ADAS

Skilled Labor Shortage in Auto Collision Industry Poses Motorist Safety Risk

July 2025

Presented by UNF UNIVERSITY of NORTH FLORIDA

SKILLED LABOR SHORTAGE IN AUTO COLLISION INDUSTRY POSES MOTORIST SAFETY RISK

Contributors:

Dr. Pingying Zhang & Dr. Debbie Wang

University of North Florida, Jacksonville, FL

July 2025

Table of Contents

EXECUTIVE SUMMARY

Advanced Driver Assistance Systems (ADAS) improve vehicle safety by minimizing human error and helping to prevent accidents. However, they also pose significant challenges, particularly high repair costs and the technical complexities of post-accident calibration (AAA, December, 2023). This calibration process, which requires the precise alignment and testing of cameras and sensors, is often not well understood by businesses or consumers (Mueller, et al., 2024). As a result, safety concerns have emerged alongside the rapid adoption of ADAS technologies in modern vehicles, tempering the otherwise optimistic outlook for their widespread integration (Mema, October, 2024).

A key contributor to this knowledge gap is the rapid pace of technological advancement, which demands that technicians continually update their skills to keep up with evolving ADAS systems. Compounding the issue is the high degree of brand and model segmentation driven by proprietary technologies, which has increased the need for specialized and OEM-specific training and is further constrained by the shrinking pool of qualified technicians. These factors underscore the need for rigorous research into the ADAS workforce in the auto collision repair market.

An Insurance Institute for Highway Safety (IIHS) study in 2024 on consumer experiences with crash avoidance feature repairs surveyed nearly 500 vehicle owners and found that fewer than half were aware of the high cost associated with ADAS calibration (Mueller, et al., 2024). More importantly, approximately 50% reported post-calibration issues, particularly in areas such as front crash prevention, blind spot detection, and camera systems, regardless of whether the work was performed at independent shops or dealerships. These findings point to a shortage of adequately trained ADAS technicians, contributing to motorist safety issues and increasing consumer dissatisfaction.

The growing concerns around the specialized nature of ADAS services have prompted the development of this study, which examines the current demand for ADAS technicians in vehicle repairs that involve ADAS-related services. The survey-based methodology was used for the study, with survey data collection carried out in two key steps: First, businesses classified under Standard Industrial Classification (SIC) code 753201, representing collision repair and painting service providers across the United States, were identified. From this group, a sample of 5,000 businesses was compiled. Second, a professional survey firm was contracted to conduct phone interviews,

resulting in 304 completed responses. These responses form the foundation of the analysis presented in this report.

Key Findings of the Study

1. The auto collision repair providers are dominated by small, single location operations.

The survey data revealed that nearly half of the shops surveyed are independently owned, single-location operations. Among these, 64% employ five or fewer technicians, while 26% have between six and ten technicians on staff.

2. ADAS skills proficiency remains limited across the auto repair industry.

ADAS technologies have introduced substantial brand-specific complexity, driven largely by differences among original equipment manufacturers (OEMs). Notably, 70% of surveyed firms reported that it is not possible for a single technician to effectively service ADAS systems across 30 different vehicle brands, a range that reflects the diversity of the U.S. automotive market.

Despite the growing importance of ADAS technologies, only 72 out of the 304 businesses surveyed reported having dedicated ADAS technicians. Of these, 42 businesses indicated that their technicians had received formal training from original equipment manufacturers (OEMs), including 14 from small operations. The remaining 30 businesses—also, including 14 small operations, relied on informal training methods.

The findings highlight not only the limited presence of specialized ADAS personnel, but also the lack of access to formal, brand-specific training, particularly in smaller operations.

3. Pre/post scans and ADAS calibrations follow two distinctive operational approaches.

The study found that pre/post scans and ADAS calibrations are typically managed through different service delivery approaches. Pre/post scans are generally performed by in-house technicians, while ADAS calibrations are more often outsourced to third-party providers.

This division reflects the varying levels of in-house capability and investment in ADAS-related equipment, where calibration often requires specialized tools/software, controlled environments, and brand-specific knowledge.

4. Difficulty in Finding Skilled ADAS Technicians Highlights Workforce Gap

The study results highlight a pronounced shortage of qualified technicians with the expertise required for ADAS calibration. Of the 304 respondents, only 81 reported no difficulty; however, they represent a minority in the industry. About one-third (105 respondents) indicated that recruitment and retention are challenging. The remaining 118 respondents reported relying on subletting to make up for the lack of in-house expertise. These findings further highlight the widespread shortage of ADAS-trained technicians. To bridge this gap, subletting appears to be a common solution.

5. The quality of outsourcing ADAS calibrations remains unknown.

Due to the shortage of in-house ADAS calibration expertise, many auto repair shops depend on external vendors for the needed calibration service. While outsourcing is a common practice, especially among small operations, this study does not evaluate the quality, consistency, or accuracy of subcontracted ADAS calibration or that brand specific services are being carried out.

As ADAS systems continue to be added to the fleet of vehicles, further research is needed to assess the reliability and safety implications of outsourcing ADAS calibrations services.

INTRODUCTION

Advanced Driver Assistance Systems (ADAS) are designed to support safe vehicle operation by reducing human error and preventing accidents. While ADAS technologies offer substantial safety benefits by significantly lowering the risk of collisions, they also introduce major challenges, particularly related to high repair costs and the technical demands of post-accident calibration (AAA, December, 2023).

One of the most time-consuming aspects of ADAS repair is calibration—the precise alignment, testing, and electronic aiming of sensors that collect critical vehicle data. When a vehicle undergoes repairs in areas where ADAS sensors or cameras are located, calibration is often necessary as part of the repair process to ensure these safety features have been restored, even if the features themselves are not damaged. This leads to further confusion with repairers, consumers, and insurers about the need for additional labor or parts, not directly related to physical damage, required to complete a safe repair, i.e., the ADAS calibration (Mueller et al., 2024).

According to the 2023 Report (AAA, December 2023), a key factor in reducing insurance claims and improving repair shop profitability is enhancing the efficiency and quality of ADAS calibration. At the core of this challenge lies technical proficiency. Skilled technicians can significantly reduce turnaround times and associated costs. However, many repairers report that instructions from vehicle manufacturers are often lengthy, difficult to interpret, or lacking in clarity. The rapidly evolving technological landscape, marked by thousands of interconnected electronic components, acts as a double-edged sword. On one hand, technological advancements have significantly improved driving safety and convenience. On the other hand, they have also made vehicle repairs increasingly complex. Frequent updates to ADAS systems make it difficult for technicians to locate and apply the correct repair procedures. This leads to inevitable delays, higher labor costs, inconsistent repair quality, and challenges in justifying these expenses to insurers and customers.

A further complication stems from the fragmented nature of the ADAS landscape, which includes over 30 OEMs and 270 vehicle models in the U.S. alone. This makes cross-brand calibration expertise a major challenge, and perhaps opportunity. OEMs often treat calibration specifications as proprietary, making it difficult to develop consistent standards across the industry.

PROBLEM DESCRIPTION

This study examines how automobile collision repair shops manage ADAS diagnostics and calibration, an increasingly critical component of modern vehicle repair. A lack of transparency has led to significant information asymmetry between repair professionals and consumers, often resulting in confusion, inconsistent service quality, and diminished trust (AAA, December 2023; Mema, October, 2024; Mueller et al., 2024). Building on prior research, this study aims to provide insights into current ADAS workforce shortages and industry practices related to ADAS services offered by collision repair shops.

FINDINGS OF THE STUDY

Survey Method

This study employed a survey method conducted in three stages: (1) defining the target market, (2) developing the survey questionnaire, and (3) collecting survey responses.

The target population consisted of firms specializing in automobile body repair and painting, identified using the Standard Industrial Classification (SIC) code 753201. These businesses typically repair vehicle bodies, fix dents, replace panels, and offer painting services following collisions or other types of damage. They often operate under names such as Auto Body Repair Shops, Collision Repair Centers, Paint and Body Shops, or Dent Repair Services.

A random sample of 5,000 shops was acquired from Data Axle USA. Shops were selected based on the following criteria: a primary industry classification of SIC 753201, a complete business profile (including a postal address or phone number), and operation by an owner or manager. The sample was further structured to reflect the distribution of business categories within the industry—approximately 50% independent shops, 20% national multi-shop operators (MSOs), and the remainder consisting of franchises, dealer body shops, and regional MSOs.

Survey administration was conducted with the assistance of TenPoint Complete, a U.S.-based firm specializing in customer satisfaction measurement and consumer research. TenPoint Complete collaborated in developing the survey questionnaire, which focused on understanding the current state of the collision repair market, particularly with respect to ADAS calibration. The final survey consisted of eleven questions (see Appendix for survey details).

To collect responses, TenPoint Complete conducted phone interviews with firms from the purchased list, yielding 304 usable responses. The distribution of business categories among these responses closely mirrored that of the broader automobile body repair and painting market, as detailed in the following section. Consequently, the 304 responses are considered representative of the market. Each interview took approximately six minutes to complete the eleven-question survey, the respondents were either managers or shop owners.

Analysis and Results

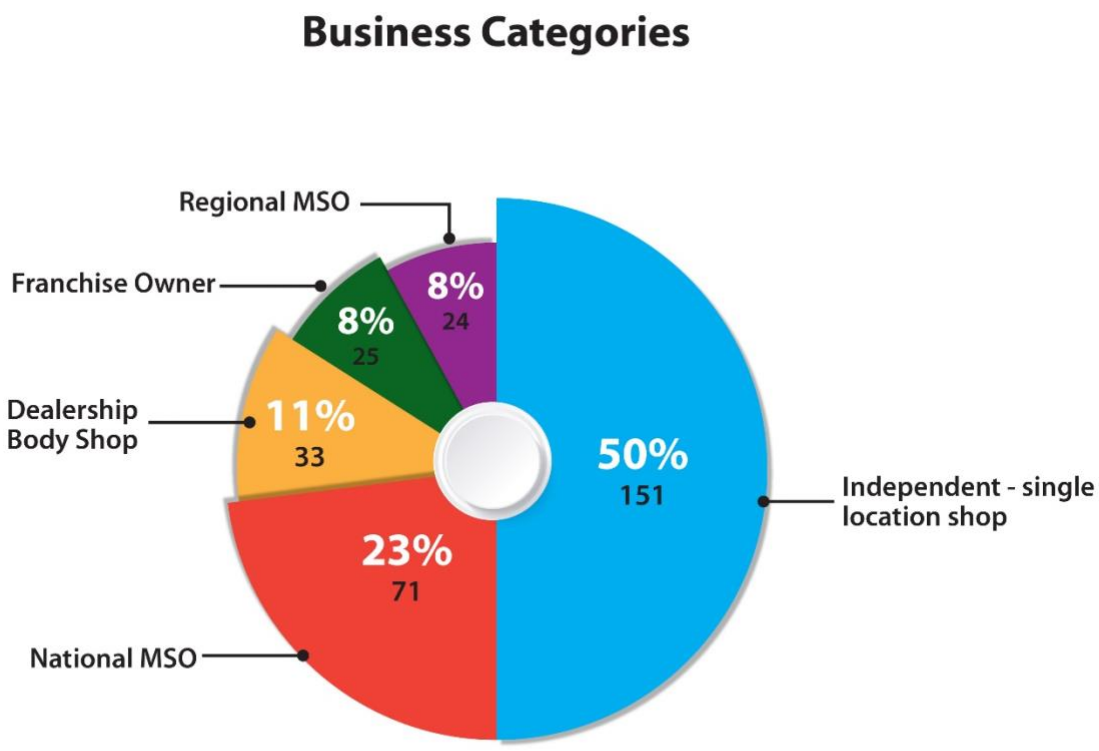
The report presents findings using a variety of visual tools, including pie charts, bar graphs, tables, and relationship maps. It is organized into four key sections: shop characteristics, ADAS workforce, approaches to ADAS services, and factors associated with the provision of ADAS services.

The features of shops

The survey data highlights two key aspects of the participating shops: the business categories they operate in (Pie Chart 1) and the general state of their technical staffing (Pie Chart 2).

The business categories reflect common business structures in this market, including independent single-location shops, national MSOs (multi-shop operators with locations across the country), regional MSOs (multi-shop operators within a specific region), franchise operations, and dealership body shops. As shown in Pie Chart 1, nearly half of the respondents (n = 151, or 49.7%) are independent single-location shops. These are followed by national MSOs (n = 71, or 23.4%). The remaining respondents include dealership body shops, franchise businesses, and regional MSOs—the latter forming the smallest group, with approximately 24 shops. Overall, this distribution closely aligns with the broader make-up of the automotive collision repair industry.

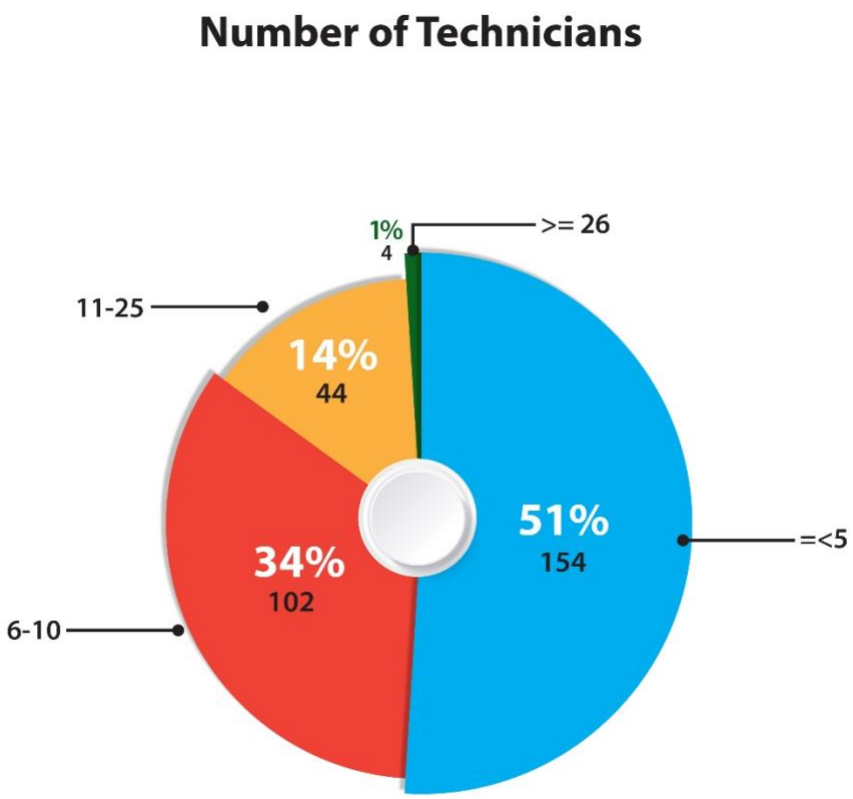
Pie Chart 1: Business Categories



Consistent with the data in Pie Chart 1, Pie Chart 2 shows that most businesses have a technician staffing pool of five or fewer (n = 154, or 50.7%). The next largest group comprises shops employing

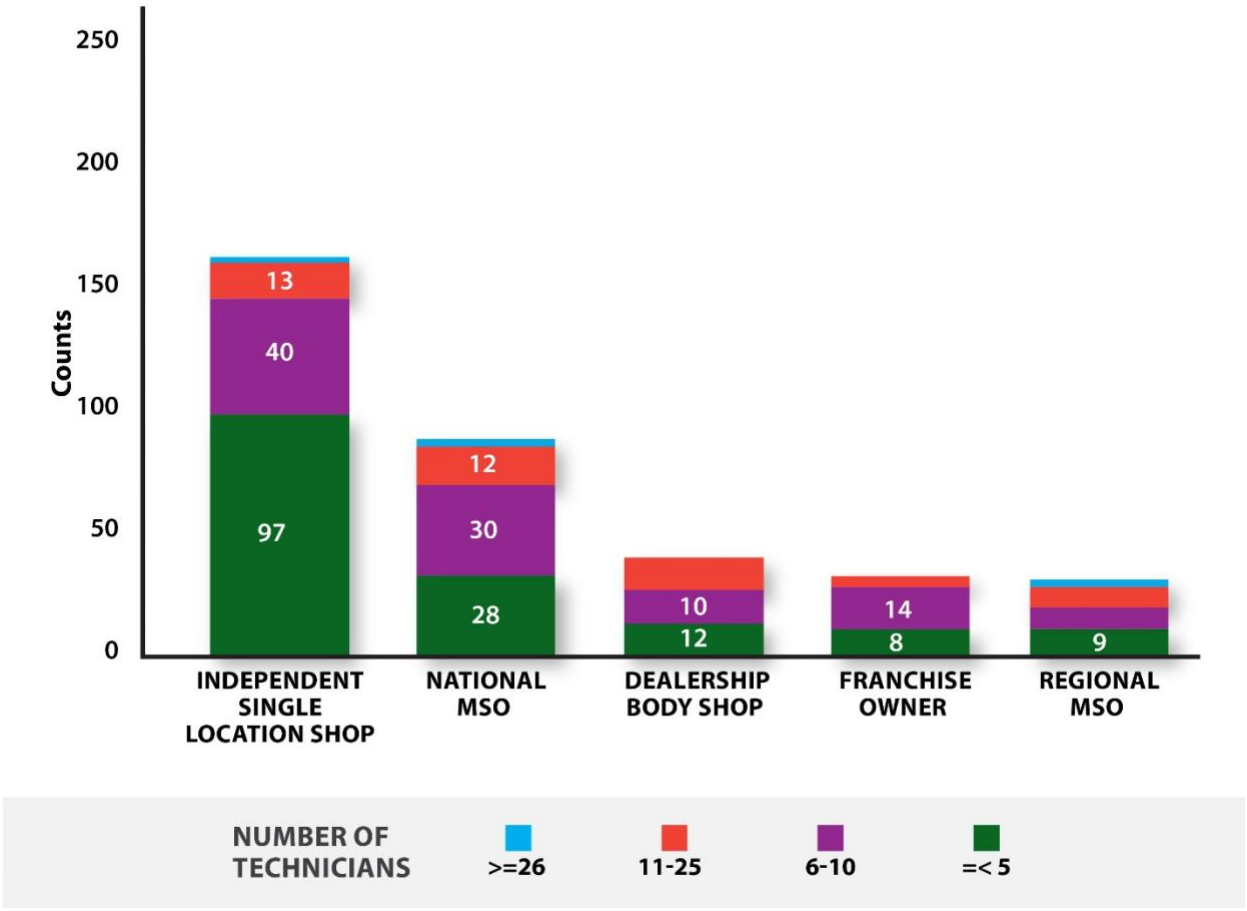
six to ten technicians. Forty-four businesses reported staffing between eleven and twenty-five technicians, while only four businesses reported employing more than twenty-six technicians.

Pie Chart 2: Technician Staffing Levels



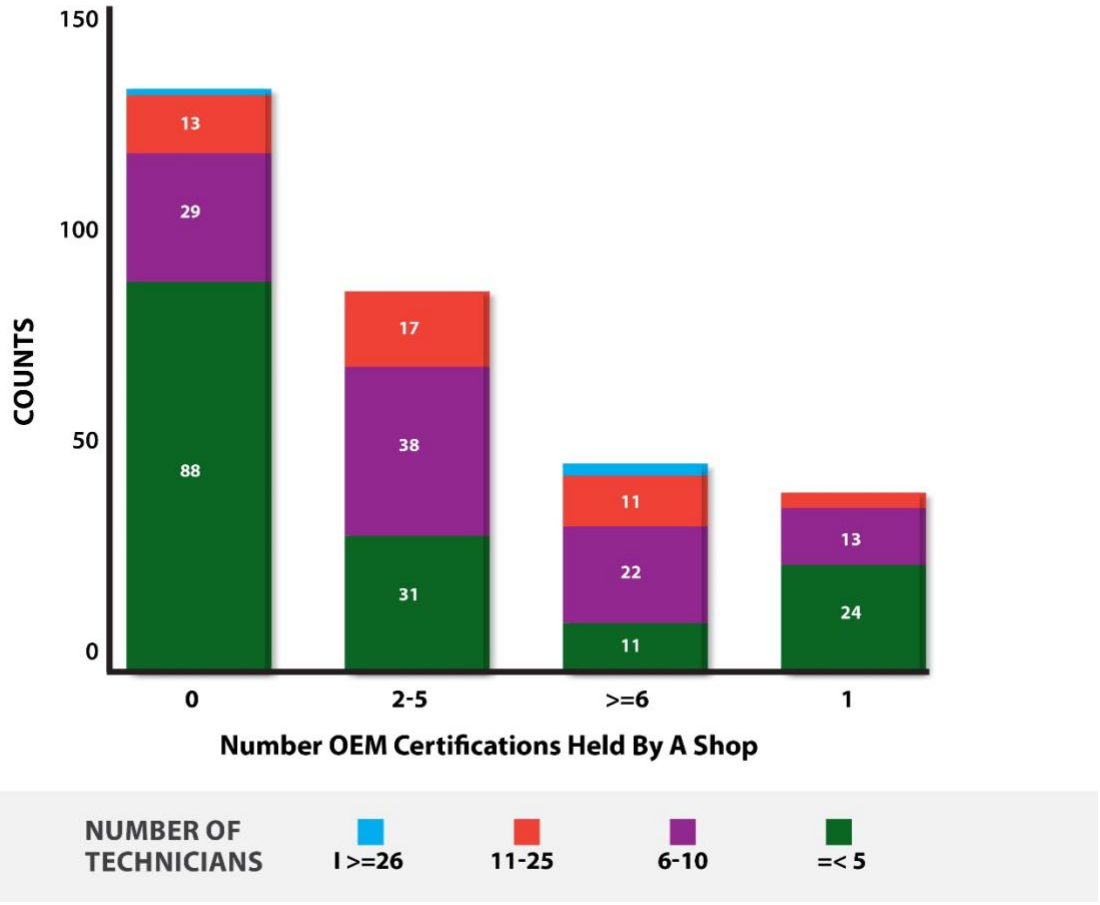
Bar Chart 1 reveals a clear pattern in technician staffing levels across different business categories. Among the 151 independent, single-location businesses, 64% (n = 97) are small operations employing five or fewer technicians, with the next most common staffing level ranging from six to ten technicians. This trend is consistent across other business categories as well, indicating that the sample market is predominantly composed of small-scale operations, many of which are independently owned and operated from a single location.

Bar Chart 1: Distribution of Technician Staffing Across Business Categories



To ensure service quality, many repair shops seek certifications from original equipment manufacturers (OEMs), with some obtaining multiple certifications. This study classifies businesses into four categories based on their OEM certification levels: one certification, two to five certifications, and six or more certifications. Bar Chart 2 illustrates the distribution of these certifications in relation to technician staffing levels. The chart shows that nearly 130 businesses, approximately 47% of those surveyed, do not hold any OEM certifications, and among these, 88 are small operations employing five or fewer technicians.

Bar Chart 2: Technician Staffing Levels Across OEM Certification Groups

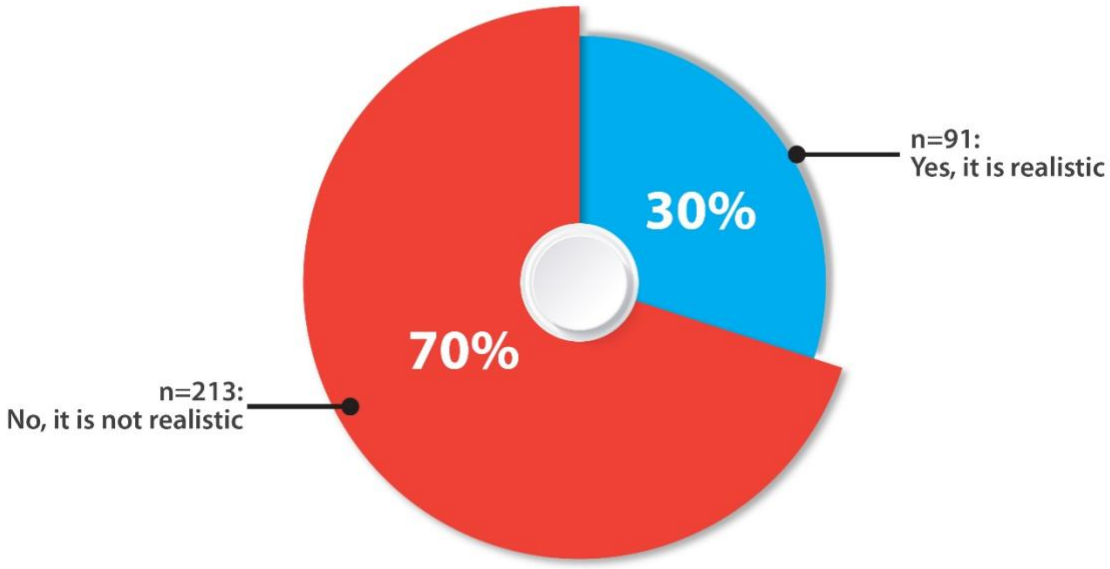


In summary, most businesses in the vehicle collision repair market are small-scale single-location operations, typically defined by limited technician staffing, and the absence of OEM certification.

Overview of ADAS Technician Workforce

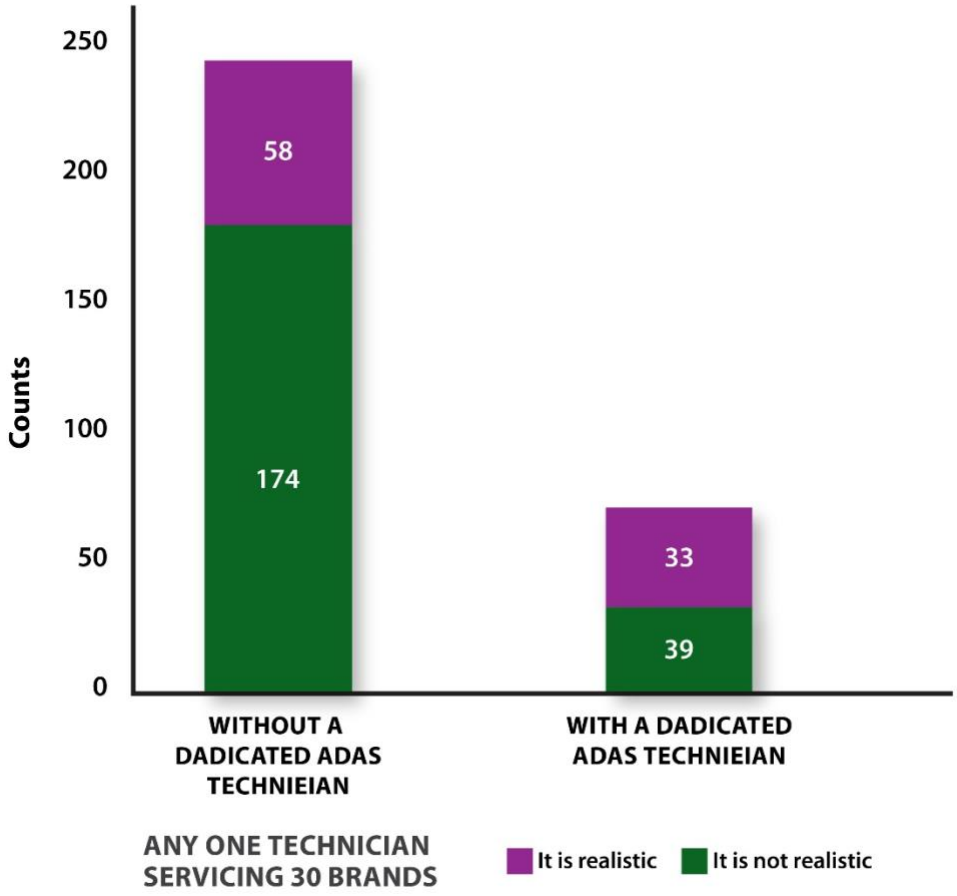
Technicians who specialize in ADAS represent a distinct subgroup within the industry, focusing on diagnostics and repairs related to these complex systems. To better assess technician capabilities in the auto collision repair market, respondents were first asked whether any technician—ADAS specialist or not—could realistically service ADAS systems across 30 different vehicle brands, which is a typical range in the U.S. collision repair industry. While 72 respondents believed this was feasible, the vast majority—232, disagreed (see Pie Chart 3).

Pie Chart 3: Perception of Any One Technician Servicing 30 Brands



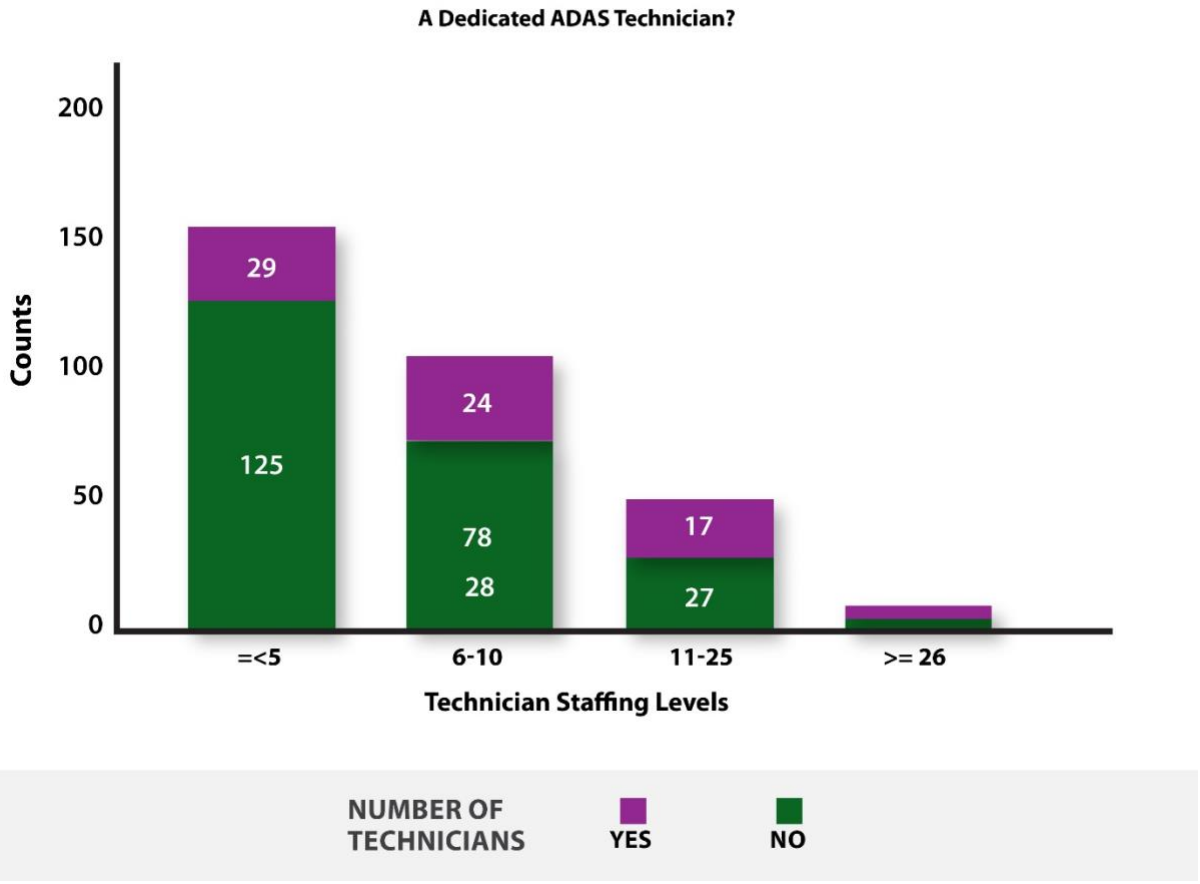
Bar Chart 3 provides additional context by comparing perceptions based on whether a shop employs a dedicated ADAS technician. Notably, 39 shops with an ADAS specialist and 174 without one believe it is unrealistic for a single technician to handle ADAS systems across 30 different vehicle brands. This underscores both the complexity of ADAS work and the specialized, brand-specific expertise it often demands.

Bar Chart 3: Complexity and Specificity of ADAS



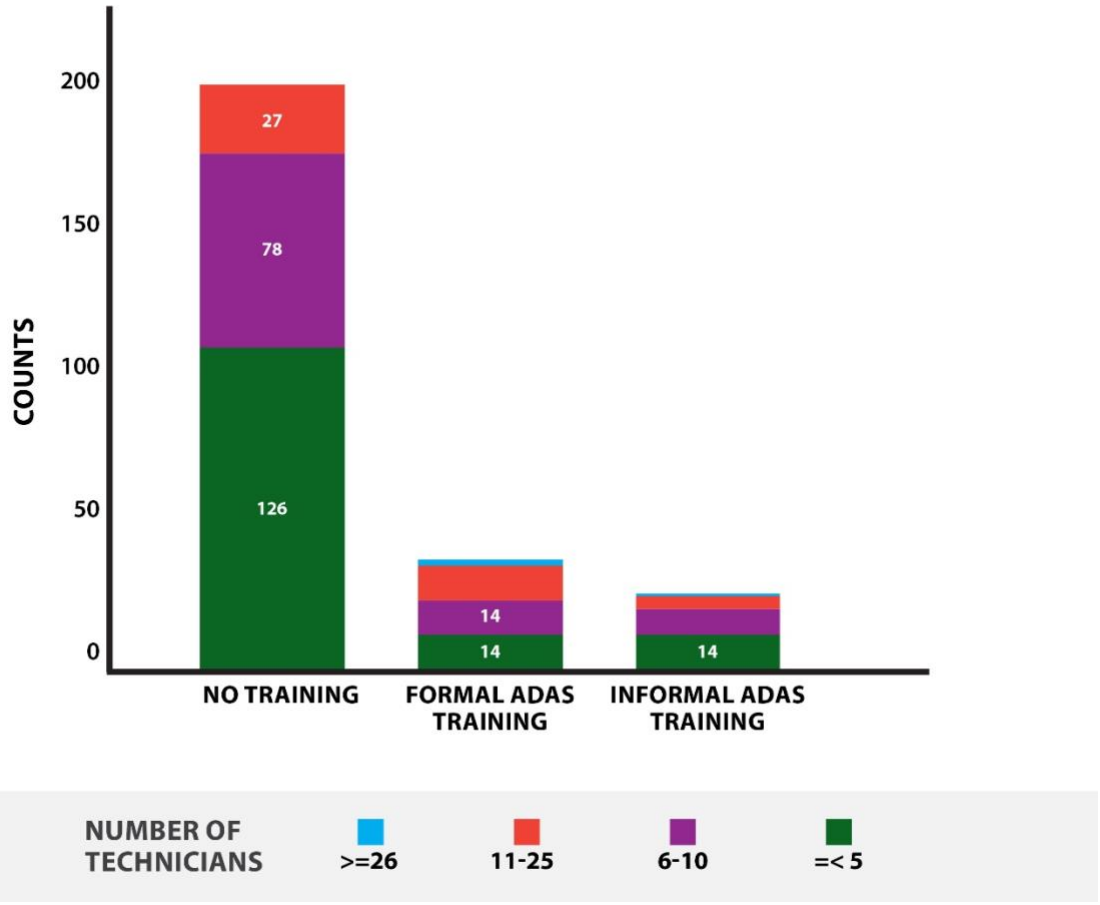
Bar Chart 4 examines the staffing differences across the two groups with or without a dedicated ADAS technician. The data shows that 125 of the businesses with small operations of five or fewer technicians do not have a dedicated ADAS specialist.

Bar Chart 4: Comparing Technician Staffing With vs. Without ADAS Specialist



The study also assessed the level of training among ADAS technicians. Training types included formal instruction from original equipment manufacturers (OEMs), informal on-the-job learning, or no training at all. Out of 304 businesses surveyed, only 72 reported employing technicians with some training. Of those, 40 had technicians who received formal OEM training, while 32 relied on informal training methods. This data is further analyzed alongside technician staffing levels in Bar Chart 5, which shows that only 14 businesses with OEM-trained specialists were small operations employing five or fewer technicians. Overall, the findings indicate that formal, and even informal, training for ADAS technicians remains uncommon in the auto repair and paint industry.

Bar Chart 5: Comparing Technician Staffing Across Training Levels

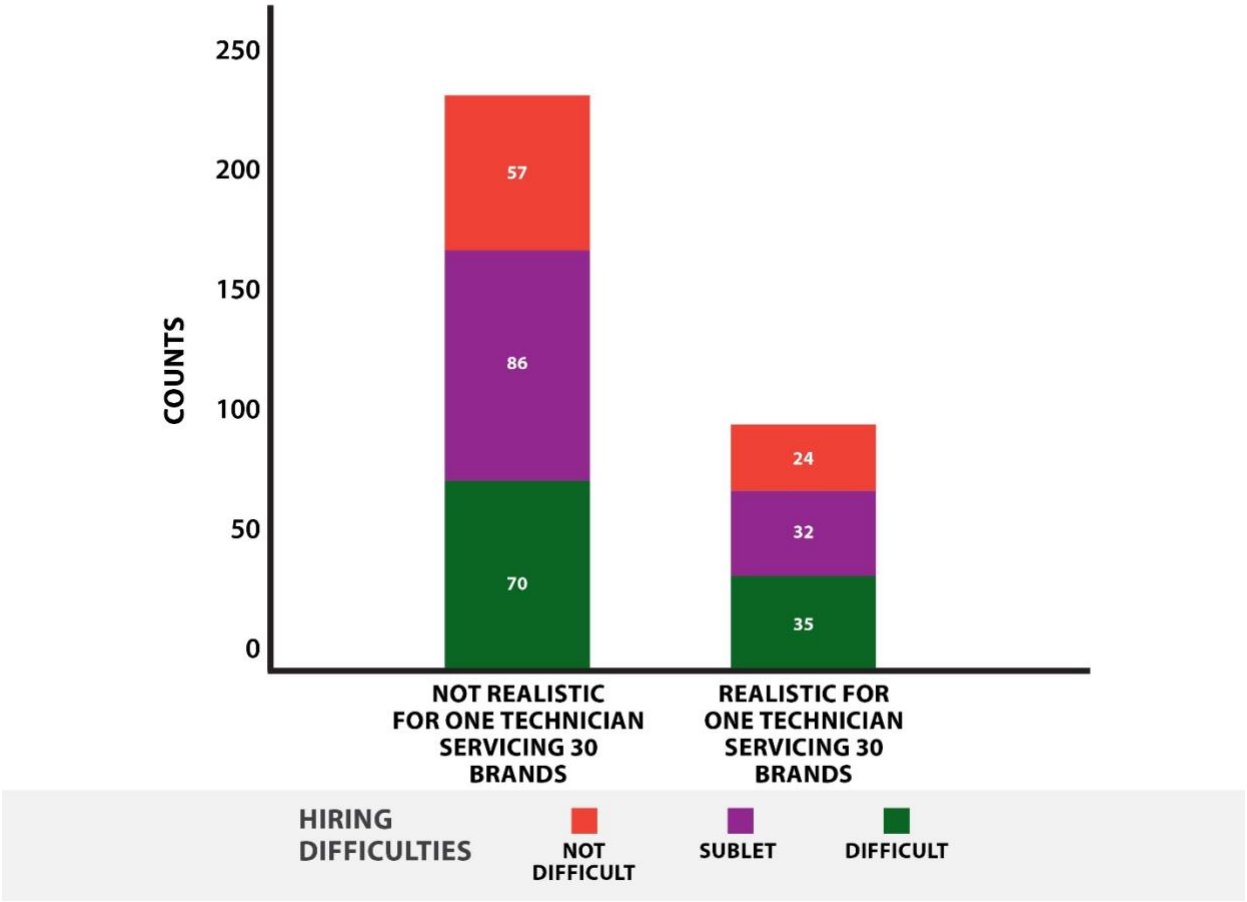


Given the evident lack of specialized ADAS technicians, survey respondents were asked to share their views on the difficulty of finding and retaining such specialists. Of the 304 respondents, only 81 reported no difficulty, suggesting they can hire qualified ADAS technicians when needed—though they represent a minority in the industry. About one-third (105 respondents) indicated that recruitment and retention are challenging. While they did not elaborate on how they address these challenges, it is reasonable to infer that overcoming them requires significant effort. The remaining 118 respondents reported relying on subletting to make up for the lack of in-house expertise.

When hiring challenges are cross-referenced with perceptions about whether a single technician can service more than 30 vehicle brands, a more nuanced picture emerges (Bar Chart 6). Among businesses that believe this scenario is realistic, 35 (or 38%) report difficulty in finding and retaining ADAS specialists. In comparison, 70 businesses that view this as unrealistic also report similar hiring

challenges, representing 33% of that group. These findings further highlight the widespread shortage of ADAS-trained technicians. To bridge this gap, subletting appears to be a common solution across both groups—raising broader concerns about the industry's growing dependence on outsourced ADAS services and their ability to deliver brand specific services. This issue is explored in greater depth in the following section on ADAS service delivery models.

Bar Chart 6: Hiring & Retaining Difficulties Across Feasibility



ADAS Services

In this study, ADAS services are categorized into two distinct areas: scanning, diagnostics, and ADAS calibration. The survey identified four common delivery approaches that businesses typically use:

In-house – Developing internal technician teams to perform ADAS services.

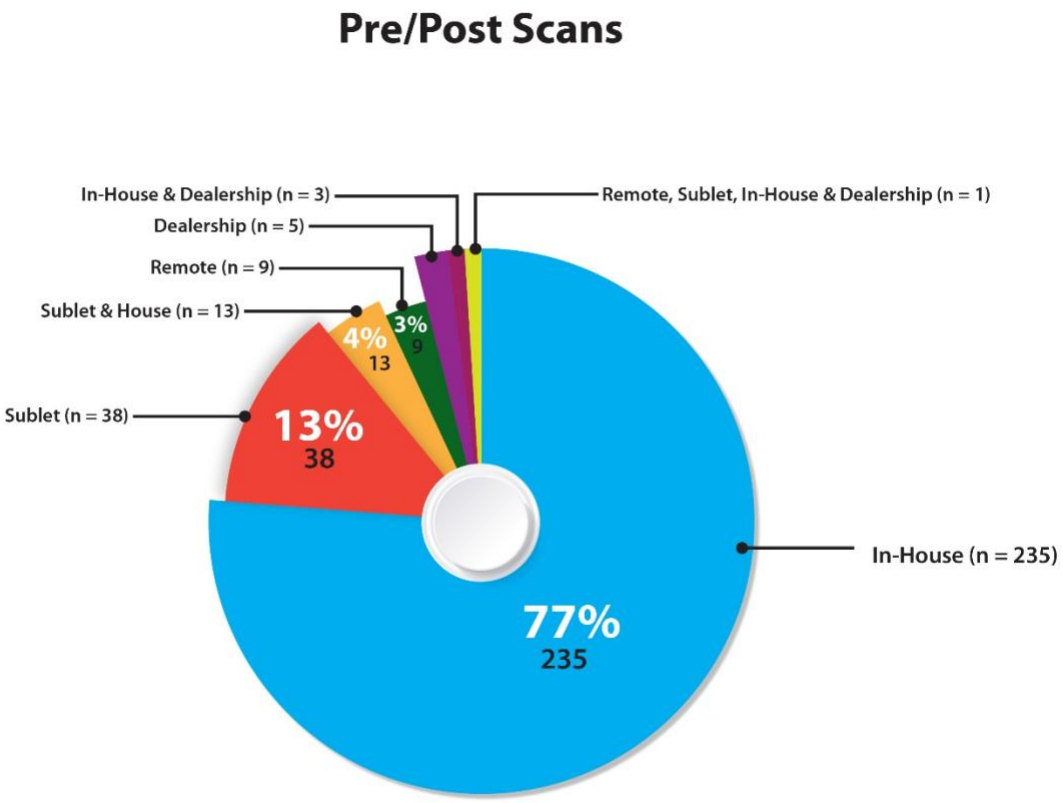
Sublet – Contracting external vendors to provide on-site ADAS services.

Remote – Engaging remote ADAS service providers with in-house employee-assistance.

Dealership – Relying on ADAS services from dealership-affiliated body shops

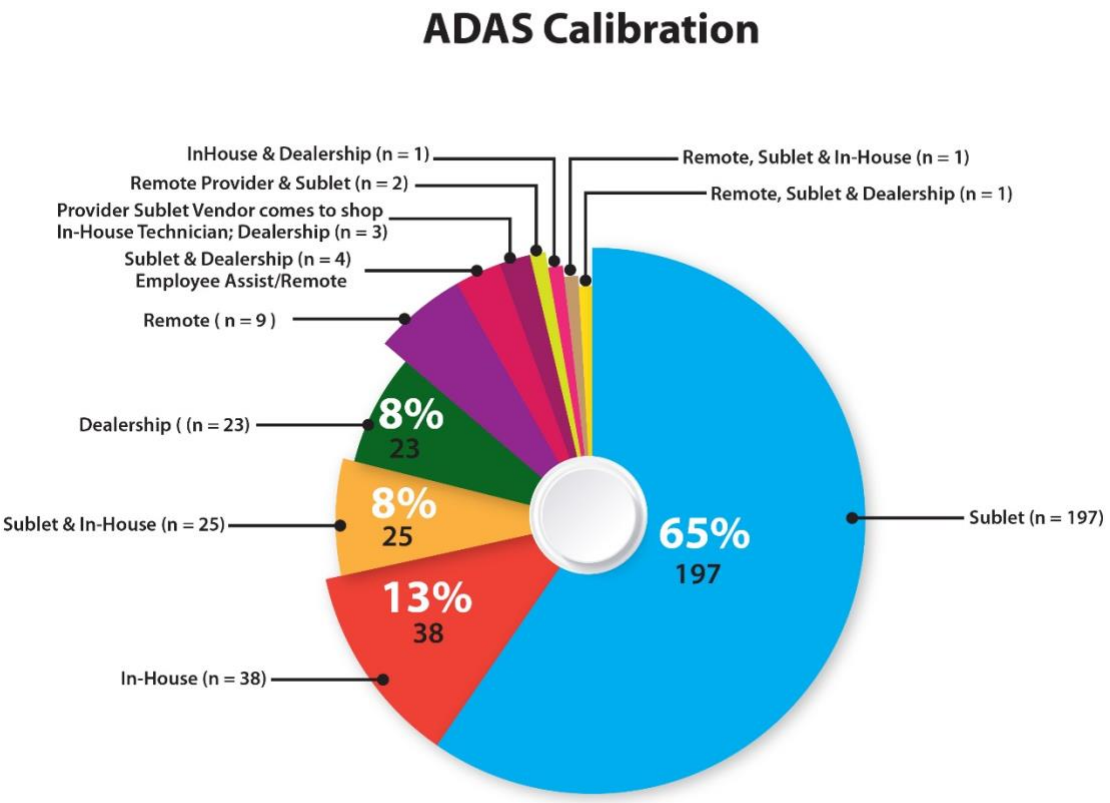
Pie Chart 4 illustrates the distribution of responses related to the first area of advanced diagnostics—specifically, pre- and post-repair scans. The data reveals that most of these scans (235 cases, or 77%) are conducted by in-house technicians, followed by services performed through sublet arrangements. It should be noted that this does not address the accuracy of the scan or any diagnostics performed by body shop personnel. While some businesses reported using multiple service providers, these instances are relatively uncommon. The most notable exception is the combination of in-house and sublet providers, which accounts for 13 cases (or 4.3%).

Pie Chart 4: Pre/Post Scan Performers



Pie Chart 5 illustrates the delivery approaches used for ADAS calibrations. In contrast to pre/post scans, a significantly larger proportion of businesses, 197 cases or 65%, rely on subletting for ADAS calibration. By comparison, only 38 businesses (13%) reported using sublet services for pre/post scans (Bar Chart 4), highlighting a notable difference in service delivery between these two ADAS service areas. This should not be interpreted as a measure of scan accuracy.

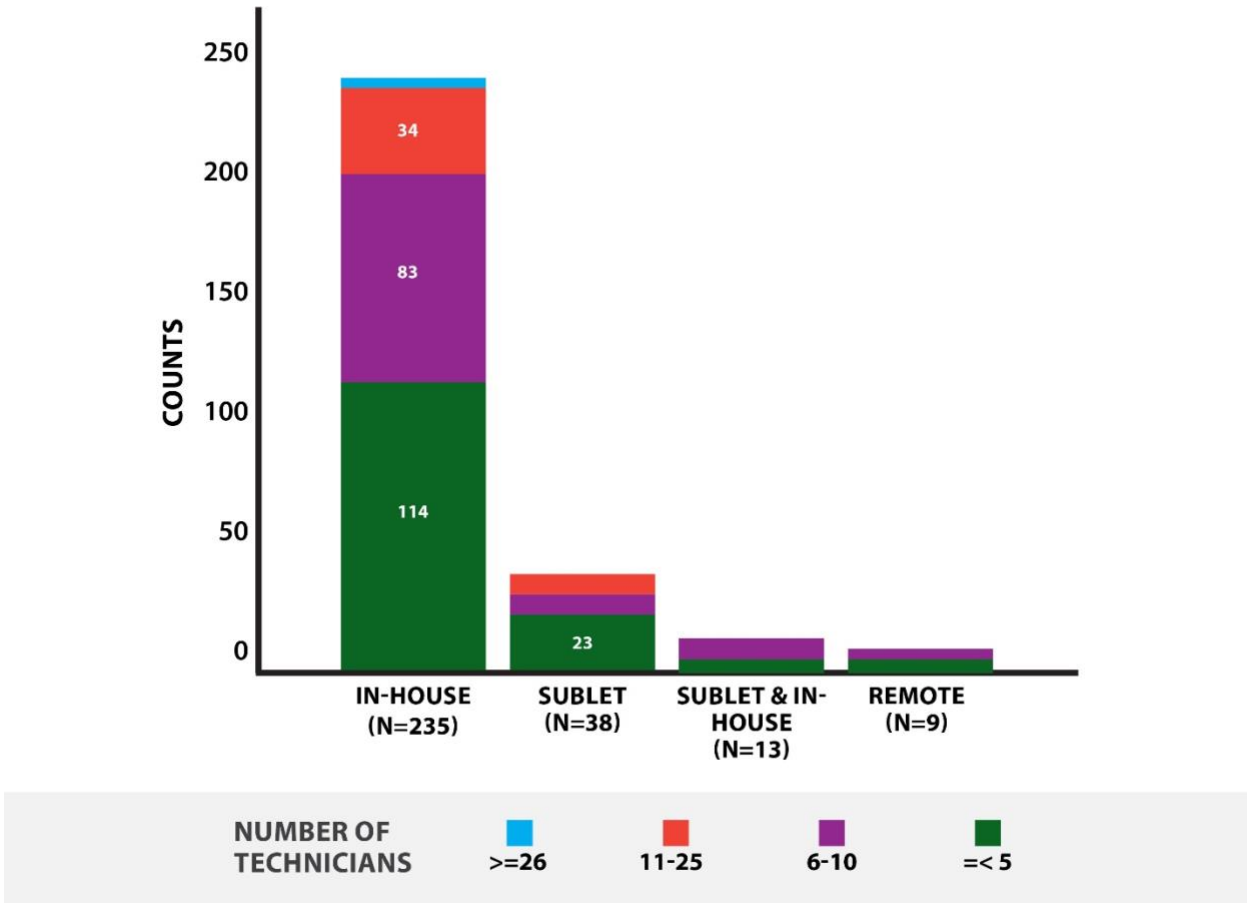
Pie Chart 5: ADAS Calibration Performers



Bar Chart 7 presents data by cross-referencing technician staffing levels with pre/post scan service providers. Accuracy considerations of the scan are beyond the scope of this report. The chart focuses on the four most common service models: In-house, Sublet, Remote, and a combination of Sublet & In-house. The data reveals that in-house pre/post scans are primarily handled by smaller businesses. Of the 235 businesses using in-house technicians, 114 shops, about 49% of the group,

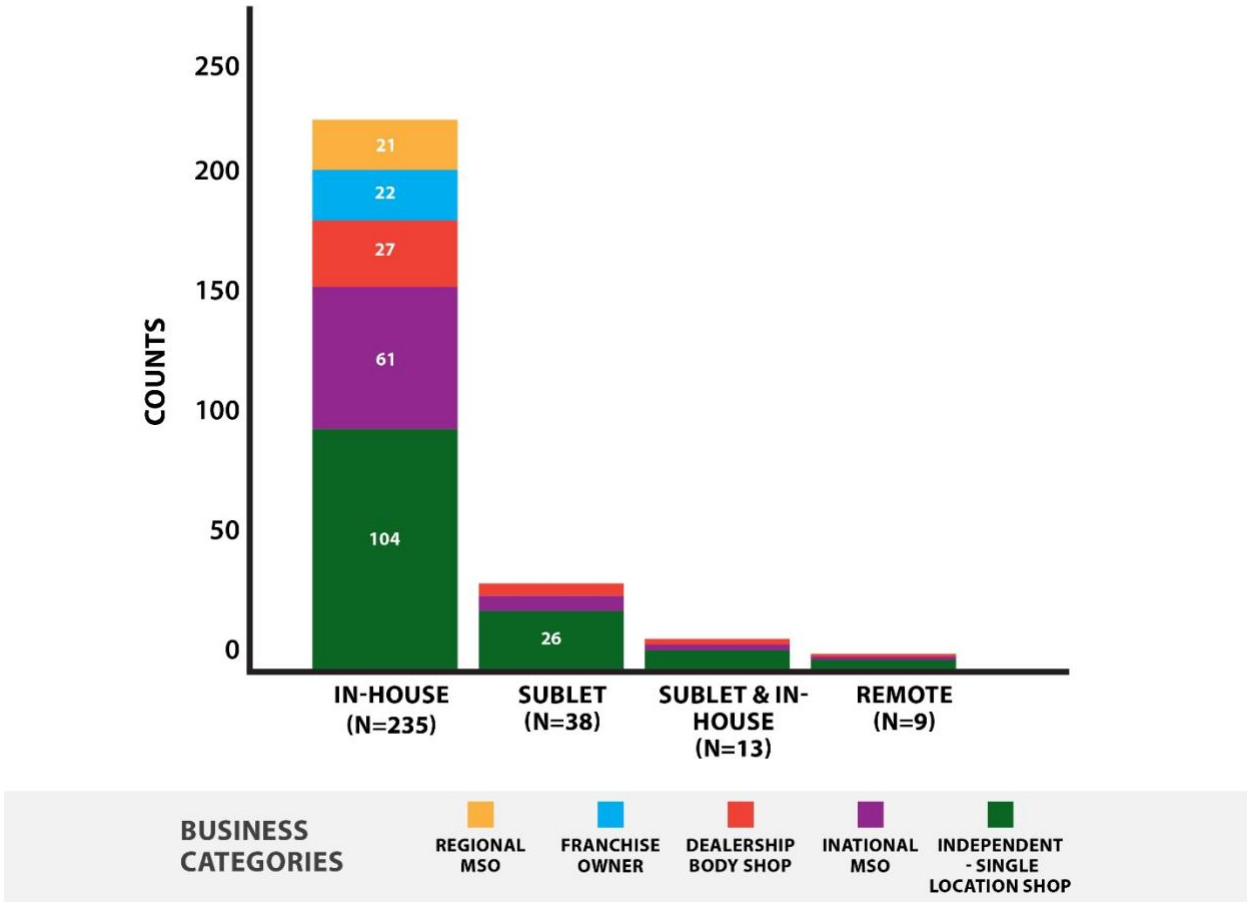
employ five or fewer technicians, while another 83 (or 35% of the group) fall within the six-to-ten technician range.

Bar Chart 7: Technicians Staffing Levels Across Pre/Post Scan Performers



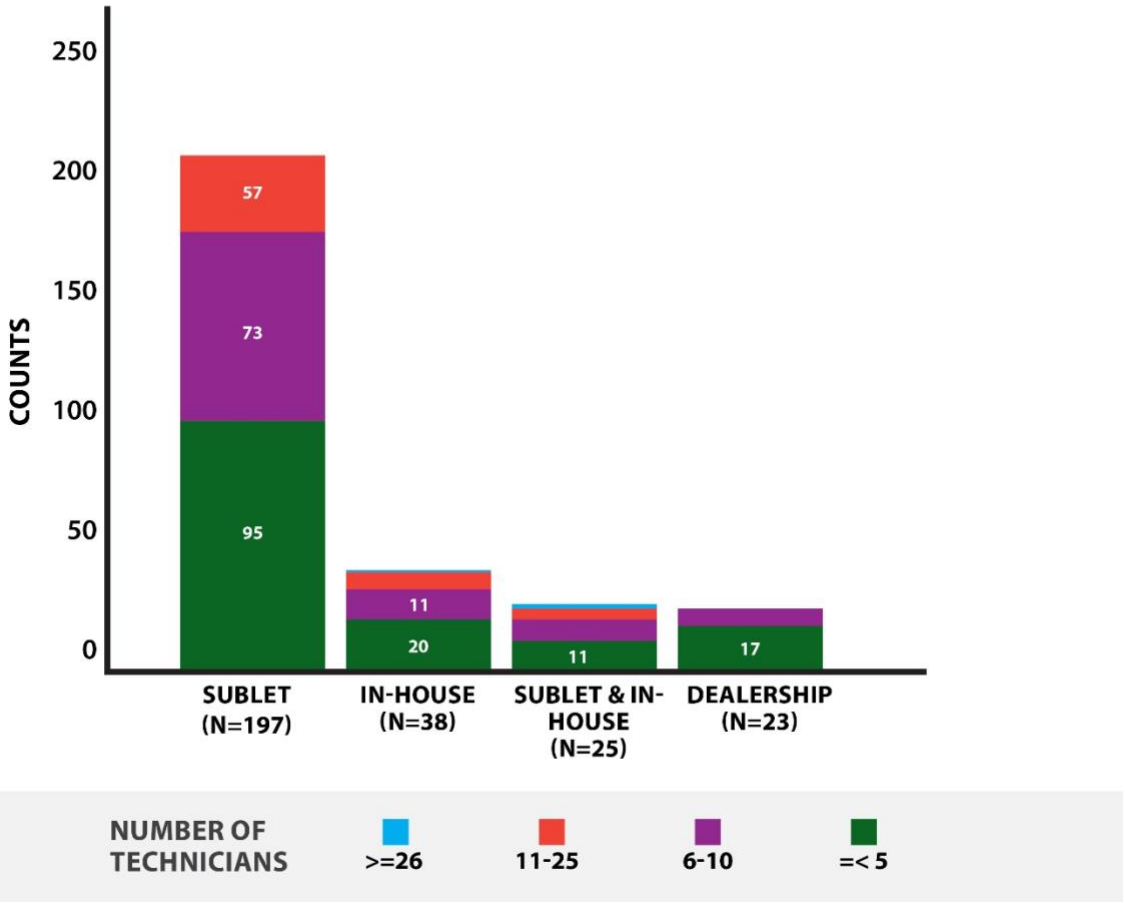
Bar Chart 8 presents a different perspective by replacing technician staffing levels with business categories, showing the distribution of pre/post scan services across these categories. Among the largest group—businesses performing pre/post scans in-house, 104 shops (44% of the group) are independent, single-location operations. This is followed by 61 national MSOs, reflecting a notable presence of larger organizations in this service segment.

Bar Chart 8: Business Categories Across Pre/Post Scan Performers



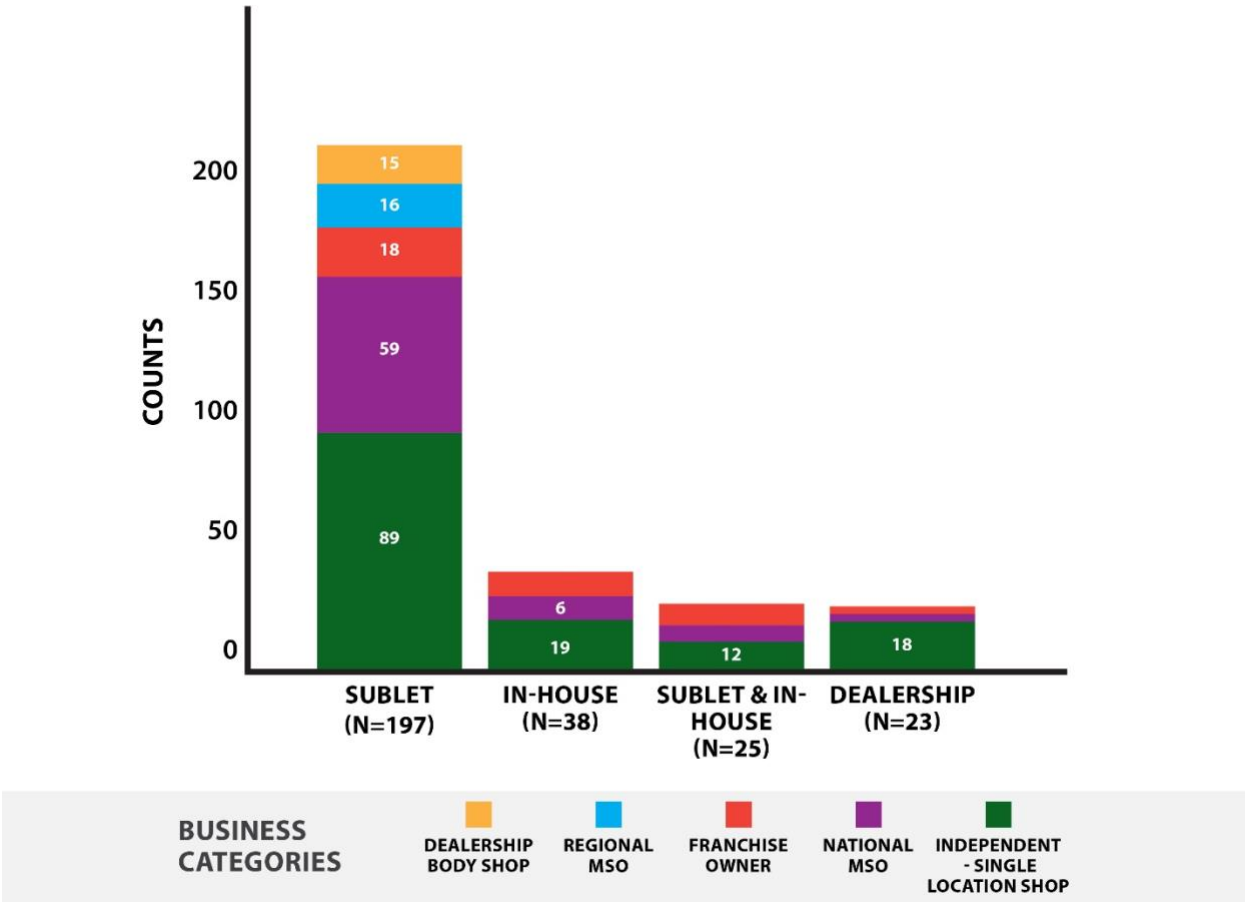
Similarly, the data enables cross-referencing technician staffing levels with ADAS calibration providers, as shown in Bar Chart 9. Among the 197 businesses that outsource ADAS calibration, the majority are smaller operations: 95 shops, 48% of the group, employ five or fewer technicians, while 73 shops, or approximately 37%, have between six and ten technicians.

Bar Chart 9: Technician Staffing Levels Across ADAS Calibration Performers



Using the information on ADAS calibration deliveries, technician staffing levels can be replaced with business categories and cross-referenced accordingly, as shown in Bar Chart 10. Within the largest group of businesses that sublet ADAS calibration services, 89 (45%) are independent, single-location operations. The next largest group consists of 59 national MSOs, accounting for 30% of the sublet group.

Bar Chart 10: Business Categories cross ADAS Calibration Performers



In summary, about one-third of ADAS services were provided by small businesses—featured with five or fewer technicians or a single location. These businesses typically handled pre/post scans in-house, while subletting ADAS calibration to external providers.

Factors Associated with Advanced Diagnostics and ADAS Calibration

Table 1 below summarizes the correlations among key factors identified in the earlier section. It presents the statistical strength of associations between variables central to this study. Specifically, the table highlights the relationships among pre/post scans, ADAS calibration, the perceived feasibility of a single technician handling ADAS services across 30 vehicle brands, and the difficulty of hiring and retaining ADAS technicians.

Table 1: Correlations

	Scan Inhouse	Scan Sublet	ADAS Inhouse	ADAS Sublet	Feasibility	Hiring Difficulty
Scans Inhouse	1					
Scans Sublet	-0.675**	1				
ADAS Inhouse	.139*	-0.076	1			
ADAS Sublet	0.055	.130*	-0.444**	1		
Feasibility	-0.027	0.046	.201**	-.160**	1	
Hiring Difficulty	-0.019	0.056	0.108	-0.051	0.054	1

Note:
** Statistically significant at 0.01 level
* Statistically significant at 0.05 level

The table above suggests that in-house and sublet approaches are more likely to function as substitutes rather than complementary methods. If a repair shop can perform services in-house, such as pre/post scans or ADAS calibration, it is unlikely to outsource them (coefficient = -0.675 for pre/post scans and coefficient = -0.444 for ADAS calibration). Conversely, when these services are sublet, they are typically not conducted internally. The negative association is slightly stronger for pre/post scans, indicating a stronger substituting effect.

While the use of sublet services for pre/post scans is not significantly associated with perceived feasibility, the same is not true for ADAS calibration. When respondents believe a technician can service 30 different vehicle brands, ADAS calibration is more likely to be performed in-house, with a positive coefficient of 0.201. Conversely, when this perception is negative, ADAS calibration is more likely to be outsourced, with a coefficient of -0.160.

It is important to note that the feasibility measure used here is fixed at the 30-brand level—a threshold that appears to be particularly relevant for ADAS calibration but not for pre/post scans. A higher threshold may be needed to detect similar sensitivities for pre/post scans, especially since scan accuracy is not accounted for, which could be a topic for future investigation.

While the 30-brand threshold proves to be extremely sensitive in the context of ADAS calibration, it also prompts an important question: at what point does perceived feasibility become negligible? It is unlikely that any single technician can competently manage ADAS systems across 30 different brands. Would 20 brands be more realistic? Or perhaps 10? This study does not establish what

constitutes a reasonable or practical expectation for brand coverage—another valuable direction for future investigation.

Table 1 also shows that hiring difficulty is not significantly associated with either in-house or sublet approaches for both pre/post scans and ADAS calibration. This is an intriguing finding. Despite a well-documented shortage of qualified ADAS technicians, repair shops appear to have mitigated this constraint by turning to sublet services. Thus, perceived hiring difficulty does not appear to be a limiting factor in current service delivery models.

What remains uncertain—and potentially concerning—is whether sublet providers consistently deliver high-quality service. It may also be worth investigating whether consumers would prefer shops to perform these services in-house, or whether additional oversight is needed to ensure sublet providers are adequately equipped to meet technical standards.

Despite the labor challenges in the ADAS space, it appears that shops find it more feasible for normal technicians to perform pre/post scans than those trained for ADAS calibration—a field where the talent market remains especially limited, if not underdeveloped. This may contribute to the consumer findings that more than 50% reported post-calibration issues (Mueller, et al., 2024).

Taken together, Table 1 underscores a critical gap in the labor market: a pronounced shortage of qualified technicians with the expertise required for ADAS calibration.

CONCLUSION & RECOMMENDATIONS

In summary, the auto repair and body paint market predominantly comprise of small operations. As illustrated in Bar Charts 1 and 2, 256 businesses reported having fewer than ten technicians, with 137 of these operating from a single location. Collectively, these small businesses represent a substantial portion of the auto repair industry, underscoring their critical role in the ADAS service landscape.

Given the dominance of small operations, the quality and capability of technicians in these businesses are a key concern. A significant number of repair shops operate without a dedicated ADAS technician, due to a shortage of skilled labor. As shown in Bar Chart 3, 232 shops (76%) reported having no dedicated ADAS specialist. Among them, 125 shops (54%) are small operations with five or fewer technicians on staff (Bar Chart 4).

Moreover, access to formal ADAS training is limited among small businesses. Only 28 shops, just 11% of the 256 businesses with fewer than ten technicians, reported having technicians who had received formal ADAS training. These were evenly split between businesses with five or fewer technicians and those with six to ten (Bar Chart 5). This persistent skill gap contributes directly to the hiring challenges faced across the industry (Bar Chart 6), which raises concerns about the overall readiness of the sector to deliver consistent, high-quality, safe ADAS services.

How do small operations address the skills shortage in ADAS services? The survey reveals two primary strategies: performing pre/post scans in-house and relying on sublet arrangements for ADAS calibration (Bar Charts 7–10). While these approaches reflect practical, reactive adaptations to workforce constraints, it remains uncertain whether subletting is an optimal or sustainable long-term solution—a question that warrants further investigation (Table 1).

The industry's heavy dependence on subletting highlights its broader challenge (lack of standards of sublet providers, etc.)—its inability to internally support the technical demands of servicing a wide array of ADAS systems, which can span up to 30 vehicle brands in the U.S. This complexity imposes significant operational burdens on small businesses, many of which lack the resources, training, and brand-specific expertise required to manage ADAS diagnostics and calibration independently.

As noted earlier, the need for pre/post scans and ADAS calibration is expected to grow with the increasing integration of electronic safety components in modern vehicles. Compounding this, many ADAS systems are proprietary, making it extraordinarily difficult, if not impossible, for a single technician to remain proficient across such a wide range.

REFERENCE

American Automobile Association (AAA), Newsroom, December, 2023. *Cost of ADAS Repair – 2023 Update: Examination of the Effects of ADAS Components on the Cost of Vehicle Repair*.

https://newsroom.aaa.com/wp-content/uploads/2023/11/Report_Cost-of-ADAS-Repairs-FINAL-23.pdf

Mueller, A., Cicchino, J., Zuby, D., & Calvanelli, Jr. J., 2024. *Consumer experience with crash avoidance feature repairs*. ***Journal of Safety Research***, Vol 88, p 8 –15. and **IIHS (Insurance Institute for Highway Safety)**

https://pubmed.ncbi.nlm.nih.gov/38485388/

https://www.iihs.org/topics/bibliography/ref/2274

Mema-Aftermarket Suppliers, October, 2024. *ADAS: Defined, Growth, Concerns, Recommendations*.

https://www.mema.org/research-and-insights/adas-defined-growth-concerns-recommendations

Acknowledgments

We thank Michael Quinn and Fred Iantorno of AirPro Diagnostics LLC for providing contextual understanding and industry insights.