

ADAS Aftermarket Service Ecosystem

2035

Navigating the ADAS Adoption Curve

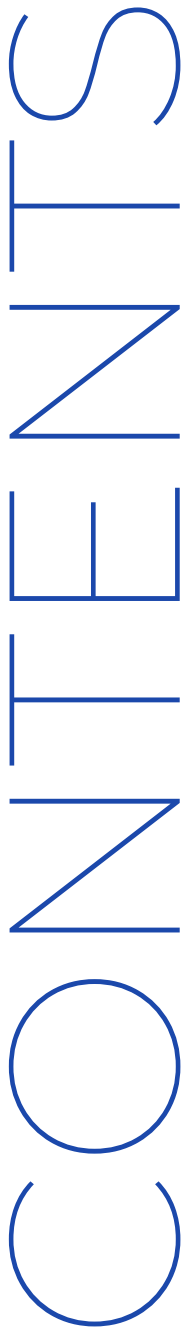
February 2025

The Aftermarket is Seizing Opportunity

- Mechanical outpaces Collision with a 13.5% CAGR through 2035
- Over 2 Million ADAS Calibrations were performed in 2024
- \$1.7B of ADAS parts forecast for 2035
- Total addressable parts CAGR of 9.5% through 2035



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This document is a brief of our recent assessment of the ADAS Service Ecosystem in the Automotive Aftermarket with projections through 2035. You can get a full copy of this report by contacting your MEMA representative.

It's safe to say the Automotive Aftermarket has undergone an unprecedented period of rapid change and impact since the emergence of ADAS (Advanced Driver Assistance Systems) in the aftermarket service ecosystem. While the Collision segment is expected to reach maturity on the classic S-curve of technology adoption by the end of the forecast period, the Mechanical segment is now entering its peak growth phase in the adoption curve.

Thank you for your interest in MEMA's research, and we hope the insights that follow prove a valuable input to your success.



Adapting and growing: the ADAS service opportunity arrives - and brings challenges

An update to the original MEMA report shows that change is already well underway in the Collision sector, with the coming years bringing a strong growth opportunity to the Mechanical repair space.

In 2022, we published our first assessment and forecast of the impact of Advanced Driver Assistance Systems on the Automotive Aftermarket, projected through 2030. This study employed students at the University of Michigan and examined the ecosystem through the lens of Michigan's Competing Values Framework.

At the time, ADAS was early in its adoption and penetration into the North American automotive parc. The safety benefits of ADAS have become increasingly evident on the road, and the customer appeal is clear. Experience outside of the collision shop servicing these technologies remained an exception in the Automotive Aftermarket.

The North American vehicle fleet is experiencing significant growth in ADAS, creating a wave of opportunities for aftermarket participants ready to engage. Unfortunately, the cost and readiness of servicing these systems, from replacement components to the equipment required to perform calibrations, is posing a double headwind to Aftermarket shops in the adoption process.

The MEMA study's uniqueness is not just in detailing how the vehicle parc will change in coming years but the resultant service required of these systems in the forecast period. We see ADAS following the classic "S-curve" in the adoption of new technology, and the beginning of the growth deceleration is now apparent in the out years of our forecast projections. Additionally, this study adjusts our 2022 forecast due to the deviation in new vehicles sold and the actual crash reductions now being seen in the actual data.

Findings Summary



Updating from our previous study forecast, the extension of the forecast period to 2035 sees the S-curve moderation of growth and leads to a **new total CAGR of 9.5% through 2035 for parts opportunities.**



ADAS opportunity is following two distinctly differently timed classic S-curves of adoption. **The Collision sector is forecast to experience a 6% CAGR, while the Mechanical sector is forecast to experience a 13.5% CAGR.**



Aftermarket for ADAS parts is forecast to be \$676M in 2025, climbing above \$1.07B in 2029 (one year before our prior estimate), and ultimately to \$1.7B in 2035.



ADAS features have the ability to reduce crashes by between 20% and 46%, depending upon ADAS feature. We are seeing a reduction in collision claims that exceeds 1% per year, but the factors of Covid recovery and the rapidly rising average claims cost are also contributors to claims reductions.



The aggregate classic “S-curve” of technology adoption is currently at peak growth rates, with year over year growth now tapering from 12.8% in 2025 to 6% in 2035.



ADAS Calibrations now exceed 2 Million per year in the Aftermarket - excluding glass replacement calibrations which currently exceed 1 Million per year.

Observations and Changes Since Our Last Forecast



The aftereffects of Covid were more pronounced than anticipated, leading to both headwinds and tailwinds in our forecast. The service ecosystem is in the later stages of reversion to mean level activities in both sales of new vehicles and repair activity.



The Aftermarket has seen some maturation in capability to service ADAS systems, with new businesses forming and new products introduced since the publication of our last forecast. This speaks to the entrepreneurial capabilities in finding solutions for consumers.



For parts, inflation was above our expectations since our original publication, leading to higher dollar amounts in our forecast, offset by lower volumes due to new vehicle sales below our model and collision claims also reducing more than our forecast. As a result, our original forecast was raised by 3%, resulting in hitting the \$1B Addressable threshold in 2029 rather than in 2030 as originally forecast.



We are seeing interesting second order effects in the adoption of ADAS technology. While acceptance is improving, there is a **rising concern that a portion of vehicles in the parc do not have systems operating as designed and are thus not delivering the anticipated safety improvements.** More collaborative industry work is needed to quantify and deliver a strategy appropriate for the Aftermarket ecosystem and vehicle owners.



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ADDRESSABLE MARKET FOR KEY ADAS TECHNOLOGY COMPONENTS

Approach

The Total Addressable Market for ADAS aftermarket parts is made up of two sources – collision repair and component failure. Collision demand is driven by the replacement of components from vehicle damage. Component failure replacement parts demand in the aftermarket is driven by post-warranty normal wear failure of the component.

Collision

Collision demand is the total possible replacement parts sold due to vehicle accidents or a comprehensive claim (non-collision). The general approach

involves analyzing the frequency at which ADAS-equipped vehicles in operation require component replacements due to collisions. This data includes appraisals, collision types, collision losses, and the impact of ADAS technologies on crash reduction rates.

Part Failures

For Mechanical, Part Failure is derived from representative data based on like part failures. The final source of failure data was to use the failure rate of Ignition Switches as actually experienced in the automotive environment. For part failure, we do not consider the warranty period of new vehicle life as addressable by the Aftermarket. For collision, the entire vehicle parc is addressable.

A key unanswered question is the consumer behavior when an ADAS system fails or is otherwise not properly functioning. At what percentage will this addressable opportunity become a repair service?

Forecast Total Addressable Market (TAM)

| Part Life Failure Replacement | | | |
|--|---------------|-----------------|-----------------|
| | 2025 | 2030 | 2035 |
| Parts Failure TAM | \$268M | \$583M | \$947M |
| Collision Replacement with crash reduction | | | |
| | 2025 | 2030 | 2035 |
| Collision w Crash Reduction | \$407M | \$589M | \$729M |
| Total Addressable Market | | | |
| | \$676M | \$1,173M | \$1,676M |

\$1.7B

TAM by 2035

The above \$1.7B Total Addressable Market for parts above reflects the aggregate addressable opportunity for the Aftermarket service ecosystem.

2031 represents the crossover point of Mechanical exceeding Collision activity.

DETAILED FINDINGS AND DISCUSSION





ADAS service growth takes off in the Mechanical segment

Growth has thus far been concentrated in the Collision space. The coming years will see a reversal of growth leadership with ADAS service activity in Mechanical exceeding Collision by the end of the forecast period.

DETAILED FINDINGS AND DISCUSSION

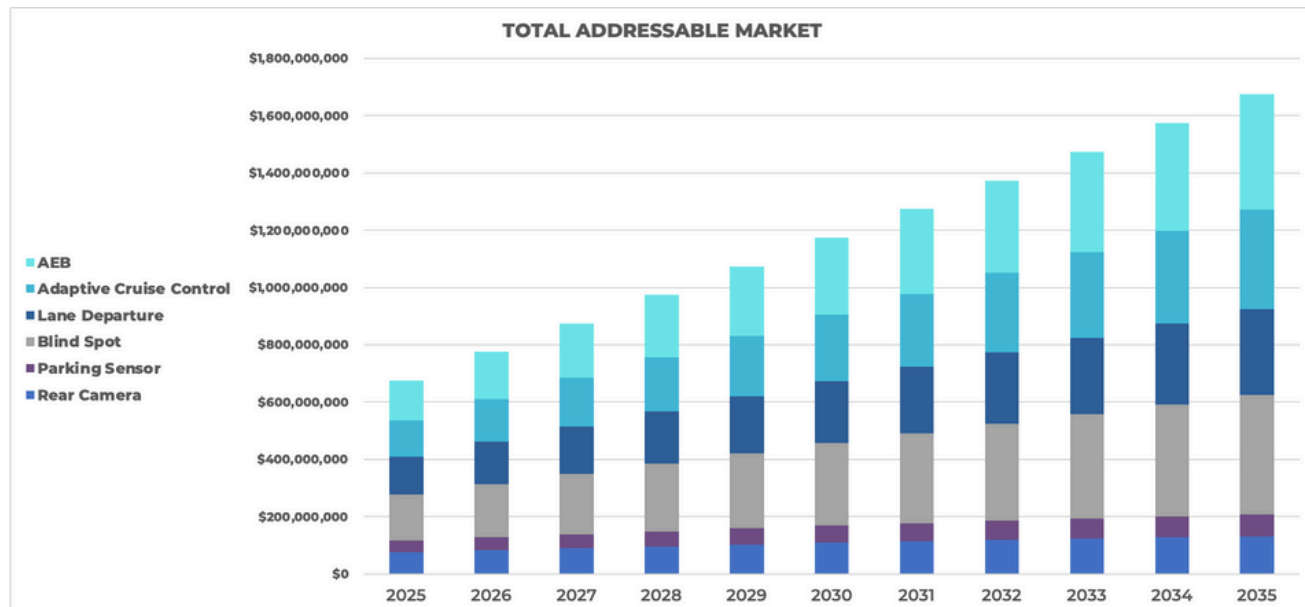
The adoption of Advanced Driver Assistance Systems (ADAS) in the automotive service ecosystem is following the classic S-curve of technology diffusion

This is marked by a rapid growth phase transitioning into a maturity phase. Current data indicates a robust annual parts growth rate of 17%, driven by advancements in vehicle safety technologies, regulatory mandates, and consumer demand for enhanced driving experiences. However, as the market matures and technology saturation increases, growth is projected to taper to approximately 6% annually by 2035. This trajectory underscores the need for service providers to adapt to a dynamic market landscape, characterized by shifting demands for skilled technicians, updated diagnostic tools, and evolving business models.

In this section, we delve into the key drivers, challenges, and opportunities shaping the ADAS service ecosystem's growth and its implications for stakeholders.

Addressable Market

The parts forecast has multiple components, each with independent growth details based upon the adoption into the vehicle parc. The summary in a stacked bar chart shows AEB systems seeing the highest growth factors going from 20.7% of the forecast total in 2025 to 24.1% of the forecast total in 2035 - coincidentally these also contribute the most to collision reduction claims. The increase in parts price has been significantly volatile in the last few years, with prices starting to hold steady in the most recent past.

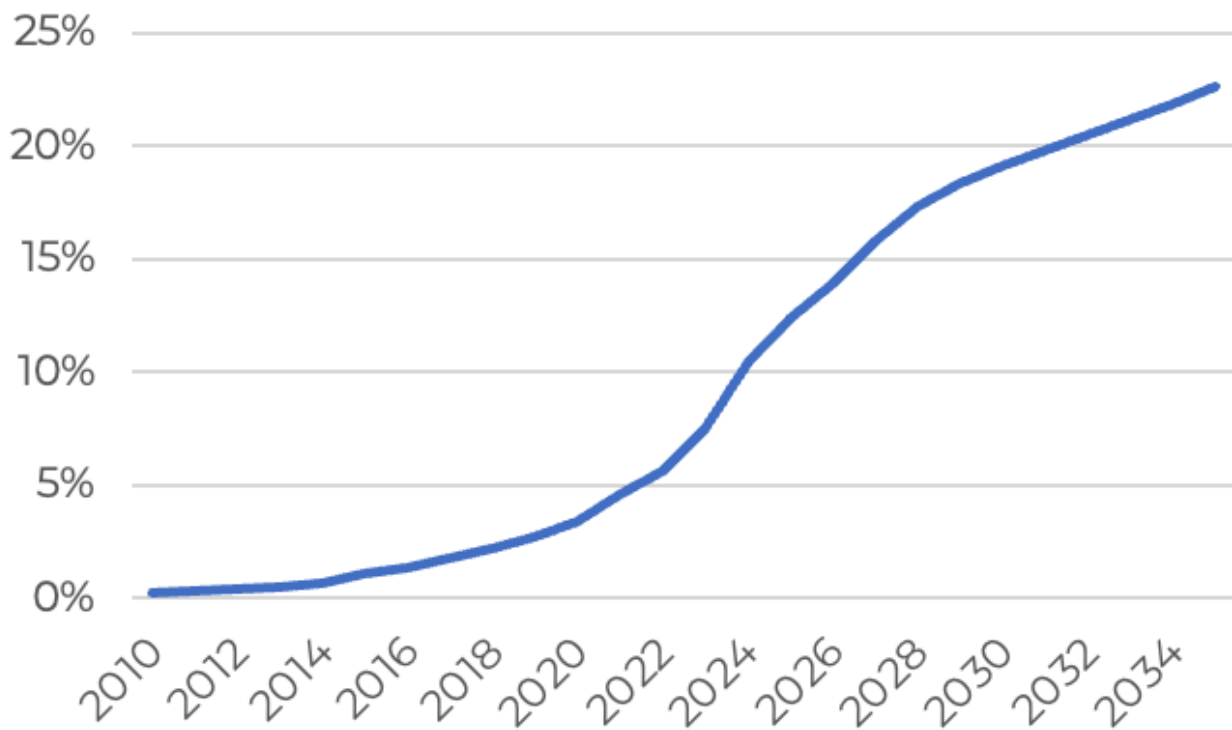


Collision Reduction

The following chart illustrates our model on the effectiveness of ADAS in collision avoidance, demonstrating a clear S-curve adoption pattern in effectiveness. The data highlights significant collision reductions, surpassing 20% by 2035, as projected in a recent study conducted by the University of Michigan's Transportation Research Institute.

This chart provides a visual representation of the absolute correlation between ADAS adoption and collision reduction, underscoring the transformative impact of these systems on road safety over time.

COLLISION YEAR OVER YEAR REDUCTION % DUE TO ADAS GROWTH IN THE VEHICLE PARC

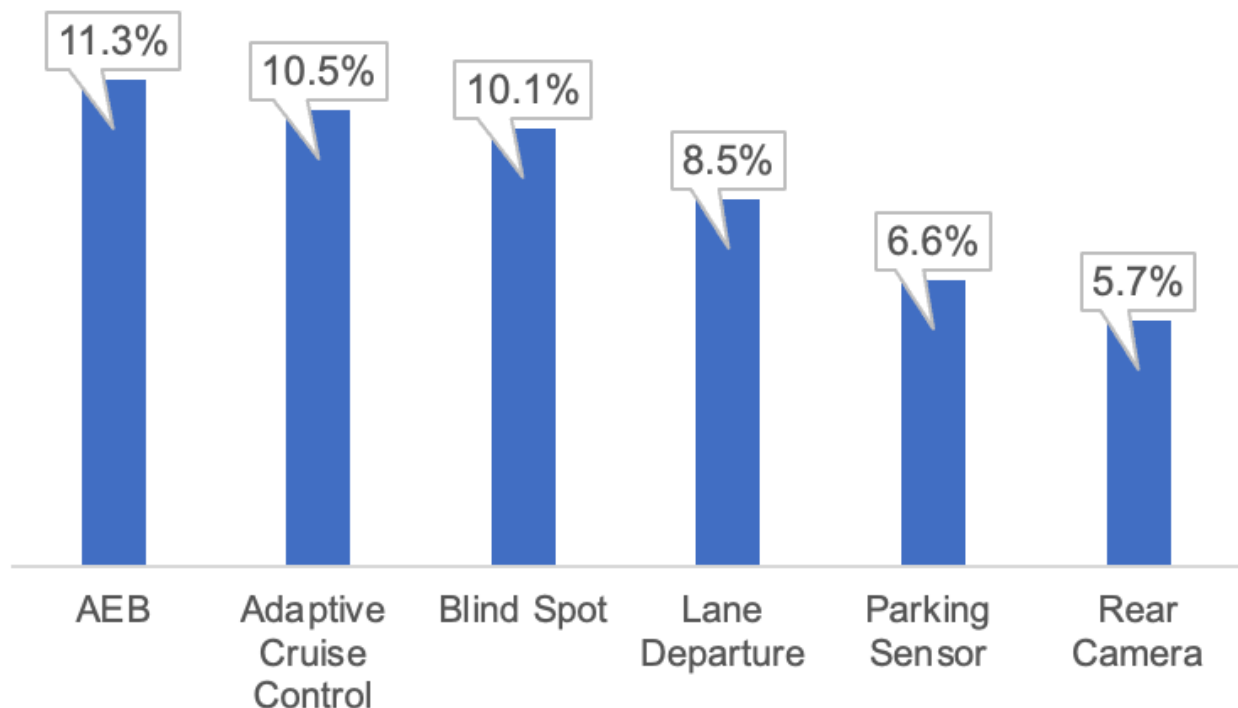


Contribution to Growth by System

There are really multiple S-curves as ADAS enters the aftermarket service bay: Collision and Mechanical segments and then the individual systems. At the system level, the later introduction of AEB, and then the agreement to make as standard equipment by the OEM's leads to AEB contributing to the greatest growth in the forecast period. While the rear camera system has been a NHTSA required feature since 2018 and most vehicles had them by 2016, the Automatic Emergency Braking requirement is not effective until 2029.

The bar chart of the addressable repaired systems shows AEB exhibiting the largest growth with a CAGR of 11.3% over the forecast period, versus the CAGR of 5.7% for backup cameras and an overall 6% CAGR for the collision segment.

CAGR BY SYSTEM

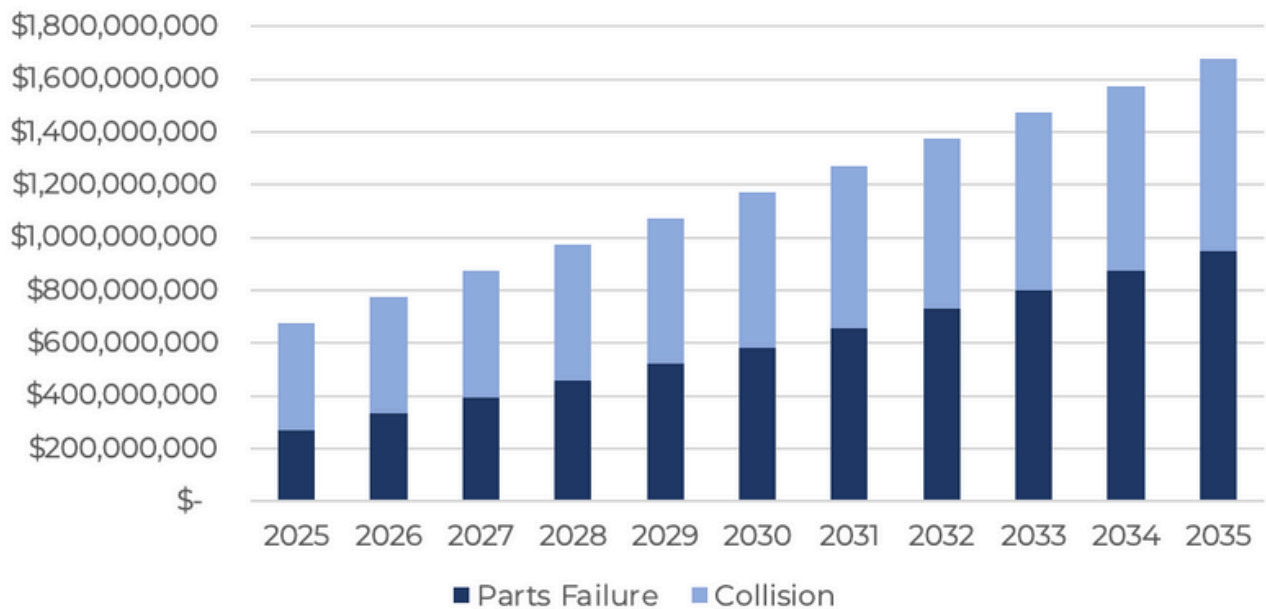


Mechanical Versus Collision Channels

While system introduction and radar technology have been driving the overwhelming ADAS service growth in the Collision Segment, during the forecast period the addressable market in Mechanical will exceed that of the Collision Segment.

The stacked bar chart below shows the higher growth in the Mechanical Segment - with a 13.5% CAGR over the forecast period, versus the 6% growth expected in the Collision Segment, with the absolute level of addressable activity crossing in 2031, as Mechanical becomes larger than collision on an absolute and addressable basis.

ADDRESSABLE MARKET BY MARKET SEGMENT



13.5%

CAGR of ADAS Parts to the Mechanical Segment over the forecast period

Calibration Activity Highly Correlated with Overall ADAS Growth

Calibration activity in the aftermarket has seen very strong growth, primarily driven again by the collision segment. Our calibration estimates DO NOT include calibrations performed after glass replacement. We exclude these from scope as a glass repair does not typically include an ADAS part replacement. In 2024 we estimate that just over 2 million calibrations were performed in aftermarket shops, predominantly in the collision space.

As ADAS-equipped vehicles increasingly exit their warranty period and find their way to aftermarket shops, we see very strong growth of calibration activity in the mechanical segment.

Static vs. Dynamic ADAS Calibrations

ADAS calibrations ensure that a vehicle's sensors, cameras, and radar systems function accurately to support critical safety features like lane-keeping assistance, adaptive cruise control, and collision warnings. Static calibrations are conducted in a controlled, stationary environment, typically within a shop.

This method involves setting up specific calibration targets, such as targets or patterns, in precise positions relative to the vehicle. Using specialized equipment, technicians align the sensors and cameras based on OEM specifications. Static calibration is often necessary when replacing a sensor or camera, performing windshield replacements, or making structural repairs that might alter the alignment or positioning of these systems.

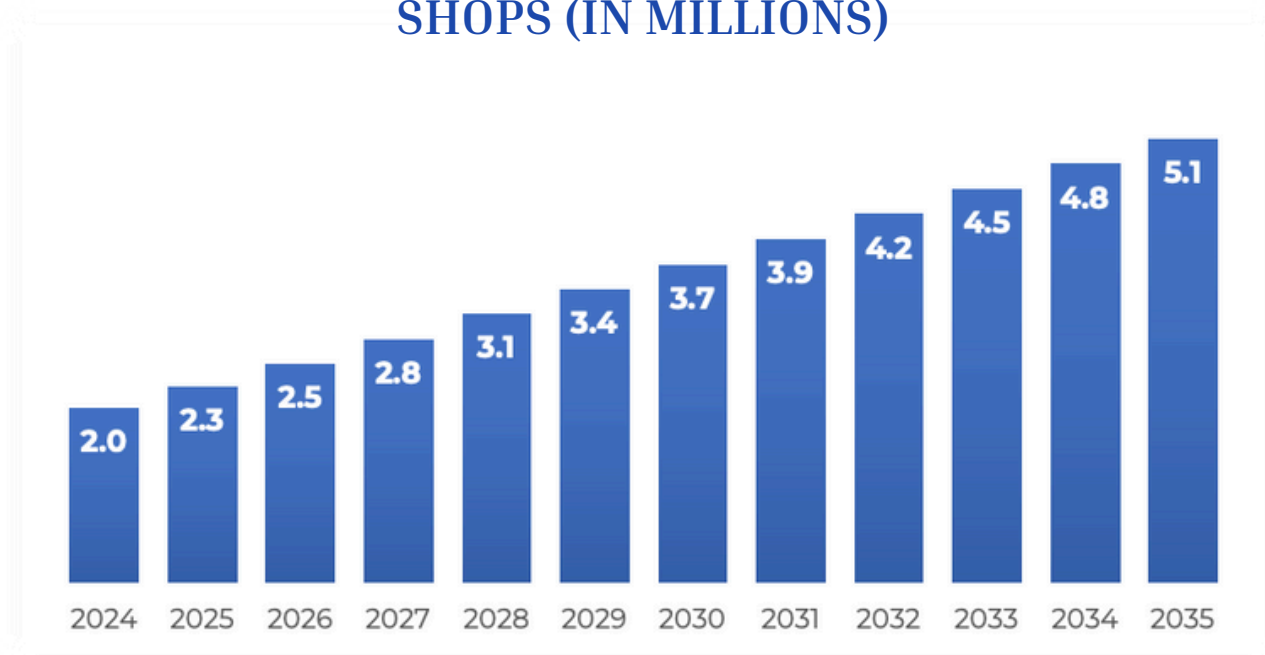
Dynamic calibrations, on the other hand, occur while the vehicle is in motion, typically on the road, to ensure the system can perform correctly under real-world conditions. During a dynamic calibration, technicians use a scan tool to initiate a calibration process while driving the vehicle at specific speeds and under particular environmental conditions as specified by the OEM. This approach allows the system to adjust to live inputs, such as varying road patterns, lighting, and surrounding traffic. The key difference between the two methods lies in their execution: static calibrations rely on fixed, shop-based setups, while dynamic calibrations adapt to operational scenarios during driving. Both processes are valuable to ensuring the accurate functionality of ADAS features, but the choice of method depends on the system being calibrated and the type of repair performed.

Forecast Calibration Activity

Calibration activity is highly correlated to parts replacement - especially in mechanical shops, and with a known correlation to parts replacement in collision shops. Thus, our forecast for calibration activity shows a similar CAGR to parts replacement activity over the forecast period, coming in at 9.8% for the forecast period.

The CAGR of calibration does outpace the overall growth of ADAS parts due to the increased mix of these safety systems. For example, a rear facing camera - which is part of our forecast model - rarely, if ever requires calibration, whereas radar systems commonly require calibration, even if the radar itself has not been replaced as part of the service activity.

CALIBRATION ACTIVITY IN AFTERMARKET SHOPS (IN MILLIONS)



9.8%

CAGR of calibrations performed in aftermarket shops for the forecast period

New Solutions and Business Models Have Emerged

The aftermarket has seen the emergence of new business models to solve the problems created in shops with the robust growth of ADAS-equipped vehicles requiring service. These solutions have come from both existing participants in the automotive aftermarket to completely new entrants and startups - making it the most dynamic and exciting portion of the service industry. There have been introductions and impacts in several areas:

Tools and Equipment

Calibration of ADAS systems requires several hardware and software elements. There are mats, targets, measurement devices and the software to actually perform the calibration on the vehicle. This software is most often operated as part of a diagnostic tool or directly from the OEM diagnostic software. These solutions have been provided primarily by existing entities in the tool and equipment space.

Mobile Technicians

Mobile techs have always been around, historically servicing those very difficult diagnostic cases in the Mechanical sector. The explosion of ADAS activity in the Collision shop has led to a material increase in the numbers of mobile technicians.

15 years ago, there were estimated to be 1,000 mobile technicians in the United States. Today the number is closer to 5,000. Mobile technicians were typically independent single-van business owners. Today, roll-up strategies and significant growth have led to large Collision MSOs, shop specialists and parts suppliers operating captive well-established mobile technician teams.

ADAS Mapping Software

These are solutions that help a shop identify the ADAS systems that are present on a vehicle, and the corresponding manufacturer's service requirements for that system.

Calibration Centers

Performing a static calibration often has a rather large space requirement - often beyond the capability of a shop. In addition to the tools, software and technicians required to perform the calibration, in the past many vehicles were simply sent to the dealer for the required calibrations. A number of service shops specializing in ADAS calibration have been opened to offer more timely and cost effective calibration services as an alternative to a dealer-performed calibration.

STEPS FORWARD



Keys to building a thriving Automotive Aftermarket

Many entities have engaged, many are thriving - but problems remain - and the solution is industry collaboration.

RECAP SINCE OUR ORIGINAL STUDY

Since the publication of the first ADAS Aftermarket Service Ecosystem in April 2022, the aftermarket has experienced the opportunity that we saw coming. The collision segment has continued to experience the change first as the “canary in the coal mine” of advanced technologies entering the aftermarket. For ADAS in the collision channel, the impact was more than other previous introductions of new technology, magnified due to the placement of expensive ADAS



ADAS components being located in commonly damaged areas of a vehicle - the bumper or front fascia.

The forecast of the original report was remarkably accurate, due to the complexity of the model to include factors such as vehicle scrappage, inflation, and the content of the vehicle parc by year for the full collection of ADAS technologies. Some adjustments upward were seen due to inflation being higher than our original models, partially offset by new vehicles sold being less than our original models. Our 2030 forecast for this model is within 3% of our original forecast, and we have now extended it to 2035.

ORIGINAL FORECAST REPORT

In our first report we called out three problems worth solving as shown in the excerpt from the original report. Considerable progress has been made, but much more needs to be done.

PROBLEMS WORTH SOLVING

| | | |
|--|--|--|
| | Problem #1 Cost of ADAS repairs | Cost of parts and equipment out of reach of most shops <ul style="list-style-type: none">• Only OEM parts available in many cases• Non-standard calibration processes |
| | Problem #2 Low Shop Competency in ADAS Services | A new and intimidating technology <ul style="list-style-type: none">• Not enough volume to bring the services in house• Requires high end diagnostic skillset to properly service |
| | Problem #3 Consumer usage of ADAS | Real life applications of ADAS tech is potentially troubling <ul style="list-style-type: none">• ADAS systems being deactivated• ADAS usage is causing drivers to drive in a less safe manner |

PROBLEM #1: COST OF ADAS REPAIRS



This remains a thorny problem in the aftermarket, and it is beginning to produce second order effects due to the average collision claim costs rising considerably faster than GDP. This is part of the explanation for the volume of claims reduced approaching 10% in 2024 versus 2023. The fundamental areas of cost are the tooling and software, as well as the components themselves. This is seen in the “Claims Severity” data - the average cost of a collision repair is rising simply due to the presence of ADAS systems on vehicles and the cost to service them. The industry has struggled to standardize the equipment necessary for performing calibrations, and aftermarket alternatives for most ADAS components remain unavailable when these systems are damaged or require replacement.

PROBLEM #2: LOW SHOP COMPETENCY ON ADAS REPAIRS



Considerable progress has been made in this area. Our original recommendation of “Initiatives aimed at informing, training, and certifying the Aftermarket shop and technician on ADAS services to increase the adoption curve and keep business in the Aftermarket shop” has seen ASE create a certification for ADAS services, I-CAR now has a deep category dealing with ADAS, and most major training providers now offer courses dealing with ADAS. Lastly, MEMA members have collaborated to launch the Tech Training Hub by MEMA and the establishment of a new Training Council to continue to explore collaborative actions to further the state of readiness by the aftermarket shop to service ADAS-equipped vehicles.

As the growth in ADAS services transitions from the collision sector to the mechanical one, technicians and shops can learn from the lessons of the collision space to adapt to engaging with the service opportunity represented by ADAS systems.

PROBLEM #3: CONSUMER USAGE OF ADAS - HAS EVOLVED TO “READINESS OF ADAS SYSTEMS TO DELIVER SAFETY BENEFITS”



The original consumer adoption problem has moderated but has been replaced by a larger concern of the readiness of the systems that are on the road to deliver the designed safety benefits. **There is a working hypothesis that a portion of the vehicles on the road do not have properly functioning ADAS systems.** Key industry stakeholders have begun discussions about a possible strategy to deal with this potentially growing problem, but there is not a clear path forward on this topic. The problem is compounded by a lack of “readiness” monitoring by the vehicle of these systems. There is no warning light in a vehicle to suggest a concern that needs to be addressed, as there are with other safety systems such as ABS and Airbag systems.

We have concluded and recommend

Industry initiate action from several perspectives and possibilities for value creation for the Automotive Aftermarket stakeholders:

- Methodology to prohibit deactivation of ADAS safety systems
- In-vehicle notification of ADAS malfunction
- Field work to identify magnitude
- Vehicle inspection and regulations to ensure that vehicle users, whatever the vehicle age or owner’s income group, can operate as a safe vehicle.

Data is needed

A logical first step in addressing the issue of inoperative ADAS has been taken by identifying key stakeholders and achieving consensus on the nature of the problem. Before developing an effective strategy to move forward, it will be necessary to validate and quantify the problem through fieldwork.

Our model focuses on addressable service opportunities but the real question is whether consumers will elect to repair failed or inoperable systems. The question of the consumer electing to repair is vital for the industry to consider and answer.

Advanced Driver Assistance Systems (ADAS) can fail in two primary ways: physical damage or misalignment, and electronic component failure. Physical damage or misalignment often occurs due to external impacts, such as collisions, potholes, or routine wear and tear. For example, a minor fender-bender or a hard pothole hit can cause misalignment of sensors or cameras, rendering them inaccurate or ineffective. These failures may not trigger warning lights, leaving drivers unaware that the systems designed to assist them are compromised.

As a result, the vehicle's safety performance is diminished, increasing the risk of accidents due to impaired functionality of features such as automatic emergency braking or lane-keeping assistance.

Electronic component failure, on the other hand, arises as a normal part of a vehicle's lifecycle. Sensors, cameras, and control modules may degrade over time due to heat, vibration, or electronic wear-out. These failures often occur silently, without any overt indication to the driver. Since these systems are critical for enhancing driver safety, their unnoticed failure undermines the intended benefits of ADAS technology. Conducting field research to determine how many vehicles have inoperative ADAS systems is essential for understanding the scope of the issue and identifying patterns of failure. This data can improve system reliability, inform maintenance practices, and potentially influence regulatory standards to ensure drivers receive the safety benefits ADAS was designed to provide.

Suggested Action Plan

01 Readiness Study

How many vehicles are not in a state to deliver their designed safety benefits?

02 Quantification

What are the potential consequences of these vehicles not being in a state of readiness, such as preventable collisions, injuries, and even fatalities? Additionally, what are the economic costs associated with this issue, including damages and other financial repercussions?

03 Position Article

Author a position paper referencing current state of ADAS readiness in the vehicle parc, articulating the economic damages that are accruing from this problem, and the injuries and lives potentially lost due to this problem.

From this information, an appropriate strategy for collaborating across industry stakeholders is likely necessary to optimize the approach, and to afford and implement these recommendations.



The adaptability of the Automotive Aftermarket plays out again

A discussion with the research authors reveals
insight into what's next.

It's only been three years since the release of the first study, yet the perspective of servicing ADAS in the Aftermarket has changed.

Matt Ballard: Yes, the change has been profound and really at unprecedented speed. The Collision shop has been forced to adapt to the new tools and repair processes very quickly. This is a repeat of the introduction of other technologies such as computer controlled systems, anti-lock braking and airbags, but because ADAS is so fundamental to a safer driving experience - these complex systems often need expensive service procedures to place them into operation as they were designed.

Jim Fish: In our first study we described it as "J2534 on steroids" as a useful analogy. J2534 is a collection of communication protocols that is today used for reprogramming electronic modules on a vehicle. The analogy

was helpful to ADAS in that it required an investment in tools and software to place a vehicle in its designed operating state. ADAS is so much more. The equipment costs tens of thousands, and the expertise to service these systems is often beyond the current capabilities of the average repair shop.

Matt Ballard: The Collision industry has adapted in several ways. Many of the larger players have their own captive teams of HUNDREDS of mobile technicians for attending to the service requirements of an ADAS system on a vehicle.

Jim Fish: Our forecast now calls for growth in the Mechanical space to exceed that of the Collision segment, leading to more ADAS service activity happening in Mechanical than Collision by 2031. There will be no looking back from there.

‘Our forecast now calls for growth in the Mechanical space to exceed that of the Collision segment, leading to more ADAS service activity happening in Mechanical than Collision by 2031.’

Matt Ballard: Yes that's true, but embracing the service opportunity will look much different in the Mechanical shop than in the Collision space. First of all, MSOs really dominate the Collision repair addressable market. The larger ones have created their own captive mobile technician teams to tackle ADAS as it arrives in a Collision repair shop.

Jim Fish: One of the larger technician organizations is actually part of the leading parts distributor. That's a remarkable strategy that is directly resultant from complex vehicles in the parc.

Matt Ballard: Yes, although in Collision a pre and post scan is now a normal part of the workflow, ADAS identification and then calibration are so much more. Thus the need for a dedicated team that isn't based in the shop.

Jim Fish: There are also ADAS calibration centers opening. The future of this business model is in the process of validation, but the concept is a separate location for calibration as an alternative to an OEM dealership. Performing static calibrations takes considerable space, and most shops just don't have the room for this activity.

Jim Fish: I expect the Mechanical embrace of ADAS services to look a bit different. The capital intensity at a Mechanical shop is at a different level than a Collision shop. As the volume arrives, they will be quite comfortable with the investment required to keep ADAS services in house. They may start with remote services or a mobile technician - but these shops already have multiple aftermarket diagnostic tools and with the Right to Repair continuing to mature, these shops are also increasingly handling reprogramming. ADAS is indeed the next big opportunity for them, and the shops I've spoken to are eager to engage.

Matt Ballard: Technology has a very long tail of introduction in Mechanical. As an example, they still see pre-OBD2 vehicles in these shops (1995 model year or earlier) and they need to dust off their old diagnostic tools to service these vehicles.

Jim Fish: But in the out years of our forecast, it will be a large growth rate for the next 20 years - just like J2534 utilization and reprogramming has been as we've mentioned previously in our original study.

‘This isn’t just one classic S-curve of adoption, but rather multiple curves. You have an S-curve for each system, whether is AEB, Lane Change Assist, or other. Then, you have the differently timed curves of the Mechanical and Collision sectors.’

Matt Ballard: Collision sees the newest vehicles literally the day they are introduced. It takes several years for these technologies to approach the “sweet spot” of aftermarket Mechanical service.

Jim Fish: As you built the proprietary MEMA forecasting model, how would you describe what is happening with ADAS entering the car parc?

Matt Ballard: Well, the title of our report is “Navigating the curve of ADAS Adoption”, and what is really happening is this isn’t just one classic S-curve of adoption, but rather multiple curves. You have an S-curve for each system, whether is AEB, Lane Change Assist, or other. Then, you have the differently timed curves of the Mechanical and Collision sectors.

Jim Fish: So the total sums of to a “flatter” curve, but still multiples of

expected growth in the overall service aftermarket.

Matt Ballard: That’s correct. While Collision has seen incredible ADAS repair growth - the Collision CAGR over the 10 year forecast is 6%, still very strong growth, but the Mechanical sector will experience a 13.5% CAGR. You see differing growth rates for the differing technologies as well. AEB leads the growth, coming in at over 11% CAGR, while rear facing cameras check in at under 5% CAGR.

Jim Fish: The next decade is going to be very interesting in the Mechanical shop. As these shops are typically much more capable with complex diagnostic processes, we anticipate shops will adopt this service technology as volumes improve and make every effort to keep the work in the shop - similar to the way J2534 played out, to reuse that analogy.

Jim Fish: Switching gears to the problems worth solving. There still isn't widely available aftermarket alternatives for many of the ADAS components. This makes safe, affordable repairs challenging for some consumers. However, MEMA has made progress on the shop competency front with a MEMA member collaborative effort that has yielded the Tech Training Hub by MEMA - an "Expedia" for automotive training.

Matt Ballard: The third problem we identified in our first study was the consumer usage of ADAS. Mostly deactivating the system. That problem has really moderated as consumers have become more comfortable with the technology.

Jim Fish: The problem has really evolved. As these systems age in the

parc, there is increasing chance that they either reach their end of life and fail, or they become damaged and don't work as intended. The question is, how big is this problem?

Matt Ballard: Exactly. But at this point it is really an unknown. The industry needs to work together to validate the size of this problem, then determine the best way to solve the what could be a contributor to unnecessary accidents and injuries that would occur when an ADAS system doesn't deliver the safety benefits for which it was designed.

Jim Fish: Absolutely, that's really our primary recommendation at the end of the study - get the key industry stakeholders together and find a way to validate and quantify what is happening out there on the roads.

As these systems age in the parc, there is increasing chance that they either reach their end of life and fail, or they become damaged and don't work as intended. The question is, how big is this problem?

Jim Fish is a Professor at the University of Michigan, the President of Diagnostic Network and a Technology Advisor to MEMA and a Venture Capitalist. **Matt Ballard** is a Technology Advisor to Fortune 500 entities and has more than 30 years of IT and Mobility experience.

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