2022 Automotive In-Cabin Safety Survey Report

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Introduction

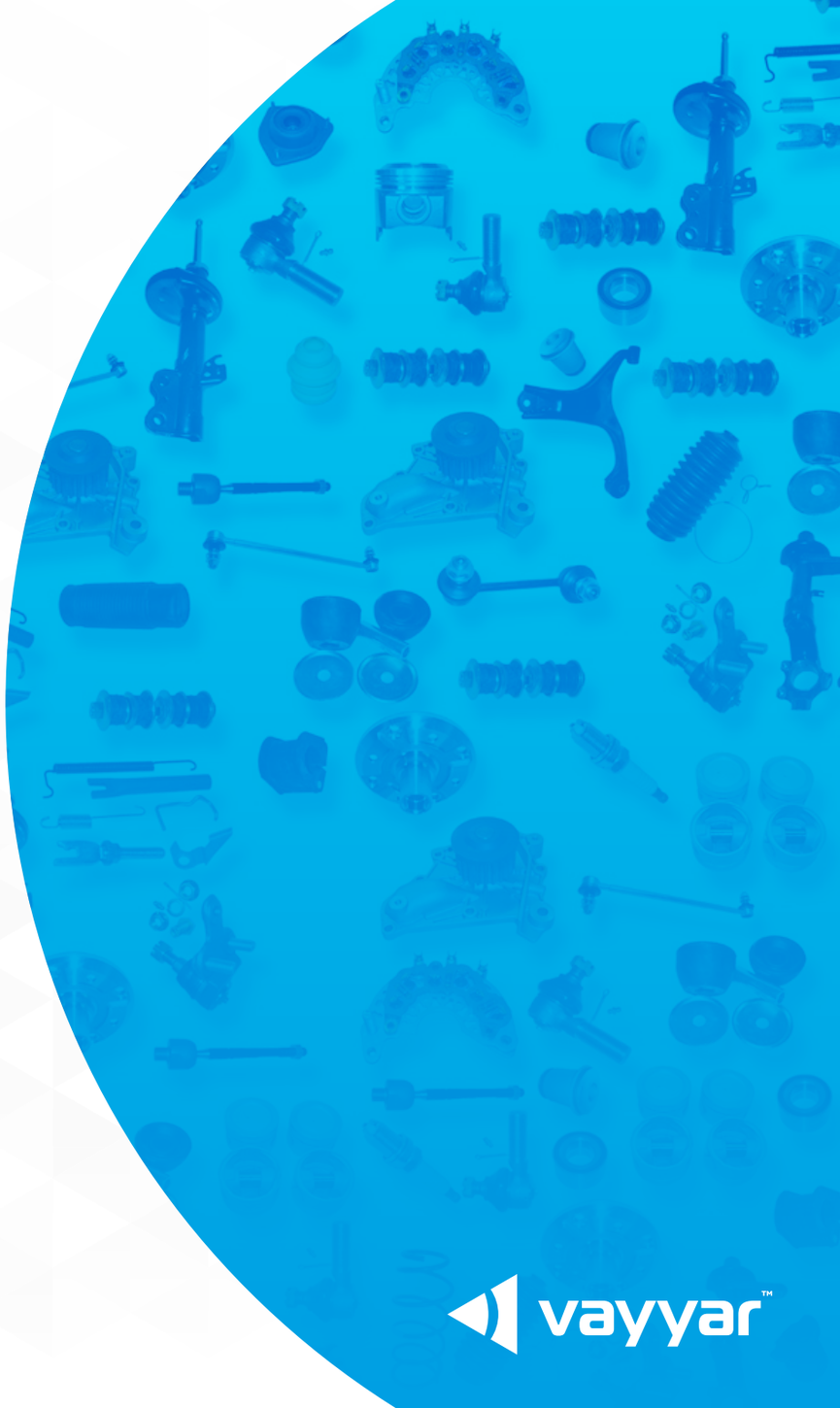
To help OEMs and suppliers formulate their innovation strategies, we launched a global consumer survey designed to provide a comprehensive understanding of consumer opinions about in-cabin safety. We found that drivers are highly aware of the advanced and affordable features available today – and that they want them in their vehicles.

For national regulators as well as international standards organizations such as the Euro NCAP, in-cabin safety is a top priority. Their goal is to enhance driver and passenger protection, while setting targets and timelines for automakers.

Every year, regulators and industry bodies must assess the feasibility of automakers meeting the requirements of the latest safety protocols, taking into account TRL and cost. Whether presented to automakers as suggestions, laid out as prerequisites for earning a certain number of safety points, or legally mandated as essential elements of the in-cabin ecosystem, automakers understand the urgency.

Consumer demand for enhanced in-cabin safety is also rising, with the global automotive safety market projected to reach more than $258 billion by 2025, at a compound annual growth rate of 10.6%. While ADAS features such as parking assist, Lane Change Assist (LCA) and Autonomous Emergency Braking (AEB) are increasingly common, motorists are aware that in-cabin safety lags decades behind.

Automakers need to evolve airbag deployment, seatbelt reminders and passenger occupancy detection by leveraging the transformative in-cabin monitoring platforms that have emerged over the past few years.



Methodology

Our survey of 2,500 individuals was split equally between respondents in the U.S., the UK, Germany, Japan and South Korea. The survey was carried out by Global Surveyz, an independent research company, and took place over two weeks between December 2021 and January 2022.

Respondents were recruited through a global research panel, and invited via email to complete the survey. The average time spent on the survey was 4 minutes and 18 seconds. The answers to the majority of the non-numerical questions were randomized, in order to prevent order bias in the responses.

Key Findings

It's not one or the other. Consumers care about both price and safety

Across all income brackets, price is the most important factor in buying or leasing a car. Safety is also a top three consideration, no matter how much money a household earns. With new technologies emerging, automakers can strike a balance between providing the safety features that motorists are expecting and maintaining affordability. This will meet consumer demand without increasing sticker prices or denting their margins.

Consumers worldwide are willing to pay extra for in-cabin safety features

With the rising demand for more advanced in-cabin safety features in new cars, 64% of respondents reported that they are willing to pay extra for this functionality. For families with children/grandchildren under 18, that number rose to 70%.

84% of consumers recognize that driver assist technology is more mature than in-cabin safety systems

Consumers won't ignore the lack of mature in-cabin safety technology much longer, and are even willing to pay more to buy or lease vehicles that provide more sophisticated monitoring and better protection for them and their loved ones. 84% of respondents recognize that ADAS technology is more evolved than current in-car safety systems, suggesting that OEMs and Tier 1s can gain real competitive advantage by offering the latest in-cabin features.

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Key Findings

Consumers are aware that in-cabin safety needs a serious update

The majority of respondents believe that Child Presence Detection sensors should come as standard in new vehicles, in order to prevent 'hot car incidents' when children are left in vehicles, and which have led to hundreds of fatalities in the US alone. Respondents also stated that they would be more likely to consider a vehicle that offers this lifesaving feature. Respondents also recognize that legacy in-car safety features such as airbags can cause injuries and even fatalities, and were quick to name ways for these systems to deploy more safely.

However, not all in-cabin safety features are seen as equal

One safety feature which is a serious turn-off for consumers is camera-based in-cabin monitoring, which raises significant privacy concerns for 62% of consumers surveyed. To avoid deploying solutions that could alienate almost two-thirds of consumers, the industry must steer toward non-optical solutions for in-cabin monitoring.

Top Considerations When Buying or Leasing a Car

Irrespective of income, the top consideration when buying or leasing a car is price (74%). Safety is also among the top three considerations, and unlike price, which becomes less important the higher the income bracket, safety remains consistent in its importance across all income groups (between 51%-54%). Even drivers in lower income brackets feel that safety is a top priority.

Automakers can leverage available technologies to offer safety solutions that reduce production costs and maintain current sticker prices, while meeting growing demand for in-car safety.

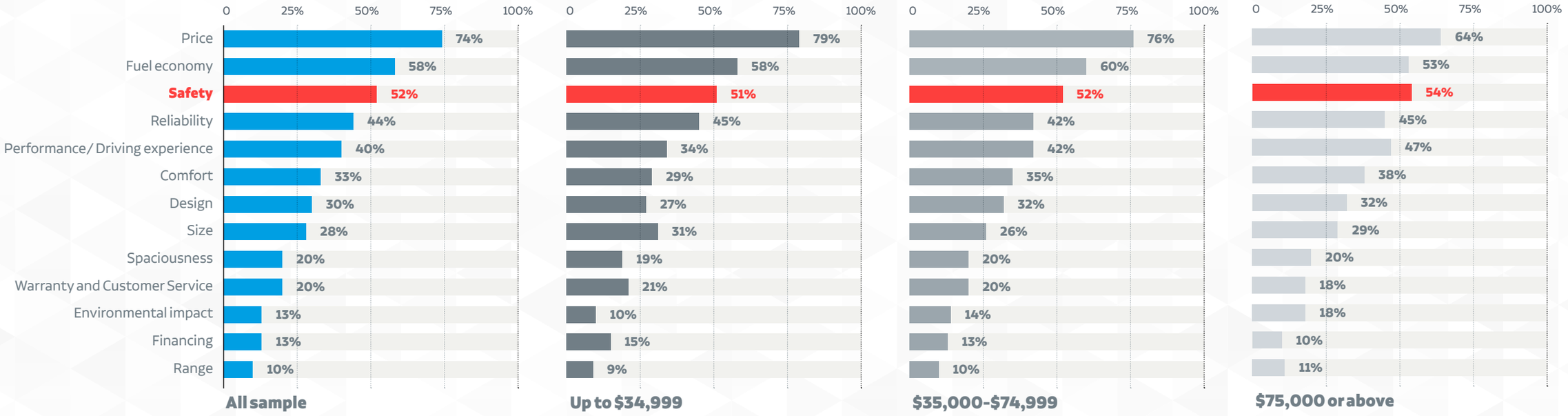


Figure 1: *Top Considerations When Buying or Leasing a Car by Household Income*

The Impact and Cost/Value
Ratio of In-Car Safety Features

84% of respondents stated that improvements to in-car safety features (e.g., smart airbags, Child Presence Detection, and enhanced Seat Belt Reminders) will affect their car buying decision (figure 2). Consumer perspectives around the importance of in-car safety features have shifted from "nice to have," to must-have. Across all geos surveyed, drivers no longer see passenger safety as a collection of discrete features, but rather as a holistic system designed to provide the utmost protection.

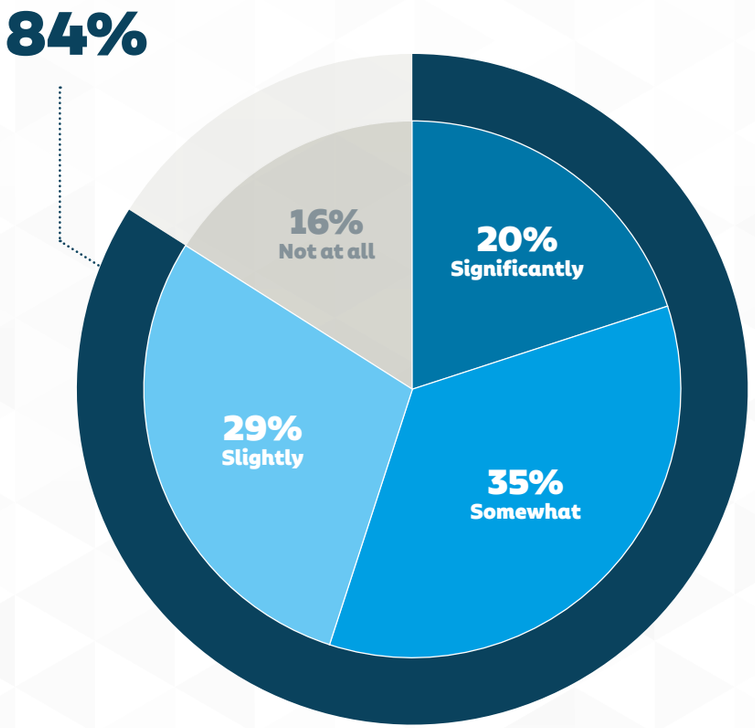


Figure 2: *How New In-Car Safety Features Impact on Car Purchasing*

64% report that they are willing to pay extra for enhanced in-car safety features (figure 3). For consumers with children/ grandchildren under 18, that number rises to **70%**

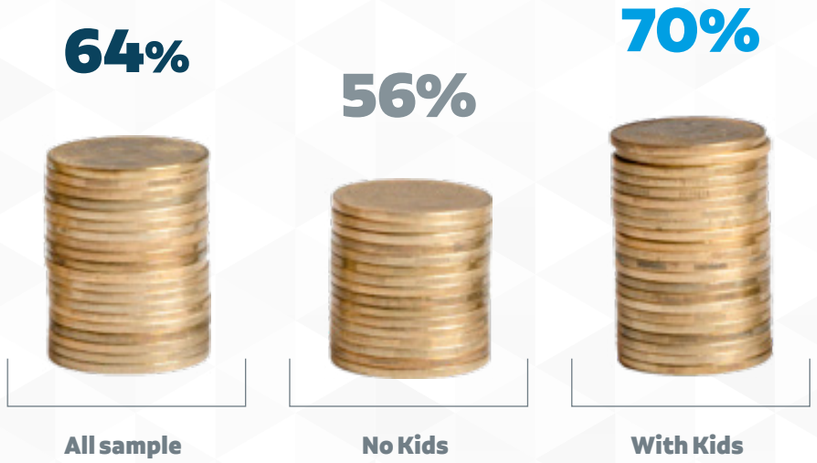


Figure 3: *Percentage of People Willing to Pay for Enhanced In-Car Safety*

Child Presence Detection:
Should It be Standard and Does it Impact Car Purchasing?

We asked survey respondents if Child Presence Detection systems should come as standard in new cars, to prevent “hot car” incidents, a global issue whereby children left behind in vehicles succumb to vehicular heatstroke which is often fatal.

85% said CPD should come as standard. This is true even for those without children or grandchildren, of whom 83% said it should come as standard. The greater the number of kids or grandkids respondents have, the more they tend to agree that the feature should be universal (figure 4).

The majority of survey respondents (69%) are more likely to consider a car that comes with Child Presence Detection (figure 5).

Consumers clearly want to be on the safe side, recognizing that vehicular heatstroke is a serious, though preventable threat.

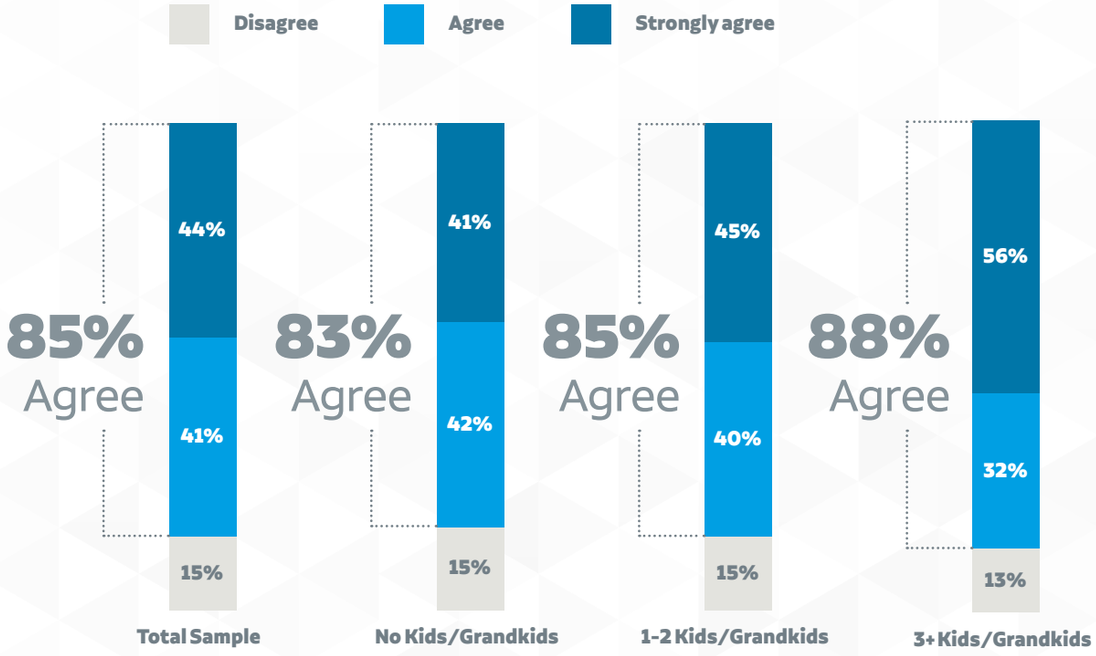


Figure 4: *Automatic Child Presence Detection Should Come as Standard in New Cars*

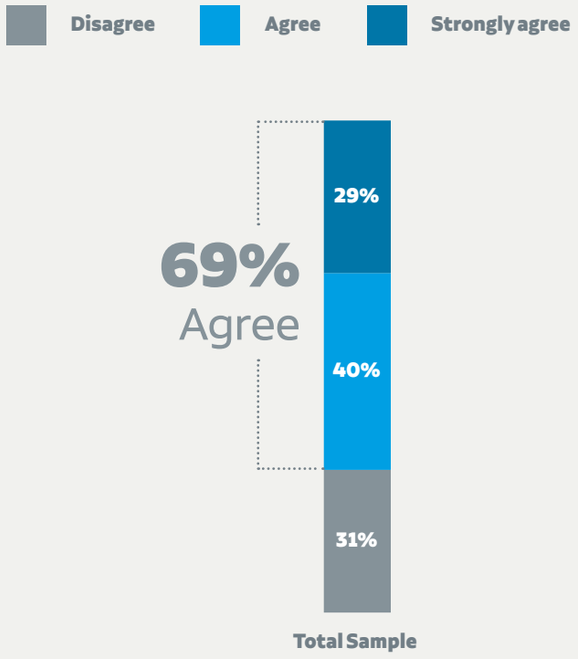


Figure 5: *I am more Likely to Consider a Car That Comes with Child Presence Detection*

The Perceived Gap between the Protection Provided by ADAS and by In-cabin Features

84% of respondents agree that Advanced Driver Assist Systems (which include features such as Blind Spot Detection and parking assistance) are more developed than current in-cabin safety systems.

Drivers feel that in-car safety is lagging behind ADAS, despite the required technology being both affordable and available to automakers.

Manufacturers can leverage advanced, cost-effective solutions to bridge the growing gap between in-cabin and ADAS safety, and better cater to consumer needs.

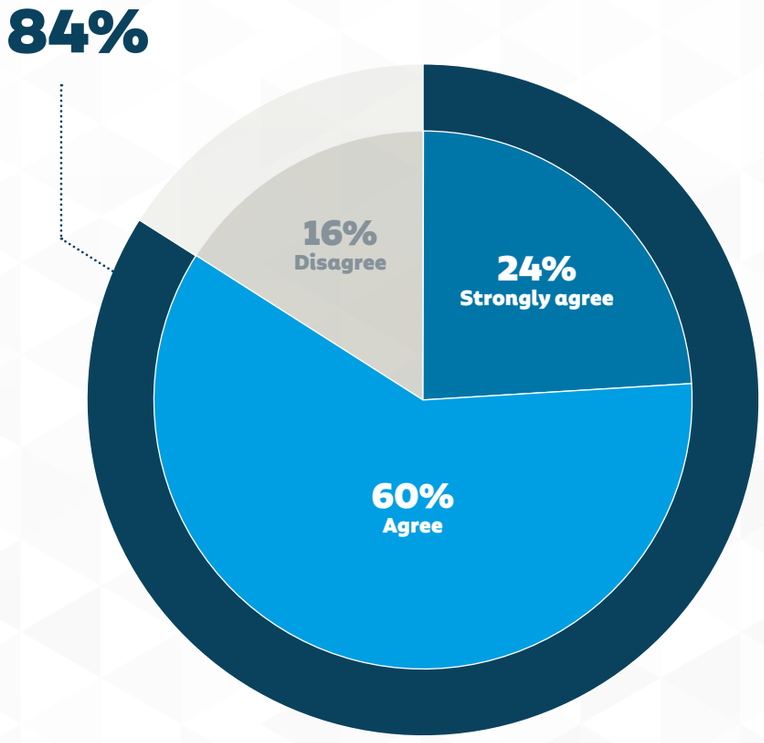


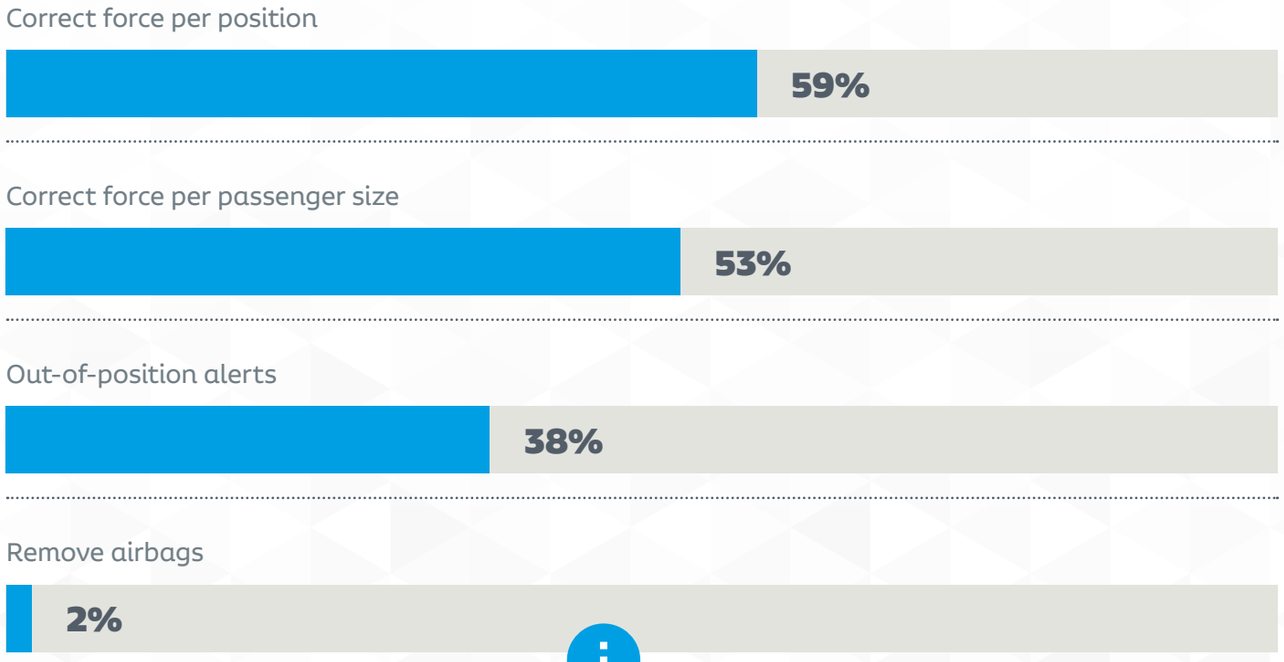
Figure 6: *Driver Assist Systems Offer a Higher Level of Occupant Protection than In-cabin Features*

Features that Can Reduce Airbag Injuries

Children and short-stature adults have historically faced the greatest risk of airbag fatalities and injuries. In fact, NHTSA estimates that 90% of airbag-related fatalities from 1990-2008 were children and infants. Short-stature and elderly drivers, who tend to sit closer to the steering wheel, are also particularly vulnerable to injuries from frontal airbags. Other injuries are suffered by passengers sitting with their feet up on the dashboard, as airbags do not account for posture or position.

These issues have led to legislation, such as a new requirement of the US Federal Motor Vehicle Safety Standard 208 for enhanced airbag suppression, the aim of which is to reduce airbag impact injuries.

We asked survey respondents what they think can reduce airbag-related injuries. The top answers were the use of technology that determines the correct force per position in the car (59%) and correct force per size of passenger (53%).



This question allowed more than one answer and as a result, percentages add up to more than 100%.

Figure 7: *Features that Can Reduce Airbag Injuries*

Optimized airbag deployment doesn't require airbags to be re-engineered. It simply requires an occupancy sensor that can detect passenger position and size and provide this data to the airbag system.

Most Annoying Car Alerts According to Owners

Driver experience ranks 5th in response to the question about “top considerations when purchasing/leasing a vehicle.” A crucial component of driver experience is the vehicle alerting system.

The most annoying car alerts are considered to be seat belt reminders (41%), low tire pressure (22%) and “door open” alerts (15%).

Automakers can address this issue with intelligent reminders that rely on more than just weight sensors, instead utilizing high-resolution occupant presence detection to eliminate false positive alerts caused by heavy bags.

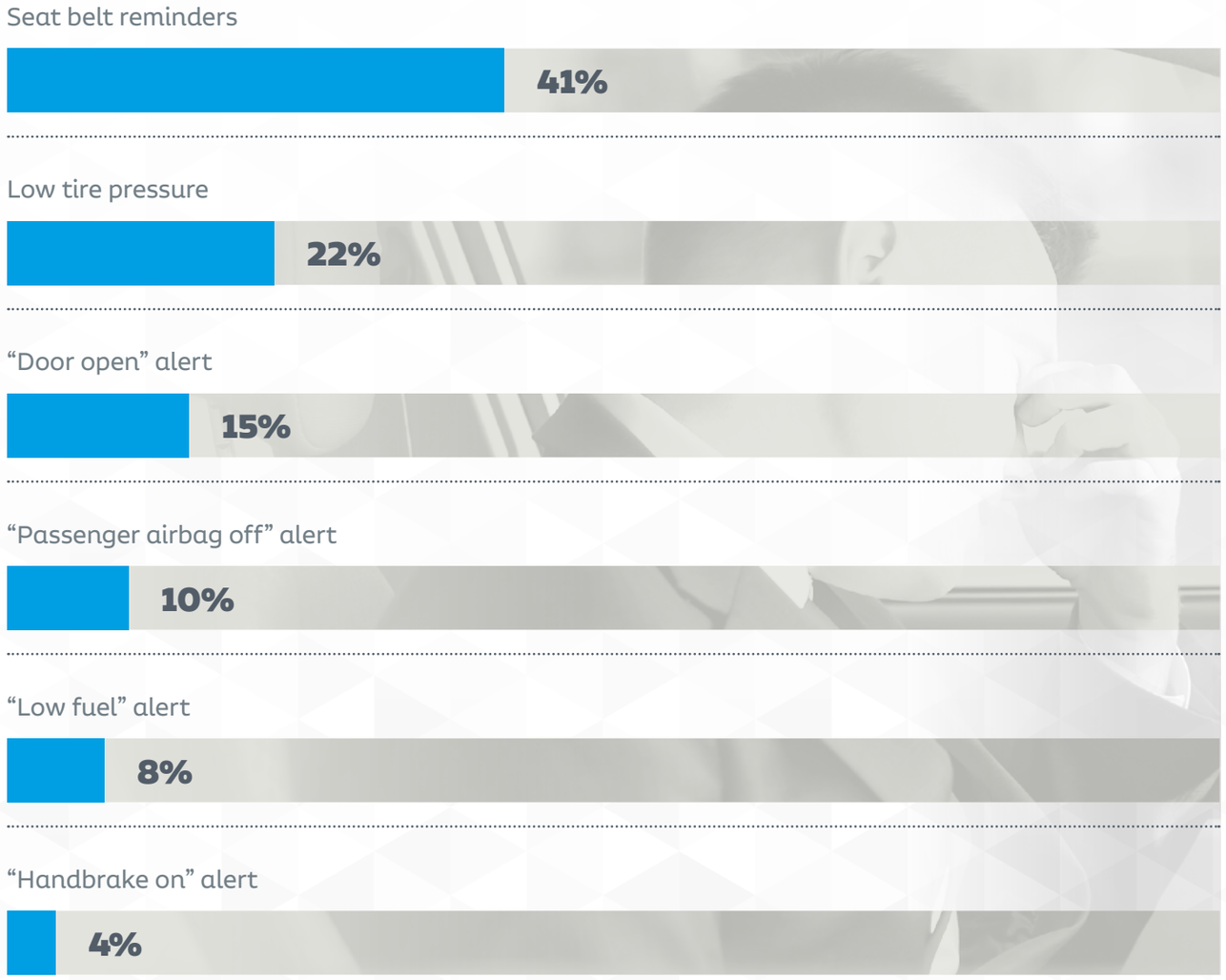


Figure 8: *Most Annoying Car Alerts According to Owners*

Concerns About Camera-Based In-Cabin Monitoring Systems Invading Privacy

62% of survey respondents indicated that while in-car safety is important, they are concerned about camera-based in-cabin monitoring systems invading their privacy.

Consumers who express concerns over privacy are more likely to decide against a vehicle with optics-based passenger monitoring.

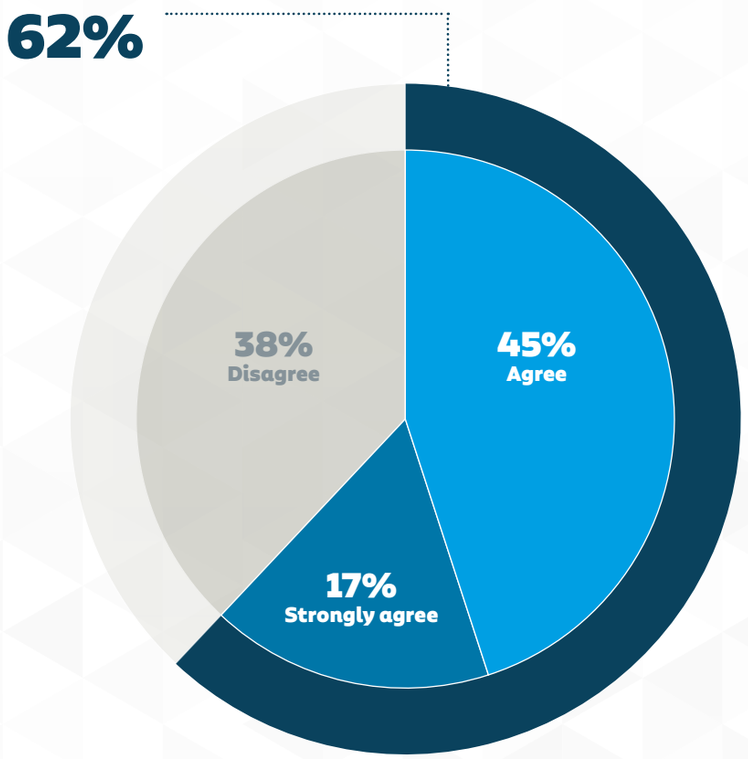


Figure 9: *Concerns About Camera-Based In-Cabin Monitoring Systems Invading Privacy*

Demographics

Country of Residence

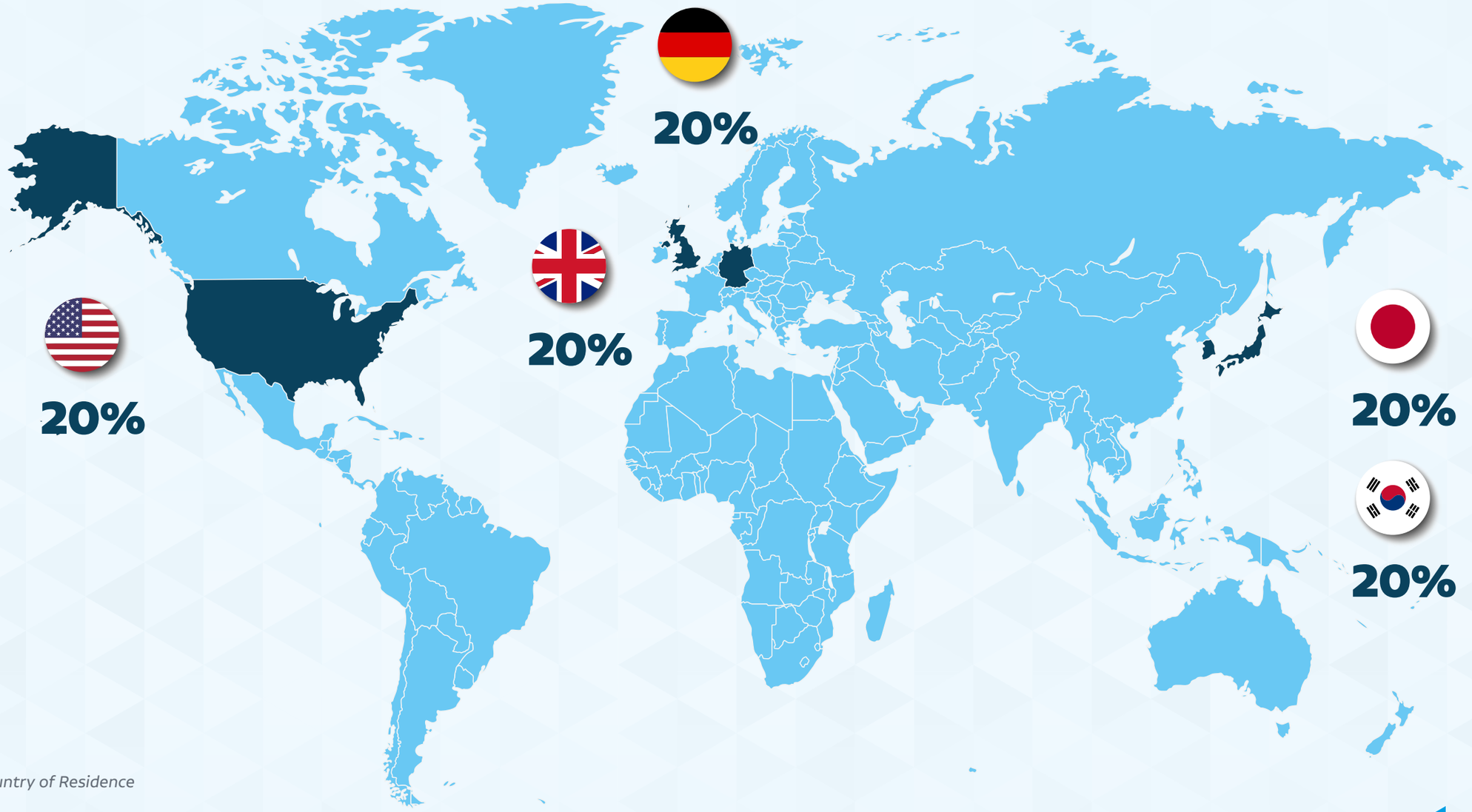


Figure 10: *Country of Residence*

Age, Gender &
Number of kids and/or grandkids under 18

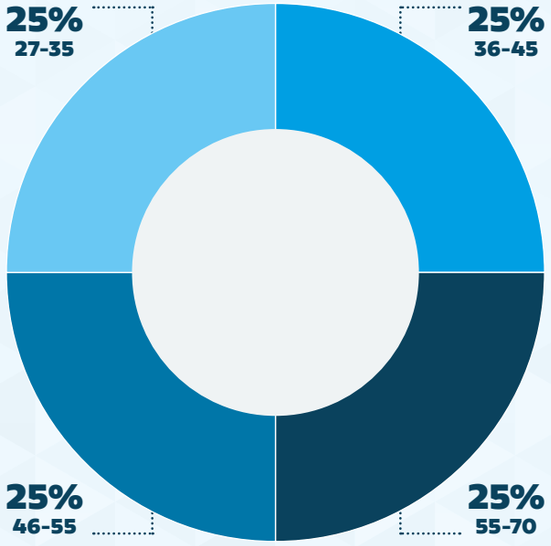


Figure 11: *Age*

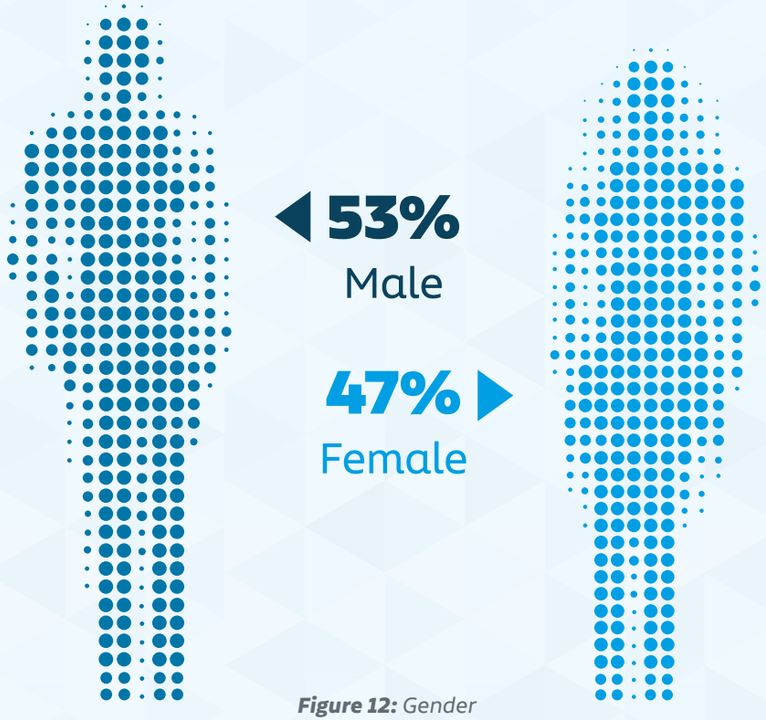


Figure 12: *Gender*

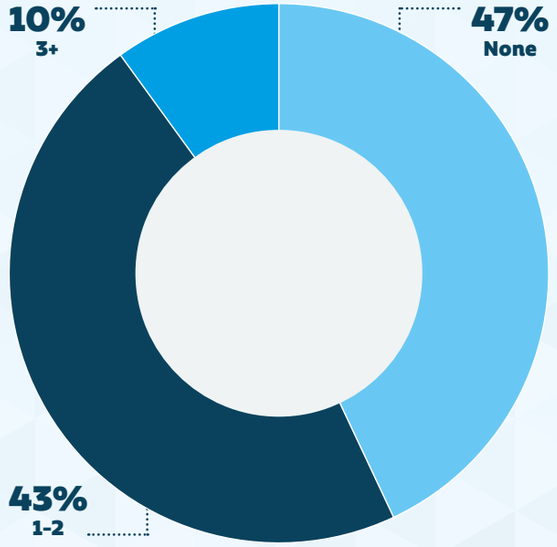


Figure 13: *Number of kids and/or grandkids under 18*

Annual Household Income & Number of Traffic Accidents Experienced

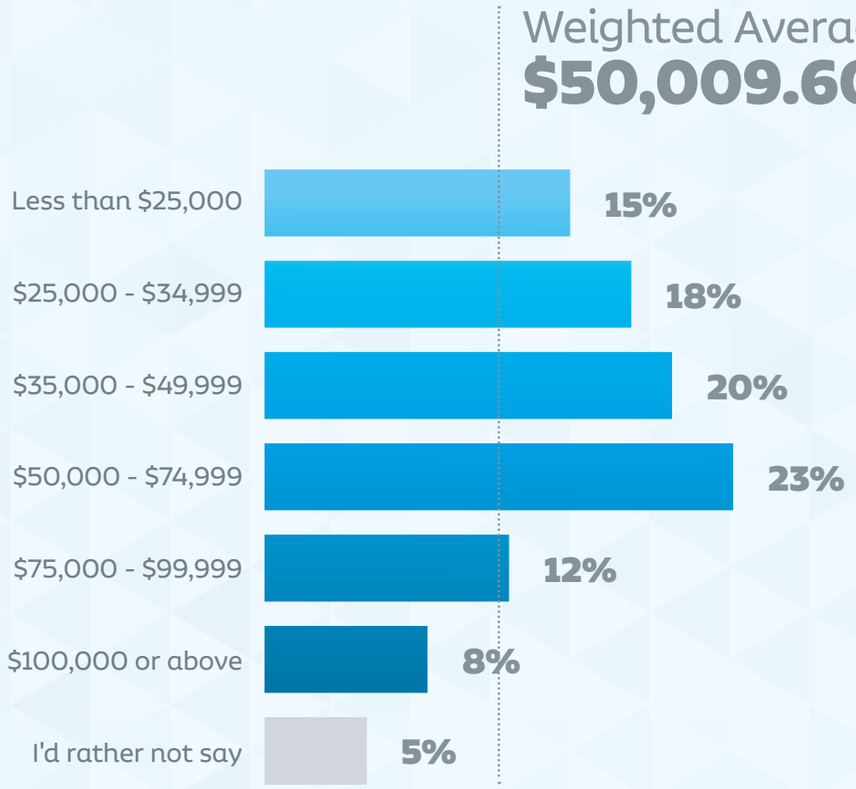


Figure 14: *Net Annual Household Income*

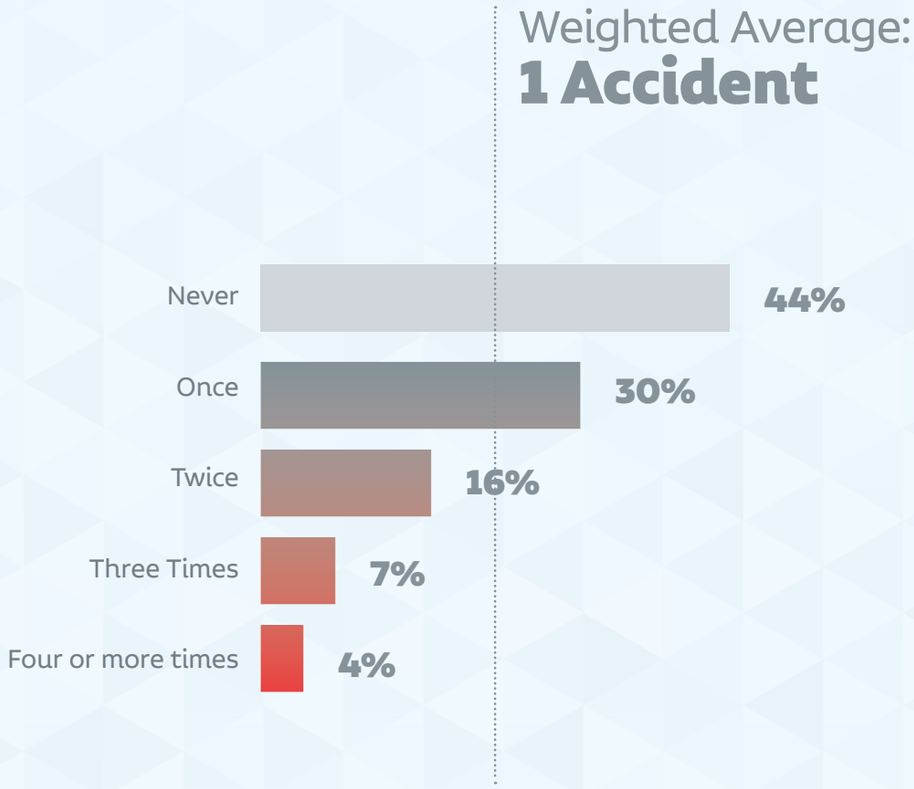
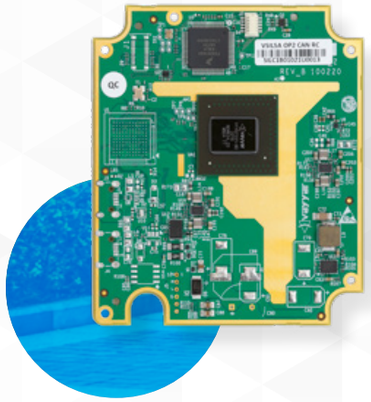


Figure 15: *Number of Traffic Accidents Experienced*

About Vayyar

Vayyar's automotive-grade 4D imaging radar platform creates holistic safety solutions for in-cabin, ADAS and motorcycle safety. Powered by a single radar-on-chip, it delivers exceptional resolution across an ultra-wide field of view, enabling it to replace multiple existing single-function sensors. The platform provides comprehensive detection in and around the vehicle, simultaneously tracking multiple static and dynamic targets.



Inside the cabin, the 60 GHz configuration detects the presence, position and size of each occupant, classifying children and adults. This enables Child Presence Detection, enhanced Seat Belt Reminders, optimized airbag deployment, out-of-position alerts, intruder detection and more. Outside the car (or motorcycle), the 79 GHz system supports most SRR, MRR and LRR applications including parking assistance, Autonomous Emergency Braking, Lane Change Assist, Blind Spot Detection, Cross Traffic Alerts, Adaptive Cruise Control and more, with an effective range from 20cm to 300m. Vayyar technology is multifunctional, affordable and available for mass production. The radar-based platform is robust in all road conditions, while protecting user privacy at all times.

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