

# 2022 Automotive In-Cabin Safety Survey

White paper  
Feb 2022





# Executive Summary

In-cabin safety is emerging as a top priority for motorists around the world. The survey results demonstrate that consumer perspectives around 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.

The survey responses indicate that price and safety are the top factors affecting purchase decisions. When asked about their top considerations when buying or leasing a car, survey respondents cited safety as a top three factor across the board, regardless of household income.

Almost two thirds of respondents from all countries stated that they would pay extra for enhanced in-cabin safety features, rising

to 70% for those with young children or grandchildren.

Meanwhile, 84% of respondents feel that in-cabin safety is significantly less developed than ADAS, despite affordable technologies being available for passenger protection.

Respondents from every market also noted that they would be more likely to purchase a vehicle with improved in-cabin safety features such as smart airbags, Child Presence Detection, and enhanced Seat Belt Reminders.

They feel that Child Presence Detection technology significantly affects purchasing decisions. A clear majority stated that CPD systems should come as standard in new cars to prevent ‘hot car’ incidents, with many saying they would be more likely to consider a car that comes with this lifesaving feature.

# Methodology Summary

As a leader in 4D imaging radar for automotive safety, Vayyar is in advanced engagements with OEMs and Tier 1s worldwide, developing next-generation in-cabin monitoring systems.

Over the past few years, consumer awareness of in-cabin safety has increased significantly. That's why we wanted to gauge the current attitudes of motorists toward features such as occupant monitoring, Child Presence Detection, enhanced Seat Belt Reminders and optimized Airbag Deployment and Disabling.

## Methodology

We created a comprehensive survey designed to evaluate the perceived importance of these features to consumers in five key automotive markets: the U.S., the UK, Germany, Japan and South Korea. These territories were

selected to ensure geographical balance and because they are widely seen as technological pacesetters for the global industry.

In addition to opinion about specific features, we gathered data about participants' genders, income levels and number of children/grandchildren, as well as their accident history, in order to identify differences between the perspectives of people in each geography.

The survey was completed by 2,500 individuals, divided equally between the five geographies. Facilitated by Global Surveyz, an independent research company, the project took place over a two-week period between December 2021 and January 2022. Respondents were recruited through a global research panel and invited to participate via email. The average time spent on completing the survey was

4 minutes and 18 seconds. The answers to the majority of the non-numerical questions were randomized to prevent order bias in the responses.

We hope you find the data illuminating. If you have any questions about the methodology of the survey or its findings, please don't hesitate to get in touch.



# Report Analysis

**The data shows consumers want a better standard of in-cabin safety: is the automotive industry ready to meet demand?**

The global automotive safety market is projected to be worth more than \$258 billion by 2025, expanding at a compound annual growth rate of 10.6%. An increasingly important dimension of automotive safety is in-cabin monitoring, designed to protect vehicle occupants and improve driver experience.

For our industry report, The 2022 Automotive In-Cabin Safety Survey, we interviewed 2,500 motorists from five key markets - the U.S., the UK, Germany, Japan, and South Korea - to gain a comprehensive understanding of consumer opinions around the trending topic of in-cabin safety. We asked what their top considerations are when buying or leasing a car, which passenger safety features they feel should evolve or come as standard in new cars, and whether they would be willing to pay extra for enhanced in-car safety.

Based on the results of the survey, this data-driven article is designed to provide insights for automotive manufacturers and suppliers planning their in-car safety development strategies. Ready to hear the true voice of the consumer in 2022? Let's dive in.



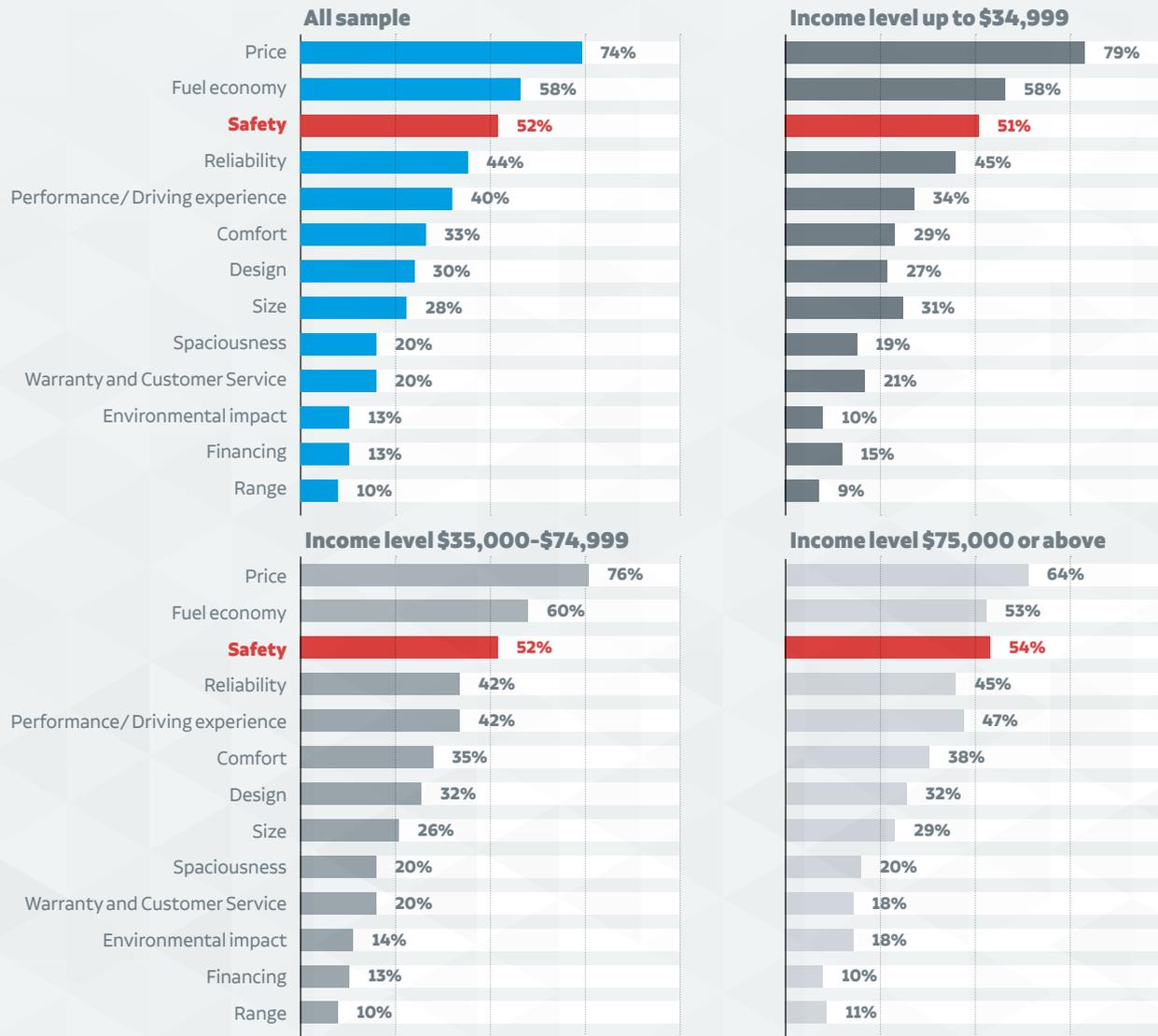


Figure 1: Top Considerations When Buying or Leasing a Car by Household Income

### What do motorists want most? Hint: it's not just low sticker prices.

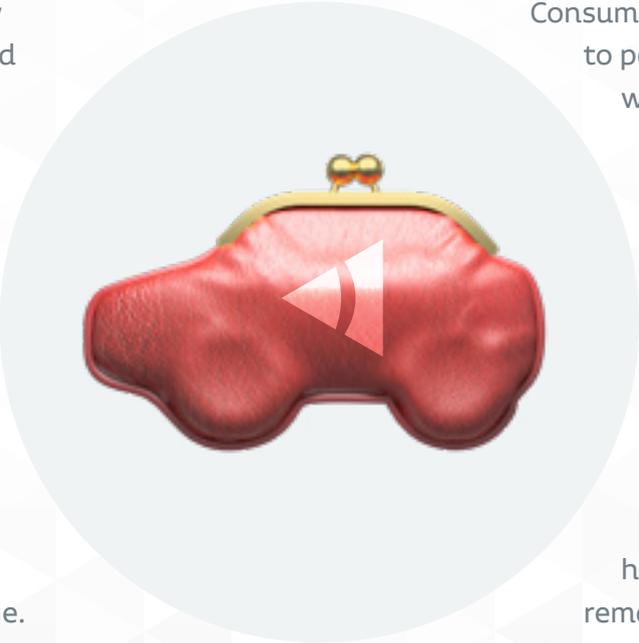
It's no surprise that price is the top factor when buying or leasing a car or that the more an individual earns, the less impact price has on their purchasing decision. In contrast, safety, the third most important factor in the consumer decision-making process, remains consistent across the whole sample, growing only slightly in importance for those with more money to spend.

This data mirrors other recent industry reports, which show that safety and reliability are increasingly among consumers' top priorities. 67% of people say

that they actively “seek out brands that are known for safety in their products and services” and 81% of drivers say that they are more likely to choose a brand that is “known for safety.”

We wanted to gauge how this sentiment applies to in-cabin safety features such as Child Presence Detection, airbags, Seat Belt Reminders, out-of-position alerts, occupant monitoring and intruder alerts. Most of these features are traditionally based on relatively basic technologies, which are now being superseded by platforms that gather real-time data on vehicle occupants, including their size, location and posture.

Consumers reported that in-cabin safety is an important consideration when buying or leasing a new car. 84% responded that enhanced passenger safety features would impact their decision, and 64% expressed willingness to pay extra for advanced features. For families with children or grandchildren under 18, this number rises to 70%.



Willingness to pay more for in-cabin safety features decreases with age. 54% of respondents aged between 55-70 would be willing to pay extra for enhanced in-cabin safety features, and this number steadily increases down through the age brackets, reaching 75% in the 27-35 demographic.

This suggests that OEMs and Tier 1s need to focus on in-cabin applications that will appeal to younger, more safety-conscious drivers, especially those with young children.

Consumers are not only happy to pay more for cars with in-cabin safety features, but these features are also overwhelmingly likely to impact which model they choose. Such features are no longer simply “nice to have” - they’re fast becoming “must-haves.” But with price remaining at the top of the list of considerations,

it’s clear that automakers need to leverage cost-effective technologies to offer smart in-cabin safety solutions that allow them to maintain competitive prices, while meeting growing demand for advanced in-car safety.

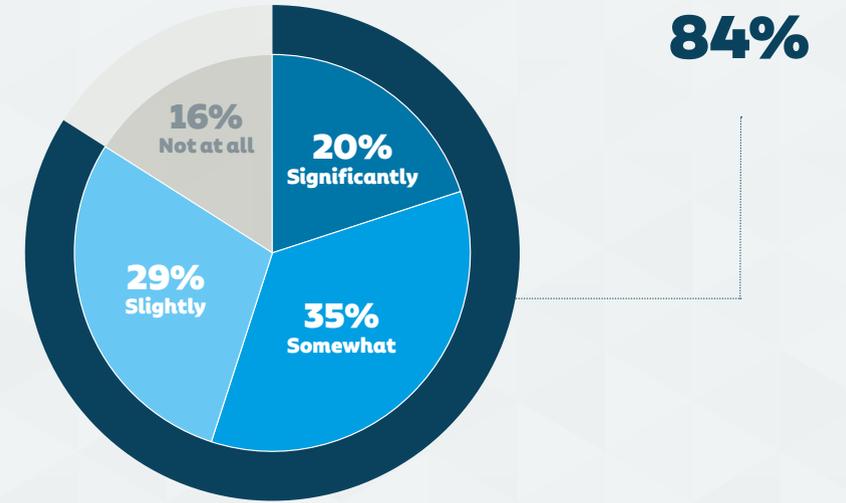
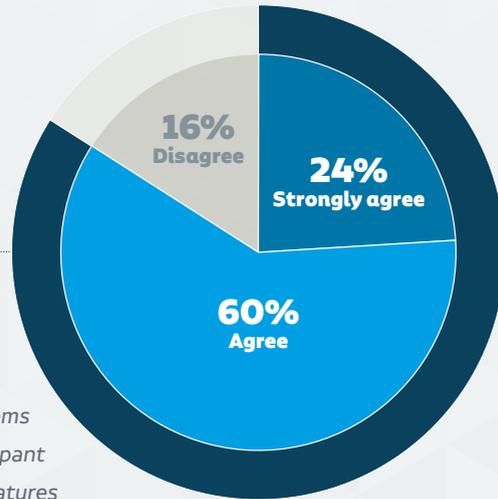


Figure 2: How New In-Car Safety Features Impact Car Purchasing



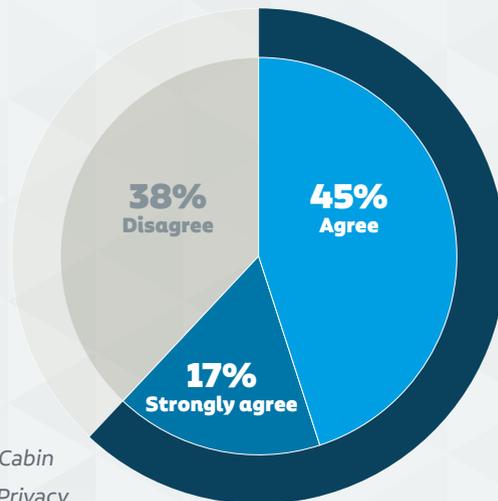
Figure 3: Percentage of People Willing to Pay Extra for Enhanced In-Car Safety

84%



**Figure 4:** Driver Assist Systems Offer a Higher Level of Occupant Protection than In-cabin Features

62%



**Figure 5:** Camera-Based In-Cabin Monitoring Systems Invade Privacy

### Which safety technologies should be explored by automakers?

Consumers are well aware that in-cabin safety needs to evolve. In fact, 84% of respondents feel that current Advanced Driver Assist Systems (ADAS) are better equipped to protect vehicle occupants than current in-cabin safety systems.

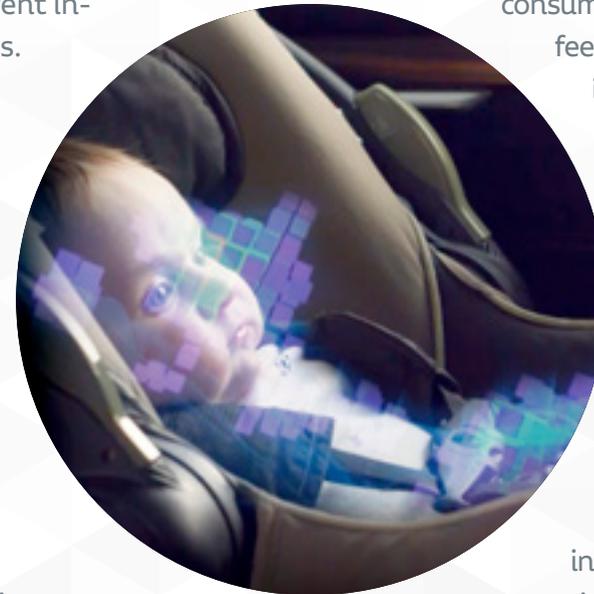
The challenge for automakers is to enhance in-cabin safety systems such as Child Presence Detection, airbags, seatbelt pretensioners and Seat Belt Reminders to achieve comparable levels of sophistication to ADAS features like Parking Assist, Blind Spot Detection, Lane Keep Assist, and Autonomous Emergency Braking, all of which are now common in new cars.

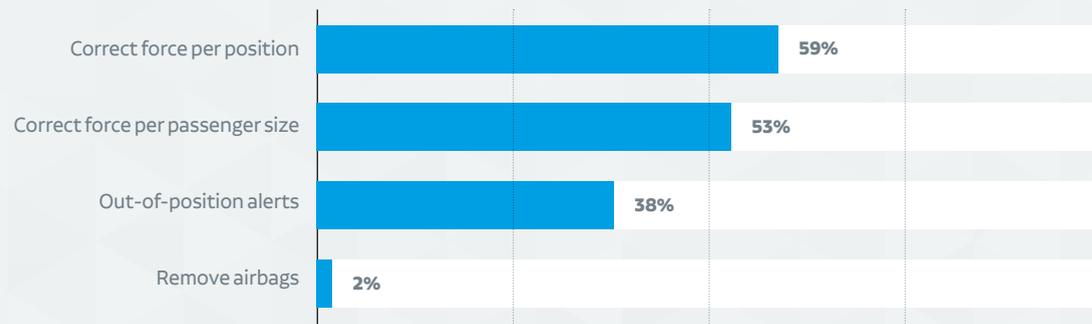
If OEMs and Tier 1s can implement technologies that bridge the gap between ADAS and in-cabin monitoring, they could be well positioned to gain significant competitive advantage.

However, not all in-cabin monitoring technologies would be welcomed with open arms by today's privacy-focused consumers. 62% of people feel that camera-based in-cabin monitoring systems are intrusive of their privacy.

Despite consumer reticence, automakers can't simply avoid occupant monitoring solutions altogether. After all, in 2023, occupant status monitoring will become part of the Euro NCAP's requirements.

Automakers need to accelerate their efforts to adopt non-optical solutions that will appeal to consumers without raising privacy issues.





**Figure 6:** Ways to Reduce Airbag Injuries

## The emerging in-cabin ecosystem

Consumers are starting to view the vehicle cabin as a holistic system designed to provide the best possible protection for both drivers and passengers. Let's look at three specific features which are important to consumers and regulators alike.

### 1. Smart airbags

Airbags are currently a "one size fits all" solution for in-cabin safety. That's why short-stature adults - and children - face the greatest risk of airbag-related fatalities and injuries.

However, even when a vehicle occupant's height and weight are within the standard parameters, traditional airbag technology still poses risks - up to 19% of drivers suffer upper extremity injuries due to airbag deployment, including broken ribs and collarbones, bruising, and burns.

As current airbag deployment does not account for size, position, or posture, life-threatening injuries can result from

a passenger sitting with their feet up on the dashboard, or a driver sitting closer than average to the steering wheel. That's why a new law - FMVSS 208 - will mandate enhanced airbag suppression with the aim of reducing airbag impact injuries, especially those suffered by children.

Many consumers are well aware of solutions that could make airbags safer and reduce impact injuries. 59% of respondents recognize that optimized airbag deployment should account for position, 53% state that deployment based on driver size is important, and a further 38% think out-of-position alerts would improve airbag safety. Automakers therefore need to consider in-cabin safety technologies that can detect the position, size and posture of occupants, and enable the airbag system to make real-time decisions about the optimal inflation force.

With affordable, easily integrated solutions now available, consumers can benefit from the standard of airbag safety they demand, without additional expense for manufacturers.

## 2. Child Presence Detection

CPD technology is essential for preventing hot car incidents, which have killed thousands of children left behind in cars worldwide. In 2023, the fitment of CPD technology will earn automakers up to four Euro NCAP safety points. In the US, meanwhile, the Hot Cars Act has already been passed by both the House and Senate. Once signed into law, it will mandate CPD for all new vehicles in the country.

Legacy Child Presence Detection solutions based on door sequencing aren't up to the job of preventing these tragedies. OEMs and their suppliers need systems based on real-time occupant data which cover the entire cabin, including all footwells and the trunk. With such technology now readily available, automakers have a real opportunity to increase their safety ratings while meeting global regulations. Consumers are already on board, with 85% agreeing that CPD should come as standard in all new cars. Meanwhile, 69% report that they would be more likely to buy or lease a vehicle offering this feature.

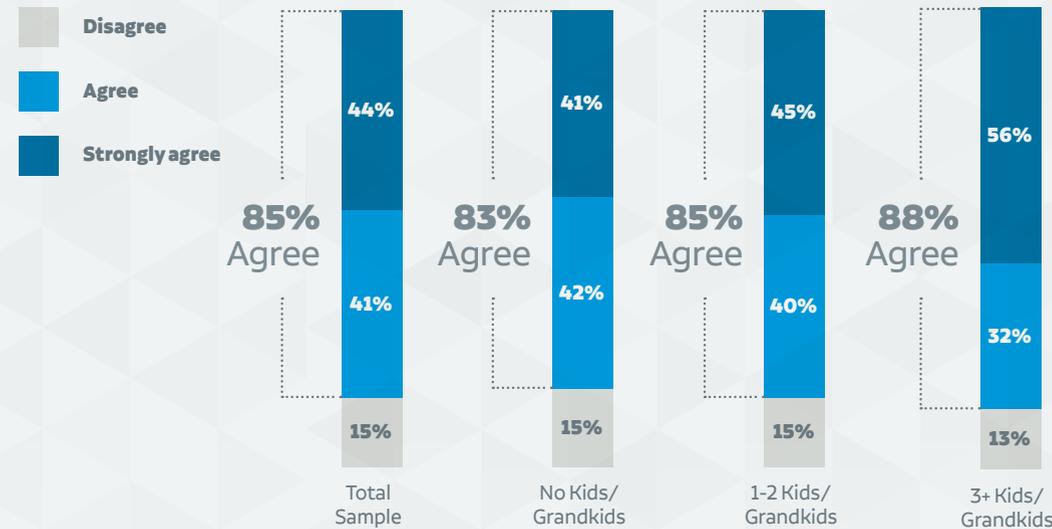


Figure 7: Automatic Child Presence Detection Should Come as Standard in New Cars

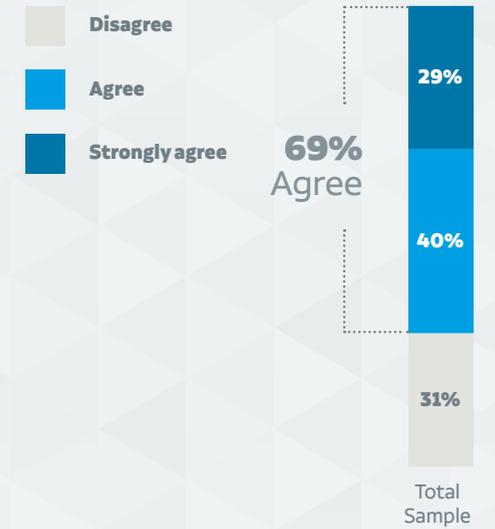


Figure 8: I am More Likely to Consider a Car That Comes with Child Presence Detection

### 3. Enhanced Seat Belt Reminders

Rear bench seat belt reminders are mandated in Europe and Japan, and will soon be a precondition for Euro NCAP in-cabin safety points. But existing systems cause false alarms since they do not rely on true occupant detection.

The vehicle alerting system is a key aspect of driver experience, and respondents rated DX among their top 5 considerations when purchasing or leasing a vehicle. Drivers called out Seat Belt Reminders, which are often triggered by luggage, as by far their “most annoying alert.” While this might seem like a small matter, it can be distracting for drivers to have to deal with a nagging alert for a non-existent “unbelted” passenger.

Automakers can address this issue by turning to more intelligent in-cabin safety solutions for Seat Belt Reminders. For example,

high-resolution occupant presence detection sensors are significantly more accurate than weight sensors, eliminating false positives by ensuring that the alert only goes off when a human passenger needs to buckle up.

**Consumers know what they want and regulators are following suit. Automakers? Your move.**

Consumer demand and regulator requirements are creating the impetus for next-generation in-cabin safety features that are just as developed as ADAS technology. These intelligent solutions have the potential to prevent hot car incidents, airbag injuries and fatalities, and reduce driver distraction caused by inaccurate alerts. It’s a trend that’s set to continue. The younger the age demographic, the more money consumers are willing to spend on in-cabin safety features that protect all vehicle occupants.

#### Seat Belt Reminders



#### Low tire pressure



#### “Door open” alert



#### “Passenger airbag off” alert



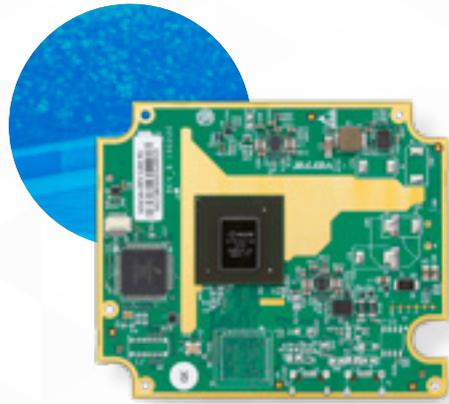
#### “Low fuel” alert



#### “Handbrake on” alert



Figure 9: Most Annoying Car Alerts According to Owners



## **For OEMs and Tier 1s, the time to act on in-cabin safety is now.**

When setting out development strategies, in-cabin safety should be as much of a priority for OEMs and suppliers as for the consumer. Automakers also need to keep in mind that non-optical technologies can avoid privacy and compliance issues raised by in-vehicle monitoring cameras.

Multifunctional sensor platforms, priced the same as single-function sensors, can support a number of lifesaving in-cabin safety features while yielding significant cost savings. With affordable, leading-edge in-cabin monitoring systems, automakers can stand out from the crowd by enhancing driver and passenger protection, improving vehicle safety ratings, and boosting brand loyalty through optimized driver experience.

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