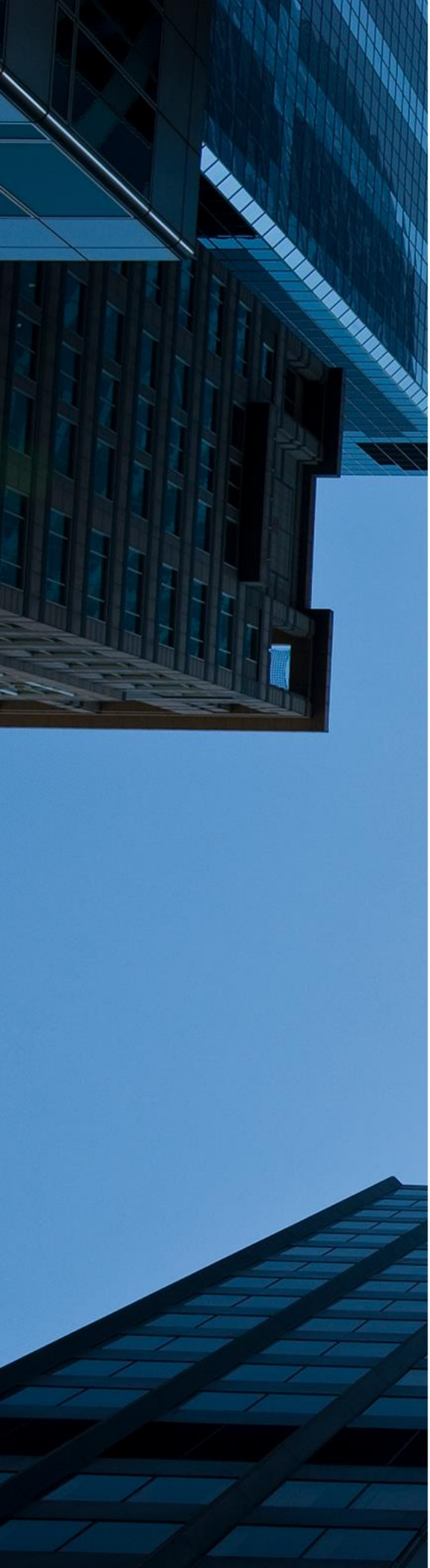

Aite Novarica

JUNE 2023

USING TECHNOLOGY FOR ACCIDENT PREVENTION AND CLAIMS COST REDUCTION IN PERSONAL AUTO

PREPARED FOR:

ADEPT DRIVER®

JUNE 2023

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EXECUTIVE SUMMARY

Using Technology for Accident Prevention and Claims Cost Reduction in Personal Auto, commissioned by ADEPT Driver and produced by Aite-Novarica Group, examines the factors behind rising claims costs for personal auto insurers. It summarizes the ecosystem of technological solutions insurers can use to mitigate claims costs before focusing on key technologies that improve claims outcomes by reducing accident frequency.

Key takeaways from the study include the following:

- **Rising claims costs are a critical issue for personal auto insurers:** Recent changes in driver behavior have combined with supply chain disruptions to dramatically increase claims costs while rendering them less predictable. Rising losses have forced insurers to pass cost increases back to consumers through premium increases, creating additional challenges for policyholder retention.
- **Insurers have a range of tools to address rising claims costs:** As the major cost center for a personal lines insurer, claims expense control is a critical task that has given rise to an ecosystem of technological solutions that can improve efficiency, identify and control cost leakage, and even prevent accidents from occurring.
- **Telematics, effective driver behavior modification, and advanced driver assistance systems (ADAS) can all help reduce claims costs by reducing accident frequency:** These solutions help alert drivers to dangerous habits or situations and aim to stop claims from happening in the first place.
- **Solutions shouldn't be siloed:** Insurers should consider a "both-and" rather than an "either-or" approach when piloting and adopting solutions to reduce claims costs. No technology comes without its own gaps, but insurers can use technologies in combination effectively such that the strengths of one tool cover the weaknesses of another.
- **Reducing accidents can reframe the insurer-insured relationship:** Technologies that can reduce accident frequency and severity allow insurers an excellent opportunity to position themselves not solely as risk indemnifiers but as the partners of policyholders united in making driving safer. This can increase customer loyalty by recasting a formerly economic exchange as a prosocial, invested relationship.

INTRODUCTION

Loss costs for personal auto insurers have risen sharply in recent years, driven by behavioral changes and systemic factors that have led to more costly accidents[1] occurring at a higher frequency. These rising claims costs, in turn, force insurers to raise premiums, creating friction for retaining existing policyholders.

Insurers have a range of technological solutions to address claims expenses, and within the technological claims cost ecosystem, carriers should especially take note of solutions that aim to improve driver behavior and prevent accidents from occurring. By reducing overall claims incidence, these solutions stand out as a way to address claims cost issues at their source while improving overall safety for all drivers.

Insurers can use this report as a resource to frame the overall ecosystem of technological solutions they can use to address claims costs and improve their familiarity with offerings that improve driver safety and accident incidence. Solution providers can use this report to locate their technologies with the claims ecosystem and improve messaging on the impact their solutions can create for claims losses, leakage, or process efficiency.

METHODOLOGY

This report is based on Aite-Novarica Group's existing research on the personal auto claims landscape and emerging technologies and their applications to the property/casualty insurance space. These include Business and Technology Trends 2022: Personal Lines, Emerging Technology for P/C Insurers 2023 and Aite-Novarica 100 Digital, Data, and Core Capabilities for P/C Insurers.

Research for Aite-Novarica Group reports includes conversations with insurers about their technology and business priorities. Information about the efficacy of effective driver behavior modification systems was provided by this report's sponsor, ADEPT Driver, and independent research done by insurers, the Traffic Injury Research Foundation, Dunlap and Associates, and DOI rate filings.

[1] By convention, *accident* is used throughout; *collision* is also widely used, particularly among automotive safety professionals.

ACCIDENT REDUCTION AS A CLAIMS COST MITIGATION STRATEGY

Claims losses are the largest single cost center within an insurer, so they've always been targets for cost savings. Recent claims cost increases spurred by COVID-19 pandemic-related factors have driven auto claims expenses to record levels. Now, more than ever, personal auto carriers are looking for ways to save on claims expenses.

RECENT TRENDS CONTRIBUTING TO RISING AUTO CLAIMS COSTS

Behavioral changes and systemic factors have combined to sharply raise insurers' auto claims costs over the past several years. The confluence of riskier driving, costlier auto components, supply chain disruption, and inflationary pressures resulted in a 2022 that was the worst in many carriers' histories: Numerous auto insurers posted combined ratios above 100; industry leader State Farm posted a US$13 billion underwriting loss; GEICO listed a US$1.9 billion loss total. In many cases, spiraling catastrophe loss costs in homeowners' and property insurance compounded these increases.

Ongoing increases in personal auto claims costs stem from several interrelated factors:

- More advanced consumer automobile technology has helped reduce accident frequency but has led to more costly repairs. Losses may include any number of expensive components (e.g., sensors, cameras, chips for onboard computers) that must be replaced.
- Pandemic-related changes in driving behavior have tended to create more risky and distracted driving. After reduced claims frequency (with higher severity) in 2020, insurers are now seeing increasing frequency of claims, with severity still high.
- Supply chain disruption substantially increased claims costs, affecting part and chip availability (leading to lengthier repairs and longer claim tails) and rental car availability (creating greater costs as policyholders' vehicles sit unrepaired).
- Due to supply chain disruption and general economic trends, inflationary factors increase costs across the board.

Rising claims costs and triple-digit loss ratios would be a major challenge on their own, but these increased expenses cause additional knock-on effects for insurers. Many insurers are passing these higher costs on to their policyholders in the form of premium

increases. This causes customer friction and challenges for retention as safe drivers seek better deals with competing carriers.

THE INSURANCE CLAIMS COST TECHNOLOGY ECOSYSTEM

Because claims costs are such a large factor for overall profitability, insurers regularly experiment with and invest in technological solutions that can improve risk management and efficiency for claims processes. In 2022, insurers rated all areas of claims technology investment as "high priority."[2] Many insurers, especially larger insurers, have matured their capabilities in these areas over the past several years, focusing on digital capabilities such as mobile first notice of loss (FNOL) and service-provider integration.[3]

Technologies that help insurers mitigate claims costs largely fall into three broad categories:

- **Operational efficiency:** These solutions reduce claims costs by reducing cycle times—getting relevant information to adjusters more quickly or optimizing decision-making, sometimes including processing claims straight-through with no human input.
- **Cost leakage:** These solution help insurers identify costs they're *not* responsible for and predict and limit expenses for those costs they do need to pay.
- **Accident reduction:** These solutions address rising claims costs at their source by helping to prevent accidents from occurring in the first place.

Technologies that support operational efficiency most often fall under digital and core areas, while cost leakage technologies frequently leverage data capabilities. Solutions that reduce claims frequency can span multiple areas and include technologies outside an insurer's internal technical environment. The Personal Auto Claims Technology Ecosystem wheel is shown in Figure 1.

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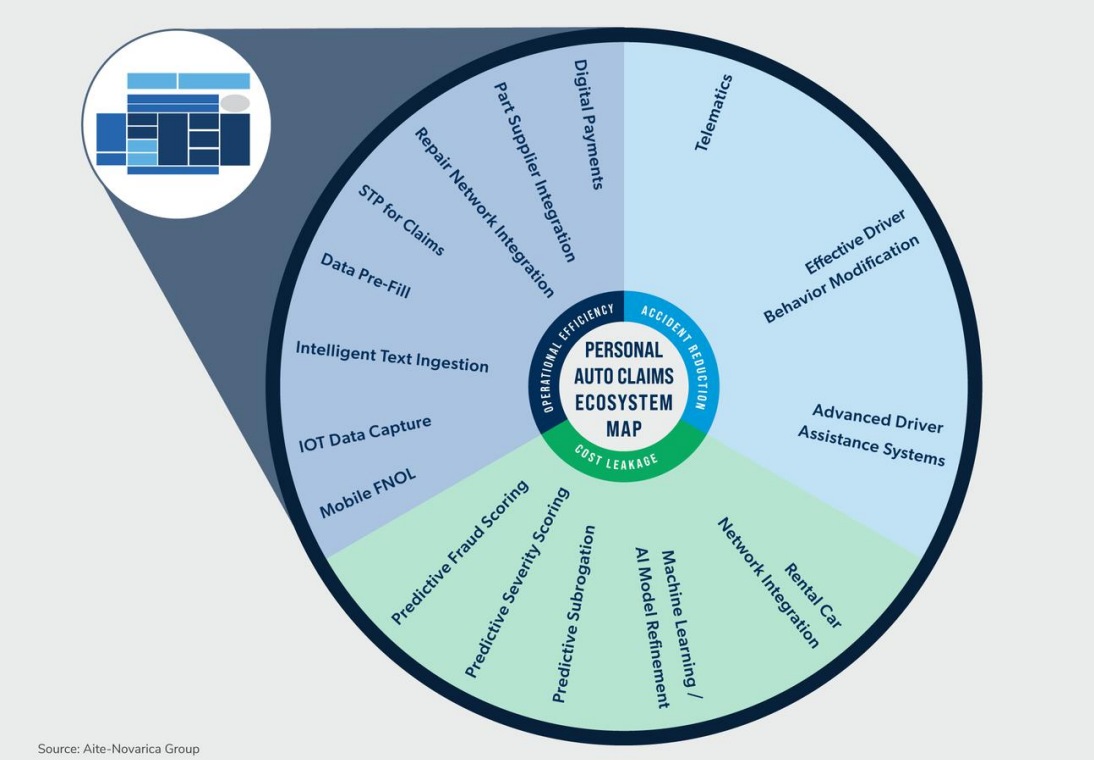
[2] See Aite-Novarica Group's report Business and Technology Trends, 2022: Personal Lines, September 2022.

[3] See Aite-Novarica Group's report Aite-Novarica 100 Digital, Data, and Core Capabilities for P/C Insurers, December 2022.

FIGURE 1: THE PERSONAL AUTO CLAIMS TECHNOLOGY ECOSYSTEM MAP



Source: Aite-Novarica Group

ACCIDENT PREVENTION AS A CLAIMS COST MITIGATION STRATEGY

Within this ecosystem, solutions that aim to *prevent* claims from occurring by reducing the frequency and severity of accidents especially stand out.

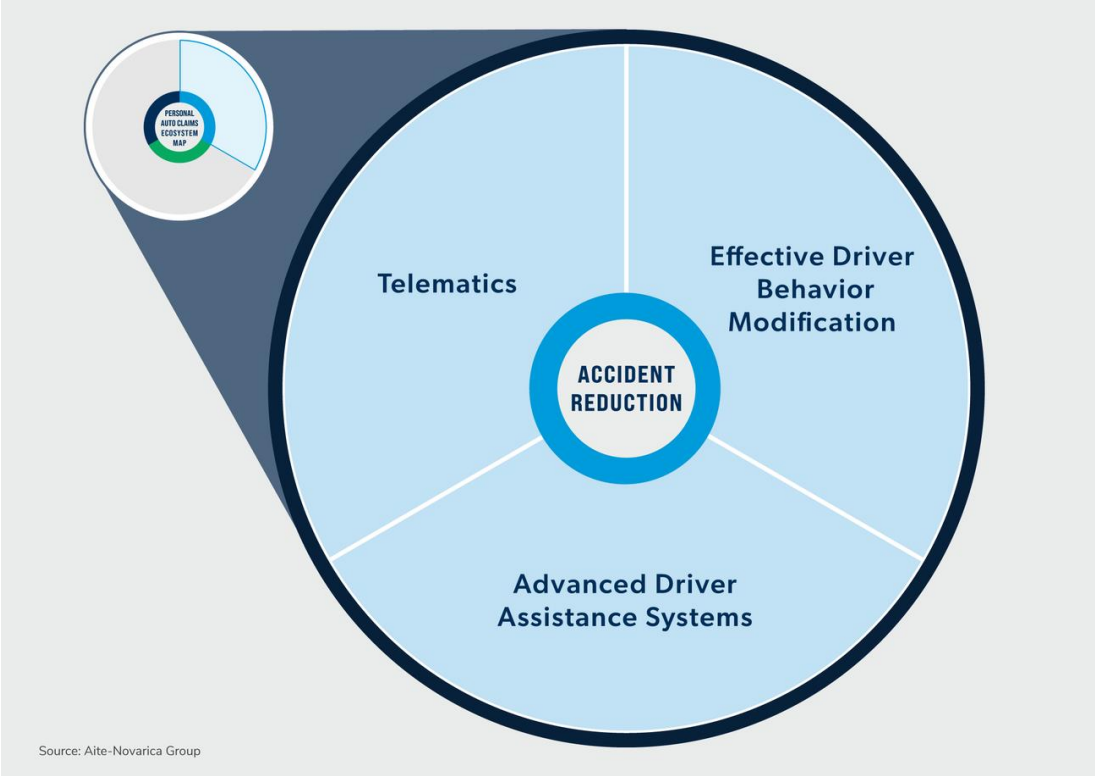
One of the key takeaways of 2022 is that claims costs are difficult to predict even when the circumstances of an accident are well understood and handled quickly: Insurers can't control factors like component shortages, shipping delays, and rental car availability that can drive up costs even for claims that are managed well. Moreover, the same pressures driving up claims costs, such as used car shortages, are pushing consumers to buy newer vehicles (which are even costlier to repair).

For several years, insurers have invested in digital and data capabilities to improve operating efficiency and control cost leakage. These capabilities remain crucial, as no insurer will ever prevent every claim. But given the unpredictability of claims costs, there are advantages for insurers willing to take a closer look at solutions that aim to

reduce claims frequency by helping to prevent accidents. After all, the least expensive claim to service is one that never happens in the first place.

The three technologies that comprise the accident reduction category, as shown in Figure 2, are telematics, effective driver behavior modification, and advanced driver assistance systems. The next section of this paper addresses all three in greater detail.

FIGURE 2: ACCIDENT REDUCTION TECHNOLOGIES WITHIN THE PERSONAL AUTO CLAIMS ECOSYSTEM



TECHNOLOGIES FOR ACCIDENT REDUCTION

Technologies designed to reduce accidents offer insurers the potential to address rising claims costs at their source by reducing total claim volumes. These tools create better insight into driver behavior and offer policyholders tools for improvement by discouraging negative habits and teaching positive ones. They can also help prevent accidents by alerting drivers to other vehicles and adverse road conditions. Features profiled in this section include telematics, effective driver behavior modification, and ADAS.

TELEMATICS

Telematics refers to the use of sensors to capture information about when, where, and how a vehicle is operated. Within personal auto insurance, telematics is frequently synonymous with usage-based insurance (UBI), a class of products that generally use the technology to quantify a driver's behavior and risk profile in the form of a driver score, which is then used to offer premium discounts to drivers the score rates as safe or premium increases to drivers the score rates as unsafe.

Telematics has a range of applications across the personal auto product life cycle. Most carriers apply it to UBI products to improve risk selection, but they can also leverage it in other areas, such as customer engagement and FNOL data capture. This report focuses on the benefits telematics has for accident reduction.

How Telematics Reduces Accidents

Fundamentally, telematics assesses driver behavior and performance. It enables insurers to give feedback to their policyholders about their driving, especially around aspects of their driving that lead to greater risk.

Consumer-focused telematics programs indicate a particular driver's assessed driving score; even those that are mostly focused on offering a UBI-style discount offer views to break down that score into the individual behaviors it aggregates, such as hard braking, rapid acceleration, aggressive lane shifts, or tight cornering. By viewing these breakdowns, drivers can learn more about their habits, which shape their risk profiles.

More mature telematics offerings offer features allowing drivers to dig deeper into these scores via trip summaries highlighting risky incidents. Mobile telematics apps can also measure distracted driving by monitoring phone interactions during the trip.

Gathering this information together, drivers can learn about their habits and how they may negatively contribute to their overall driving risk.

Limitations of Telematics

Telematics-based tools' ability to shape driver behavior has some limitations. One is that improvement is generally up to the driver's own initiative. Feedback is normally delivered after the fact as a trip summary or a driver score breakdown that illustrates various individual actions and how each contributes to the driver's overall score. These scores can be confusing to some drivers, so it's important that such tools be very clear about how each component is measured and factored in.

Driver score breakdowns can tell drivers *what* to focus on to improve their scores. Still, it's up to drivers to figure out *how* to change their driving to make that happen. The telematics app may give helpful suggestions, and its feedback can help drivers tell whether they're trending in the right direction, but it can't in itself diagnose the root cause of dangerous behavior or poor habits.

In that sense, telematics isn't *constructive*. Telematics is highly useful for detecting actions that negatively impact a driver score, but it doesn't actively teach new, safer behaviors in a structured way.

Telematics-based behavior modification is most effective when drivers are monitored continuously so that poor habits are consistently discouraged; there is some evidence to suggest that skills begin to deteriorate when drivers are no longer monitored. With mobile phone data collection more the norm, however, continuous monitoring is becoming the dominant trend.

Representative Telematics Providers

The telematics service provider (TSP) market has grown considerably since the technology's early years, particularly now that mobile has been broadly accepted as an accurate vector for gathering driver data. Some consolidation in the market has also begun, as evidenced by Cambridge Mobile Telematics' acquisition of TrueMotion in 2020. Sample providers to the U.S. and Canadian markets include the following:

- **Cambridge Mobile Telematics**, based in Cambridge, MA, is the U.S. market leader among TSPs, currently supporting telematics products at nine of the top 10 U.S. auto carriers. Most programs are administered via mobile apps. The company also

produces a proprietary vehicle tag to collect more granular information about vehicular motion.

- **Insurance & Mobility Solutions**, based in Waterloo, Ontario, offers a variety of telematics products via mobile app. The company also supports a data exchange to ingest telematics data from a variety of sources. Clients include Aviva Canada.
- **The Floow**, a U.K.-based TSP, offers mobile-based telematics products via a white-label app that can be customized to client needs. U.S. clients include Auto Club South. Israeli-connected data firm Otonomo acquired The Floow in 2022.

EFFECTIVE DRIVER BEHAVIOR MODIFICATION

Effective driver behavior modification products are interactive driving skills courses that simulate a variety of driving scenarios and allow users to practice and learn proper safe driving behavior. They target the driving skill factors that contribute to a vast majority of accidents and attempt to address and correct the underlying causes contributing to unsafe driving behavior by raising driver awareness of their habits and giving structured feedback for improvement.

These are most effectively delivered through interactive modules that showcase each crash avoidance skill, with immediate feedback for positive and negative inputs. Insurers should consider these effective driver behavior modification programs distinct from a non-interactive offering, such as one that only presents information via videos and assesses via static questions.

How Effective Driver Behavior Modification Reduces Accidents

Driver behavior modification programs are flexible by nature. They can teach various skills, but effective training typically focuses on the key underlying causes that lead to most accidents. They, therefore, seek to train specific skills, such as visual awareness, hazard detection, risk perception, speed and space management, assessing the safety of traffic gaps before turning, and reducing distracted driving. Fully-featured programs include modules that can be customized according to user capabilities and needs (e.g., by age cohort) to focus on particular skills for younger, adult, or older drivers.

The experiential nature of effective driver behavior modification modules helps challenge drivers' presumptions about their skills and habits by simulating driving scenarios that require them to pay close attention to their surroundings and recall

specifics about pedestrians, vehicles, and road hazards. Initial stumbles help underscore the cognitive load required for safe driving, and repeated practice can result in demonstrated improvement in spatial awareness and object recognition.

Effective driver behavior modification is unique among accident reduction tools in that it attempts to correct the underlying causes of poor driving behavior. As a participatory program normally presented as an added-value service for an auto policy, it can also have important benefits for customer engagement and retention.

Challenges for Effective Driver Behavior Modification

Driver behavior modification modules include two main challenges. First is that by itself, effective driver behavior modification doesn't directly measure the extent to which drivers are putting these skills into practice. While safer driving behavior can be inferred from reduced claims incidence at a population level, and video monitoring studies indicate that drivers do put skills learned into practice, an effective driver behavior modification program deployed alone may miss drivers who need additional practice or instruction beyond what the standard module offers.

An additional challenge is that insurers can struggle to motivate policyholders to complete driver behavior modification programs. While some drivers will be naturally motivated to do everything they can to improve their safety skills, some will view additional training as unnecessary, particularly if insurers don't defray the program cost or incentivize it with a premium discount.

Insurers may have the best experience deploying effective driver behavior modification when participation can be compelled as a condition of a particular product, such as for substandard auto products in which drivers may have lengthy histories of unsafe driving or when other actors can help motivate participation, as with a product for teenage drivers or for small commercial fleets (wherein parents or owners can require participation).

Representative Driver Behavior Modification Providers

A number of insurers offer discounts to drivers, typically younger drivers, who complete defensive driving training courses. These may or may not be truly interactive products; many are educational videos that assess participation via static questions. Prominent driver behavior modification providers include the following:

- **ADEPT Driver** creates and administers online driver behavior modification programs that improve crash avoidance skills, including specific programs for youth, adult, and mature drivers. Based on neurocognitive science and epidemiological studies of auto accidents, these courses are designed to address leading causes of vehicle crashes by developing critical safe driving habits. Future products include a course focused on improving telematics-based driving scores.
- **eDriving** supports a suite of technologically based driver improvement modules via web and mobile apps. Mobile features include telematics-based driver feedback; users can supplement this feedback with online learning modules delivered through the app or the company's website.

ADAS FEATURES

ADAS refers to various technological systems integrated into modern vehicles to assist drivers with noticing and navigating hazardous situations. These generally include tools such as lane assistance features that can alert drivers that their vehicle has begun to drift (or sometimes physically steer the vehicle back to the middle of the lane), blind spot notifications, automated emergency braking, and adaptive cruise control systems that maintain consistent speed and distance from other vehicles.

How ADAS Reduces Accidents

ADAS aims to alert drivers when an accident is about to occur so the driver can take corrective action. Industry research from LexisNexis indicates that these systems are effective in reducing accident frequency and property damage costs by 15% to 20% compared to vehicles without ADAS. Impacts on collision costs are more muted due in part to the costly components required to support ADAS features. However, it's worth noting that prior conventional wisdom suggested that cost savings from reduced accidents were completely offset by higher repair costs.

ADAS features can also include vehicle parking and visibility features that support driver awareness of a vehicle's surroundings in tight situations; these can even include automated parking systems that don't require driver interaction. These latter tools can be useful, but they don't tend to prevent high-value claims.

Most insurers don't offer discounts to customers who insure vehicles with ADAS features, though SwissRe has developed a proprietary ADAS Risk Score to guide

carriers that do want to offer such incentives. SwissRe indicates that proper assessment of ADAS can improve accuracy for claims outcome predictions by as much as 35%.

Challenges for ADAS

The most fundamental challenge to ADAS from the insurer's perspective is that whether an insured vehicle has these features is out of the insurer's control. Insurers can offer perks to policyholders who happen to own a vehicle equipped with ADAS features, but there's little they can do to motivate drivers to seek out these features or to switch from a vehicle without ADAS features to one with them.

Insurers should also have a plan to monitor whether ADAS features are actually being used—some can be disabled, so just because a vehicle model has them doesn't mean the driver is actively benefitting from them.

COMBINING APPROACHES

As with many areas of technological innovation, insurers shouldn't treat accident reduction technologies as a solitary choice. Implementing multiple solutions can enable one tool's strengths to cover for another's weaknesses or create a positive synergy in which the solutions mutually reinforce one another. Thus, a "both-and" approach can be more effective than a single solution implemented in isolation.

TELEMATICS AND EFFECTIVE DRIVER BEHAVIOR MODIFICATION

Telematics and effective driver behavior modification naturally dovetail well, approaching the issue of driver improvement in different contexts from different directions. Effective driver behavior modification covers one weakness of telematics for driver improvement by giving clear and structured training to improve specific driving behavior, so drivers have an accessible resource to help themselves build better habits. Telematics can confirm that driver behavior learned via the effective driver behavior modification module is being implemented in real driving scenarios.

Continuous monitoring via telematics can also provide individualized data so that training programs can be more effectively structured to improve a particular driver's individual tendencies. Similarly, driver behavior modification modules can be customized to target specific driving behaviors that telematics data reveals as an area of need, giving drivers clear instructions to curtail negative habits and build positive ones.

A combined telematics/effective driver behavior modification program could even be constructed around the objective of helping a driver understand and improve their telematics-based driver score, enhancing the sense of control a driver feels over their score and increasing their confidence that the telematics system is "really" capturing their driving performance.

EFFECTIVE DRIVER BEHAVIOR MODIFICATION AND ADAS

Effective driver behavior modification and ADAS focus on the same fundamental goal: making the driver more aware of their surroundings and reducing the overall riskiness of their driving. Driver behavior modification does so proactively, teaching skills before the insured gets behind the wheel; ADAS does so reactively, using advanced safety features to warn drivers of hazards in real time or correct lapses in attention. Improving visual awareness, hazard detection, and escape route identification skills can

complement ADAS when alerts are given, allowing the driver to assume control more quickly during an emergency maneuver.

These solutions can cover for each other in that driver behavior modification modules can teach the skills required to, ideally, never need the ADAS features in the first place. In real life, drivers don't perfectly replicate the skills they know, and roads are complicated. ADAS can warn drivers about unsafe situations as they arise, especially when those situations are caused by the dangerous behavior of other drivers.

Effective driver behavior modification can also help insurers when ADAS features aren't available, such as when drivers have older vehicles.

ADAS AND TELEMATICS

ADAS and telematics have little natural overlap, though both use immediate feedback to help drivers correct negative behaviors at the moment they happen. In this manner, both can help reduce dangerous driving behavior.

One area of potential overlap for these approaches is maturing onboard sensors in new vehicles, which could offer a new avenue for collecting telematics driver data. The vehicular sensors in most vehicles currently on the road aren't accurate enough to diagnose individual driver behavior, though they can capture habits like average trip length and time of day driven.

Nevertheless, partnerships between original equipment manufacturers and insurers have flourished in recent years. These alliances are largely marketing endeavors that create a direct sales channel for insurers. These technologies may combine more effectively in the future as onboard sensor technology continues to improve and original equipment manufacturers' data streams become fitter for measuring driver behavior.

CONCLUSION

Rising claims costs have become a major challenge to insurers in 2022 and 2023. Insurers should consider their range of technological solutions for mitigating these increases, even in an environment in which cost pressure makes innovation difficult. In particular, solutions to reduce claims incidence can help obviate unpredictable costs.

These solutions may also multiply in value when used together so that each can emphasize the strengths of the others or cover areas wherein one solution alone would be less effective. Combining telematics and ADAS with effective driver behavior modification—and especially using a diagnostic/prescriptive approach to give drivers tools for improving their own habits—shows promise not only for influencing how an insurer might underwrite a personal auto policy but also for how an insurer can shape public safety more broadly.

As with all technological innovation, insurers should know that getting maximum value from accident reduction solutions may require rethinking existing products or processes to take advantage of the technology's new capabilities. Solutions designed to improve driver performance may require more robust customer engagement approaches to ensure drivers use the features and feel they understand their resources for improving. That style of customer engagement points to an additional benefit of technological solutions to prevent accidents: They also enable insurers to reframe their relationship with their policyholders.

Traditionally, auto insurance exists to indemnify loss and defray costs for policyholders whose exposure to risk exceeds their ability to pay out for repairs or liability. By focusing on preventing accidents, insurers recast themselves as mutually invested partners whose chief goal is to improve the overall safety of their insured drivers (and, for that matter, the overall experience of driving for everyone). That offers insurers the potential to be viewed as positive social actors rather than mere economic partners. In turn, they may enjoy increased loyalty from customers who no longer view them as the cheapest means to an end but as a net benefit to their health, safety, and economic security.

ABOUT AITE-NOVARICA GROUP

Aite-Novarica Group is an advisory firm providing mission-critical insights on technology, regulations, strategy, and operations to hundreds of banks, insurers, payments providers, and investment firms—as well as the technology and service providers that support them. Comprising former senior technology, strategy, and operations executives as well as experienced researchers and consultants, our experts provide actionable advice to our client base, leveraging deep insights developed via our extensive network of clients and other industry contacts.

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