The Future of Automobiles and Automobile Insurance: Separating Scientific Fact from Fiction

Casualty Loss Reserve Seminar

Austin, TX
September 18, 2019

Matt Moore - Senior VP

Insurance Institute for Highway Safety
Highway Loss Data Institute

iihs.org

IIHS is an independent, nonprofit scientific and educational organization dedicated to reducing the losses — deaths, injuries and property damage — from crashes on the nation's roads.

HLDI shares this mission by analyzing insurance data representing human and economic losses from crashes and other events related to vehicle ownership.

Both organizations are wholly supported by auto insurers.

IIHS and HLDI member groups

AAA Carolinas
Acceptance Insurance
Alfa Insurance
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BITCO Insurance Companies
California Casualty
Celina Insurance Group
Central States Health & Life Co. of Omaha and Affiliates
CHUBB
Colorado Farm Bureau Mutual Insurance Company
Commonwealth Casualty Company
Concord Group Insurance Companies
COUNTRY Financial
CSAA Insurance Group
Desjardins Insurance
DTRIC Insurance
ECM Insurance Group
Elephant Insurance Company
EMC Insurance Group
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Goodville Mutual Casualty Company
Grange Insurance
Grinnell Mutual
Hallmark Financial Services, Inc.
The Hanover Insurance Group
The Hartford
Haulers Insurance Company, Inc.
Horace Mann Insurance Companies
Imperial Fire & Casualty Insurance Company
Indiana Farm Bureau Insurance
Indiana Farmers Insurance
Infinity Property & Casualty
Kemper Corporation
Kentucky Farm Bureau Mutual Insurance Companies
La Capitale General Insurance
Liberty Mutual Insurance
Louisiana Farm Bureau Mutual Insurance Company
The Main Street America Group
MAPFRE Insurance Group
Mercury Insurance Group
MetLife
Mississippi Farm Bureau Casualty Insurance Company
MMG Insurance
Munich Reinsurance America, Inc.
Mutual Benefit Group®
Mutual of Enumclaw Insurance Company
Nationwide
NJM Insurance Group
Nodak Insurance Company
The Norfolk & Dedham Group®
North Carolina Farm Bureau Mutual Insurance Company
North Star Mutual Insurance Company
Northern Neck Insurance Company
NYCM Insurance
Ohio Mutual Insurance Group
Oregon Mutual Insurance Company
Pekin Insurance
PEMCO Insurance
Plymouth Rock Assurance
Progressive Insurance
PURE Insurance
Qualitas Insurance Company
Redpoint County Mutual Insurance Company
The Responsive Auto Insurance Company
Rider Insurance
Rockingham Insurance
Root Insurance Co
RSA Canada
Safe Auto Insurance Company
Safeco Insurance
Samsung Fire & Marine Insurance Company
SECURA Insurance
Selective Insurance Company of America
Sentry Insurance
Shelter Insurance®
Sompo International
South Carolina Farm Bureau Mutual Insurance Company®
Southern Farm Bureau Casualty Insurance Company
State Farm Insurance Companies
Stillwater Insurance Group
Swiss Reinsurance Company Ltd
Texas Farm Bureau Insurance
The Travelers Companies, Inc.
United Educators
USAA
Utica National Insurance Group
Virginia Farm Bureau Mutual Insurance
West Bend Mutual Insurance Company
Western National Insurance Group
Westfield

Funding Associations
American Property Casualty Insurance Association
National Association of Mutual Insurance Companies

Haddon matrix

Recognizing opportunities to make a difference

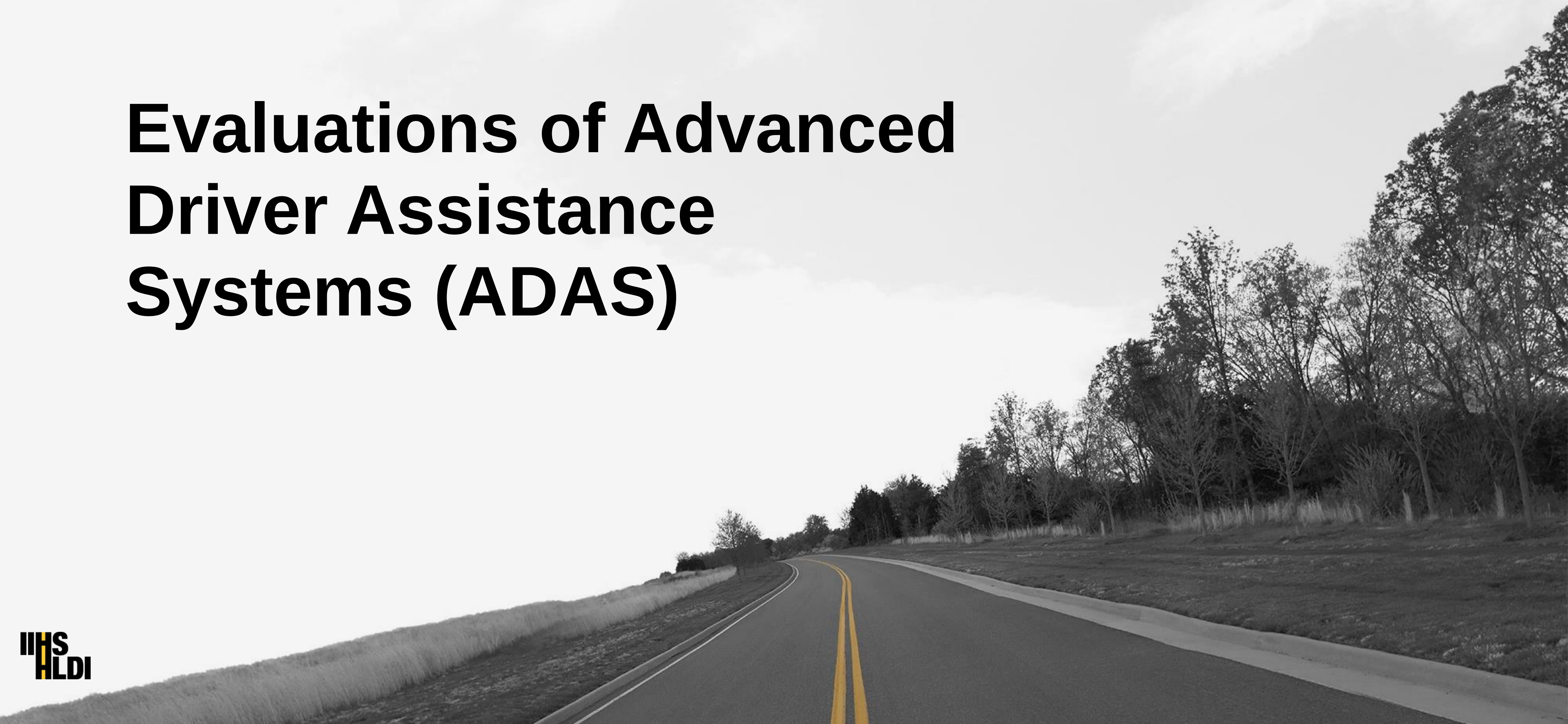
	pre-crash	during crash	after crash
people	graduated licensing impaired driving laws automated enforcement	safety belts helmets	medical bracelets general health
vehicles	crash avoidance technology	airbags crashworthiness truck underride guards	automatic collision notification fuel system integrity
environment	roundabouts rumble strips	roadside barriers breakaway poles	emergency medical services long-term rehabilitation


CBS Evening News
55 MPH
MAXIMUM

HLDI data providers insure approximately 85% share of PPA

21st Century Insurance
Alfa Alliance Insurance Corporation
Allstate Insurance Group
American Family Mutual Insurance
American National Family of Companies
Amica Mutual Insurance Company
Auto Club Group
Automobile Insurers Bureau of Massachusetts
Chubb & Son
COUNTRY Financial
CSAA Insurance Group
Erie Insurance Group
Esurance
Farm Bureau Financial Services
Farmers Insurance Group of Companies
Florida Farm Bureau Insurance Companies
Foremost
GEICO Corporation
Hanover Insurance Group
The Hartford
Kemper Preferred
Kentucky Farm Bureau Insurance
Liberty Mutual Insurance Company
MetLife Auto and Home
National General
Nationwide
New Jersey Manufacturers Insurance Group
PEMCO Insurance
Plymouth Rock Assurance
Progressive Corporation
Rockingham Group
Safeco Insurance Companies
SECURA Insurance
Sentry Insurance
State Farm Insurance Companies
Tennessee Farmers Mutual Insurance Company
Texas Farm Bureau
The Travelers Companies
USAA

Evaluations of Advanced Driver Assistance Systems (ADAS)



Highway Loss Data Institute Bulletin
Mercedes Distronic Loss Experience

Vol. 26, No. 9 — December 2009

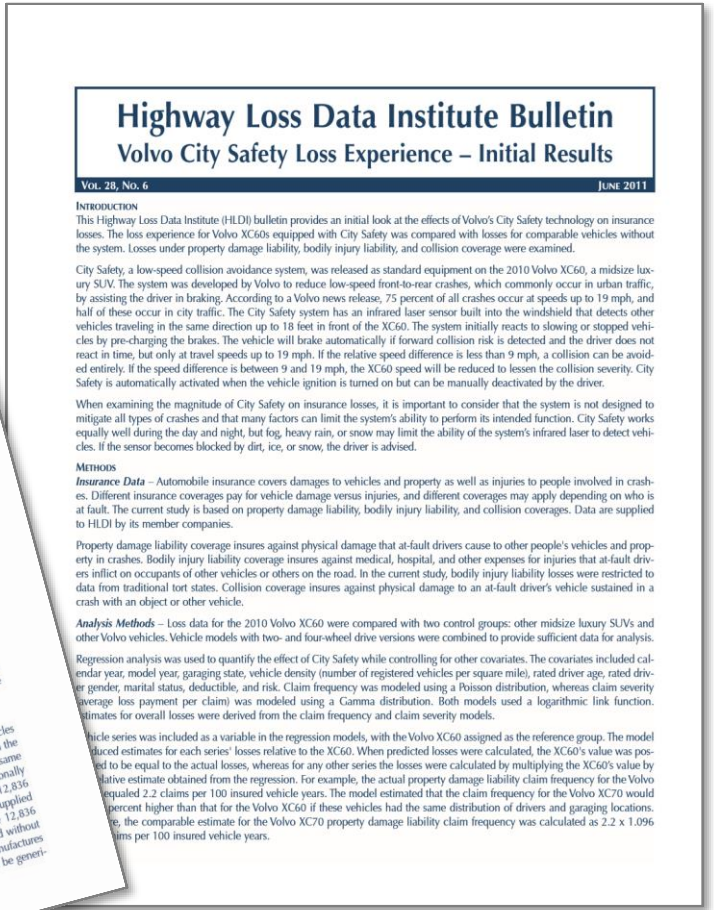
INTRODUCTION
This Highway Loss Data Institute (HLDI) bulletin provides an initial look at the effects of forward collision warning systems on insurance losses. Specifically, it evaluates the Mercedes Distronic system. The loss experience of vehicles optionally equipped with the system was compared with the experience for the same model vehicles without the system. Losses under five crash-related coverage types assessed not only the ability of the system to avoid collisions but also to reduce injuries.

The Distronic system was introduced in the U.S. market in model year 2000 with the Mercedes S class. Over time, the system became optional equipment throughout much of the Mercedes lineup. Distronic is an adaptive cruise control system that uses radar sensors to automatically monitor the distance to preceding vehicles and slow the vehicle when approaching another vehicle too closely and then re-accelerates to a preset speed when traffic allows. The system is bundled with a forward collision warning system that also makes use of the radar sensors to determine if a collision is imminent and then notifies the driver with auditory and visual warnings. The warning system is switch-activated and operates whenever the vehicle exceeds 20 mph, whether or not the adaptive cruise control is engaged. Table 1 contains a list of the vehicles that were available with the Distronic system.

When reviewing the magnitude of the effect that Distronic has on insurance losses, it is important to consider that the system is not designed to mitigate all types of crashes and that many factors can limit the ability of the system to perform its intended function. The system does not operate at speeds under 20 mph and cannot detect an oncoming car. The system's sensors can be impeded by inclement weather. Additionally, the system will not mitigate crashes when a vehicle departs the roadway. In this situation, the detection of objects may be unreliable given the environment and the erratic path of the vehicle, and braking will be less effective than on a normal road surface. Nevertheless, the large number of claims resulting from everyday front to rear collisions suggests some benefit of Distronic should be discernable in insurance loss experience.

METHODS
Coverages
Automobile insurance covers damage to vehicles and property as well as injuries to people involved in crashes. Different insurance coverages pay for vehicle damage versus injuries, and different coverages may apply depending on who is at fault. In the present study, five different insurance coverage types were examined: collision, property damage liability, personal injury protection, bodily injury liability, and medical payment. Collision coverage insures against physical damage to a driver's vehicle sustained in a crash with an object or other vehicle. Generally, when a collision claim is filed the driver is at fault. Property damage liability insures against physical damage that an at-fault driver causes to another vehicle and property in a crash. Personal injury protection is sold in states with no-fault insurance systems and pays up to a specified amount for injuries regardless of who is at fault in a crash. Bodily injury liability insures against injuries that an at-fault driver inflicts on occupants of another vehicle. Medical payment is sold in states with traditional tort insurance systems and covers injuries sustained by the insured driver and occupants of the vehicle.

Subject Vehicles
For the purpose of this study, Mercedes supplied HLDI with the vehicle identification numbers (VINs) of vehicles equipped with the Distronic system. These VINs were decoded and matched where possible to vehicles included in the HLDI database. The loss experience of these vehicles was then compared with the loss experience of vehicles of the same model year, make, and series. For example, Mercedes supplied VINs for 343 model year 2006 S class sedans optionally equipped with Distronic. Of those, 261 matched VINs in the HLDI database for collision coverage. There were 12,836 model year 2006 S class sedans in the HLDI database for collision coverage that did not match with the VINs supplied by Mercedes. The loss experience of the 261 matched VINs was compared with the loss experience of the 12,836 unmatched VINs. For each vehicle in the study in every model year, vehicle versions were produced with and without the systems. It should be noted that both the Maybach 57 and 62 were included in this study. Mercedes manufactures Maybach and offers them with the Distronic system. For the sake of simplicity, the vehicles in this study will be generically described as Mercedes.



Highway Loss Data Institute Bulletin
Volvo City Safety Loss Experience – Initial Results

Vol. 28, No. 6 — June 2011

Introduction
This Highway Loss Data Institute (HLDI) bulletin provides an initial look at the effects of Volvo's City Safety technology on insurance losses. The loss experience for Volvo XC60s equipped with City Safety was compared with losses for comparable vehicles without the system. Losses under property damage liability, bodily injury liability, and collision coverage were examined.

City Safety, a low-speed collision avoidance system, was released as standard equipment on the 2010 Volvo XC60, a midsize luxury SUV. The system was developed by Volvo to reduce low-speed front-to-rear crashes, which commonly occur in urban traffic, by assisting the driver in braking. According to a Volvo news release, 75 percent of all crashes occur at speeds up to 19 mph, and half of these occur in city traffic. The City Safety system has an infrared laser sensor built into the windshield that detects other vehicles traveling in the same direction up to 18 feet in front of the XC60. The system initially reacts to slowing or stopped vehicles by pre-charging the brakes. The vehicle will brake automatically if forward collision risk is detected and the driver does not react in time, but only at travel speeds up to 19 mph. If the relative speed difference is less than 9 mph, a collision can be avoided entirely. If the speed difference is between 9 and 19 mph, the XC60 speed will be reduced to lessen the collision severity. City Safety is automatically activated when the vehicle ignition is turned on but can be manually deactivated by the driver.

When examining the magnitude of City Safety on insurance losses, it is important to consider that the system is not designed to mitigate all types of crashes and that many factors can limit the system's ability to perform its intended function. City Safety works equally well during the day and night, but fog, heavy rain, or snow may limit the ability of the system's infrared laser to detect vehicles. If the sensor becomes blocked by dirt, ice, or snow, the driver is advised.

Methods
Insurance Data – Automobile insurance covers damages to vehicles and property as well as injuries to people involved in crashes. Different insurance coverages pay for vehicle damage versus injuries, and different coverages may apply depending on who is at fault. The current study is based on property damage liability, bodily injury liability, and collision coverages. Data are supplied to HLDI by its member companies.

Property damage liability coverage insures against physical damage that at-fault drivers cause to other people's vehicles and property in crashes. Bodily injury liability coverage insures against medical, hospital, and other expenses for injuries that at-fault drivers inflict on occupants of other vehicles or others on the road. In the current study, bodily injury liability losses were restricted to data from traditional tort states. Collision coverage insures against physical damage to an at-fault driver's vehicle sustained in a crash with an object or other vehicle.

Analysis Methods – Loss data for the 2010 Volvo XC60 were compared with two control groups: other midsize luxury SUVs and other Volvo vehicles. Vehicle models with two- and four-wheel drive versions were combined to provide sufficient data for analysis.

Regression analysis was used to quantify the effect of City Safety while controlling for other covariates. The covariates included calendar year, model year, garaging state, vehicle density (number of registered vehicles per square mile), rated driver age, rated driver gender, marital status, deductible, and risk. Claim frequency was modeled using a Poisson distribution, whereas claim severity (average loss payment per claim) was modeled using a Gamma distribution. Both models used a logarithmic link function. Estimates for overall losses were derived from the claim frequency and claim severity models.

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HLDI Highway Loss Data Institute

Bulletin | Vol. 35, No. 34 : September 2018

Compendium of HLDI collision avoidance research

Summary

The Highway Loss Data Institute (HLDI) has evaluated and reported on collision avoidance technologies since 2009. HLDI has published nearly 50 research reports to date evaluating collision avoidance technologies offered by individual manufacturers. This compendium synthesizes the most recent findings from these analyses and combines findings from individual manufacturers to estimate the overall effect of each technology on the frequency of claims and overall losses. Overall, many collision avoidance technologies have reduced the frequency of claims under collision coverage and were seldom associated with increased claim frequency. Front automatic emergency braking (AEB) and rear AEB, technologies that automatically take action for the driver in a crash-imminent situation, were associated with larger reductions in the frequency of claims than technologies that rely on the driver to respond to warnings. Curve-adaptive headlights and forward collision warning, both of which are enabled by front-mounted equipment vulnerable to damage in a crash, were associated with increased claim severity. Although the findings indicate that collision avoidance technologies are reducing the frequency of claims under various coverage types, the benefits are only being experienced by a fraction of vehicles in the U.S. fleet. The number of claims filed by the entire population of vehicles in the U.S. fleet each year will continue to decrease as the proportion of the vehicle population equipped with collision avoidance technologies increases in the coming decades.

Percent change in claim frequency associated with the presence of various collision avoidance technologies by coverage type

Vehicles with forward collision warning

2000
Mercedes-Benz S Class
$73,095

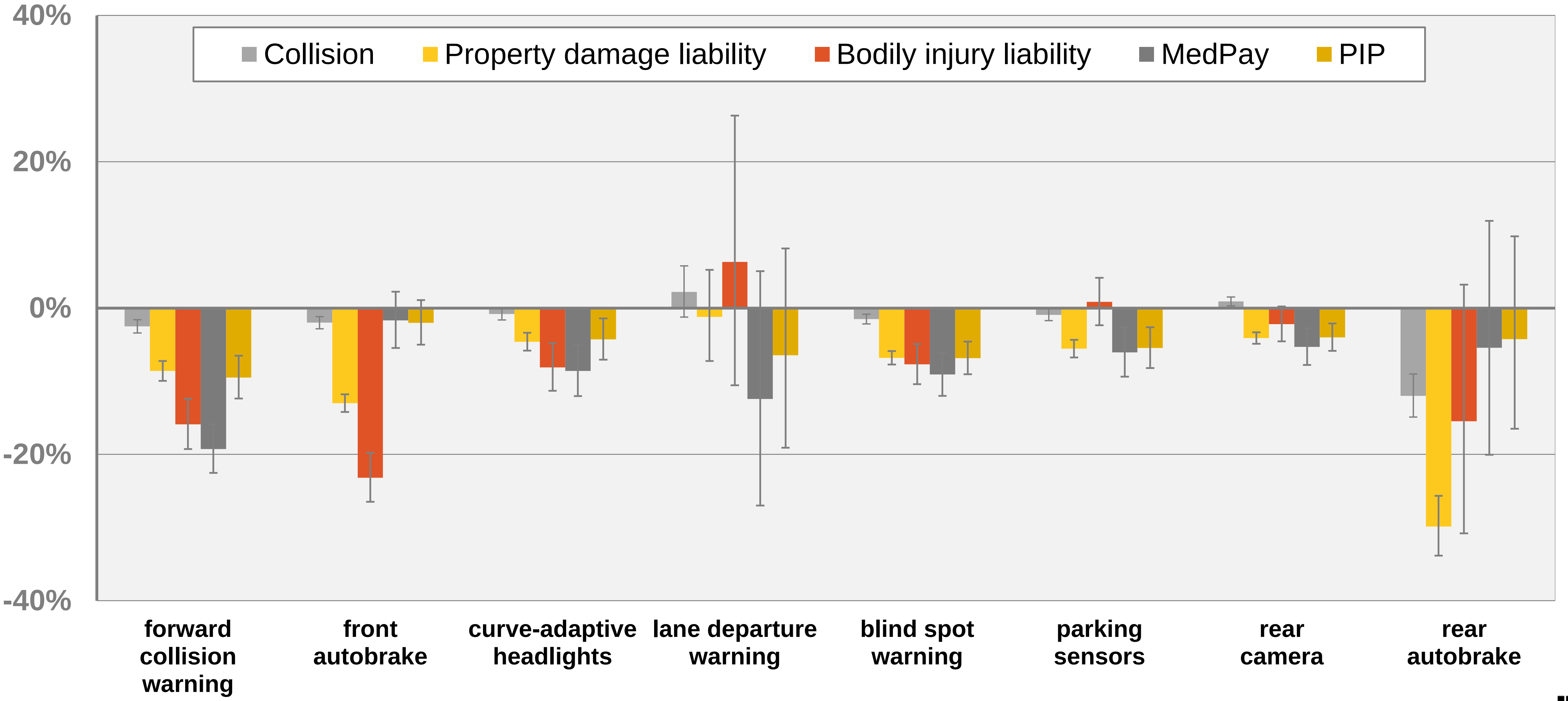
2018
Chevrolet Spark
$18,015

HLDI collision avoidance analysis

- The HLDI database includes data from companies that represent about 85% of private passenger auto insurance in the U.S.
- On a monthly basis, HLDI processes 320 million insurance data transactions
- The insurance data includes the garaging zip code and rated driver demographics
- Manufacturers shared with us 17 digit VINs and information about collision avoidance systems fitted to those vehicles
- Our collision avoidance analysis used the manufacturer supplied feature data along with our geographic and demographic data
- Large amount of timely data
- Limited information on crash circumstances

Effect of crash avoidance systems on claim frequency

Results pooled across automakers



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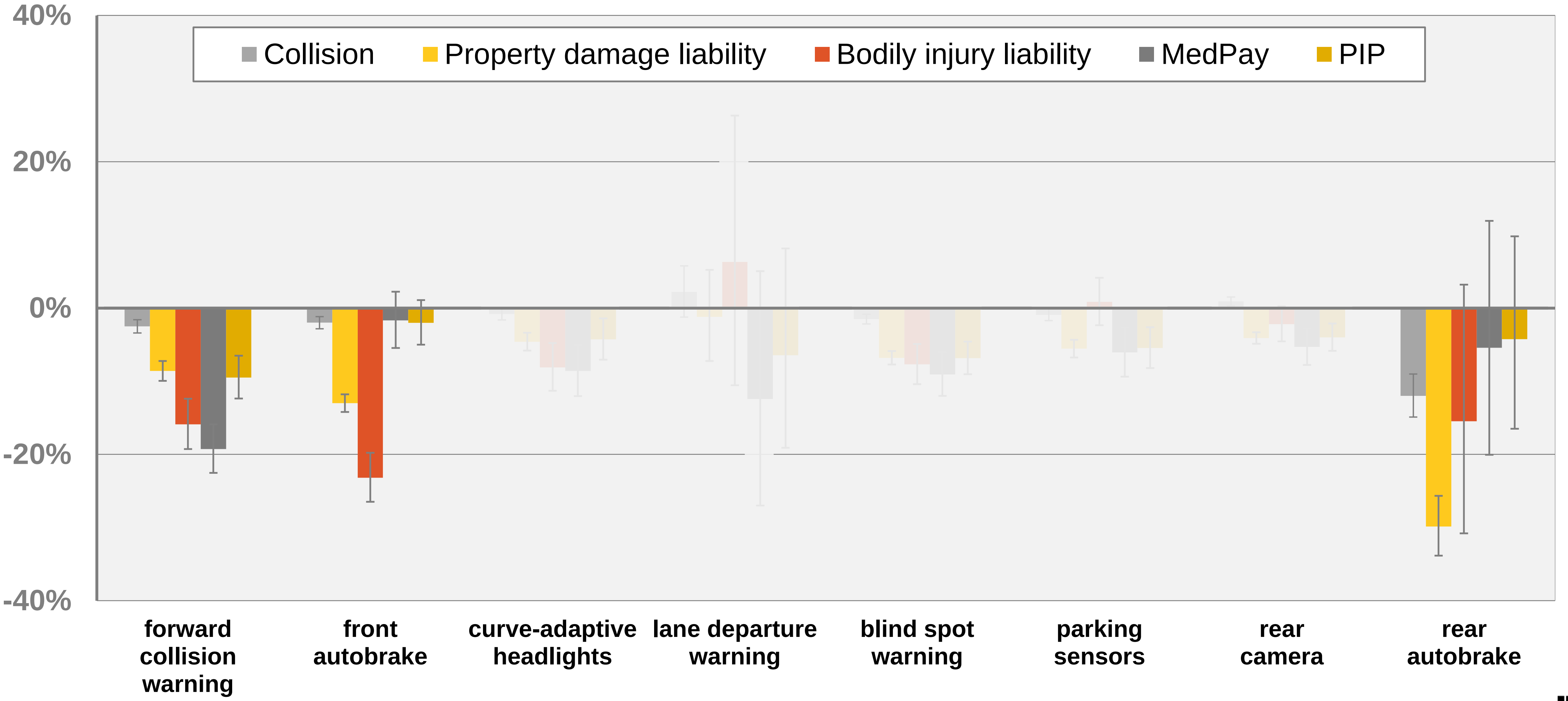

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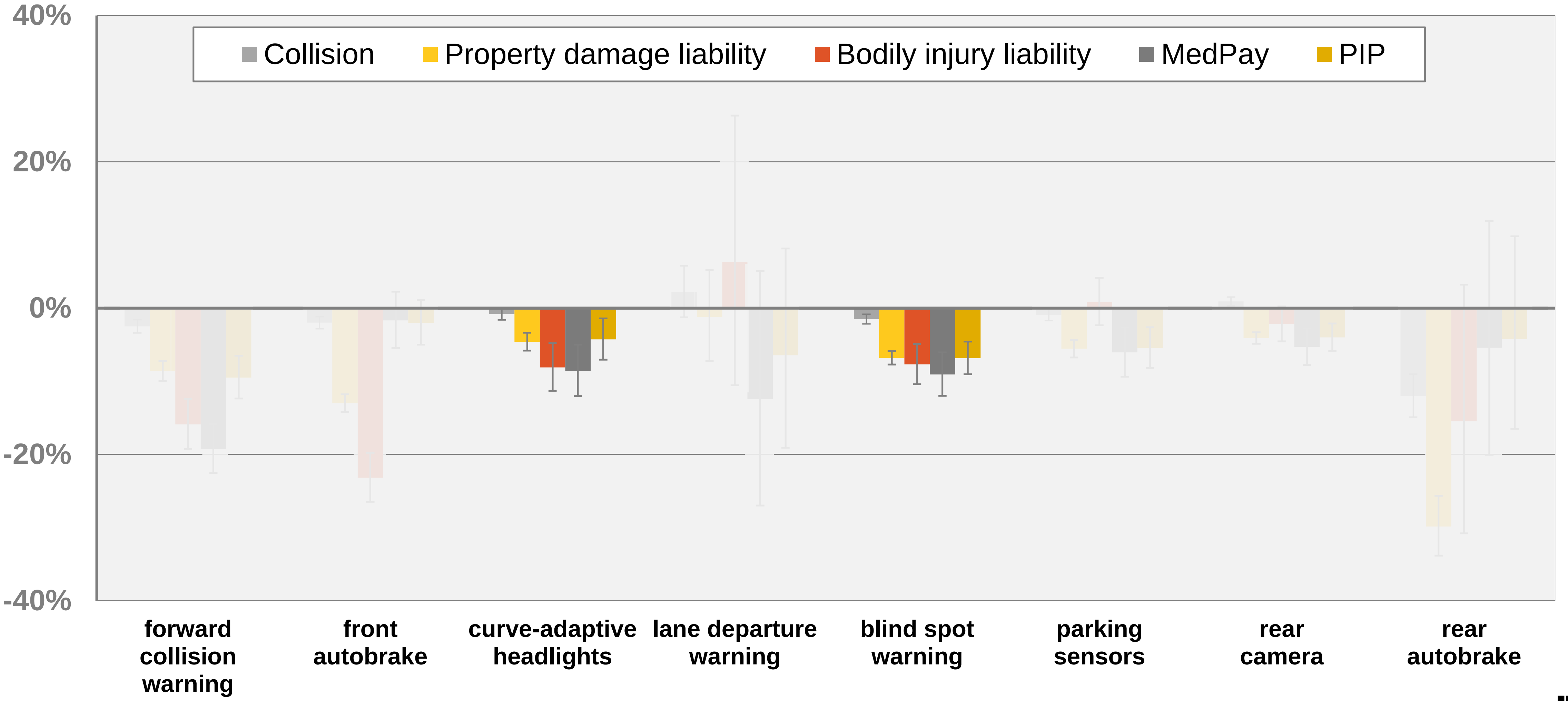

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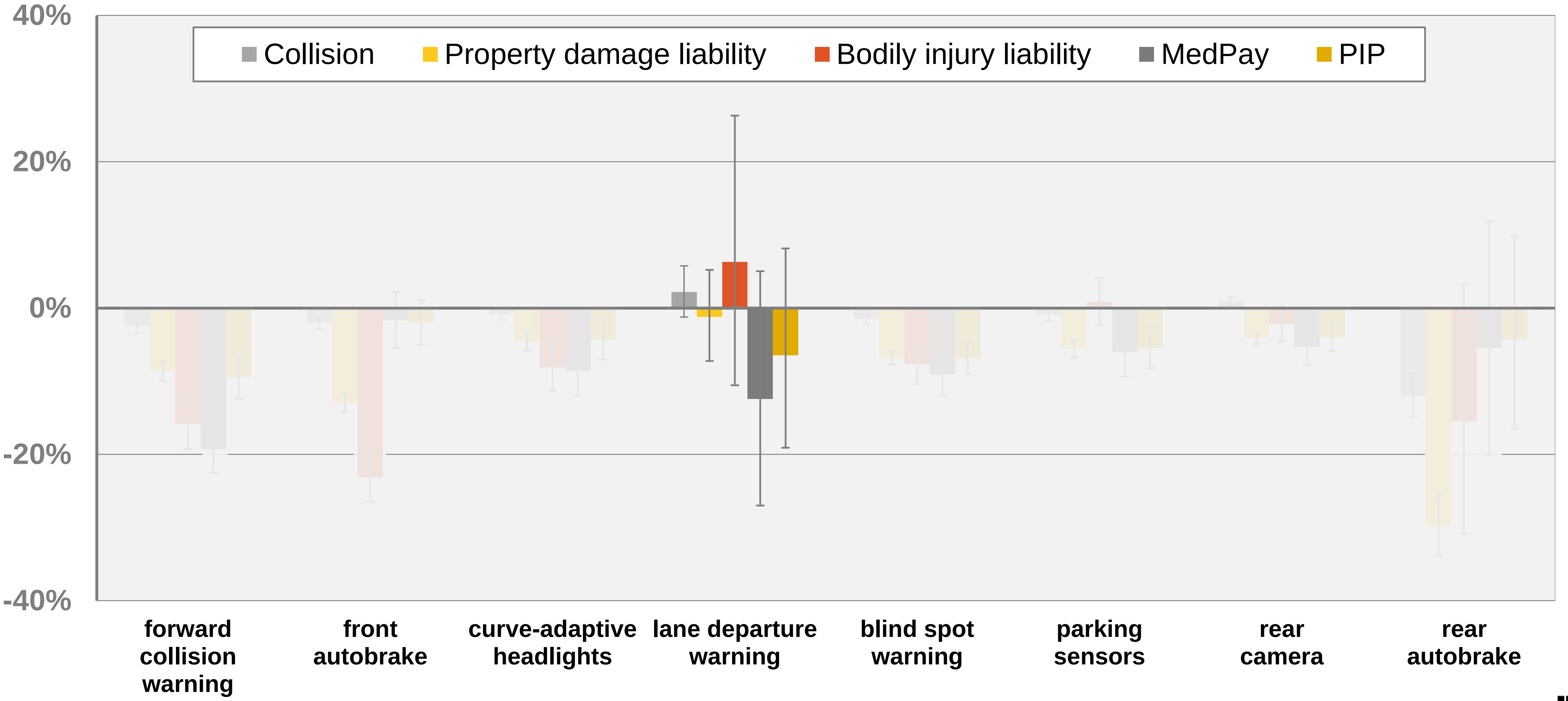

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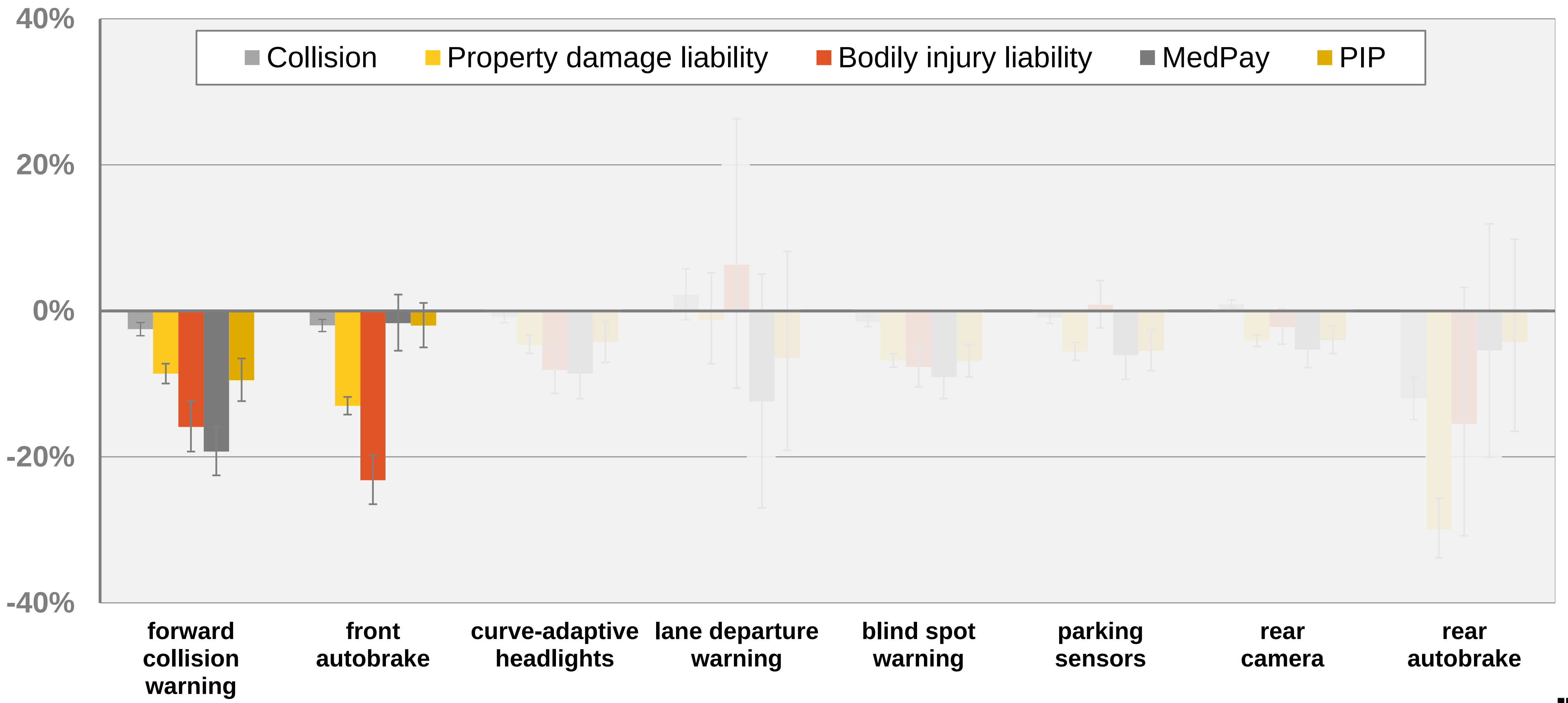

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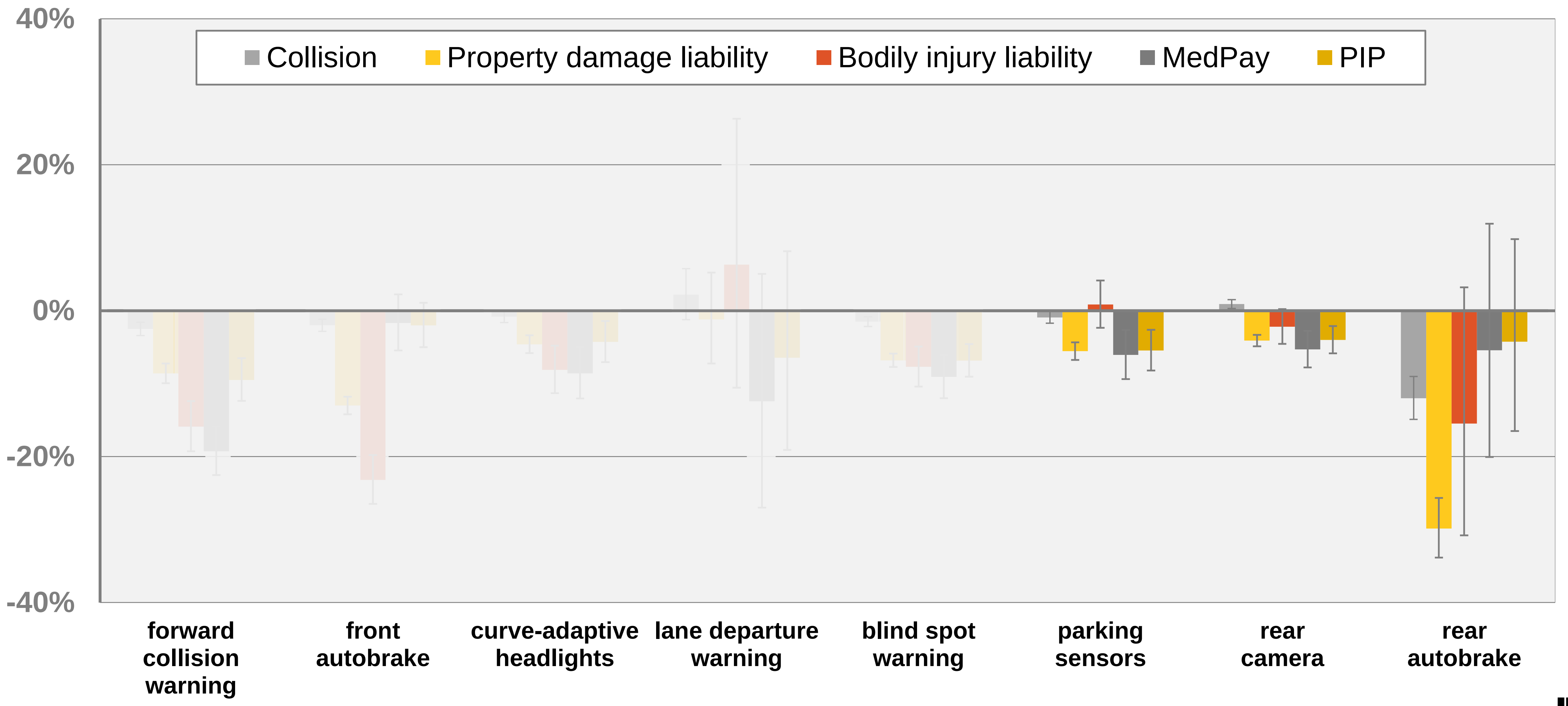


HLDI and police-reported crash data

Insurance data

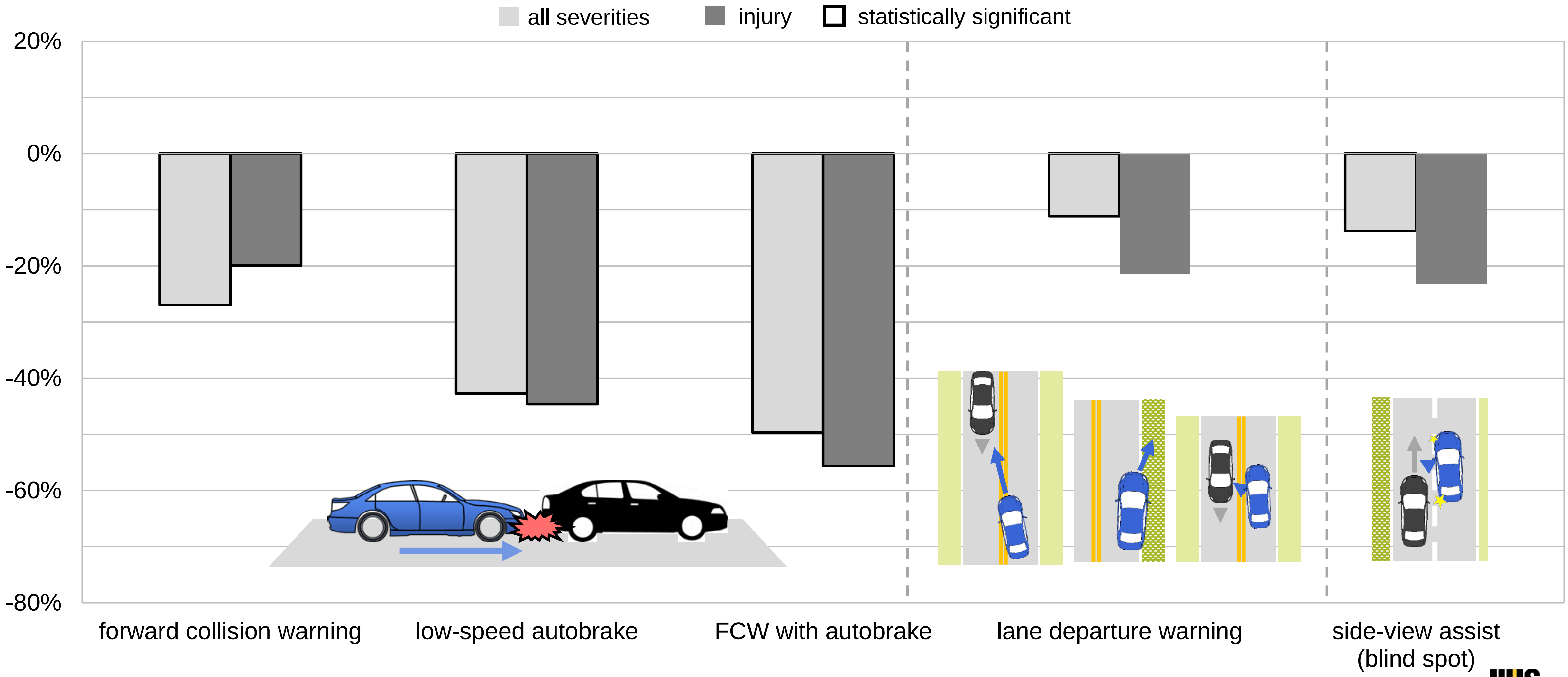
- Large amount of timely data
- Limited information on crash circumstances

Police-reported crash data

- More detailed information on crash type
- Limitations
  - Some crashes not reported to police
  - Delay in obtaining data
  - Data collected not uniform among states, and not all states have information to determine crash types

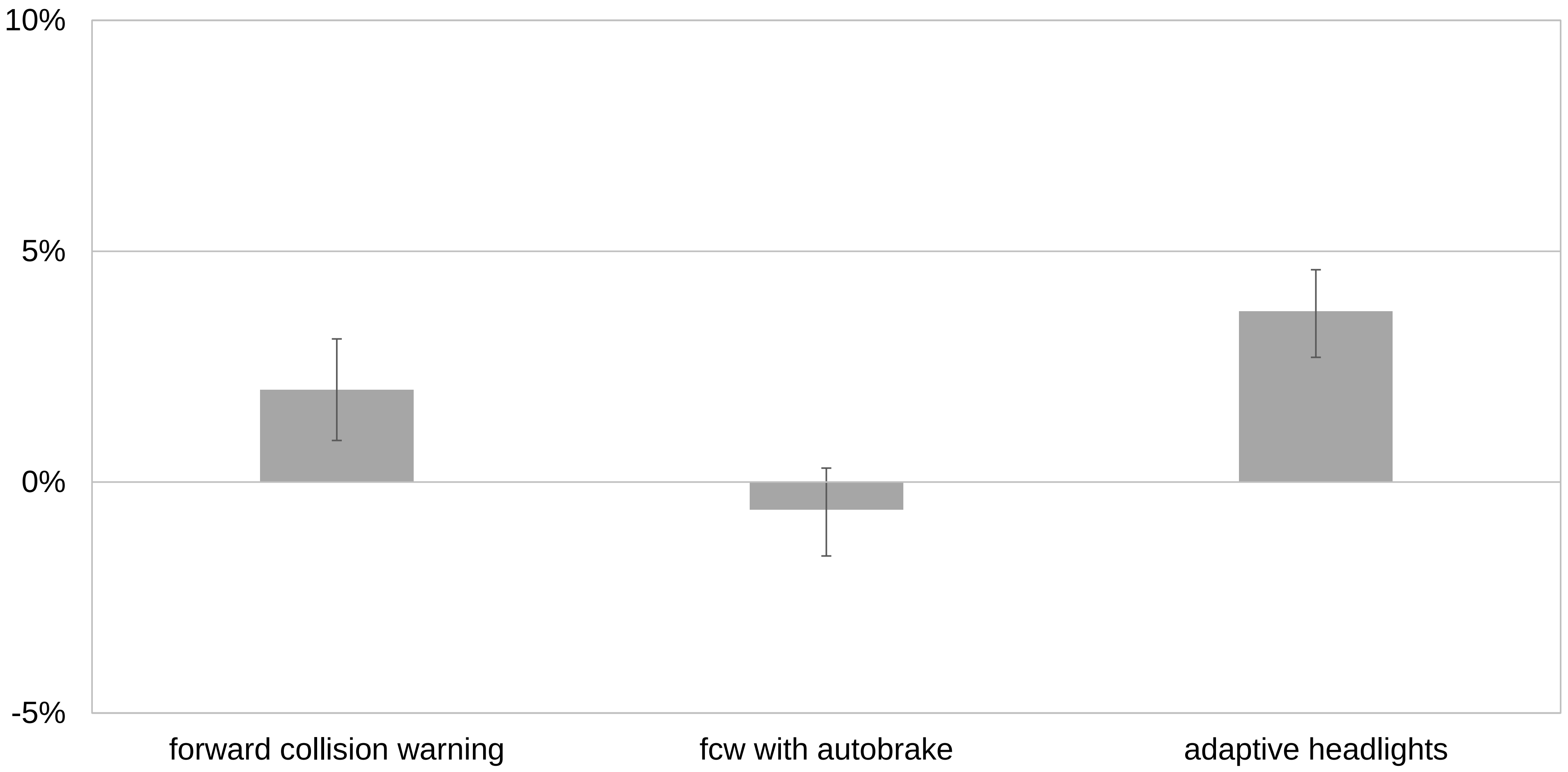
Most crash avoidance technologies are living up to expectations

Effects on relevant police-reported crash types



Summary of technology effects on collision claim severity

Results pooled across automakers



GM collision avoidance features

Change in insurance losses for GM vehicles

With parking sensors and rearview camera

	claim frequency			claim severity			overall losses		
collision	-9.3%	-7.1%	-4.8%	$151	$283	$418	-$21	-$7	$9
property damage liability	-19.9%	-16.6%	-13.2%	$7	$139	$277	-$20	-$15	-$9

	claim frequency			low severity frequency			high severity frequency		
bodily injury liability	-23.3%	-14.2%	-4.0%	-28.2%	-11.7%	8.6%	-21.5%	-3.7%	18.2%
medical payment	-21.5%	-12.6%	-2.7%	-31.9%	-7.9%	24.6%	-23.6%	-10.6%	4.7%
personal injury protection	-12.1%	-4.6%	3.5%	-29.4%	-12.3%	9.1%	-16.3%	-6.7%	4.0%

Change in insurance losses for GM vehicles

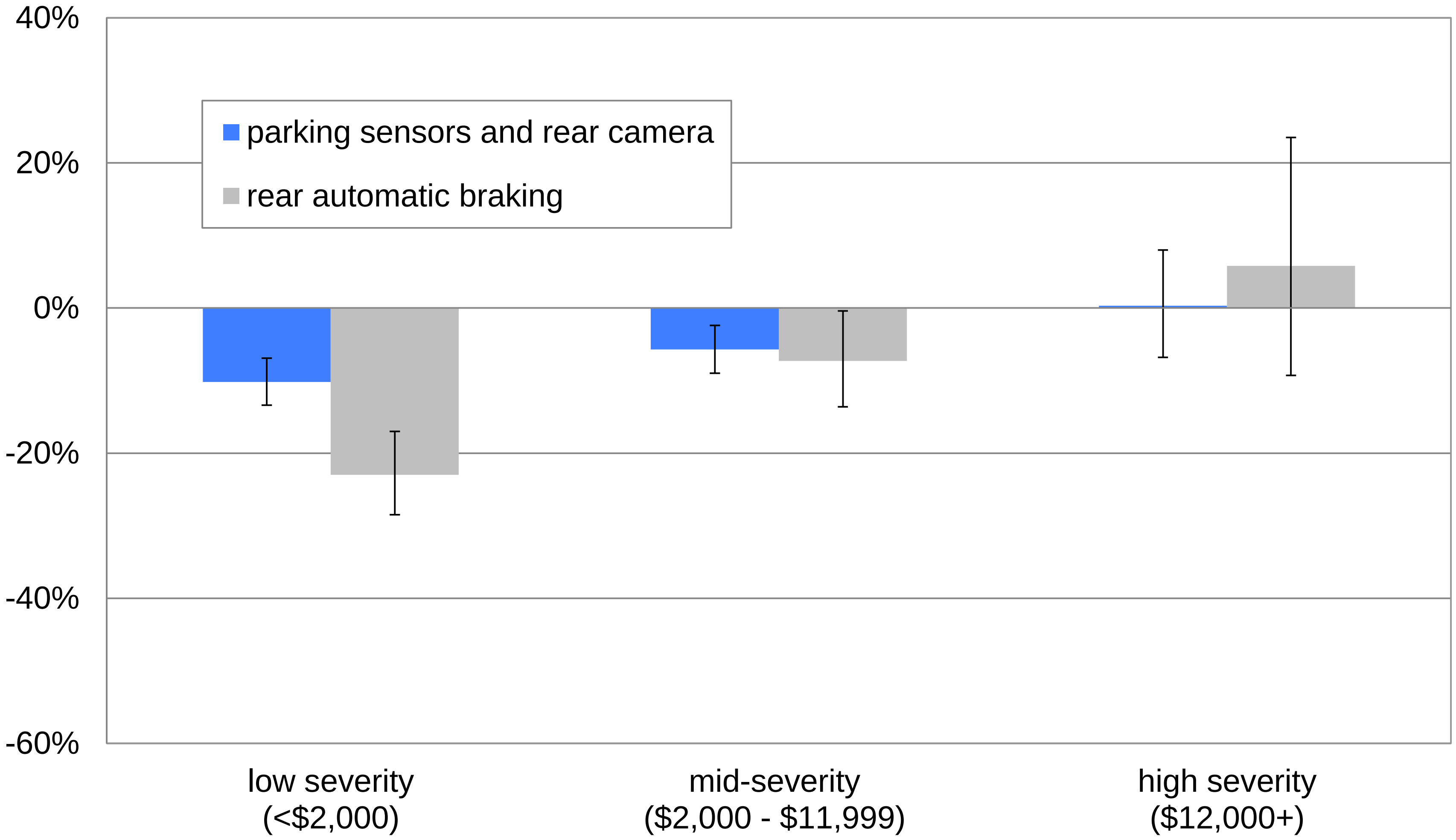
With rear automatic braking

	claim frequency			claim severity			overall losses		
collision	*-17.2%*	-13.1%	*-8.7%*	*$537*	$846	*$1,173*	*-$21*	$7	*$37*
property damage liability	*-32.1%*	-26.3%	*-20.1%*	*$300*	$601	*$926*	*-$22*	-$13	*-$3*

	claim frequency			low severity frequency			high severity frequency		
bodily injury liability	*-28.8%*	-8.9%	*16.5%*	*-30.5%*	8.3%	*68.8%*	*-46.5%*	-15.1%	*34.8%*
medical payment	*-22.6%*	-1.5%	*25.4%*	*-63.4%*	-23.8%	*58.3%*	*-32.4%*	-4.5%	*34.9%*
personal injury protection	*-19.9%*	-1.8%	*20.4%*	*-46.0%*	-7.9%	*57.1%*	*-17.0%*	9.6%	*44.7%*

Change in collision claim frequency

By severity range



Front crash prevention testing and rating

Front crash prevention ratings

NOT AVAILABLE

vehicles without forward collision warning or autobrake; or vehicles equipped with a system that doesn't meet NHTSA or IIHS criteria

BASIC

vehicles earning 1 point for forward collision warning or 1 point in either 12 or 25 mph test

ADVANCED

vehicles with autobrake that achieve 2-4 points for forward collision warning and/or performance in autobraking tests

SUPERIOR

vehicles with autobrake that achieve 5-6 points for forward collision warning and/or performance in autobraking tests

25 mph

$28,131

12 mph

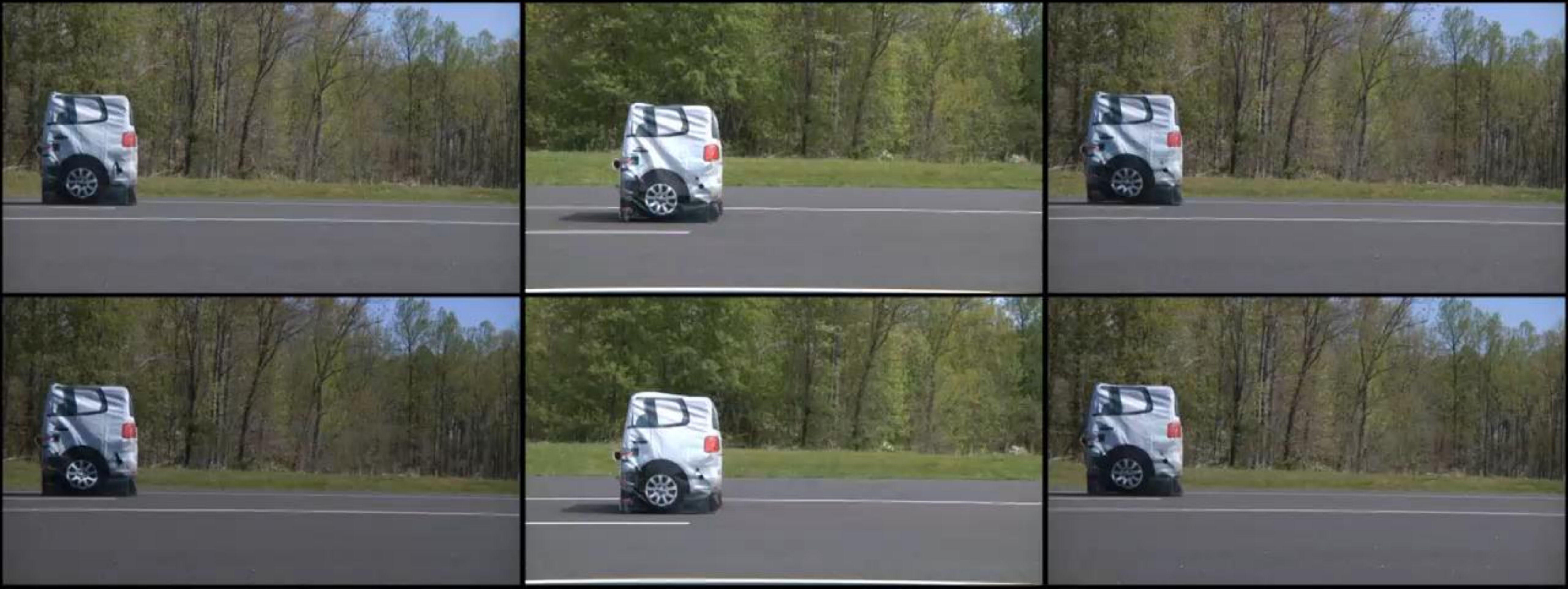
$5,715

Speed reduction in 12 and 24 mph tests

Volvo S60
2 point advanced

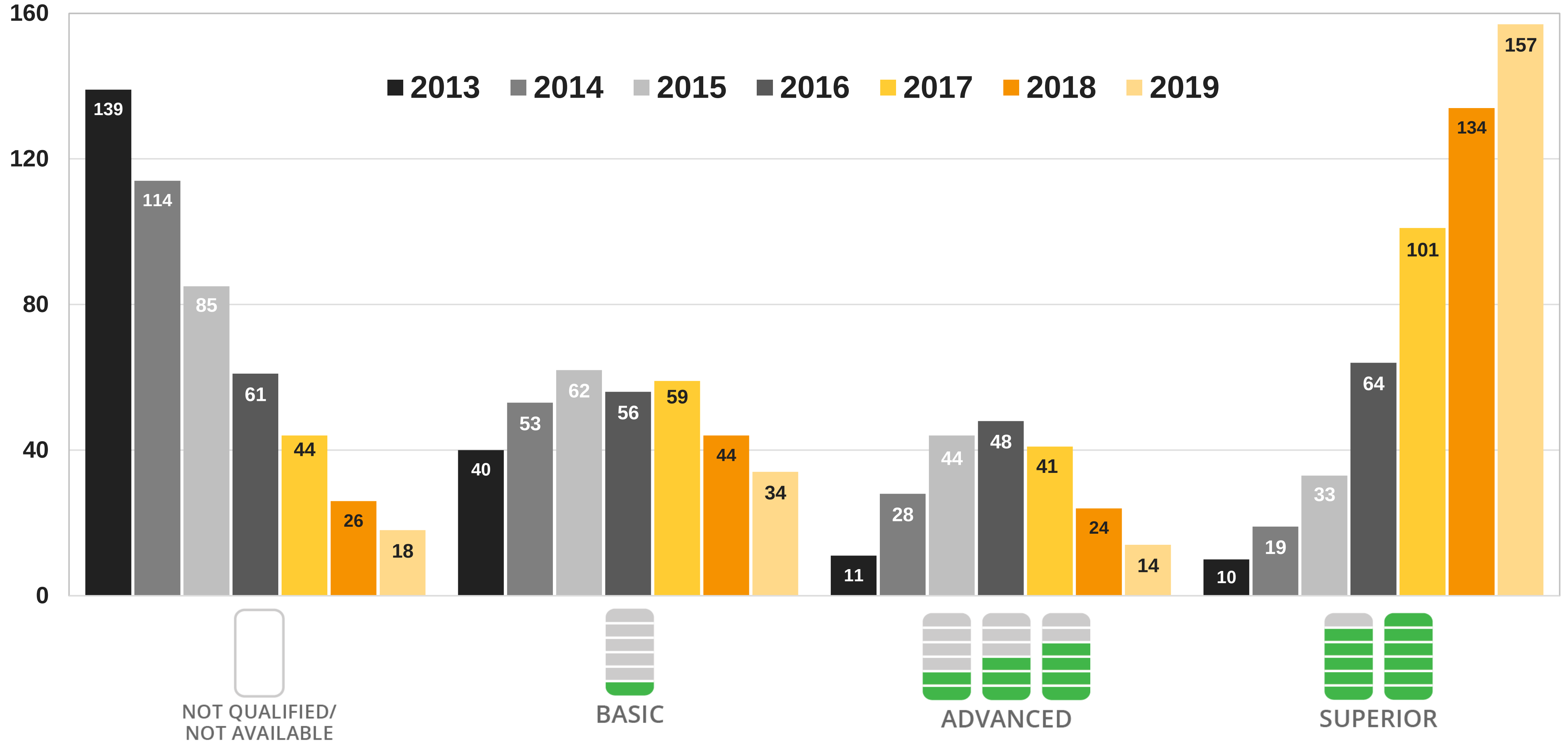
Dodge Durango
3 point advanced

Subaru Outback
6 point superior



Front crash prevention ratings

2013-19 models, as of September 2019



20 automakers have committed to make AEB a standard feature by September 2022

99+% of
U.S. market


Hyundai
advertisement

Headlight testing and ratings

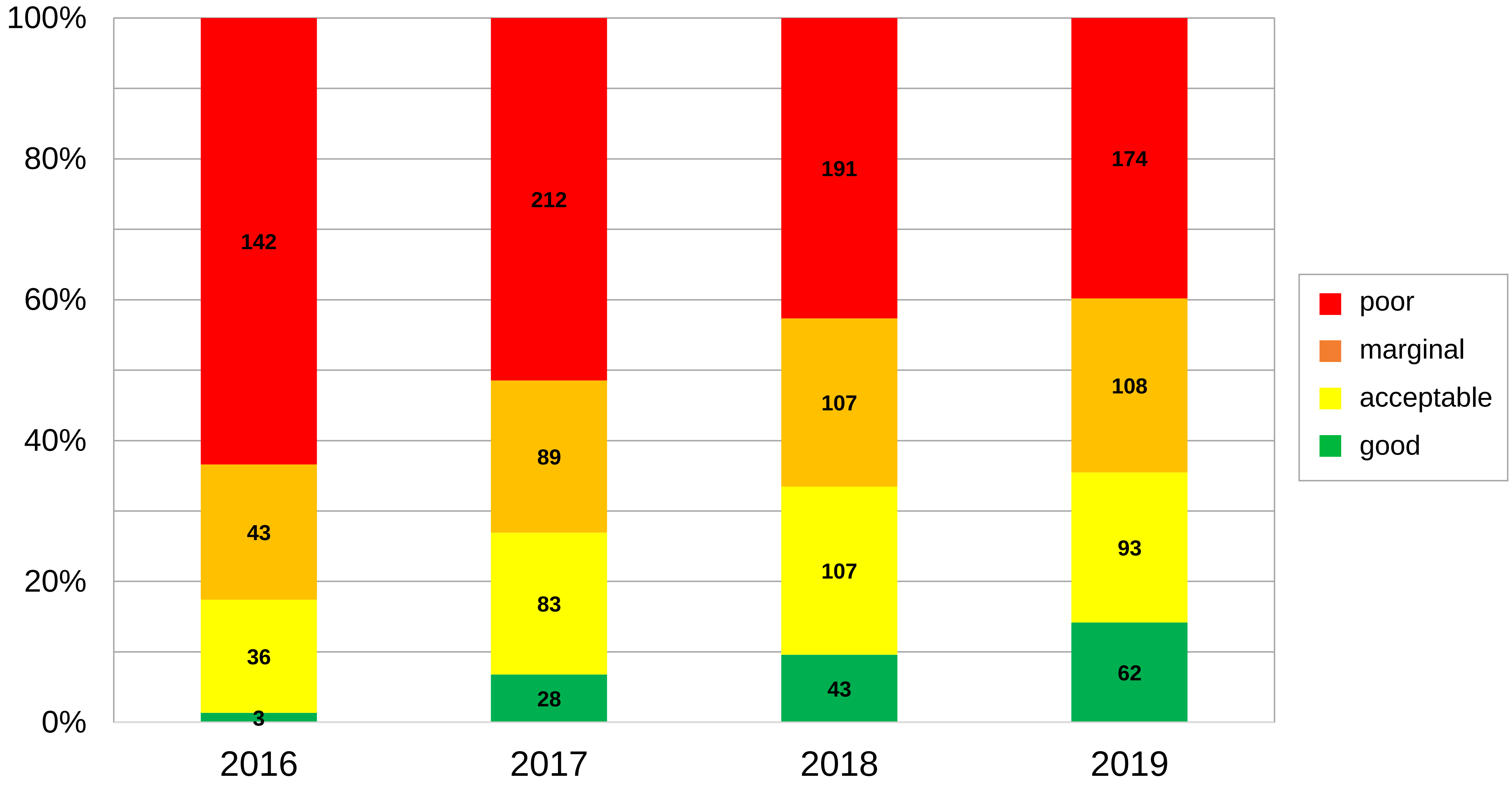
IIHS
HLDI

Toyota Prius v LED and BMW 3 series halogen

On-road comparison

Headlight ratings (as of September 2019)

2016-19 model years – all headlight variants



Evaluations of system status

IIHS HLDI

On-off status of front crash prevention systems

By manufacturer

	percent with system on	number observed
Cadillac	92	206
Chevrolet	87	142
Honda	98	239
Mazda	95	20
Volvo	94	52
total	93	659

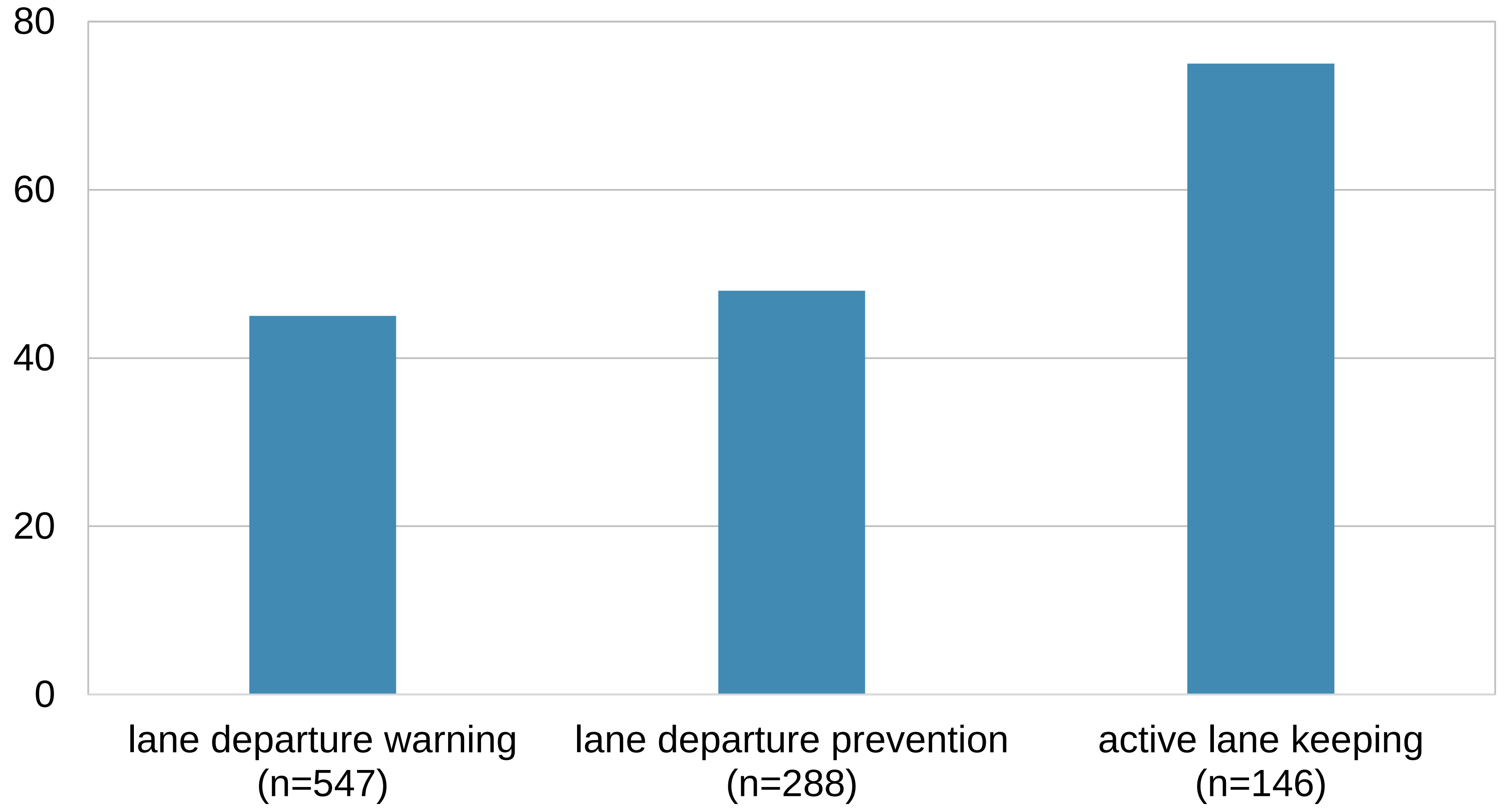
On-off status of lane-maintenance systems

By manufacturer

	percent with system on	number observed
Cadillac	56	204
Chevrolet	50	147
Ford/Lincoln	21	115
Honda	36	239
Lexus/Toyota	68	147
Mazda	77	26
Volvo	75	105
total	51	983

On-off status by maximum observable lane-maintenance intervention level

Percent with system on



GM lane departure warning on-off status by warning modality

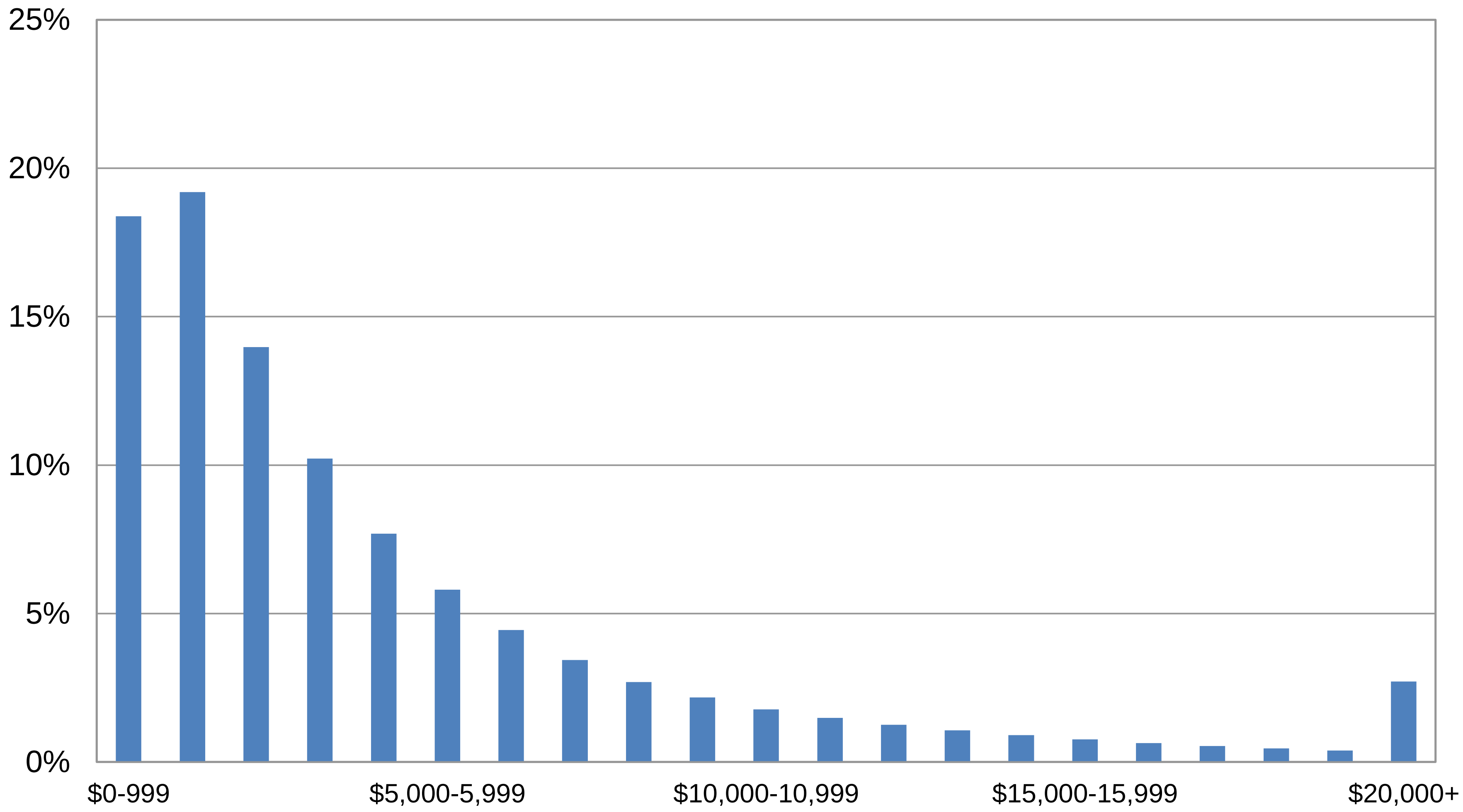
		percent with system on	number observed
beep	Cadillac	33	18
	Chevrolet	39	66
	total	38	84
vibrating seat	Cadillac	58	142
	Chevrolet	49	49
	total	56	191


Advertisement:
Lane valet

Park assist systems

Distribution of collision claims, 2017 calendar year

By claim size, 1981–2018 models



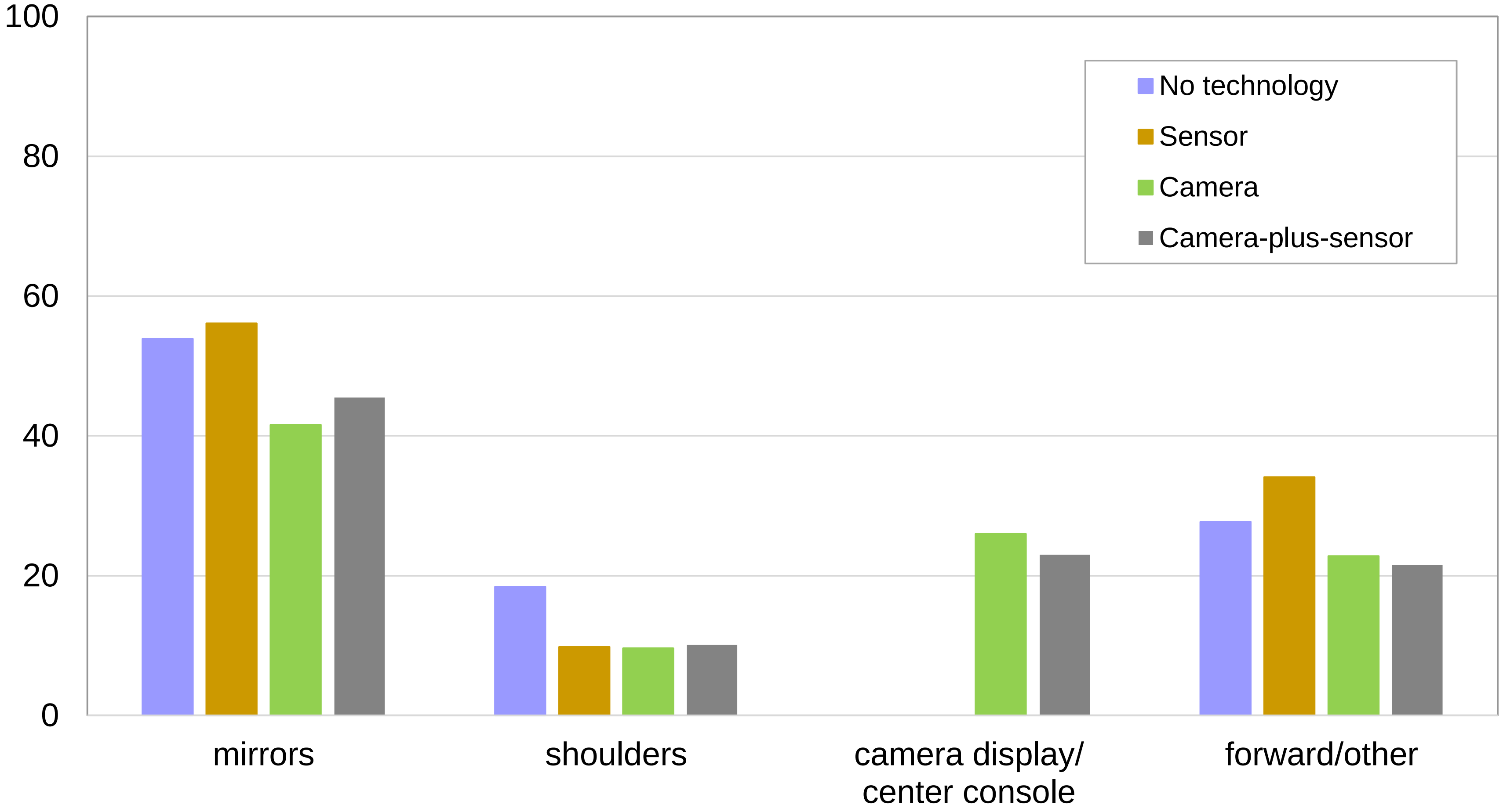
Drivers must respond to sensors for them to work

Objects are not always easy to see in the camera display

Rearview cameras can help drivers avoid backing over objects in reverse

Technology influences the way we look around the vehicle while backing

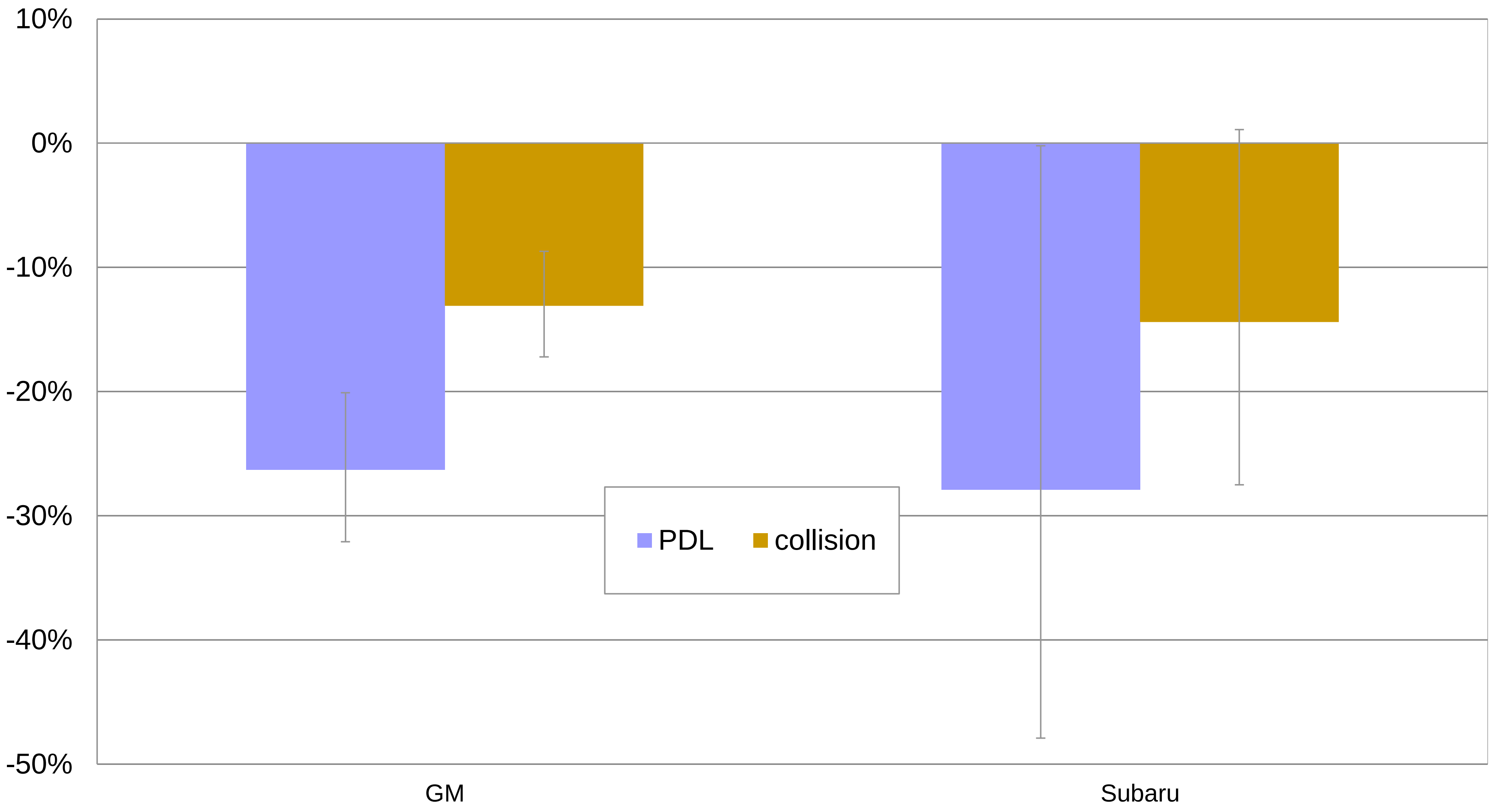
Percentage of time spent looking at different fields of view



Rear automatic braking

Rear automatic braking

Change in claim frequency



Benefit of rear autobrake

Benefit of rear autobrake

Insurance results for Level 2 systems

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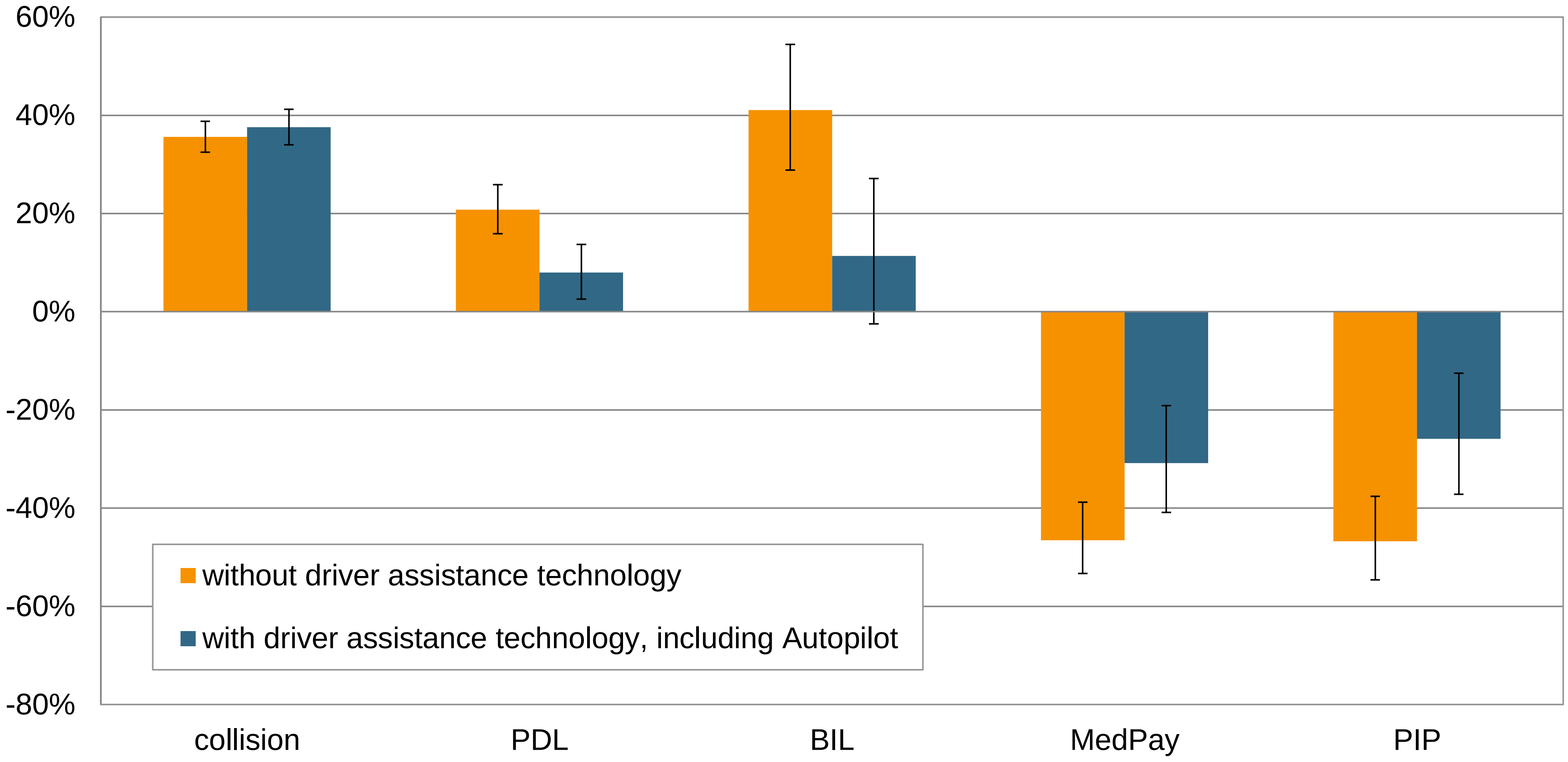
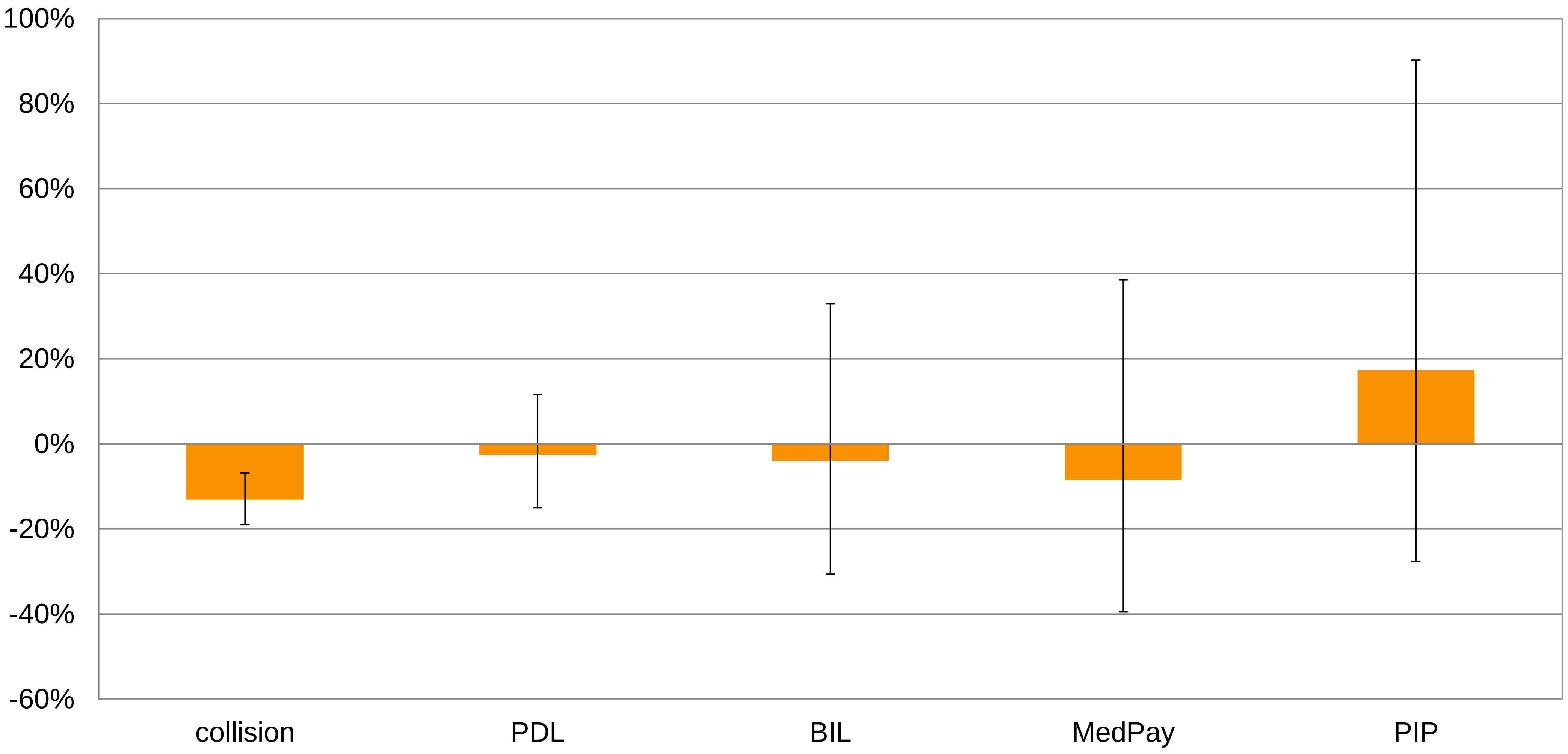
Tesla Model S claim frequencies with and without driver assistance technology versus large luxury vehicles

Effect of driver assistance technology, including Autopilot



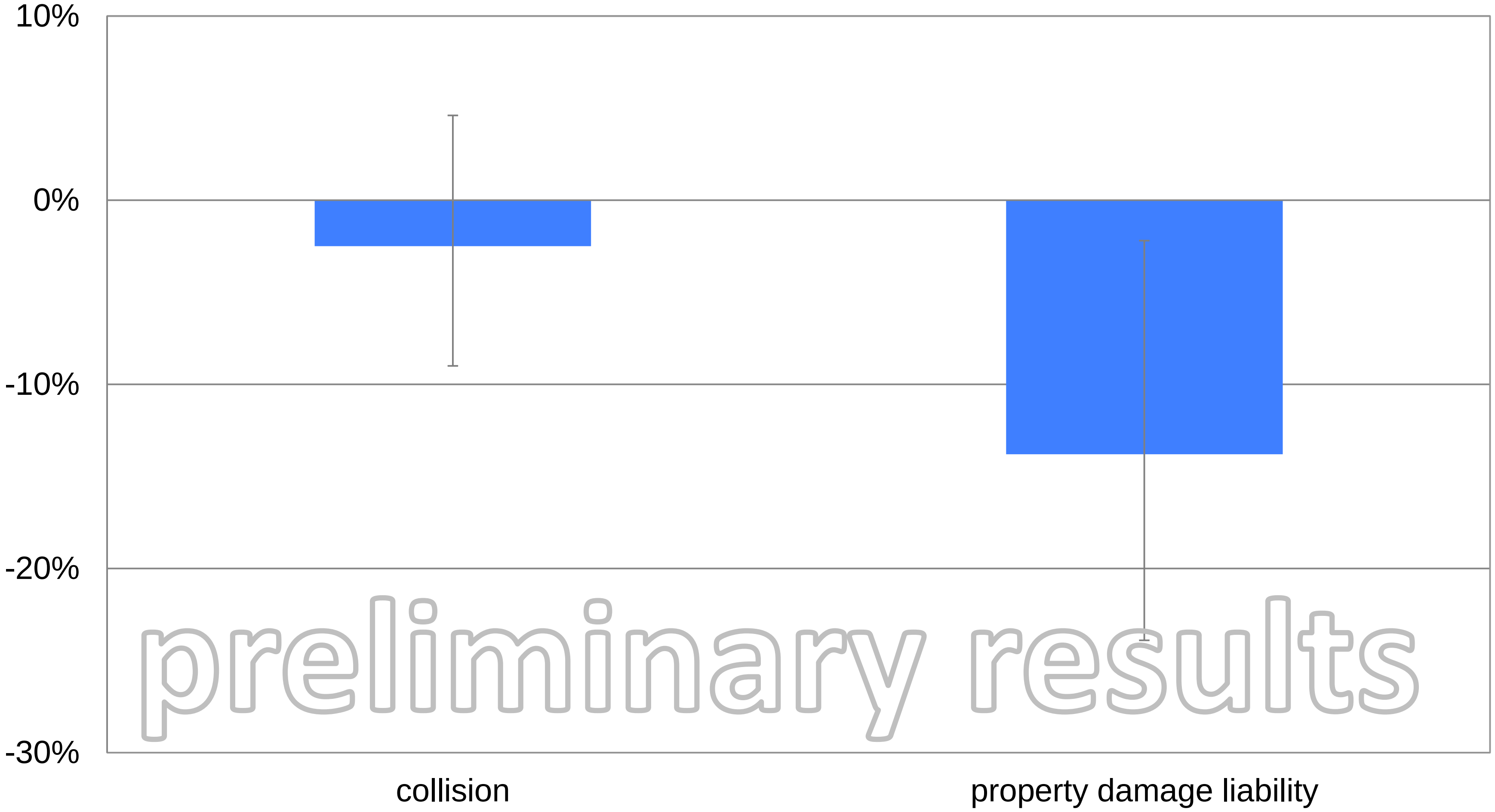
Estimated effect of Tesla Model S Autopilot on claim frequency

Driver assistance technology plus Autopilot vs. early driver assistance technology alone



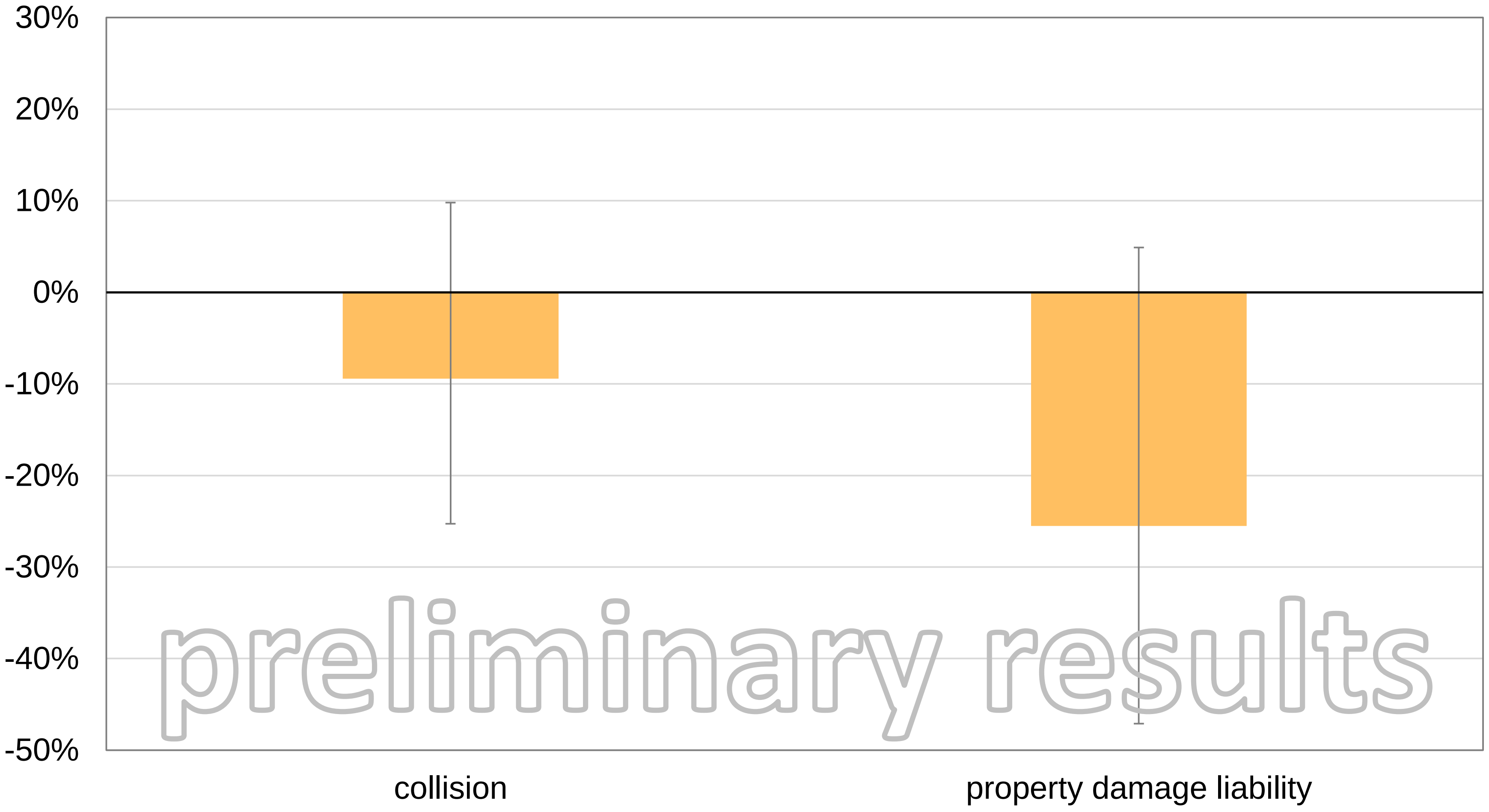
Effect of Audi Traffic Jam Assist, adaptive cruise control, active lane assist and high-beam assist on claim frequency

2017 Audi A4 and Q7, by insurance coverage type



Effect of Nissan ProPilot Assist on claim frequency

2016–18 Leaf and 2017–18 Rogue, by insurance coverage type



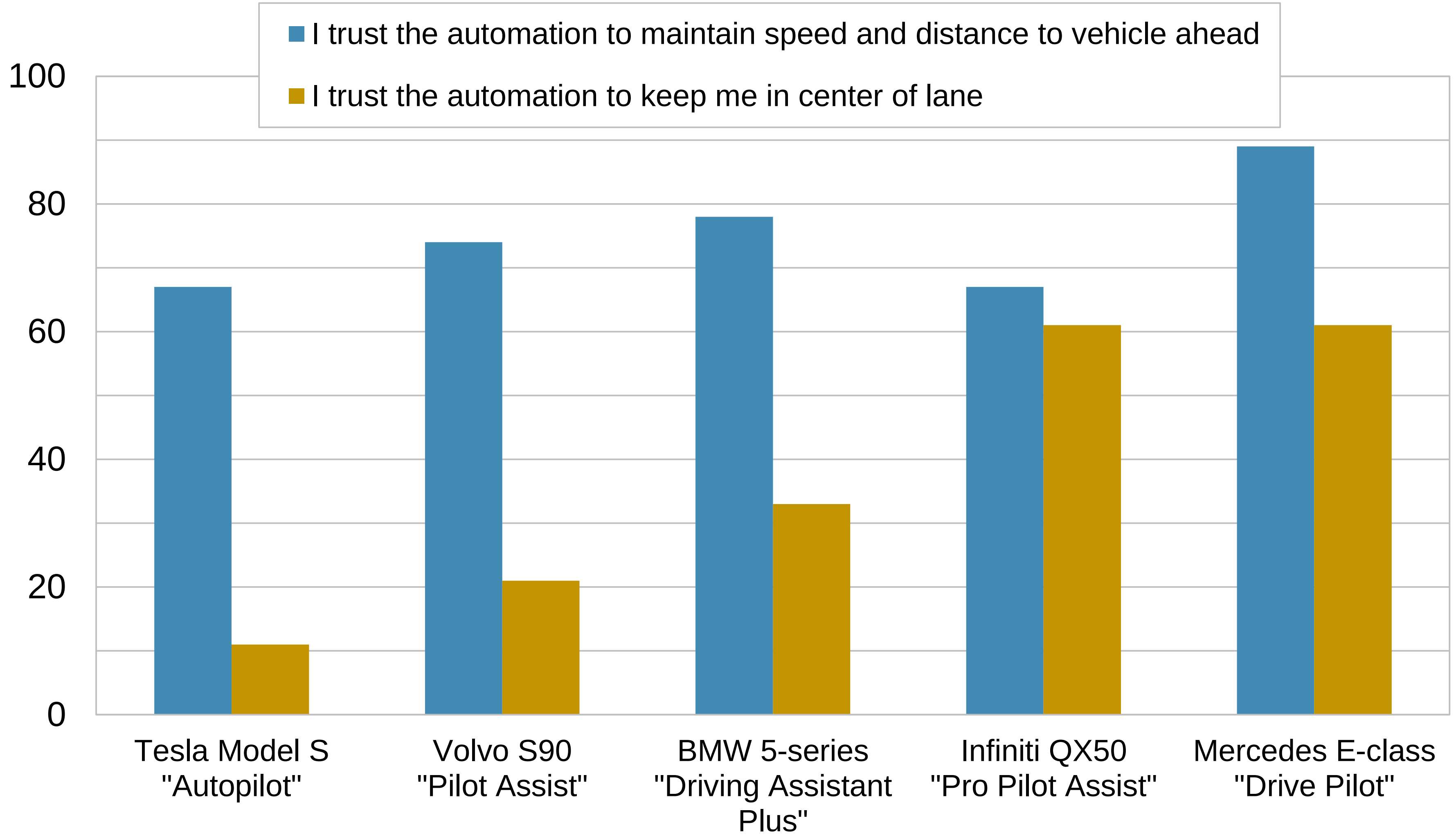
Experiences with driving automation

Opinions of level 2 driving automation technology after brief use

- 17-20 employees drove each vehicle on a 20-mile route while using level 2 driving automation the entire drive
- Completed a survey about their experience after the drive
- Five vehicles:
  - 2017 BMW 5 series with “Driving Assistant Plus”
  - 2017 Mercedes E-Class with “Drive Pilot”
  - 2016 Tesla Model S with “Autopilot”
  - 2018 Volvo S90 with “Pilot Assist”
  - Pre-production 2019 Infiniti QX50 with “Pro Pilot Assist”

Adaptive cruise control trusted more than active lane keeping

Percentage of drivers who agreed or strongly agreed



Functional performance of adaptive cruise control

Functional performance testing of adaptive cruise control

2016 Tesla Model S with Autopilot software ver. 7.1

2017 BMW 5 series with Driving Assistant Plus

2017 Mercedes E-Class with Drive Pilot

2018 Volvo S90 with Pilot Assist

2018 Tesla Model 3 with Autopilot software ver. 8.1

Functional performance testing of adaptive cruise control

- Combination of track and on-road tests
- Adaptive cruise control scenarios
  - Stopped lead vehicle
  - Vehicle exiting lane
  - Acceleration/deceleration profiles

Approach stationary target with ACC on

Test track performance was not necessarily replicated on road

On-road testing – approaching stationary vehicles

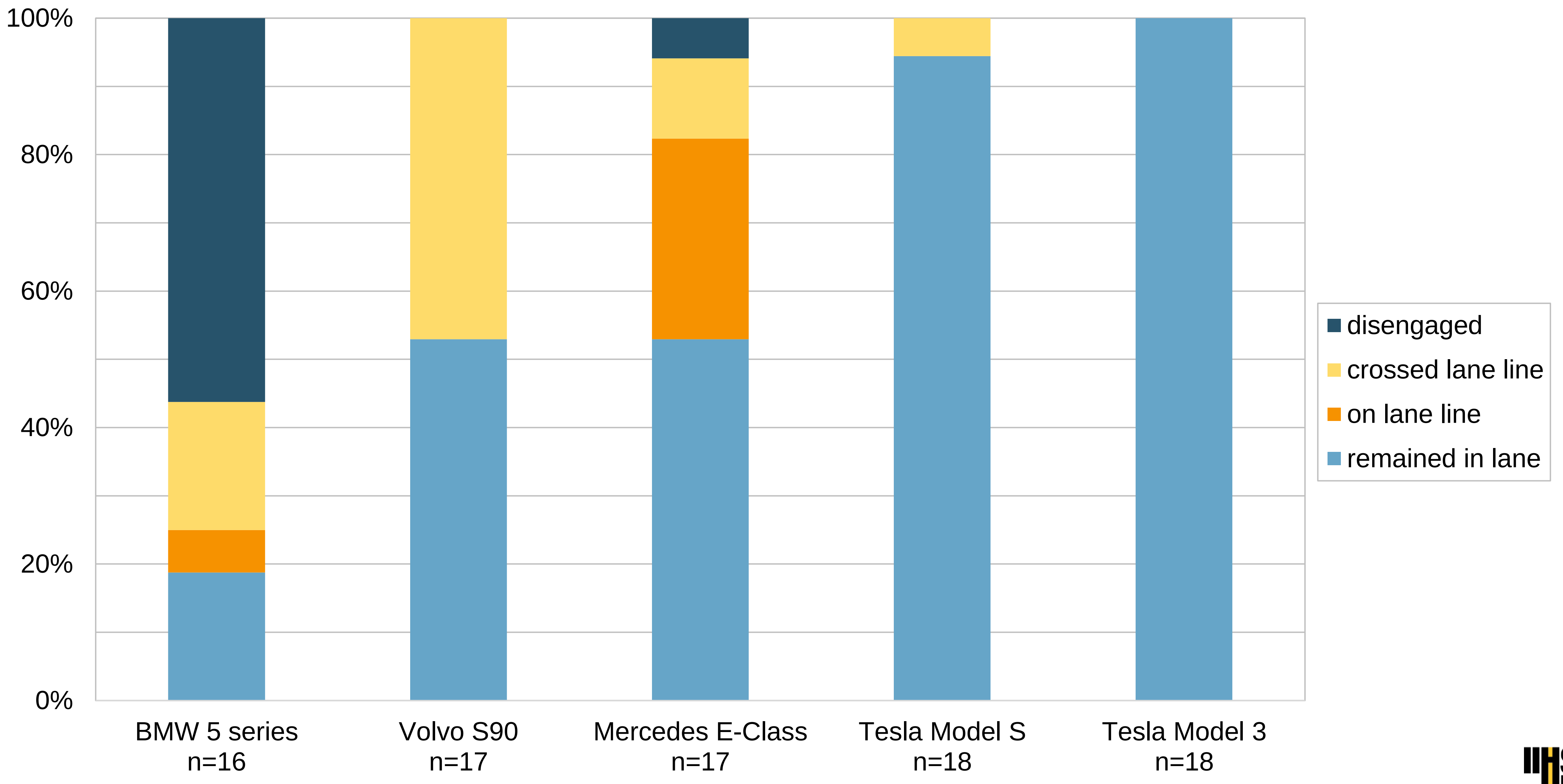
Less common hazards may or may not be detected

On-road testing

Functional performance of lane-keeping systems

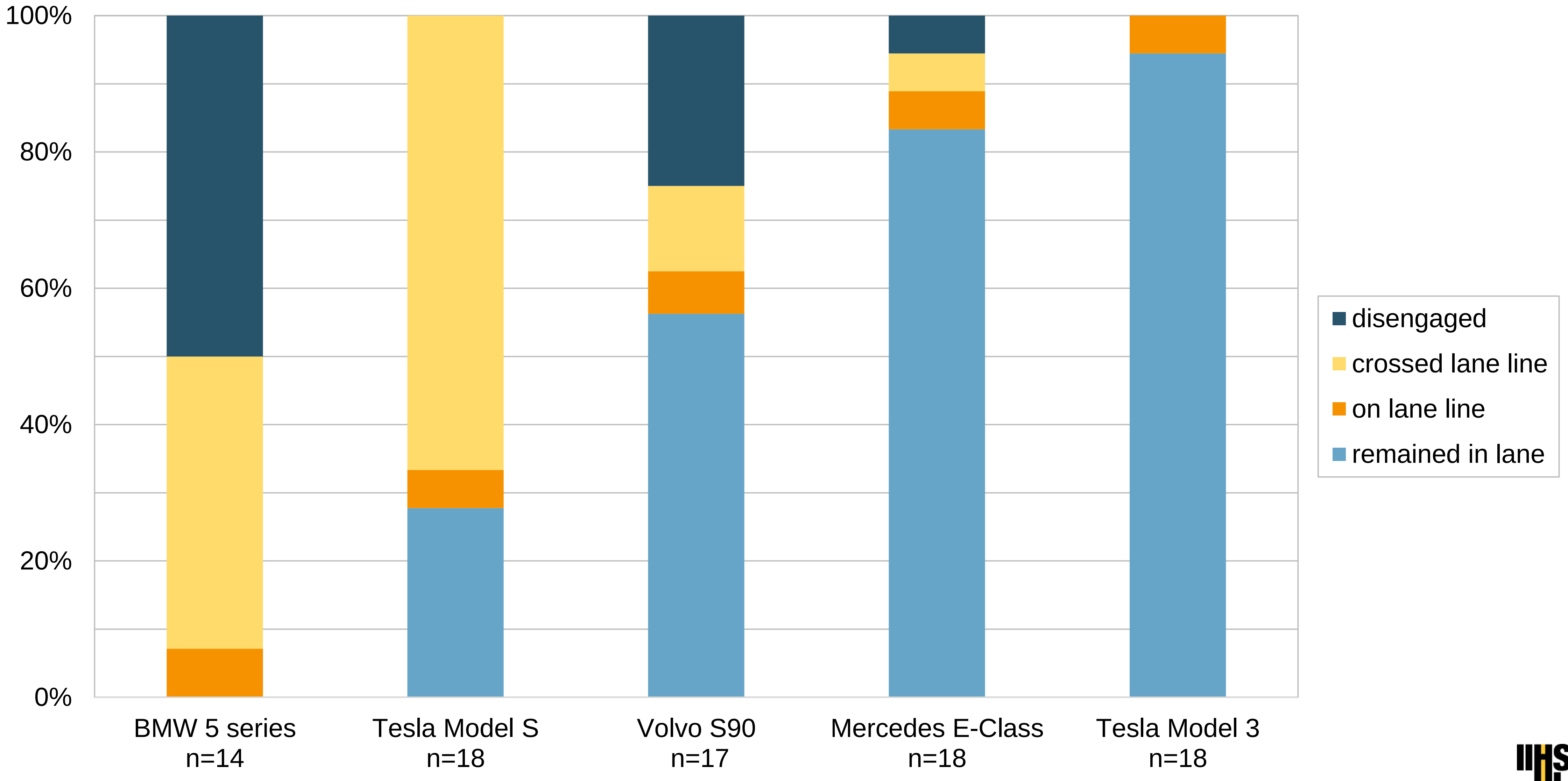
Lane keeping in curves

Lane keeping in curves



Lane keeping on hills

Lane keeping on hills



Can automation eliminate all crashes caused by human error?

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Human error contributes to most crashes

Necessary conditions for automation to be safer than human drivers

- Better than human driver crash rates.[1] Fewer than...
  - 560 people in police-reported crashes
  - 99 injuries
  - 1.2 fatalities

  ...per 100 million miles travelled
- The critical precrash event was attributed to drivers in 94 percent of crashes[2]

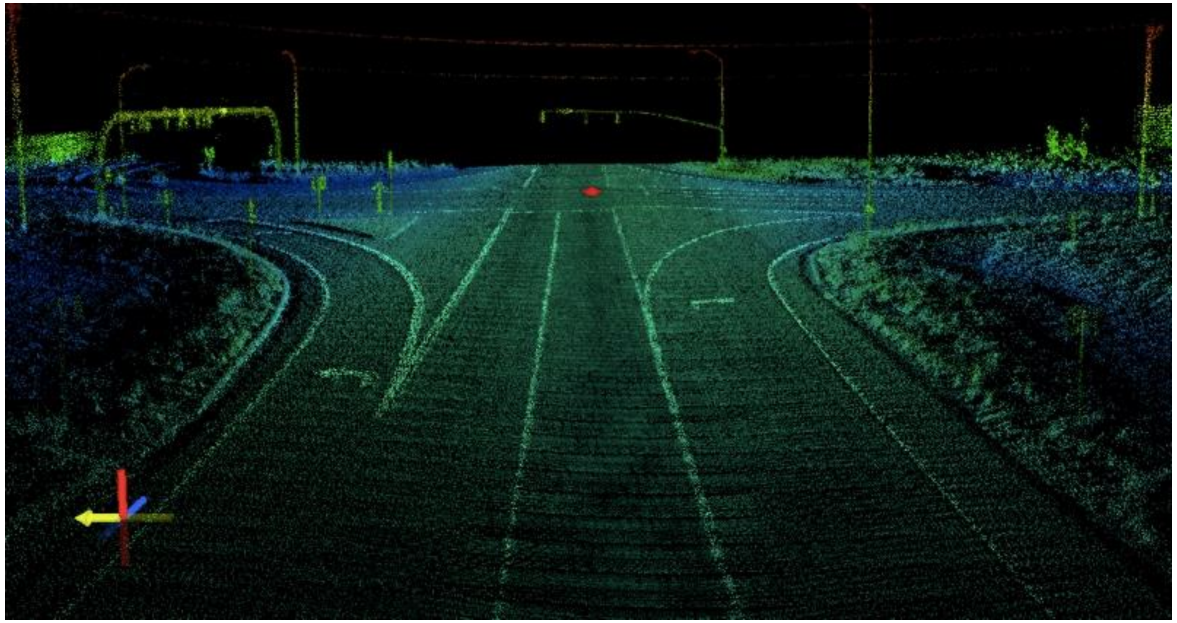
1. NHTSA, Police-Reported Motor Vehicle Traffic Crashes in 2016 (DOT HS 812 501)
2. NHTSA, Critical Reasons for Crashes Investigated in the National Motor Vehicle Crash Causation Survey (DOT HS 812 115)

Forty-one percent were recognition errors

Automated driving systems need to reliably "recognize" and avoid critical situations better than humans

- Inadequate surveillance
- Distraction
- Inattention
- Other

what humans see



what robo-cars see

Thirty-three percent were decision errors

ADS need to make better decisions, obey traffic laws and predict the future better than humans

- Speed
- Wrong assumptions about other road users
- Illegal maneuver
- Aggressive driving

Eleven percent performance and 7 percent nonperformance errors

ADS need to reliably control the vehicle better than humans

- No or insufficient braking
- Over or under steering
- Freezing
- Other

Did the Uber self-driving system avoid humanlike errors?

PRELIMINARY REPORT

HIGHWAY

HWY18MH010

The information in this report is preliminary and will be supplemented or corrected during the course of the investigation.

About 9:58 p.m., on Sunday, March 18, 2018, an Uber Technologies, Inc. test vehicle, based on a modified 2017 Volvo XC90 and operating with a self-driving system in computer control mode, struck a pedestrian on northbound Mill Avenue, in Tempe, Maricopa County, Arizona. The Uber test vehicle was occupied by one vehicle operator, a 44-year-old female. No passengers were in the vehicle.

In the area of the crash, northbound Mill Avenue consists of two left-turn lanes, two through lanes, and one bike lane. The crash occurred before the formation of a right-turn lane. Roadway lighting was present. The posted speed limit was 45 mph.

The crash occurred as the pedestrian, a 49-year-old female, walked a bicycle east across Mill Avenue. The Uber test vehicle was traveling in the right through lane when its right front side struck the pedestrian (see figure 1). As a result of the crash, the pedestrian died. The vehicle operator was not injured.

In this area, northbound Mill Avenue is separated from southbound Mill Avenue by a center median containing trees, shrubs, and brick landscaping in the shape of an X. Four signs at the edges of the brick median, facing toward the roadway, warn pedestrians to use the crosswalk. The nearest crosswalk is at the intersection of Mill Avenue and Curry Road, about 360 feet north of where the crash occurred.

Figure 1. (Left) Location of the crash on northbound Mill Avenue, showing the paths of the pedestrian in orange and of the Uber test vehicle in green. (Right) Postcrash view of the Uber test vehicle, showing damage to the right front side.

- Recognition error?
  - – Uber's AV detected pedestrian and classified her as an unknown object, then a vehicle, finally a bicycle
  - – Paths were converging at 6 seconds before impact, but Uber's AV computed varying expectations of future path
- Decision error?
  - – Six seconds before impart, Uber's AV was moving 43 mph in 45 mph zone
  - –Impact speed was 39 mph
    - NTSB preliminary report gives no explanation for speed change
    - Should Uber's AV have slowed more?
- Performance error?
  - –Emergency braking maneuvers were disabled

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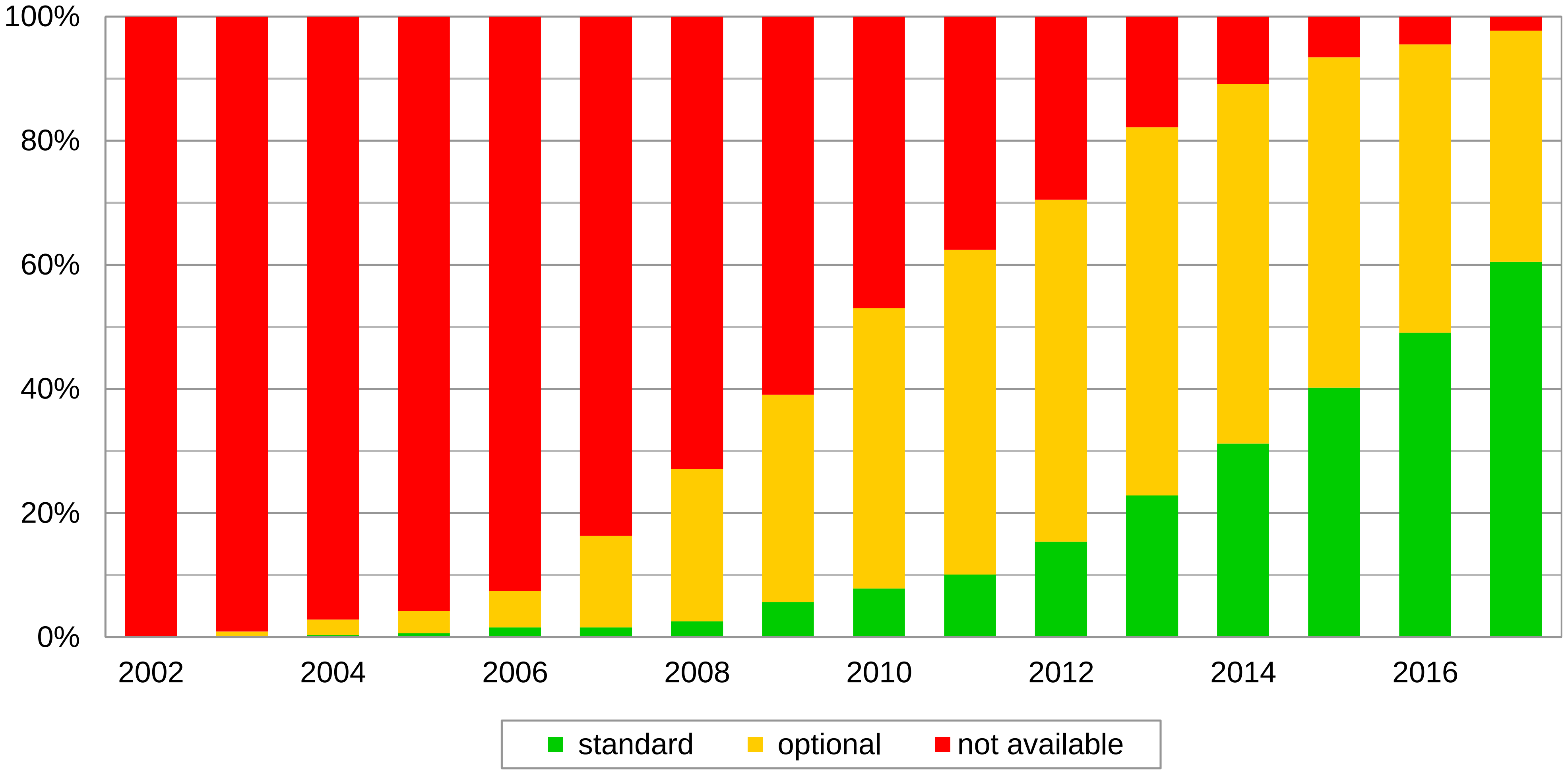
Fleet fitment of ADAS

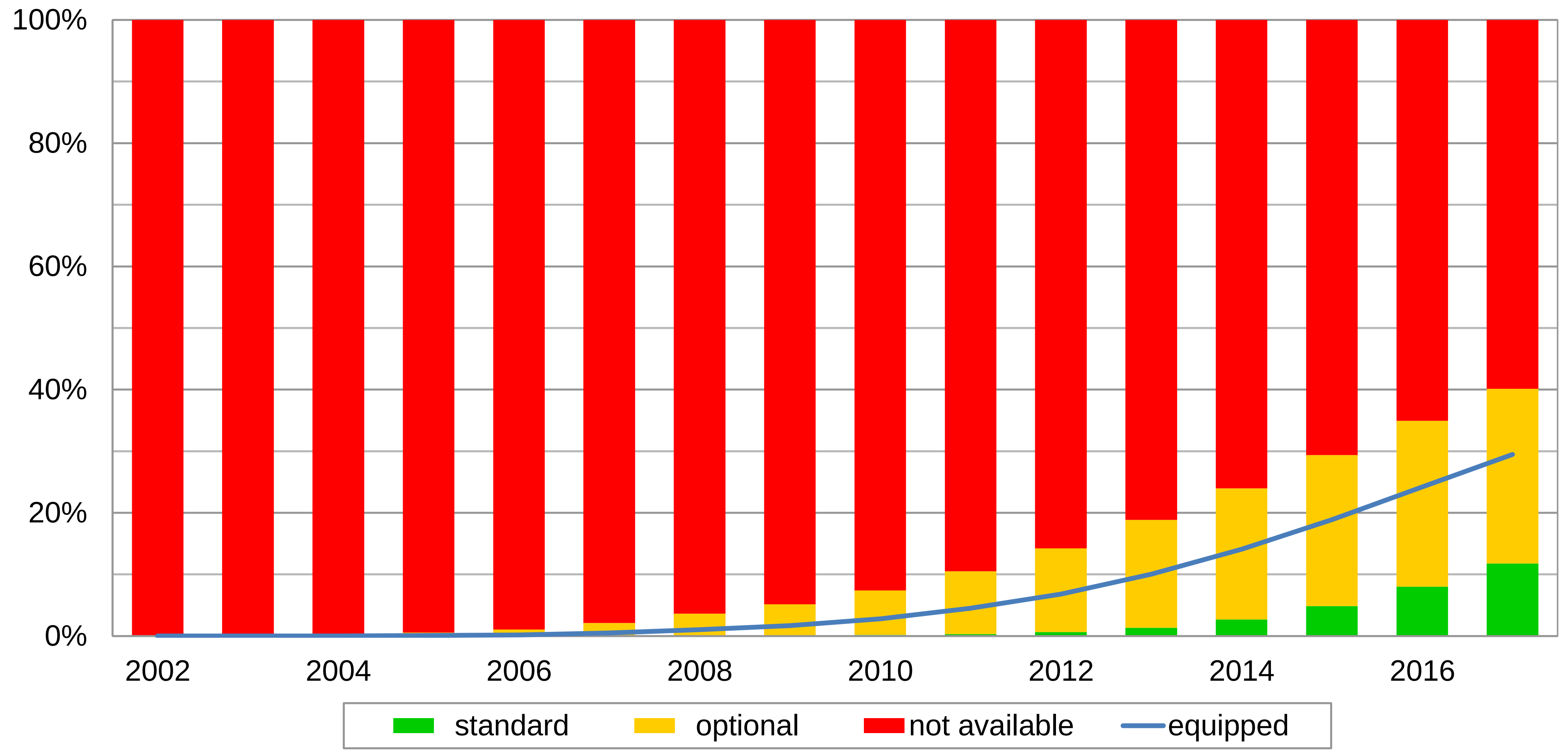
New vehicle series with rear camera

By model year



Registered vehicles with rear camera

By calendar year



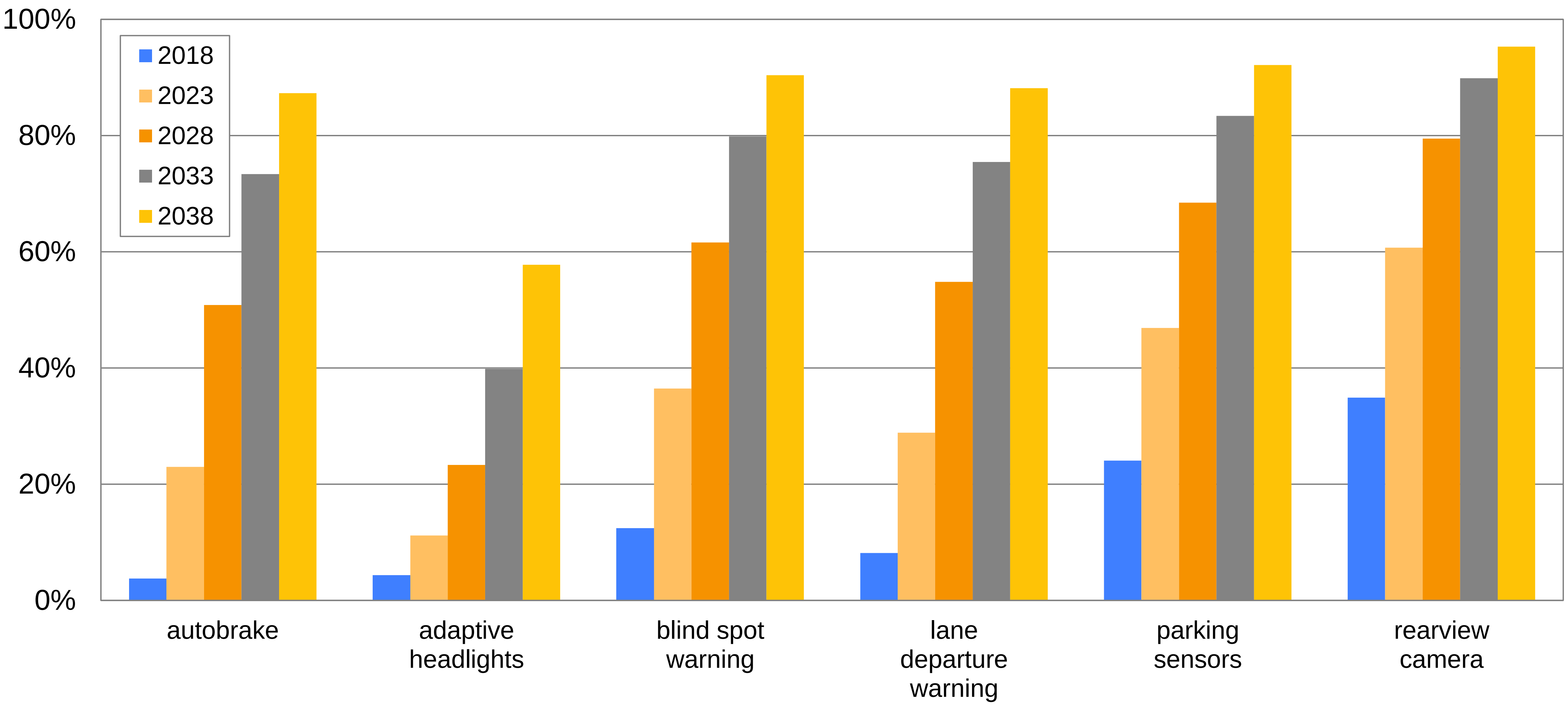
New vehicle series with autonomous emergency braking

By model year

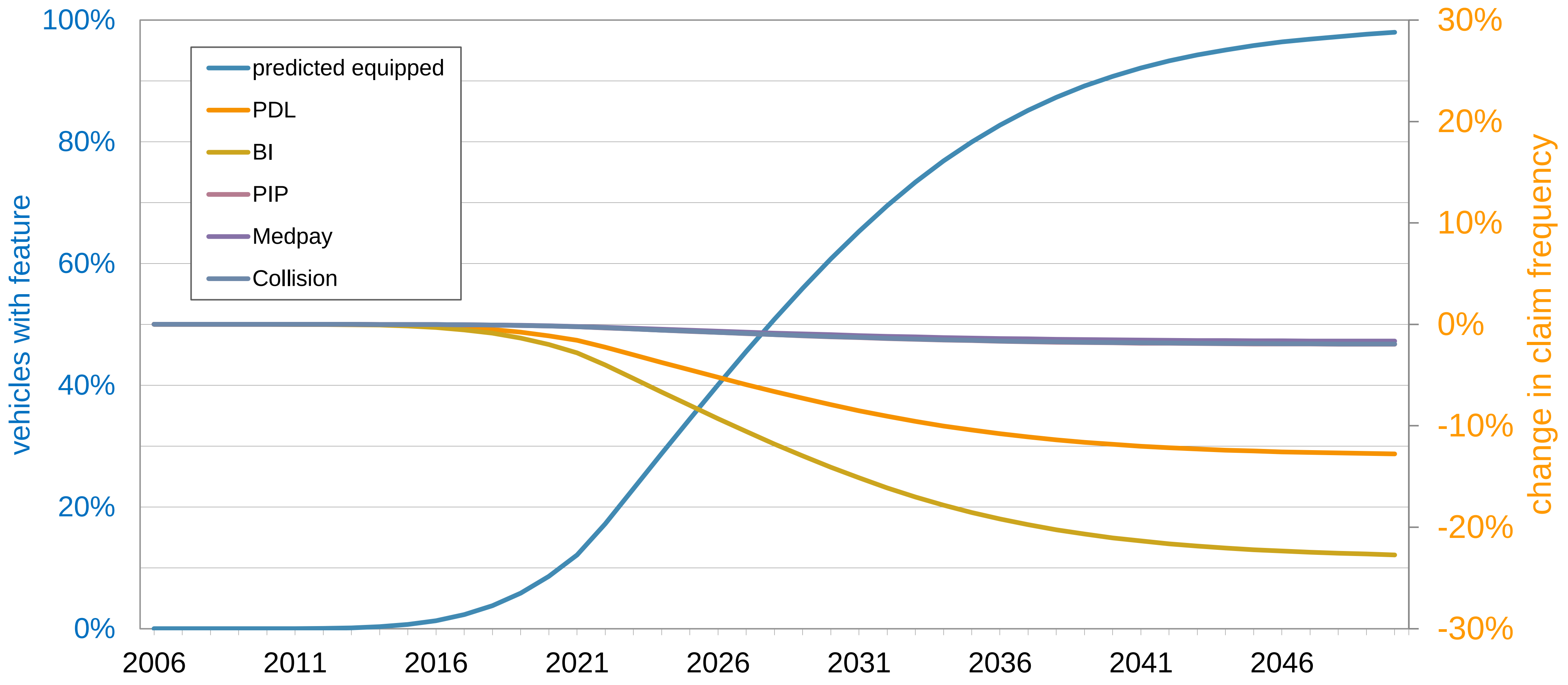
Registered vehicles with autonomous emergency braking

By calendar year

Predicted registered vehicles by feature by calendar year



Estimated change in claim frequency due to increased fitment of front autobrake systems



Insurance Institute for Highway Safety
Highway Loss Data Institute

More information at iihs.org and on our social channels:

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