light distribution all the time during night driving. Only a few car models were equipped with this solution.”

“Matrix headlights with high-power white LEDs were the game changer, the breakthrough. Software replaced mechanics; a true disruptive innovation. The headlamp suppliers, who usually bring the innovations to the car companies together with the light source manufacturers, were not happy at first. They preferred to continue with the mechanical solution because they had invested heavily in this technology. It was a classic innovation cycle, as Michael Hamm recently showed in his fantastic keynote during ISAL 2023.”

“Today we have millions of cars equipped with LED ADBs, especially in Europe, and drivers who have used them don't want to be without them. I am sure once it is statistically proven in numbers and figures how big the improvement in road safety really is, it will become mandatory, just like ABS and airbags are today.”

“In this 6th DVN Study, you will discover the history of ADB and detailed information on ADB technologies and the market. Lighting never stops. Working with lighting is one of the best jobs in the automotive industry.”

MICHAEL LARSEN

Michael Larsen is GM's veteran exterior lighting technical lead and head of the SAE Lighting Systems Group's ADB-related activities:



"ADB is a true game changer. There were prior technological improvements for headlight performance, but none were nearly as significant and impactful to headlight safety. ADB, in essence, added a degree of freedom to headlight beam pattern design, enabling on-the-fly dynamic updates to the beam pattern to enhance seeing light while simultaneously protecting for glare."

"Since ADB's introduction, there have been many innovations moving ADB forward from a mechanical to a digital system, improving performance and reliability. Future ADB innovations will continue this trend while better utilizing the vast amount of information available from the vehicle, making ADB systems perform even better. These innovations will continue to improve ADB's performance in a reduced packaging size, and at lower costs. This will help drive an increasing pace of adoption across all vehicle classes."

"For the United States, the ADB story has been and continues to be much more drawn-out. Despite the efforts of the industry, the path to allow ADB in the US was a 10-year journey, culminating in a complex, restrictive, non-harmonized regulation. A year and a half after that regulation's release, the automotive and lighting industry is still working to understand the regulation. Perhaps as a result, as of this writing, no US vehicle is yet in production with ADB. However, many expect that once the first OEM begins to sell ADB in the US market, other OEMs will quickly follow. This will hopefully result in the US quickly catching up with the rest of the world. It's an exciting time in lighting and I'm glad to be a part of it."

ZHAO ZHUN

Zhao Zhun, of CATARC, is in charge of the C-NCAP lighting rating, among other responsibilities:



"With the increasing acceptance of vehicle ADB functions in the industry and the continuous progress of matrix and projection technologies, we believe that ADB will eventually become the mainstream type of vehicle headlights in the future. At the same time, the integrated draft of Chinese national standards will also be released, which will fill the gap in the Chinese national standard for ADB performance testing requirements on component level. At the level of ADB vehicle testing, we believe there are still aspects that need to be improved and supplemented."

"Therefore, in the 2024 version of the C-NCAP draft, we have included performance and functional verification tests on vehicle ADB functions. In addition to the performance assessment of road lighting distance and lighting width, we also included assessment items such as ADB functional system response, response time, and shielding width. Overall, C-NCAP encourages the application of emerging lighting technologies such as ADB and projection. In the future, we will also consider further improving this evaluation system. For example, the next version of C-NCAP procedures will improve the test project of ADB function to enhance the field of view of the front surrounding scenery, and also consider the assessment of bonus points for headlight projection function."

"Finally, we also note that the current promotion and application of ADB technology is mainly limited by its manufacturing cost. We believe that with the promotion and leadership of DVN organization and experts, the cost can be further reduced, and its equipment rate on vehicles will be further improved."