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RELATED SBD REPORTS

2538 – ADAS & Autonomy Forecast

SBD has prepared this report to understand at a regional level the differences in penetration for various types of ADAS and the technologies supporting these features. Our forecasts provide a deeper understanding by estimating the technology and feature penetrations at an OEM level.



ADAS & Autonomy

#534

ADAS Guide

Since their arrival, automated and autonomous driving technologies have continued to advance. As these technologies allow for increasing levels of autonomy, key players in the sector - including OEMs, start-ups, and technology firms - are trialing advanced solutions. These trials are occurring alongside the steady development and release of such solutions to the public in passenger vehicles and commercial fleets.

This ecosystem is developing rapidly and will only continue to develop as its technologies become more advanced. Today, ADAS and autonomous systems are being developed, or have already launched, across multiple vehicle segments and in many industry sectors. With different OEMs and regions at different levels of maturity, and with the breadth of use cases offered by these systems, understanding the global scope of today's ADAS and autonomous offerings can quickly become overwhelming.

The ADAS Guide works as a reference point and planning baseline for the landscape of automated driving systems. It details the ADAS and autonomy offerings of three main regions while identifying the features provided by OEMs today. The guide comprehensively compares these features on a number of verticals - including their availability and pricing models - and dispels the jargon used by OEMs to describe them.

COVERAGE



FREQUENCY



PUBLICATION FORMAT



PAGES



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Key questions answered

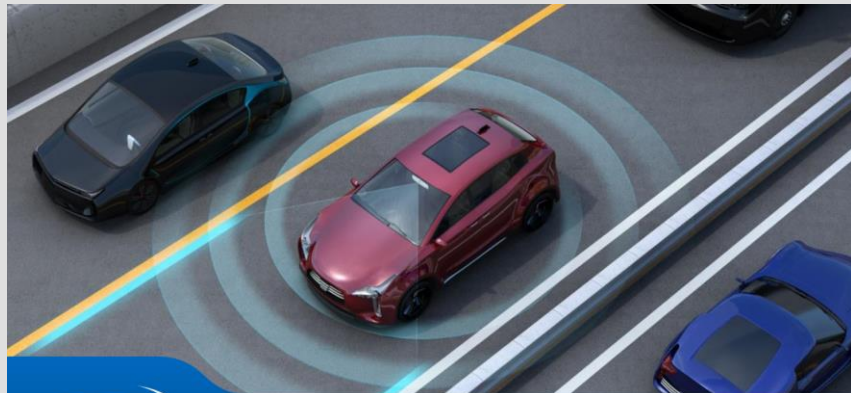
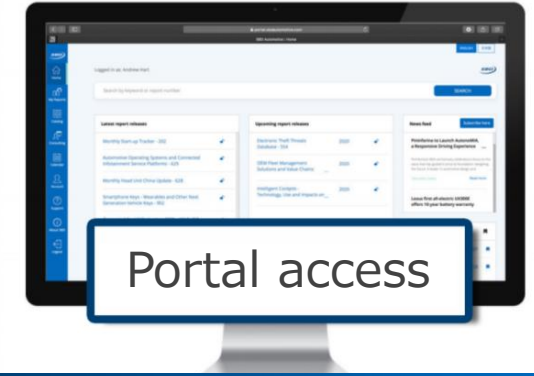
- > Which OEMs provide which ADAS?
- > What underlying technologies and suppliers do they rely on?
- > What are the functional differences between similar features offered by each OEM?
- > How aggressively are OEMs pricing and fitting ADAS across each of their models?

This research supports

-  PRODUCT PLANNERS
-  C-SUITE
-  MARKETING
-  Engineers

Do I have access?

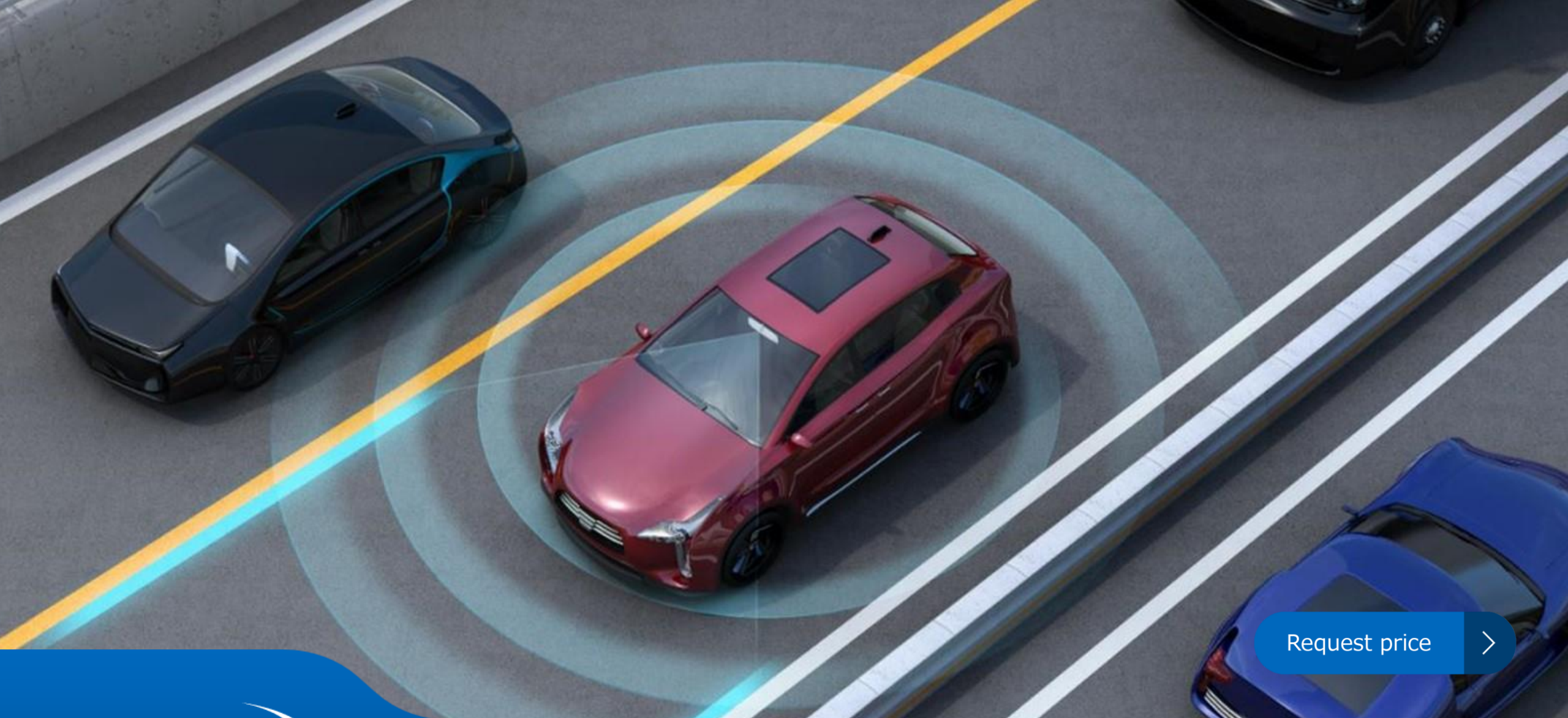
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50k+ Slides of insights, forecasts & data
4,000+ # of auto professionals who access our reports



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Annual Report for 2023

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ADAS Guide

534 – ADAS Guide Europe

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Introduction



Introduction

While fully self-driving cars may still sound like a far-fetched idea, the safety impact of automation is already being felt through the lens of rapid ADAS adoption by vehicle manufacturers across the globe. ADAS systems that once would have been considered ‘add-ons’ for premium models are now making their way to almost every new model sold– be it a premium, volume, budget, or startup OEM.

With more advancements in sensor technology, artificial intelligence, and data processing, OEMs are now challenged to offer a wide range of active safety features at an affordable price. This is to make safety a compelling use case for the end-user and, develop competitive advantages to tackle the competition. These advancements also go together with the regulatory groundwork being undertaken by the government bodies to further the uptake of ADAS by the industry as a whole and benefit the society at large by reducing the number of road fatalities (or at least reducing the severity).

The purpose of this report is to address the ‘What’, ‘Who’, and ‘How’ type of questions related to ADAS:

- **What are the ADAS features available in Europe*?**
- **Who are the market leaders and what are their ADAS offerings?**
- **How are OEMs supporting their ADAS and at what price point?**

SBD’s 534 ADAS Guide covers ADAS offerings from the automakers in various regions along with their technologies (sensor), fitment/pricing strategy, and supplier information. It draws necessary inferences from the raw data and provides actionable insights for the strategic and product planning teams to act upon.

Note: To study the European models, SBD has considered the pricelists, configurator and brochures published on the German (.de) websites.

Section	Content
Executive Summary	A high-level overview of the latest ADAS trends i.e., model-level penetration, SAE Level 3 preparedness and others. Conclusion: Safety-based ADAS is commoditized, convenience-based ADAS is being monetized
The Basics	A brief overview of the SAE levels of vehicle autonomy (with ADAS classification) and defining the scope of this report
What’s New?	Section focusing on notable OEM and industry announcements in the ADAS and autonomy space.
Analysis	An in-depth look into the data-driven market dynamics, ADAS strategy, availability trends, legislative background, among others. Conclusion: The European OEMs are well positioned to launch SAE Level 2 hands-free driving systems on their flagship models in the near future.
Summary Tables	Each slide in this section is dedicated to a particular sensor or a combination thereof and mapped with the OEM brands along with their model-level penetration and pricing points.
Next Steps	Can SBD help you with any unanswered questions?



Examples slides from the report

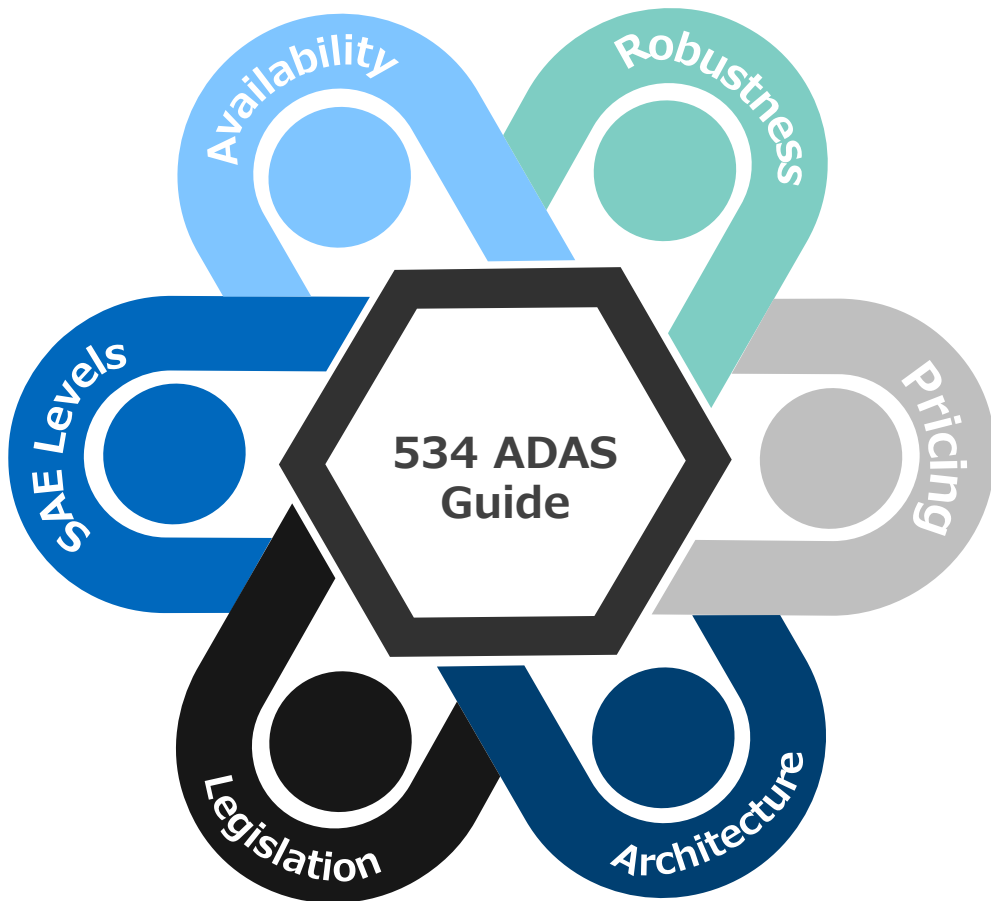


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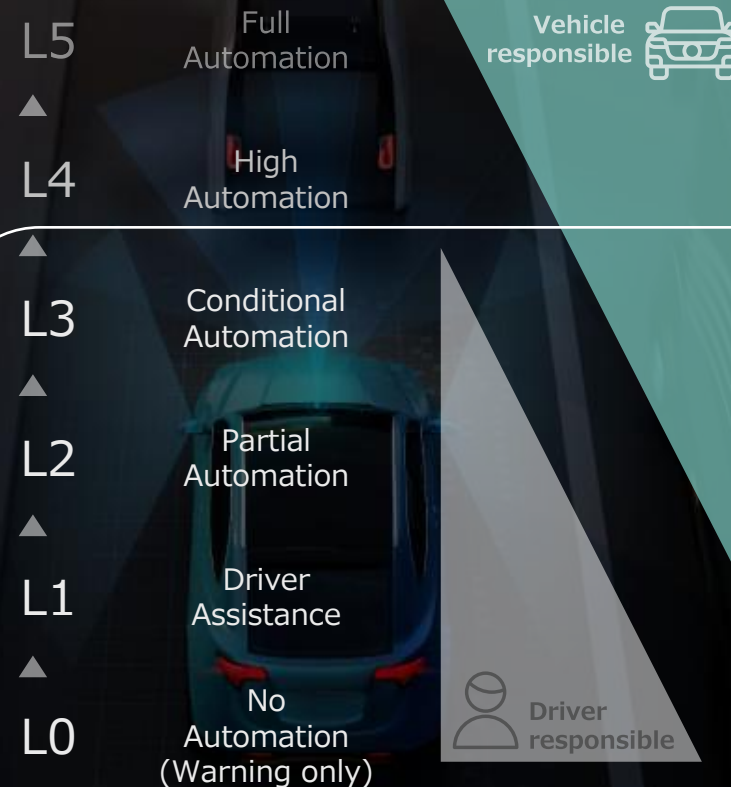


Scope of this report

Throughout this document, the focus is on ADAS that comprises of SAE Level 0 (no automation) to SAE Level 3 features (conditional automation). The SAE Level 4 and SAE Level 5 features are not commercially available as of 2023 and are therefore beyond the scope of this report. The report covers the ADAS/automated driving features commercially available on passenger models only and excludes AV pilot trials,

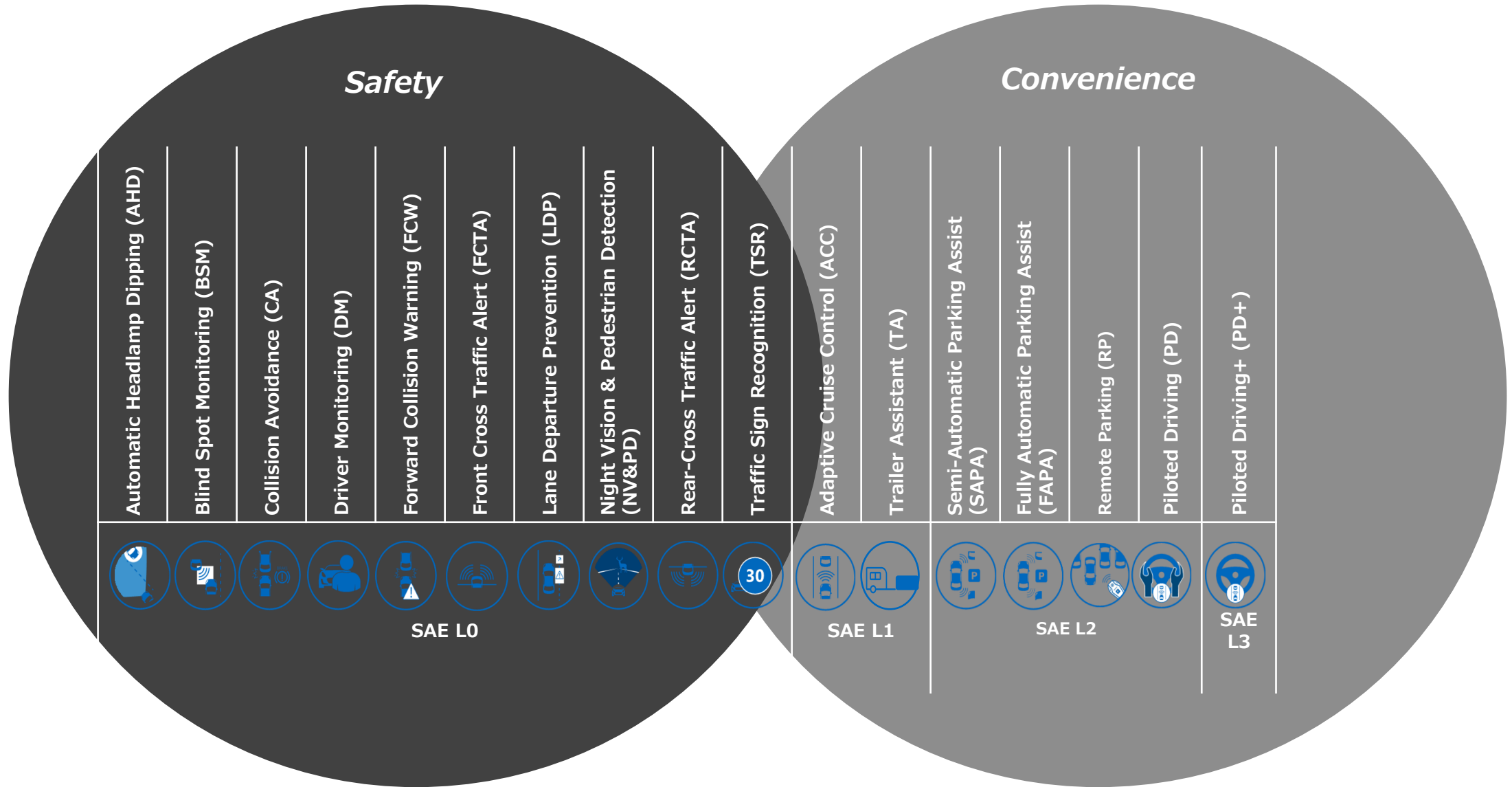


Which ADAS are more popular?
How are they offered?
Who is closer to SAE Level 3?





Classification of ADAS features listed in 534









Note: There have been repeated mentions of 'SAE Level 2+' throughout this report but that is not officially part of SAE Levels of autonomy (SAE J3016)



What? are the key ADAS addition in the new models launches

Following is a list of a few new models that have been introduced with noteworthy updates or innovations.

OEM	New model/variant launched	Notable features
	iX1, i5, i7	The new electric models from BMW get optional piloted driving systems (hands-on) along with fully automated and remote parking assistant. Some of these models are likely to get hands-free PD in the near future.
	e:NY1, ZR-V	Honda introduced two new models in the European market but none of them gets the same piloted driving system as their predecessor Honda E
	EV6	The all-electric EV6 and EV6 GT from Kia gets standard piloted driving system, automated and remote parking assistant. The US version of this model is likely to get hands-free driving soon.
	MG4/MG5, Cyberstar, ZS	The new BEVs launched in the European market by MG Motors are getting SAE Level 2 hands-on, eyes-on piloted driving standard on all variants.
	#1	Smart #1 electric model gets piloted driving (with driver-initiated lane change) in all the variants as standard fit. It also gets evasive steering assistance, front cross traffic alerts and semi-automatic parking assistant
	bZ4X	bZ4X midsize sedan gets standard piloted driving (hands-on) and driver monitoring system (powered by an infrared in-cabin camera).



What? Are the new partnerships, M&A activities in the ADAS space

2023



Porsche and Mobileye collaborate to develop SuperVision ADAS and autonomy suite

Collaboration is expected to make Mobileye SuperVision available as a platform solution within the overall Volkswagen Group targeting models worldwide. Future Porsche models could come with hands-free driving technology.



AGE and Hella Gutmann renew partnership to advance ADAS calibration

This partnership enables AGE to offer advanced ADAS calibration solutions to their customers, ensuring safety and functionality after automotive glass replacement/repairment.



地平线
Horizon Robotics

Horizon Robotics and BYD partner on BYD's bird's eye view perception solution

Bird's Eye View ADAS sensor platform will be powered by Horizon Robotics' Journey 5 computing solution and will enter mass production later in 2023



NIO and NXP develop 4D imaging radar to achieve high-level autonomous driving

4D imaging expands radar capabilities to accurately detect, separate, and classify objects making them suitable for SAE Level2+ and higher-level autonomy



Innoviz and Drive Group collision detection system based on lidar sensing

The solution leverages data gathered from Innoviz lidar sensors positioned at both sides of a highway, several kilometers ahead of the entrance to a bridge or tunnel



Single sensor – Camera only

	Level 0	Level 1	Level 2	Level 3
Radar				
Camera				
Lidar				
Sensor Fusion				

Key Highlights

Most OEMs prefer a single camera-based hardware suite as it can support multiple front ADAS functions up to SAE L1 in a cost-effective manner (specially ADAS that can't be robustly supported by a single radar i.e., pedestrian detection). Unlike China where single sensor-based PD systems exist, the PD function is always powered by a sensor fusion (mostly radar + mono camera) in Europe.

	CA			ACC		PD	
	OEM	# of models	Pricing range (¥)	# of models	Pricing range (¥)	# of models	Pricing range (¥)
Premium		9	Standard	NA	NA	NA	NA
		22	Standard	2	3250 - 5180	NA	NA
		1	Standard	NA	NA	NA	NA
		2	Standard	NA	NA	NA	NA
Volume		7	Standard - 650	NA	NA	NA	NA
		1	Standard	NA	NA	NA	NA
		1	Standard	1	Standard	NA	NA
		2	Standard - 1250	NA	NA	NA	NA
		6	700	6	300 - 541	NA	NA
		5	Standard - 675	NA	NA	NA	NA
		NA	NA	1	Standard - 1100	NA	NA
		6	Standard	6	Standard	NA	NA
		1	Standard - 1000	NA	NA	NA	NA



What the Excel Version Contains



ADAS Guide

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Excel Database Includes



Vehicle details							No. of Sensors supporting ADAS features					Price (€)						
OEM Group	Vehicle manufacturer	Vehicle model	Vehicle segment	Model lifecycle	Vehicle price - Min (€)	Vehicle price - Max (€)	Radar	Ultrasonic	Lidar	Camera	Other external sensors	Supplier	Stand alone	Part of ADAS bundle	Part of general bundle	Std on all	Std on some, NA on some	Std on some, Opt on some
Stellantis	Alfa Romeo	Giulia	C	2021	36,800	55,000	3	6		1 • Surround View	N/A	TBC				y		
Stellantis	Alfa Romeo	Giulia	D	2023	55,500	101,000	3	6		1	N/A	TBC					y	
Stellantis	Alfa Romeo	Stelvio	D	2021	51,500	101,000	3	6		1	N/A	TBC				y		
Volkswagen Group	Audi	A1	B	2019	22,200	30,100	3	8		1	N/A	Gentex			135			
Volkswagen Group	Audi	Q2	B	2020	28,150	50,050	3	8		1	N/A	Gentex			135-990			
Volkswagen Group	Audi	A3	C	2019	30,000	44,450	3	8		1	N/A	Gentex			100-1590			
Volkswagen Group	Audi	Q3	C	2023	38,300	50,900	3	8		1 • Surround View	N/A	Gentex			135-1590			
Volkswagen Group	Audi	Q4 e-tron	C	2020	51,900	57,900	3	8		1 • Surround View	N/A	TBC			100-1120			
Volkswagen Group	Audi	TT	C	2019	39,700	49,600	3	8		1	N/A	Gentex			150-2140			
Volkswagen Group	Audi	A4	D	2021	40,450	52,050	3	8		1 • Surround View	N/A	Kostal			150-1590			
Volkswagen Group	Audi	A5	D	2021	44,000	61,350	3	8		1 • Surround View	N/A	Kostal			1150			y
Volkswagen Group	Audi	Q5	D	2020	49,950	69,950	3	8		1 • Surround View	N/A	Kostal			150-1260			
Volkswagen Group	Audi	R8	D	2022	150,500	228,500	3	8		1	N/A	TBC			180			
Volkswagen Group	Audi	A6	E	2023	53,800	75,640	3	8	1	1 • Surround View	N/A	Gentex			140-990			y
Volkswagen Group	Audi	A7	E	2022	63,500	67,250	3	8	1	1 • Surround View	N/A	TBC			140-1690			
Volkswagen Group	Audi	e-tron GT	E	2020	101,600	191,000	3	8		1 • Surround View	N/A	TBC			1540			
Volkswagen Group	Audi	Q7	E	2019	72,100	94,770	3	8	1	1 • Surround View	N/A	Kostal			150-1250			y
Volkswagen Group	Audi	Q8	E	2019	81,400	N/A	3	8	1	1 • Surround View	N/A	TBC			150-1690			y
Volkswagen Group	Audi	A8	F	2022	101,500	166,950	3	8	1	1 • Surround View	N/A	TBC			Std-1820	y		
BMW Group	BMW	1-Series	C	2019	30,800	40,200	1			2	N/A	Veoneer	1400					
BMW Group	BMW	2-Series Active Tourer	C	2021	35,300	38,850	5	4		1 • Surround View	N/A	ZF			1950-3200			
BMW Group	BMW	2-Series Coupe	C	2021	36,500	58,100	5	4		1 • Surround View	N/A	Veoneer	600					
BMW Group	BMW	X1	C	2023	55,000	58,950	1			1 • Surround View • Rear View • Trifocal	N/A	TBC			1750-3200			
BMW Group	BMW	X1	C	2019	42,900	46,650	5	4		1 • Surround View	N/A	Veoneer			1750-3200			
BMW Group	BMW	X2	C	2020	37,750	60,500	5	4		1 • Surround View	N/A	Veoneer	800					
BMW Group	BMW	Z4	C	2018	50,200	69,400	4	2		1 • Rear View	2	TBC	1200	3150				
BMW Group	BMW	3-Series	D	2019	45,200	73,900	5	4		1 • Surround View • Rear View • Driver Facing • 1	N/A	TBC	1000					
BMW Group	BMW	4-Series	D	2021	51,000	71,600	5	4		1 • Surround View • Driver Facing	N/A	TBC	1700					
BMW Group	BMW	i4	D	2021	56,500	71,100	5	4		1 • Surround View • Rear View • Trifocal	N/A	TBC	1700					
BMW Group	BMW	iX3	D	2021	67,300	75,700	5	4		1 • Surround View • Rear View • Driver Facing • 1	N/A	Veoneer				y		

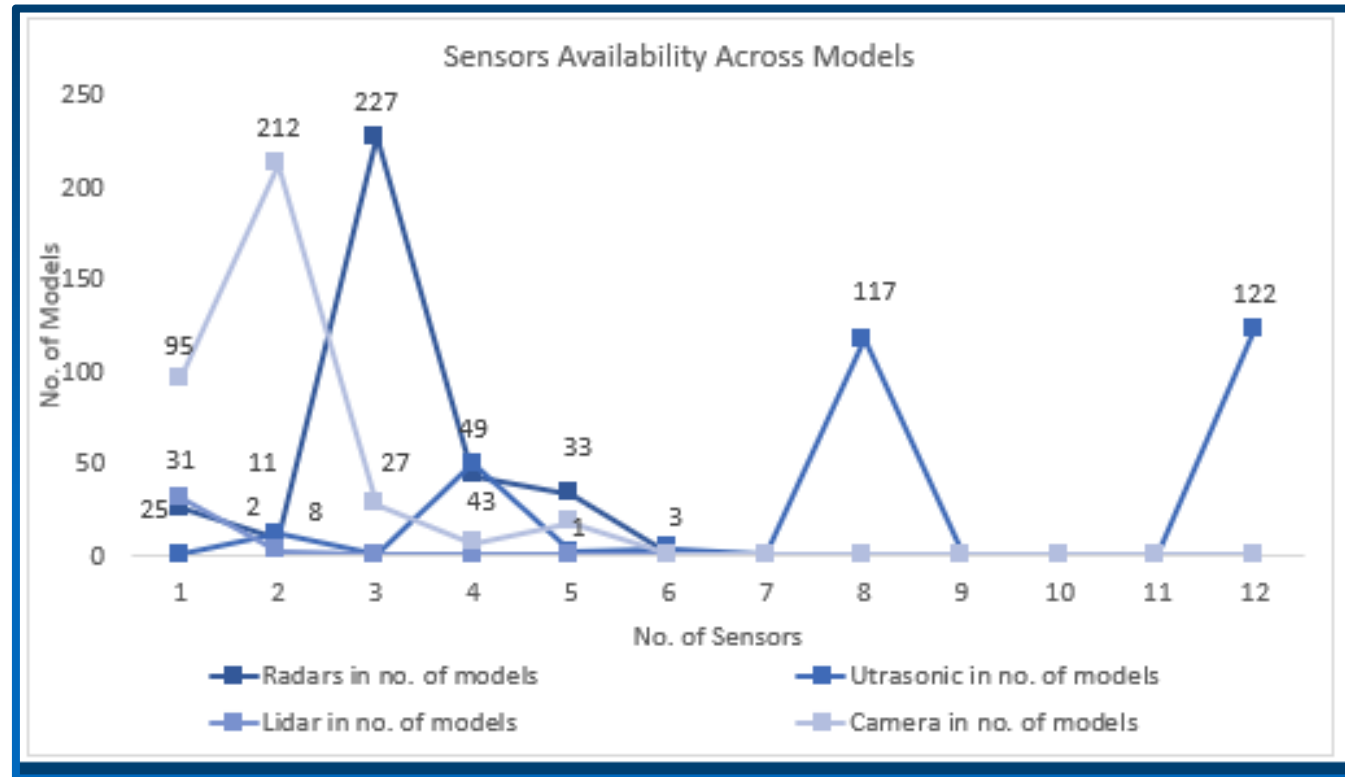
Excel Data Points:
85,000+

OEM Groups covered:
42

Excel Tabs:
5



Excel Database Includes



Excel Data Points:
85,000+

OEM Groups covered:
42

Excel Tabs:
5



Excel Database Includes




Excel Data Points:
85,000+

OEM Groups covered:
42


Excel Tabs:
5



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The advertisement features a top-down view of a road with several cars. A central red car is highlighted with a circular sensor range and a yellow line extending forward, representing an ADAS feature. Other cars in black, blue, and purple are visible in the background.

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Contact SBD Automotive

Do you have any questions?

If you have any questions or feedback about this research report or SBD Automotive’s consulting services, you can email us at info@sbdautomotive.com or discuss with your local account manager below.



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USA

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Garren Carr
North America
garrencarr@sbdautomotive.com
+1 734 619 7969

Luigi Bisbiglia
UK, South & West Europe
luigibisbiglia@sbdautomotive.com
+44 1908 305102

SBD China Sales Team
China
salesChina@sbdautomotive.com
+86 18516653761

Andrea Sroczynski
Germany, North & East Europe
andreasroczynski@sbdautomotive.com
+49 211 9753153-1

SBD Japan Sales Team
Japan, South Korea & Australia
postbox@sbdautomotive.com
+81 52 253 6201