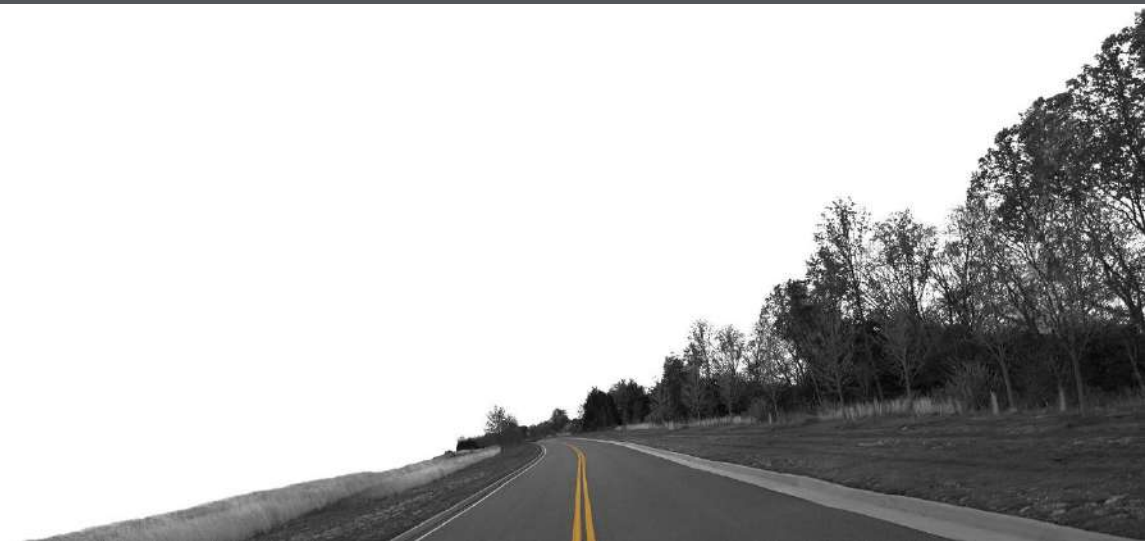
The evolution of ADAS, automation, and safety

AIRB

January 29, 2026

Kay Wakeman
Director of Insurance Outreach



Saving lives. Preventing harm.

IIHS-HLDI mission:

To reduce deaths, injuries and property damage from motor vehicle crashes through **research and evaluation** and through **education** of consumers, policymakers and safety professionals.

Member groups

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Auto Club Group
Auto-Owners Insurance
Celina Insurance Group
CHUBB
The Cincinnati Insurance Companies
Clearcover Insurance Company
Colorado Farm Bureau Insurance Company
Commonwealth Casualty Company
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COUNTRY Financial
CSAA Insurance Group
Desjardins Insurance
Donegal Insurance Group
DTRIC Insurance
Elephant Insurance Company
Encova Insurance
Erie Insurance Group
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Farm Bureau Insurance Company of Michigan
Farm Bureau Insurance of Tennessee
Farm Bureau Mutual Insurance Company of Idaho
Farmers Insurance Group
Farmers Mutual of Nebraska
Florida Farm Bureau Insurance Companies
Frankenmuth Insurance
Gainsco Insurance
GEICO Corporation
The General Insurance
Georgia Farm Bureau Mutual Insurance Company
Goodville Mutual Casualty Company
Grange Insurance
The Hanover Insurance Group
The Hartford
Haulers Insurance Company, Inc.
Horace Mann Insurance Companies
Incline
Indiana Farm Bureau Insurance
Indiana Farmers Insurance
Just Insure
Kemper Corporation
Kentucky Farm Bureau Mutual Insurance Companies
Kin Insurance
Lemonade, Inc.
Liberty Mutual Insurance
Louisiana Farm Bureau Insurance Company
Main Street America Insurance
MAPFRE Insurance Group
Mercury Insurance Group
Mississippi Farm Bureau Casualty Insurance Company
MMG Insurance
Mountain West Farm Bureau Mutual Insurance Company
Munich Reinsurance America, Inc.
Mutual Benefit Group®
Mutual of Enumclaw Insurance Company
National General Insurance
Nationwide
NJM Insurance Group
Nodak Insurance Company
North Carolina Farm Bureau Mutual Insurance Company
North Star Mutual Insurance Company
Northern Neck Insurance Company
NYCM Insurance
Ohio Mutual Insurance Group
Openly
PEMCO Mutual Insurance Company
Plymouth Rock Assurance
Propel Insurance
The Responsive Auto Insurance Company
Rider Insurance
Rockingham Insurance
Root Insurance Co
Rural Mutual Insurance Company
Safe Auto Insurance Company
Safeco Insurance®
Samsung Fire & Marine Insurance Company
SECURA Insurance
Selective Insurance
Sentry Insurance
Shelter Insurance®
Sompo International
South Carolina Farm Bureau Mutual Insurance Company®
Southern Farm Bureau Casualty Insurance Company
State Auto Insurance Companies
State Farm Insurance Companies
Stillwater Insurance Group
Texas Farm Bureau Insurance
The Travelers Companies, Inc.
United Auto
USAA
Virginia Farm Bureau Mutual Insurance
The Wawanesa Mutual Insurance Company
West Bend Insurance Company
Westfield

Funding associations

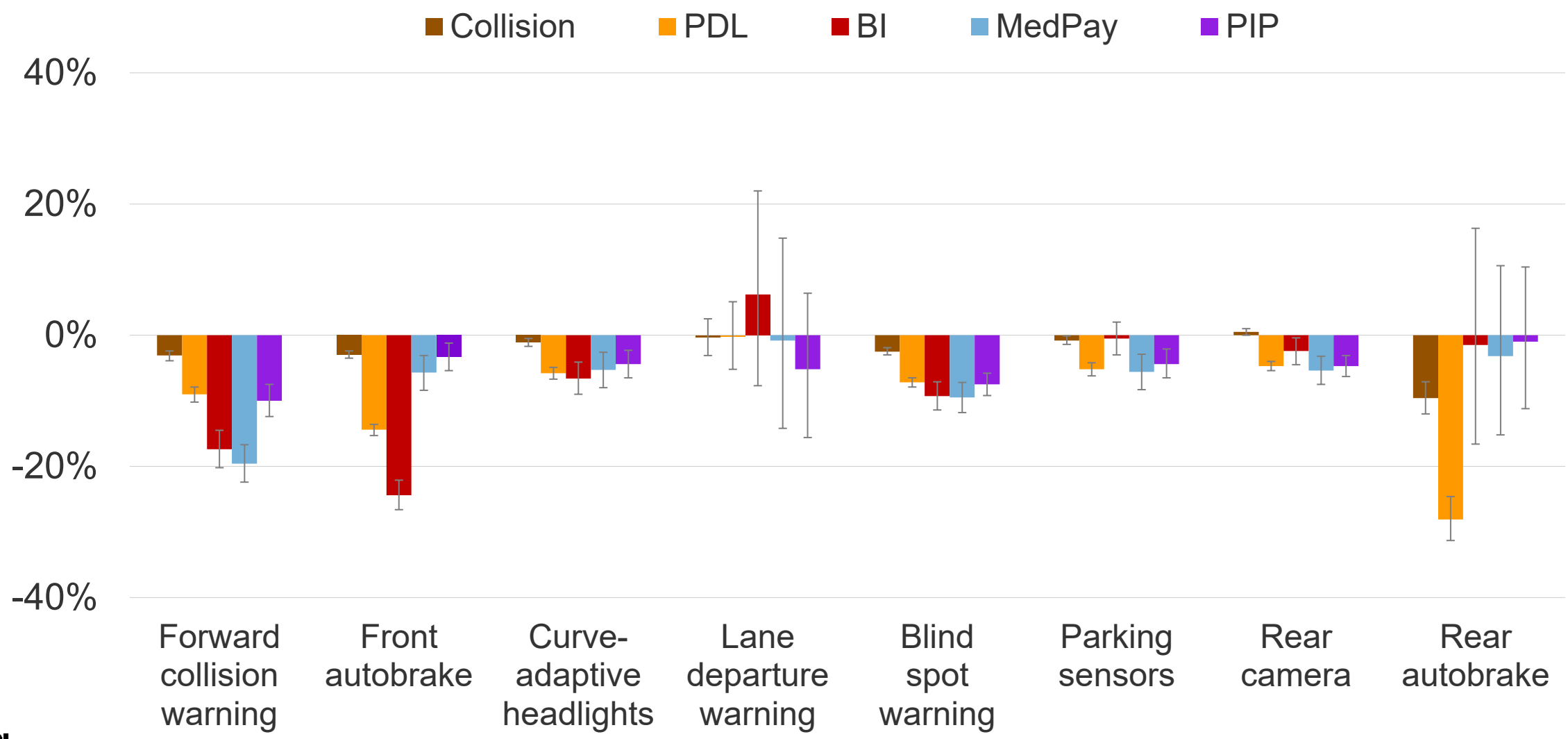
American Property Casualty Insurance Association
National Association of Mutual Insurance Companies

Co-operators Financial Services Limited
Desjardins Insurance
The Wawanesa Mutual Insurance Company

Advanced Driver Assistance Systems – early implementations

Summary of technology effects on insurance claim frequency

Early implementations



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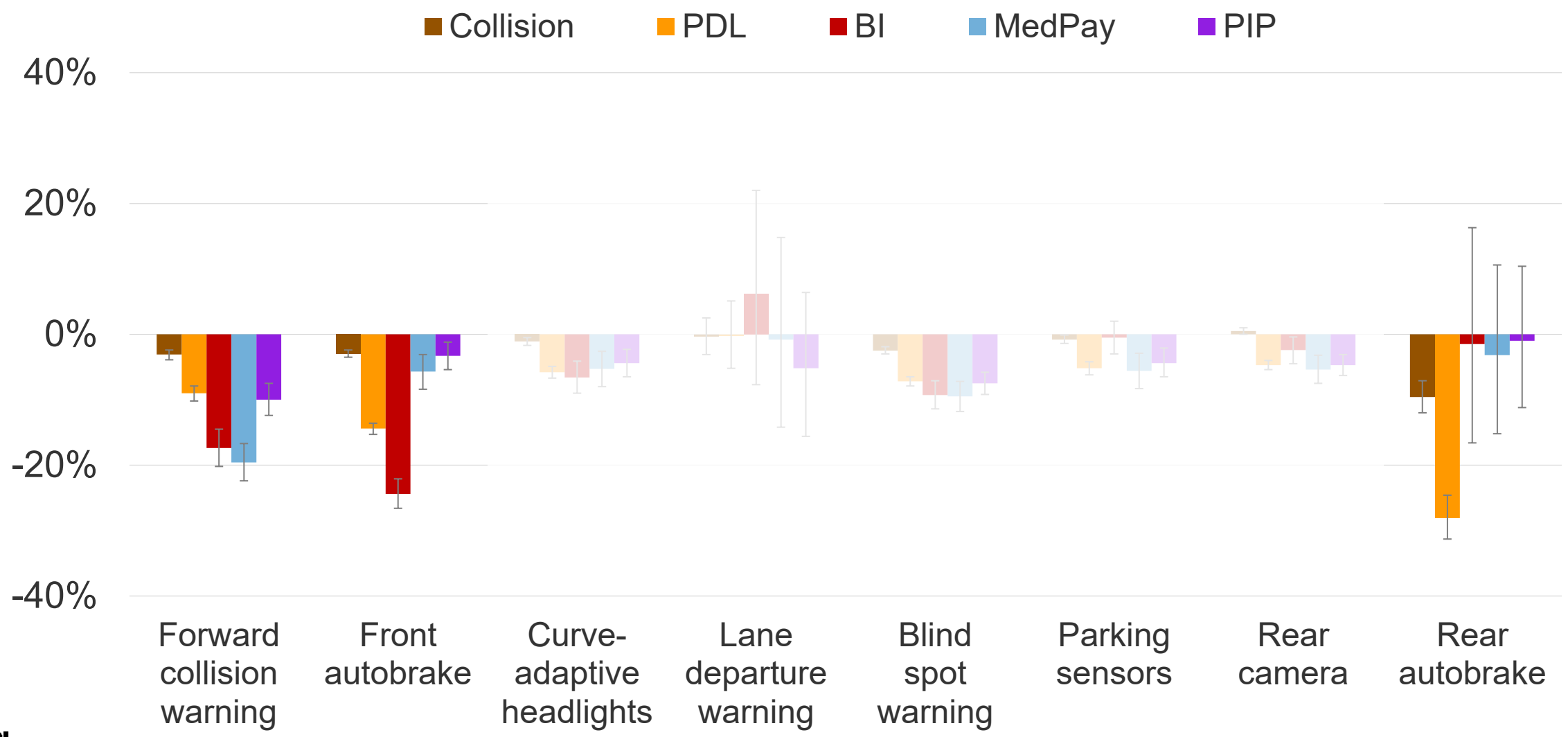
Summary of technology effects on insurance claim frequency

Early implementations



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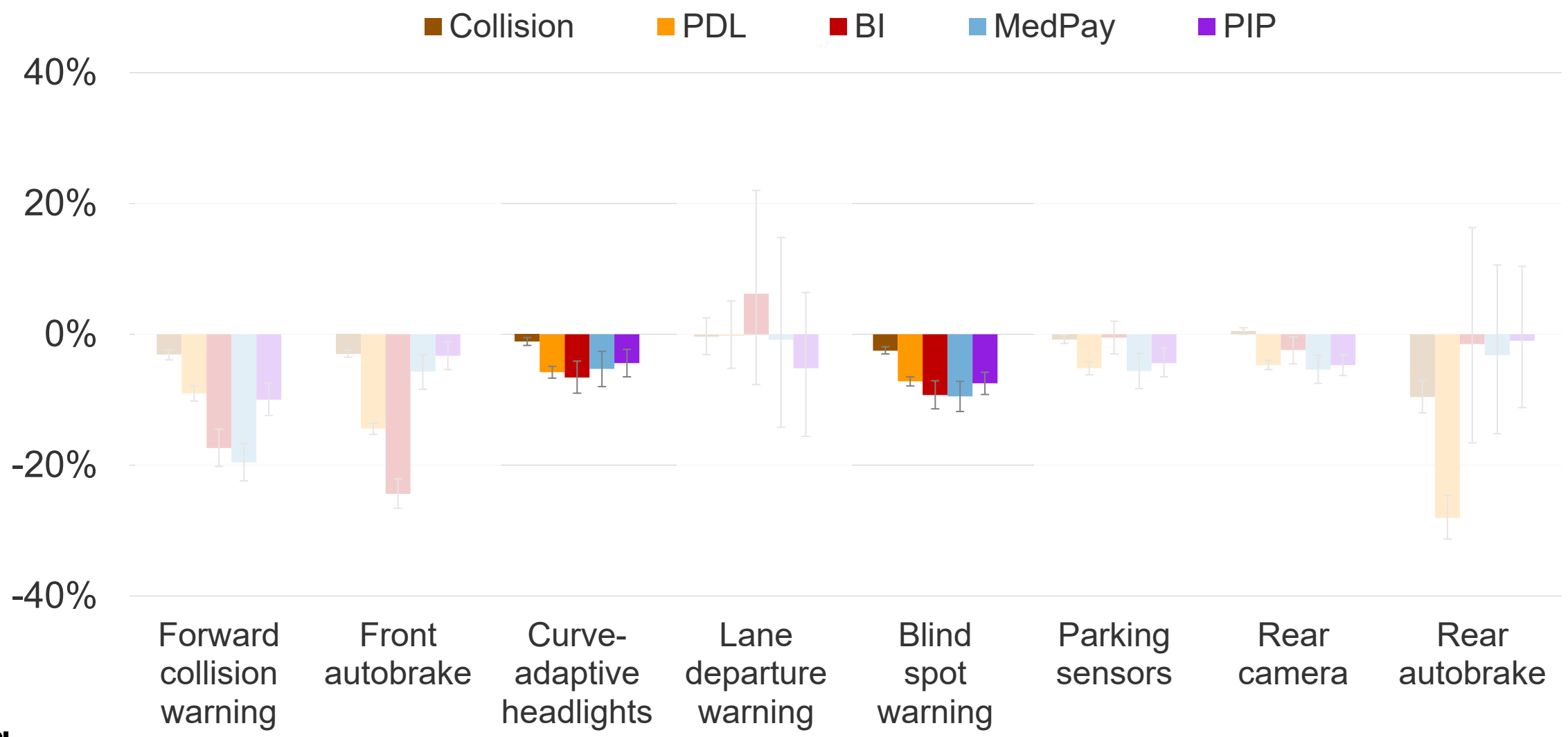
Summary of technology effects on insurance claim frequency

Early implementations



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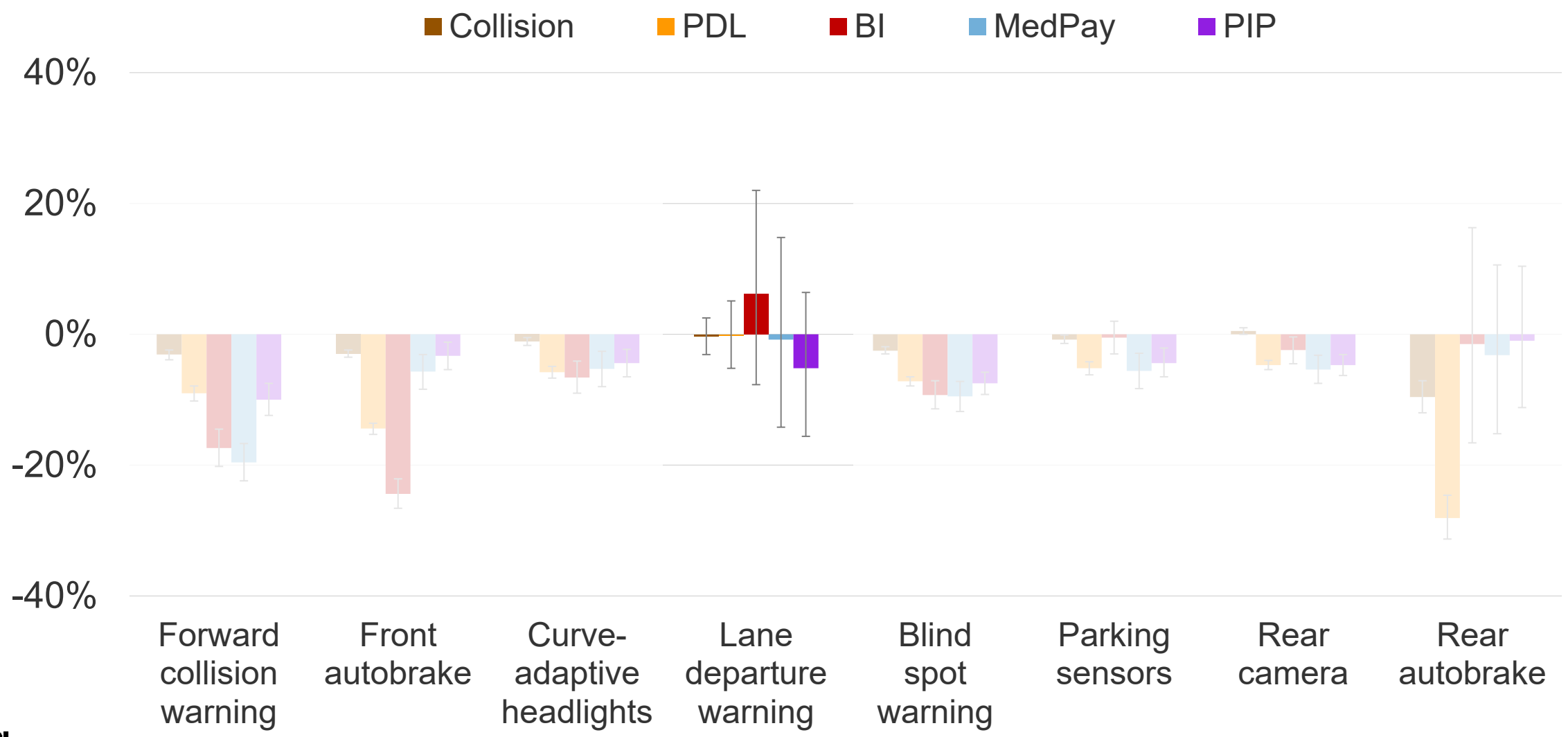
Summary of technology effects on insurance claim frequency

Early implementations



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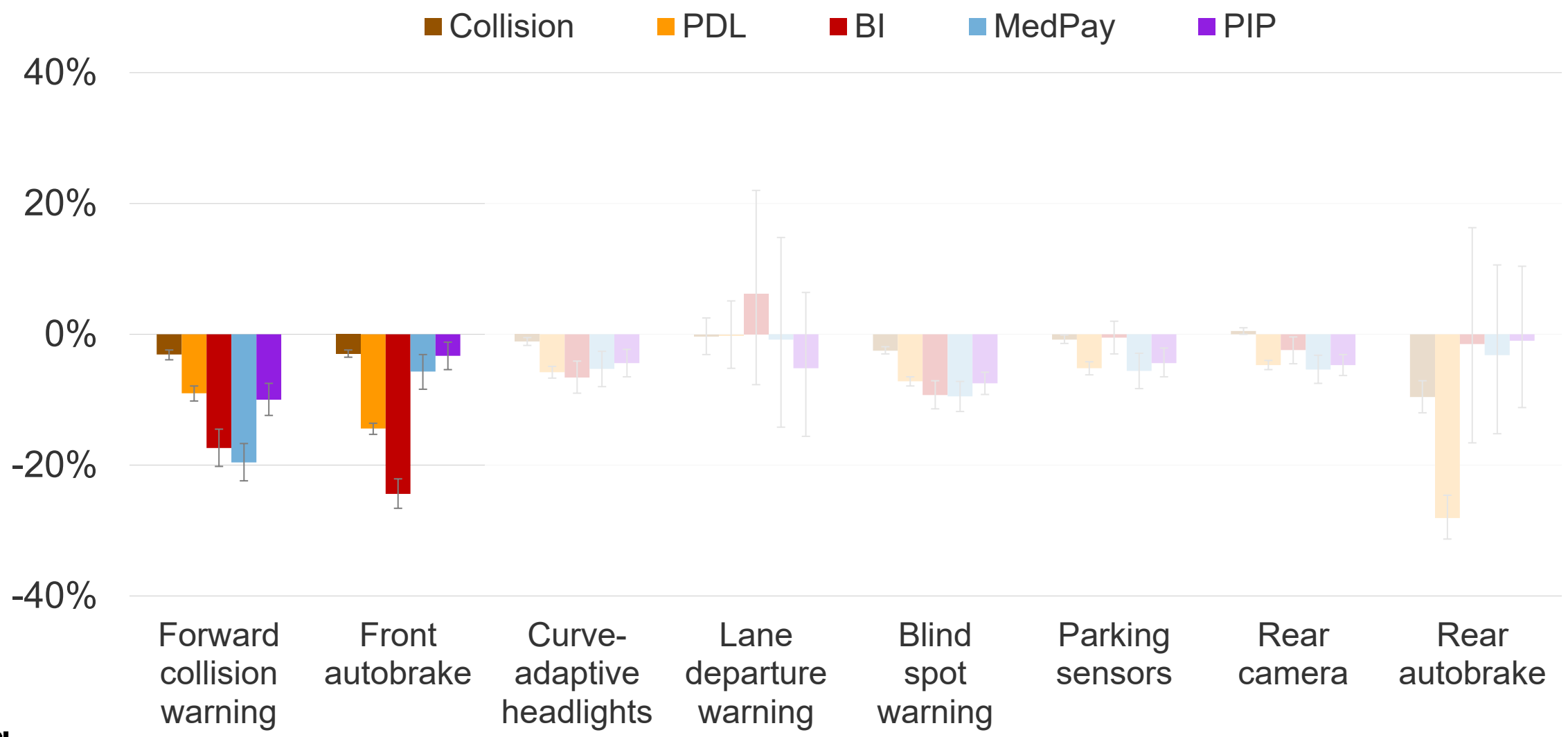
Summary of technology effects on insurance claim frequency

Early implementations



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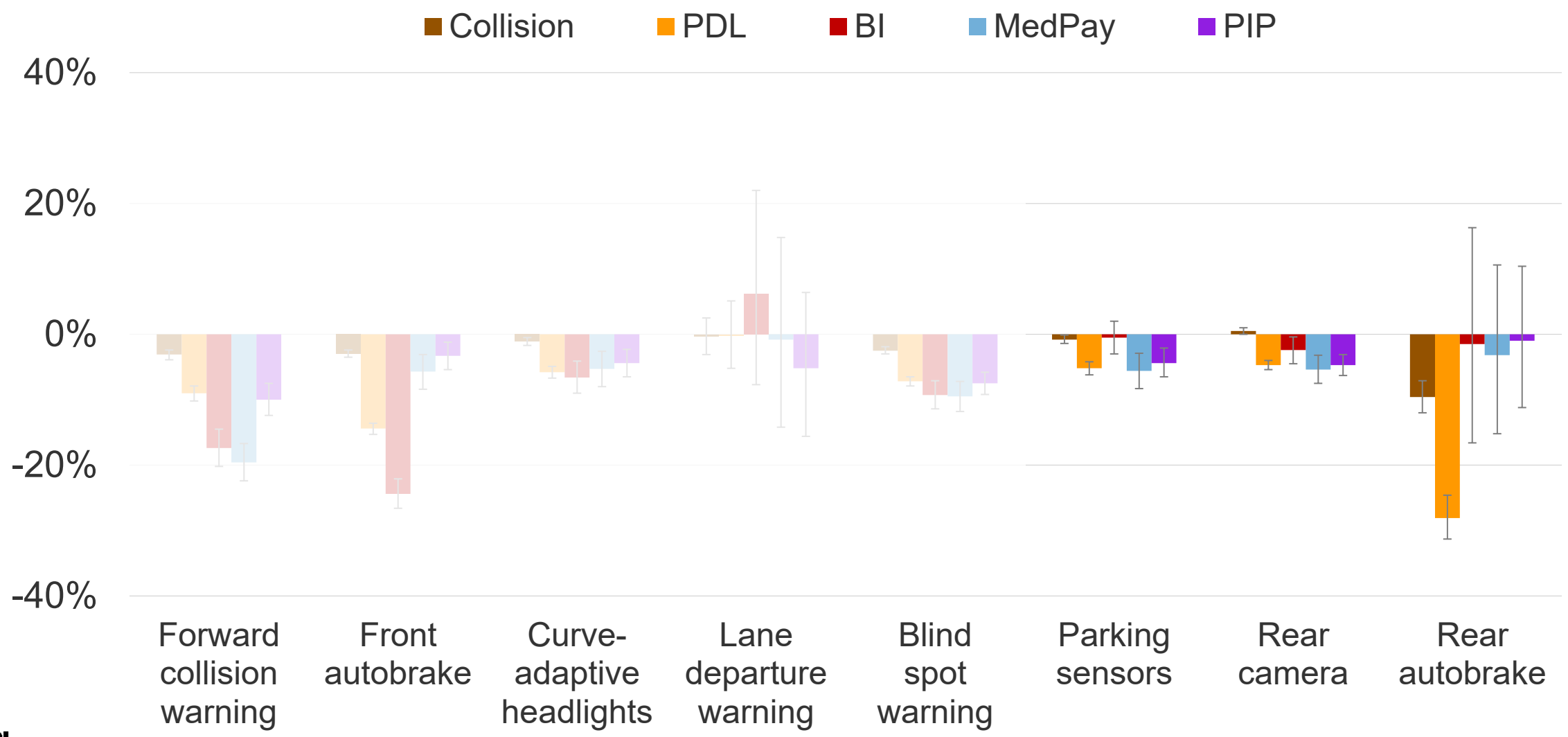
Summary of technology effects on insurance claim frequency

Early implementations



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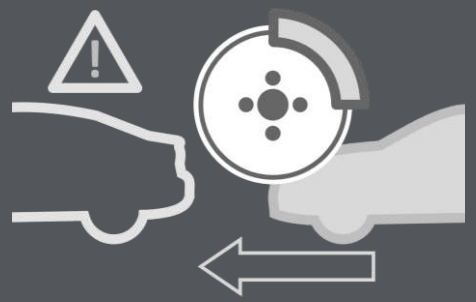
Crash reductions with front, lane departure and blind spot technologies

50%

With AEB

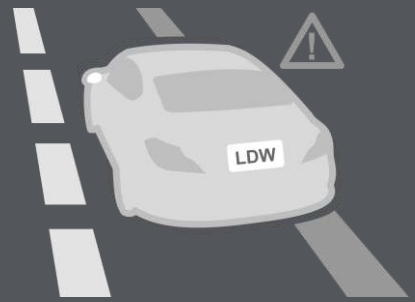


27%

With AEB
+ pedestrian detection

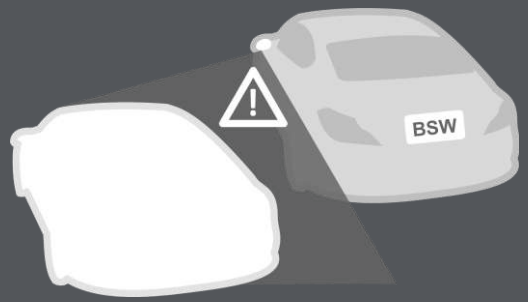
11%

With lane
departure warning



14%

With blind
spot warning



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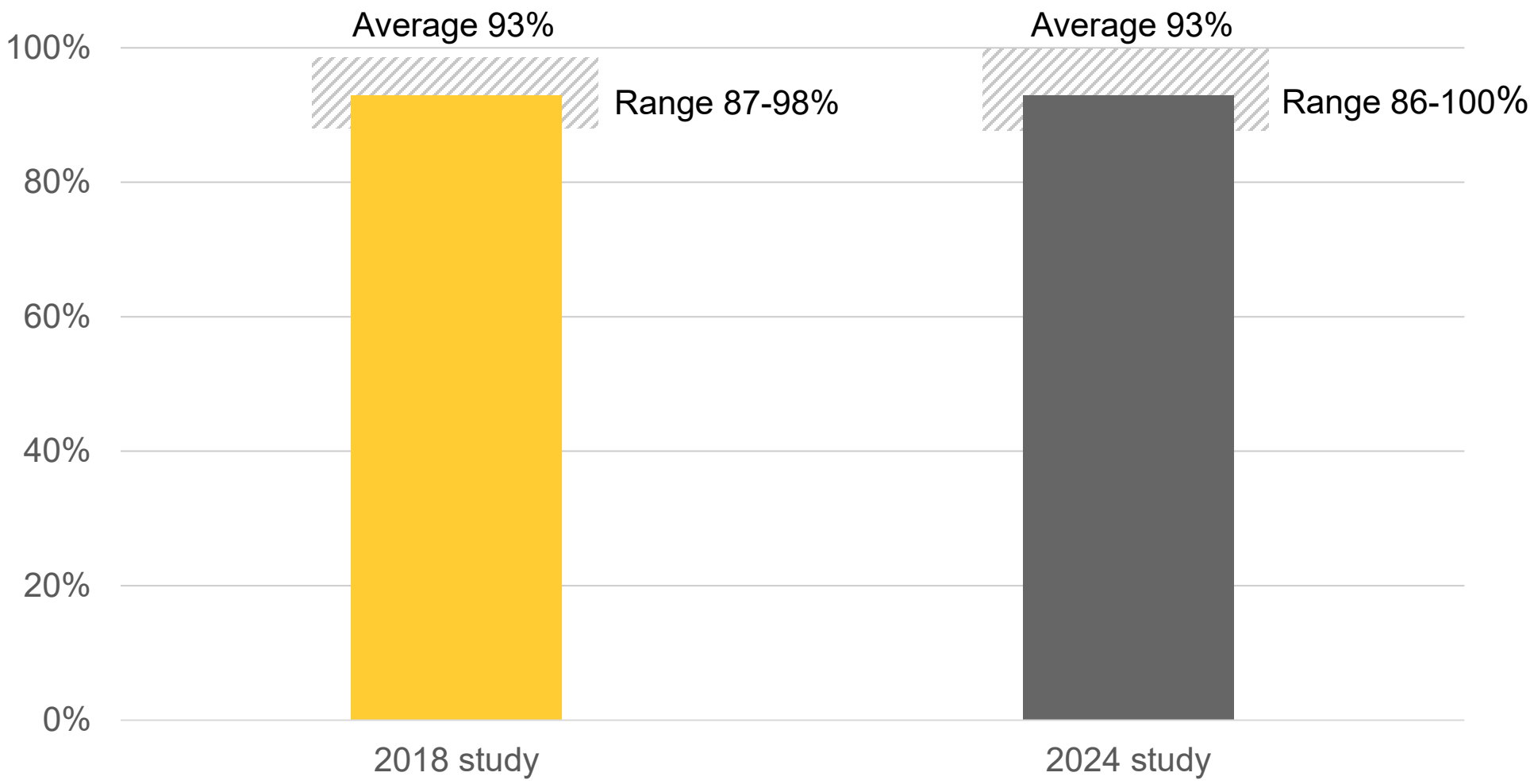
Usage rates of ADAS systems by drivers

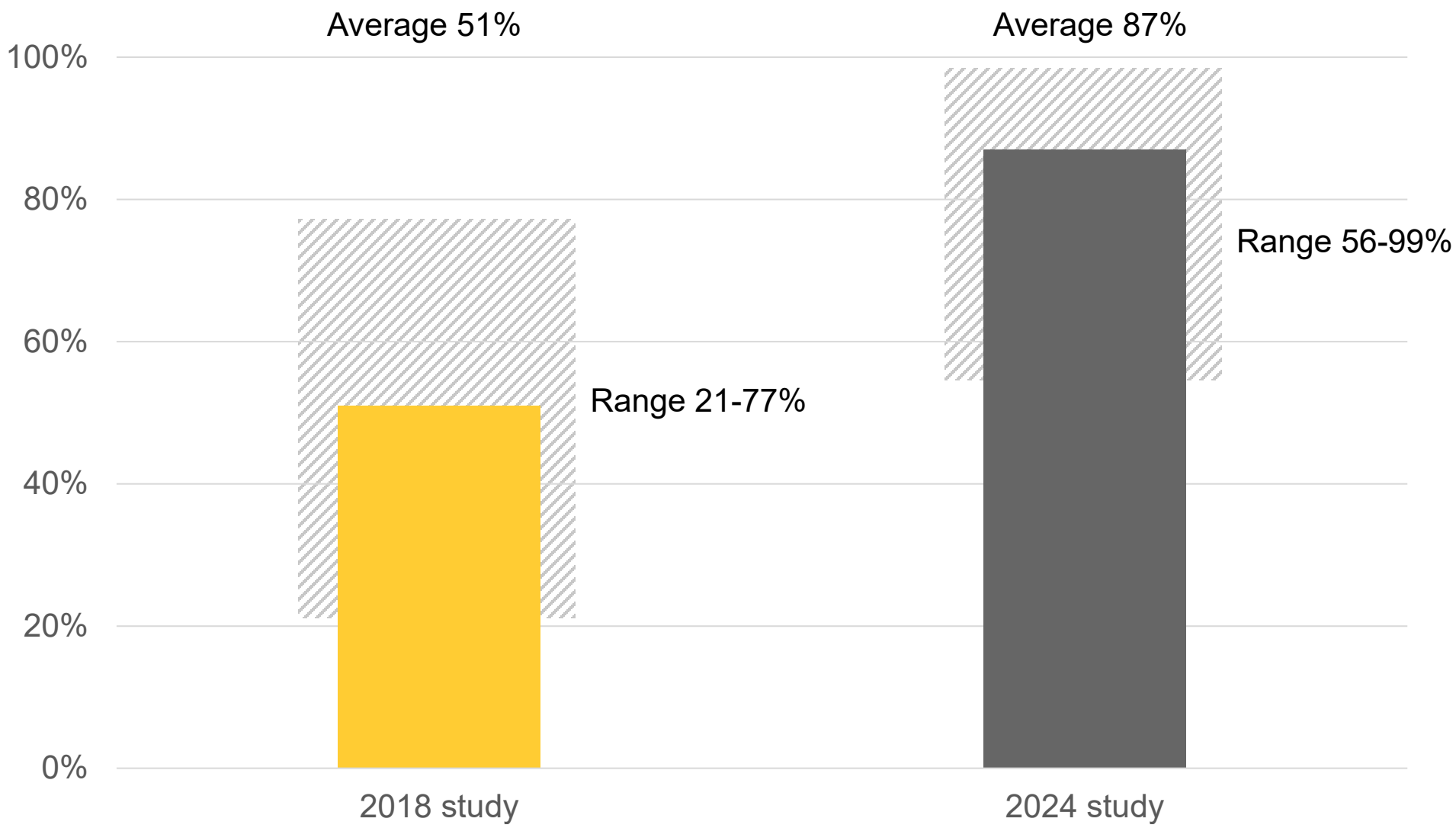
Dealership observations of front crash prevention system status

Percent with system on — mean values and range



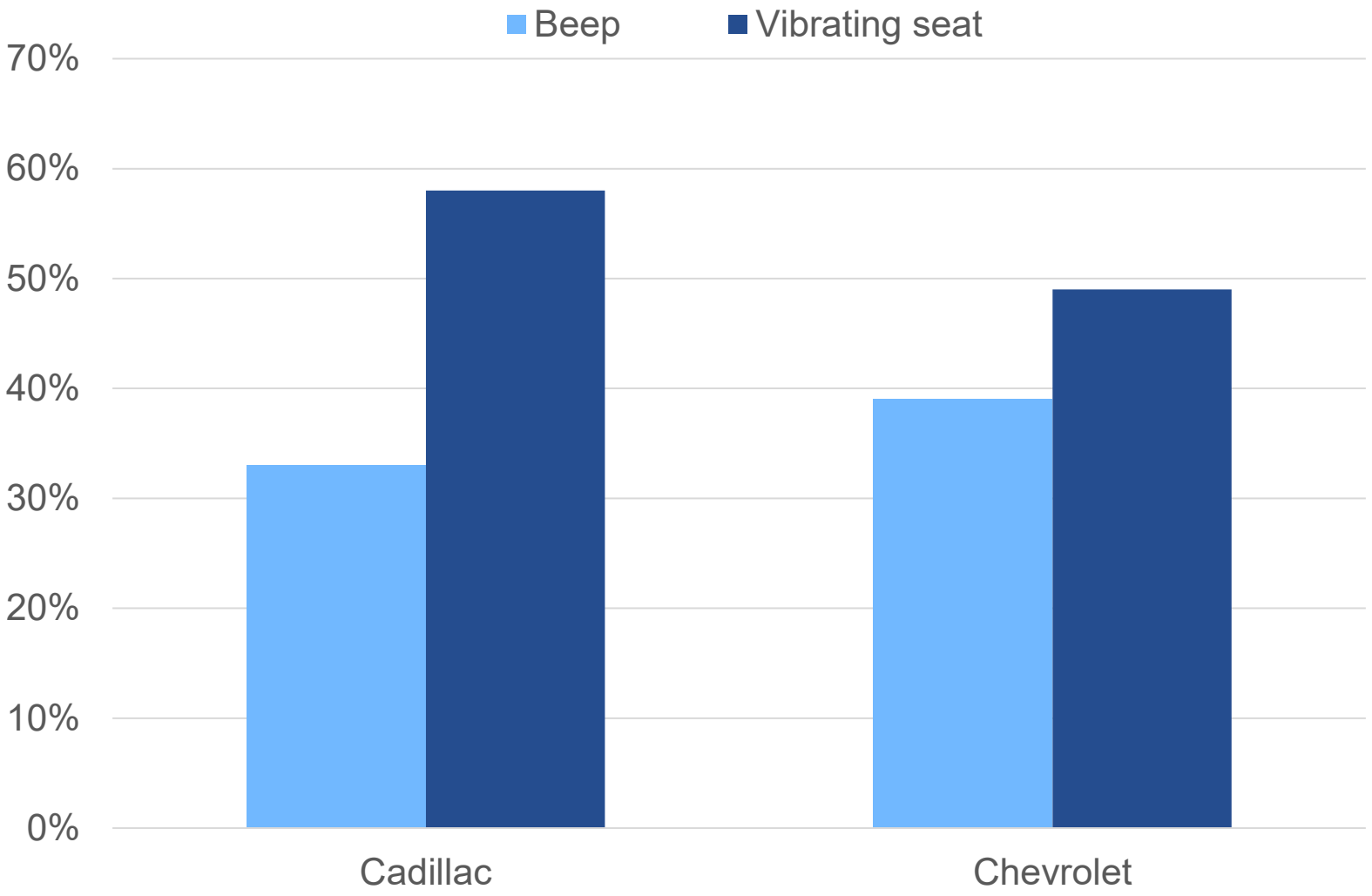
Dealership observations of lane departure mitigation system status

Percent with system on — mean values and range



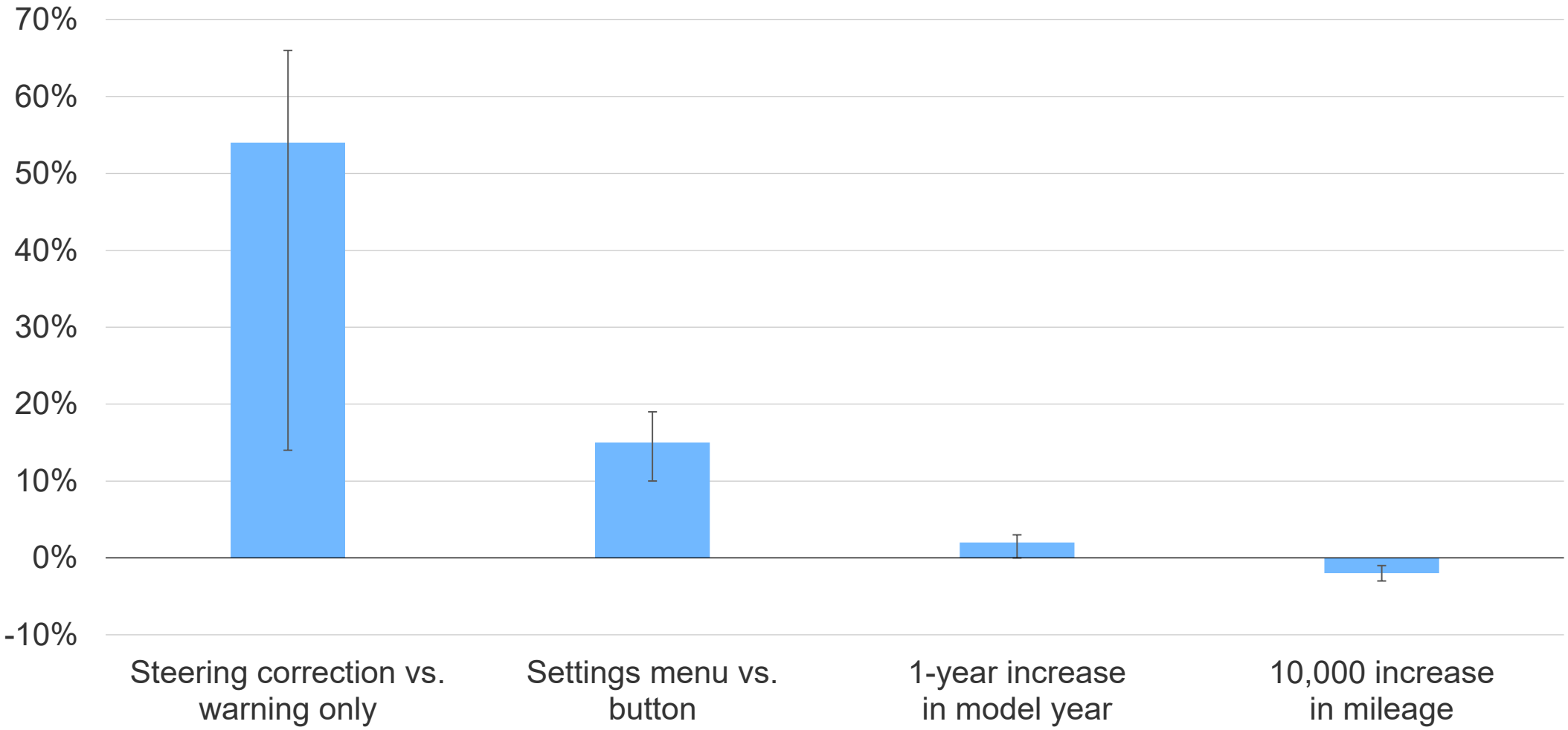
GM lane departure warning on-off status by warning type

2018 study



Differences in lane departure mitigation use

Relative likelihood of system use, 2024 study




Do you turn off your lane maintenance system?

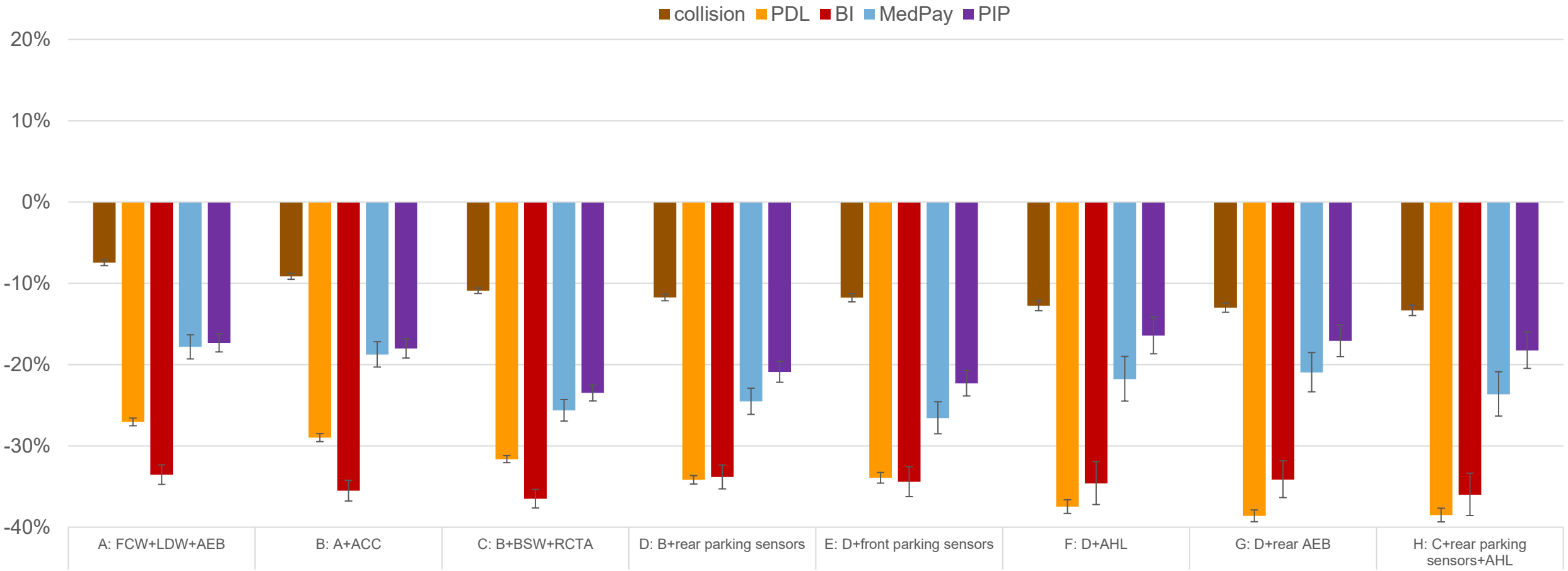
Do you turn off your lane maintenance system?

- A. Yes
- B. No
- C. I don’t have one

ADAS bundles (model years 2017-22)

Estimated changes in claim frequency associated with ADAS bundles

Model years 2017-22



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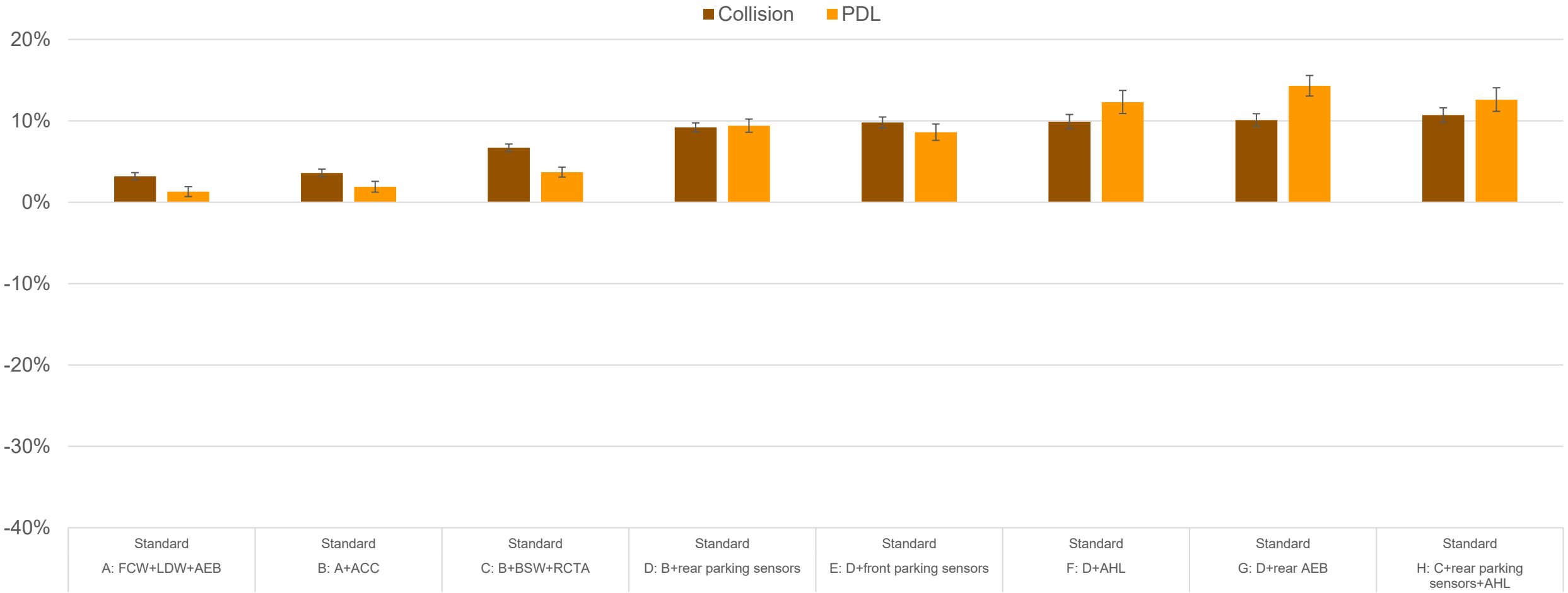
Estimated changes in physical damage claim severity associated with ADAS bundles

Model years 2017-22



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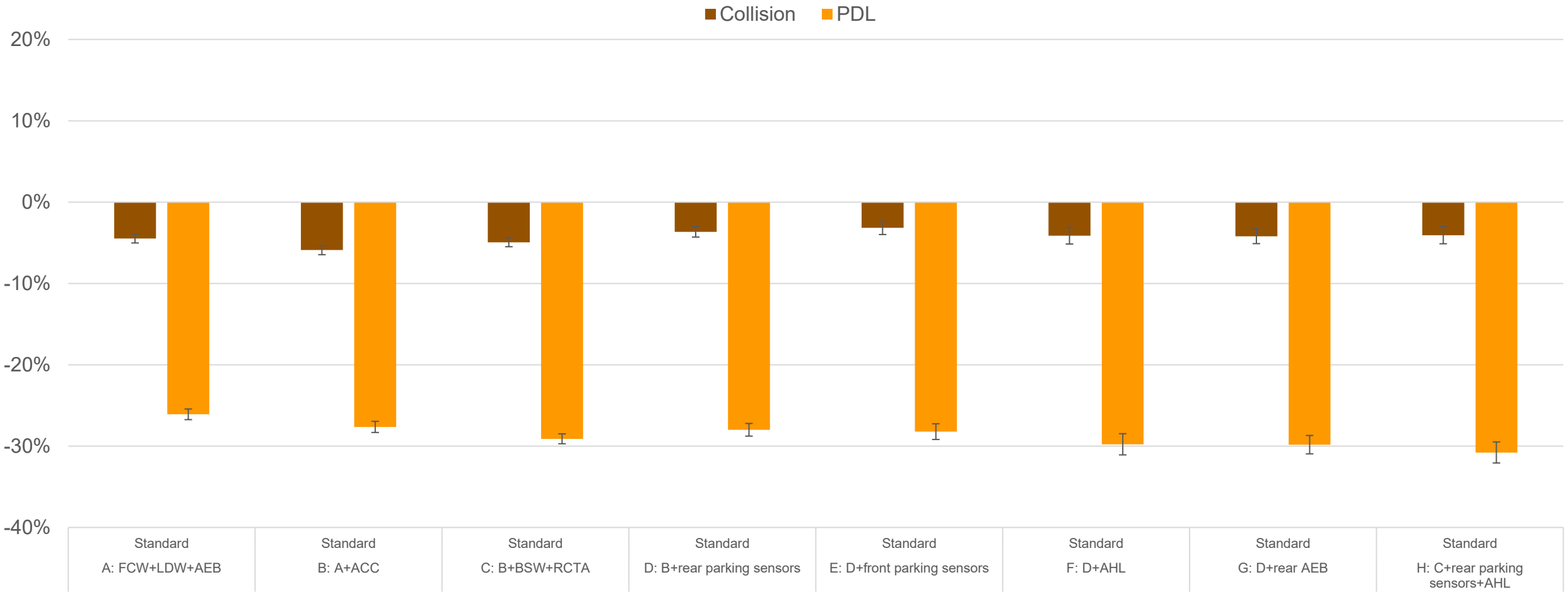
Estimated changes in physical damage overall losses associated with ADAS bundles

Model years 2017-22



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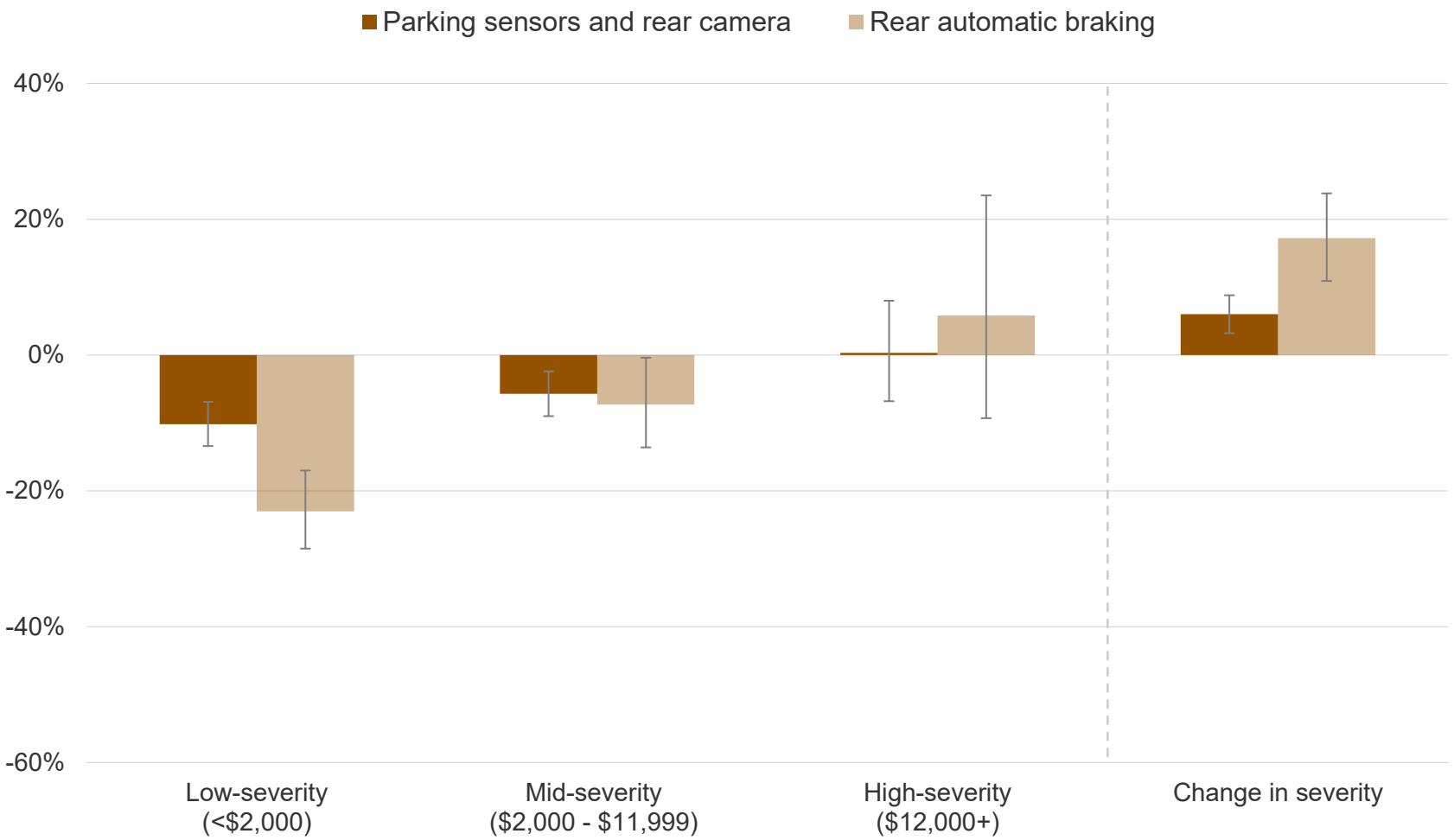
ADAS and claim severity for collision and PDL

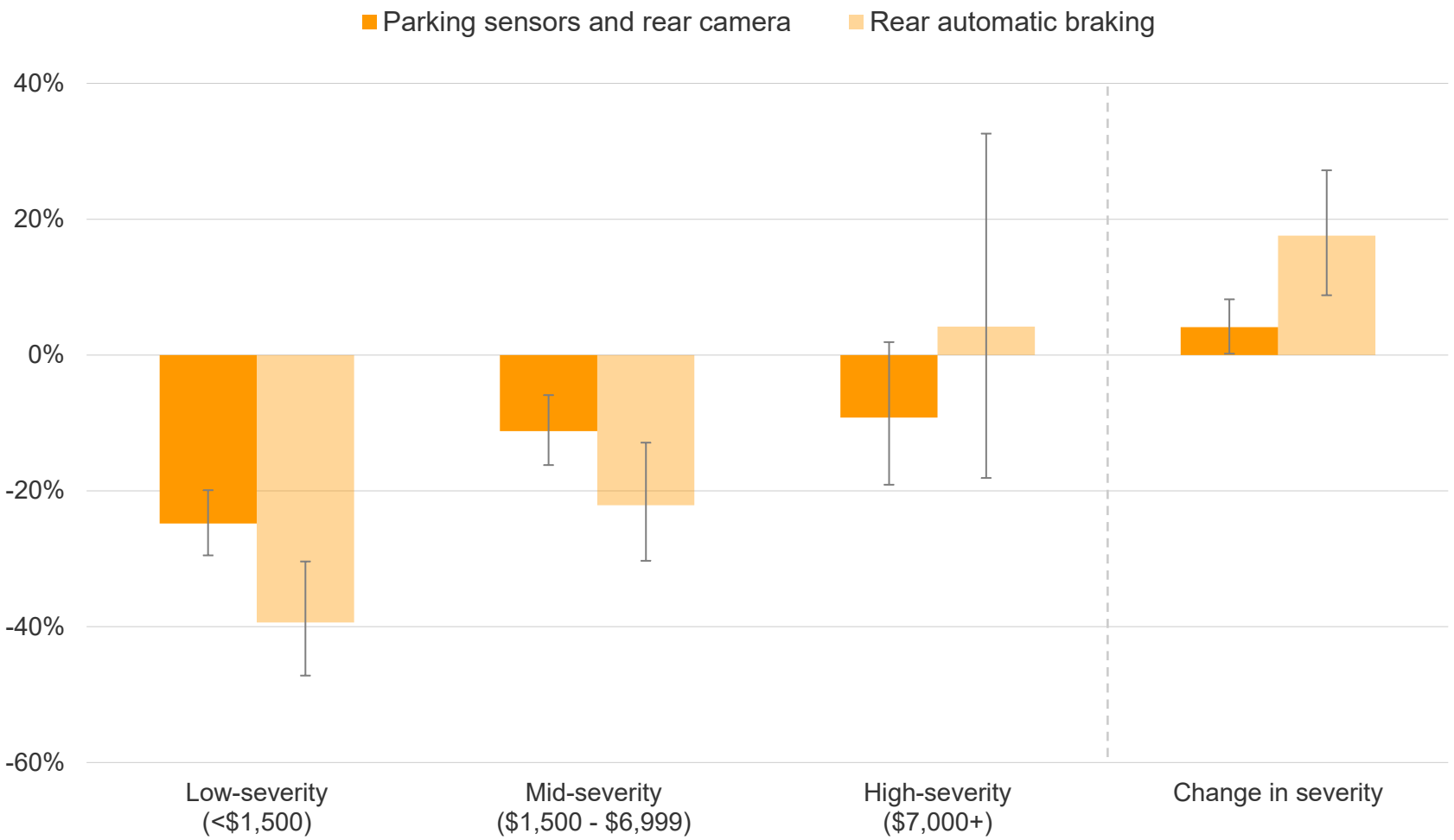
Changes in collision claim frequency by claim size

General Motors parking assist systems



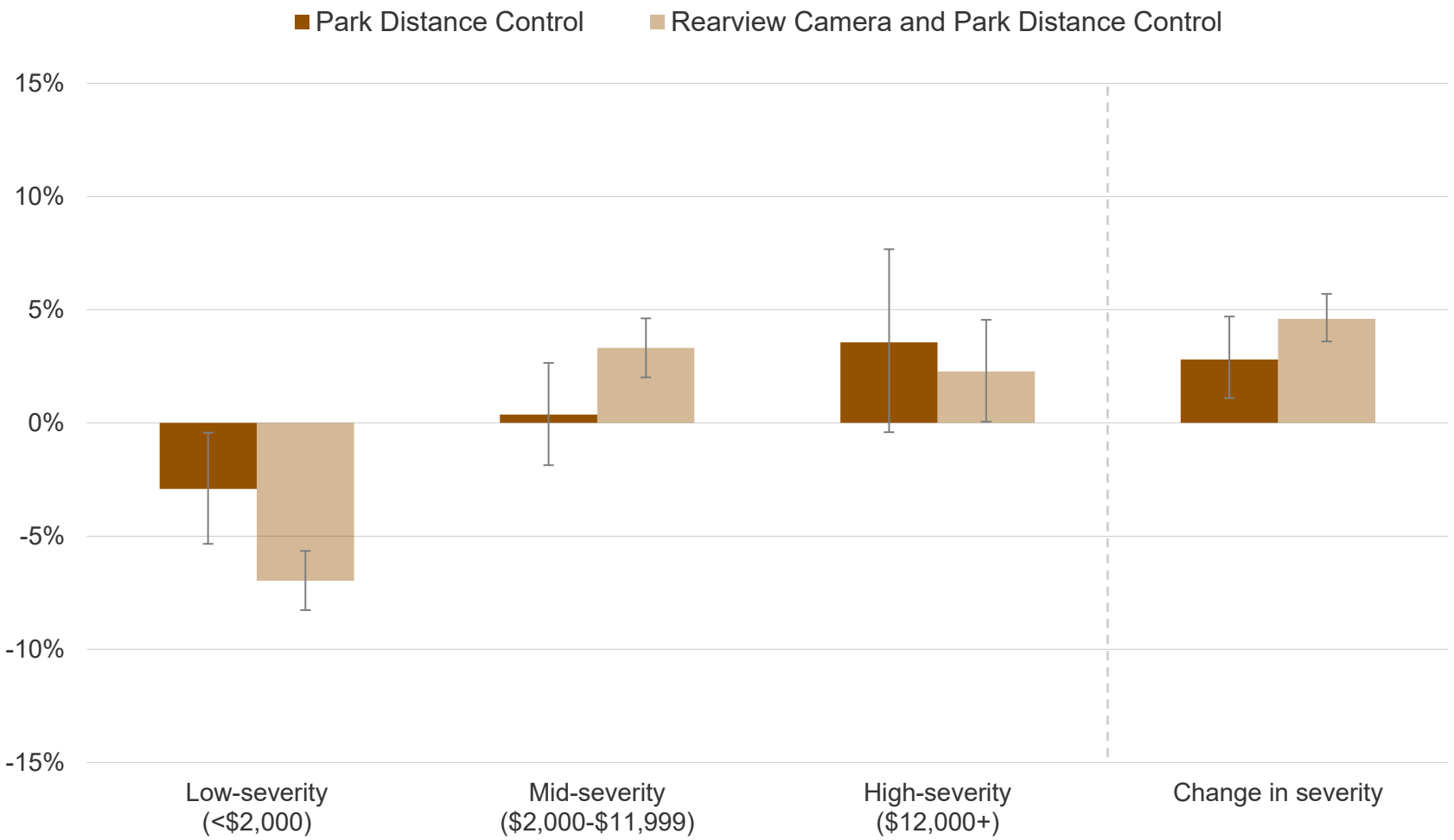
Changes in PDL claim frequency by claim size

General Motors parking assist systems



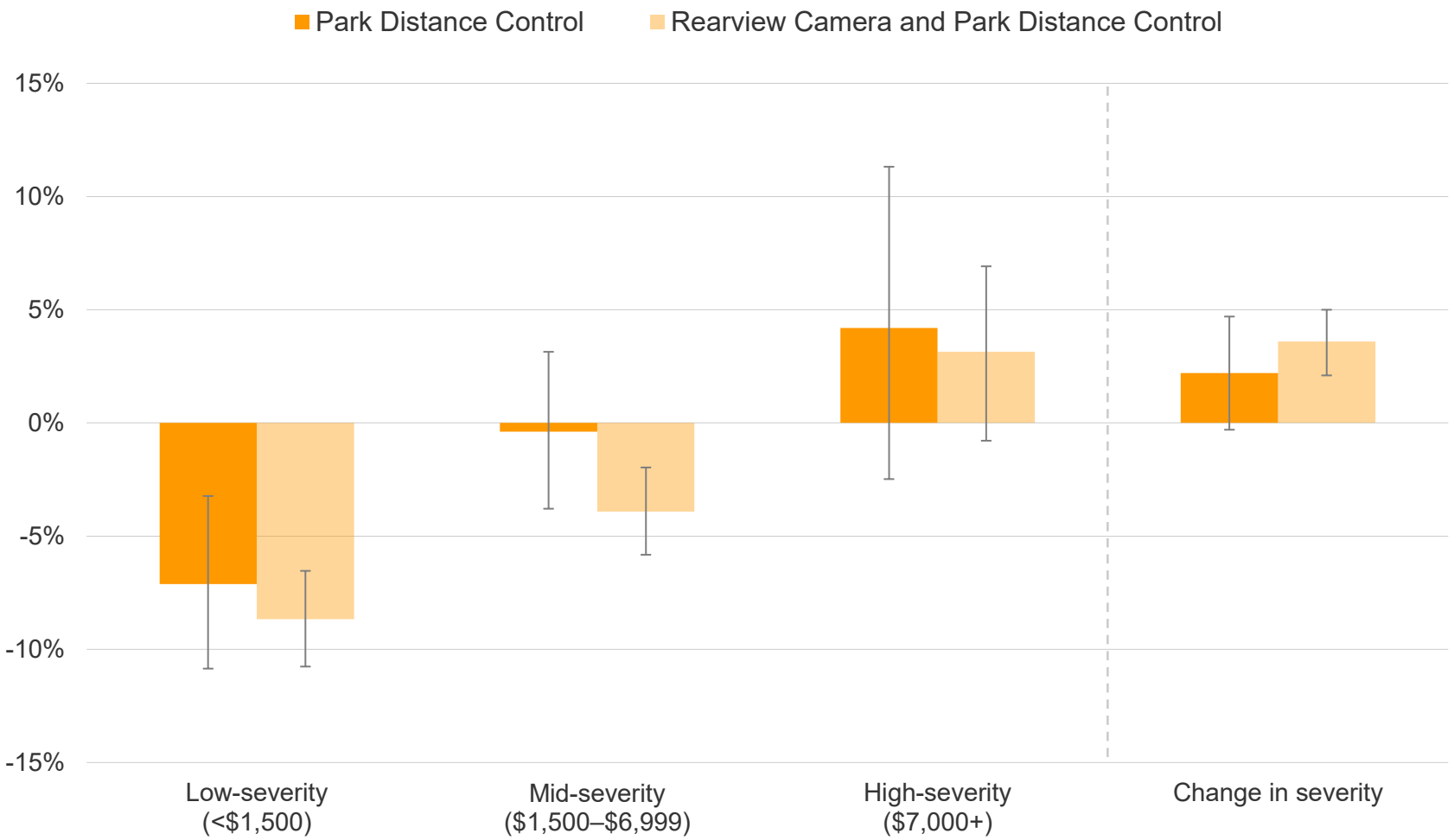
Changes in collision claim frequency by claim size

BMW parking assist systems



Changes in PDL claim frequency by claim size

BMW parking assist systems



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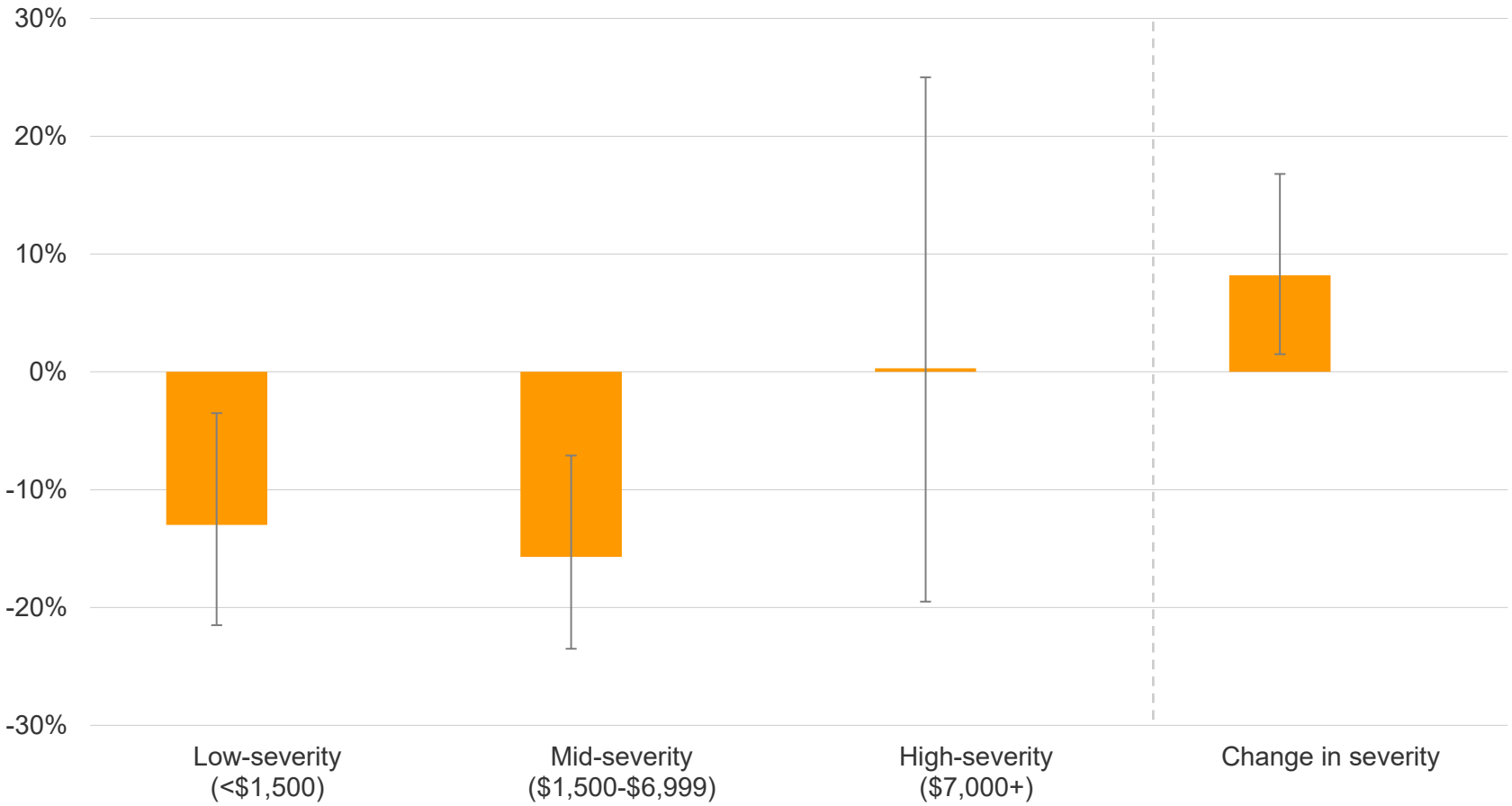
Operational speed ranges of front crash prevention systems impact on PDL severity

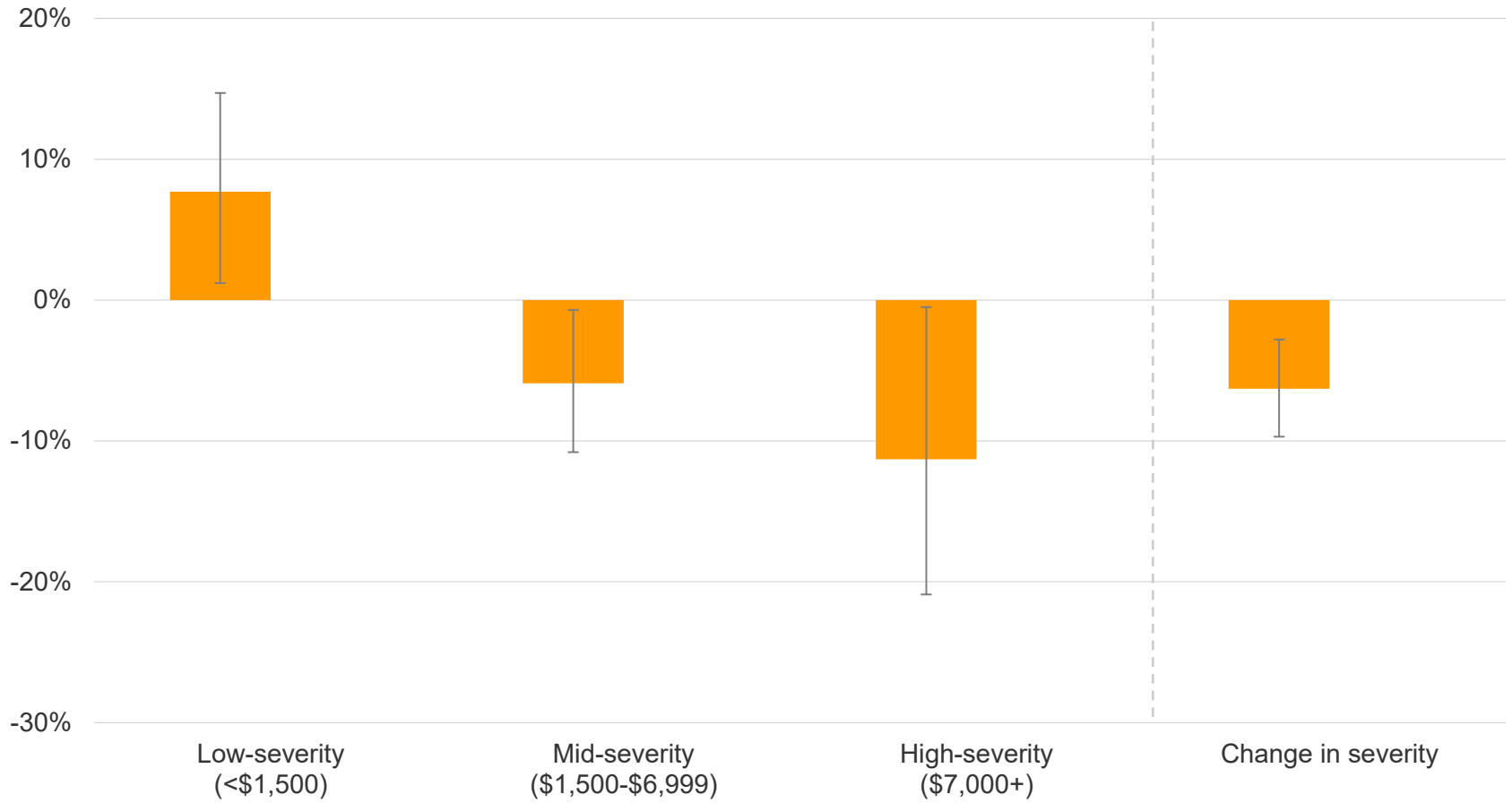
Changes in PDL claim frequency by claim size

Mazda's Smart City Brake Support (speeds 2-18 mph)



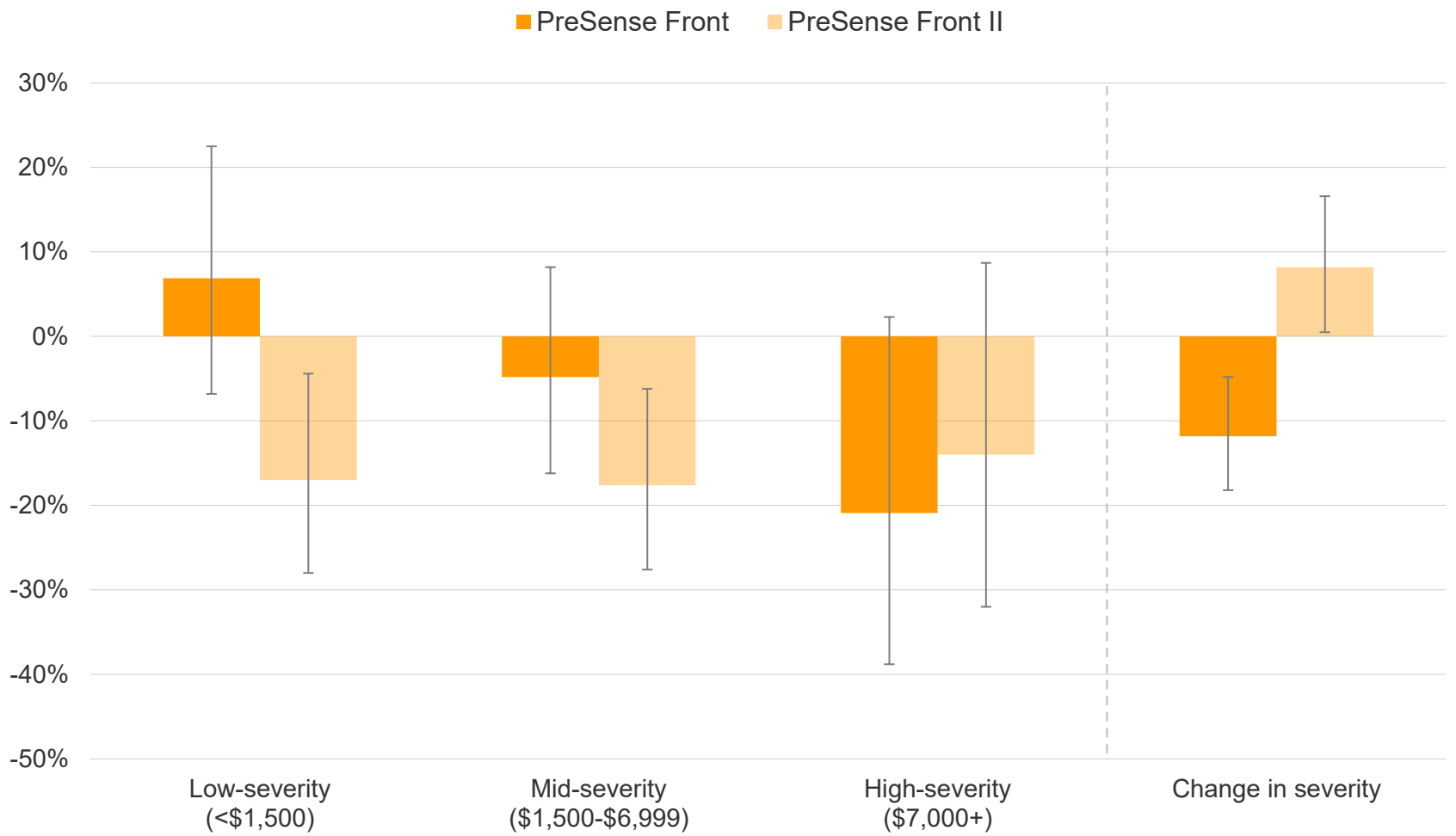
Change in PDL claim frequency by claim size

General Motors Forward Collision Alert with Lane Departure warning (speeds >25 mph)



Changes in PDL claim frequency by claim size

Audi's PreSense Front (speeds >19 mph) and PreSense Front II (all speeds)



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Evolution of AEB testing

Original vehicle-to-vehicle front crash prevention tests

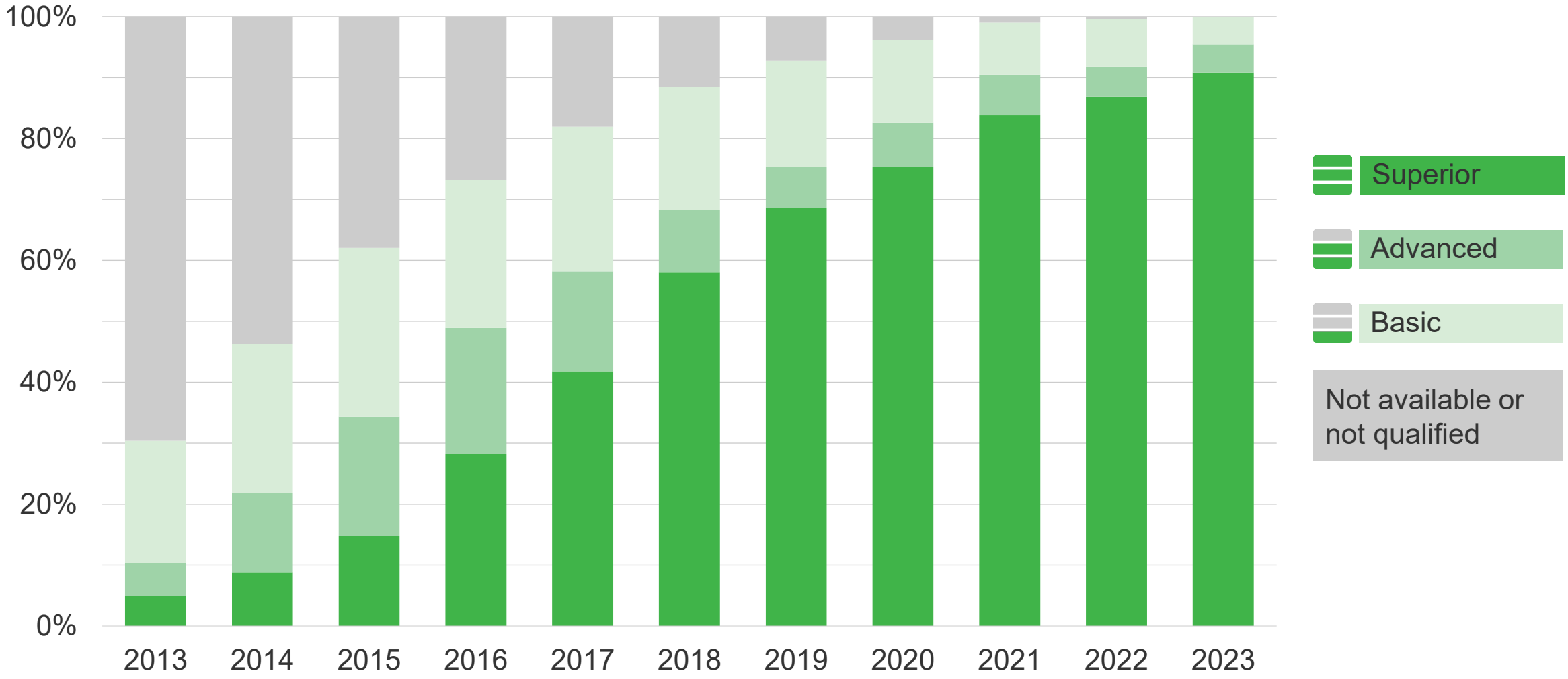
12 mph and **25 mph**

Superior Advanced Basic

Front AEB testing

Front crash prevention ratings

2013-23 models



Police-reported rear-end crashes

59% occur on **30-45** mph roads

Medium or heavy trucks struck in

32%

of fatal rear-end crashes

Motorcycles struck in

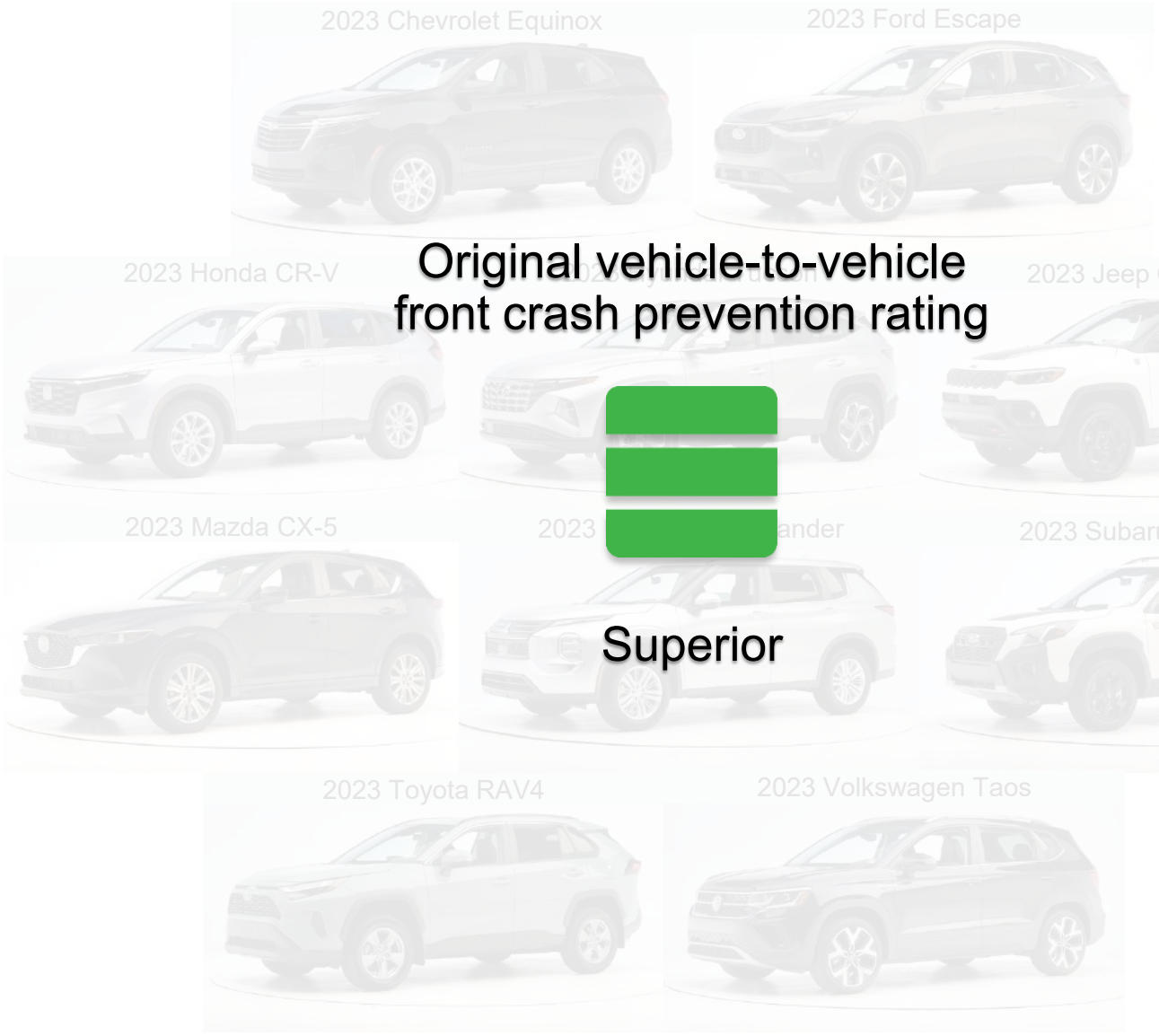
11%

of fatal rear-end crashes

Small SUVs

Original vehicle-to-vehicle front crash prevention rating

Superior




IIHS
2021 Toyota CH-R
10:51
70°F
44 MPH
87 miles
D
ODO
366 miles
Velocity 70.3
+124.2 Fwd
+0.0 Lat
6.370 TTC

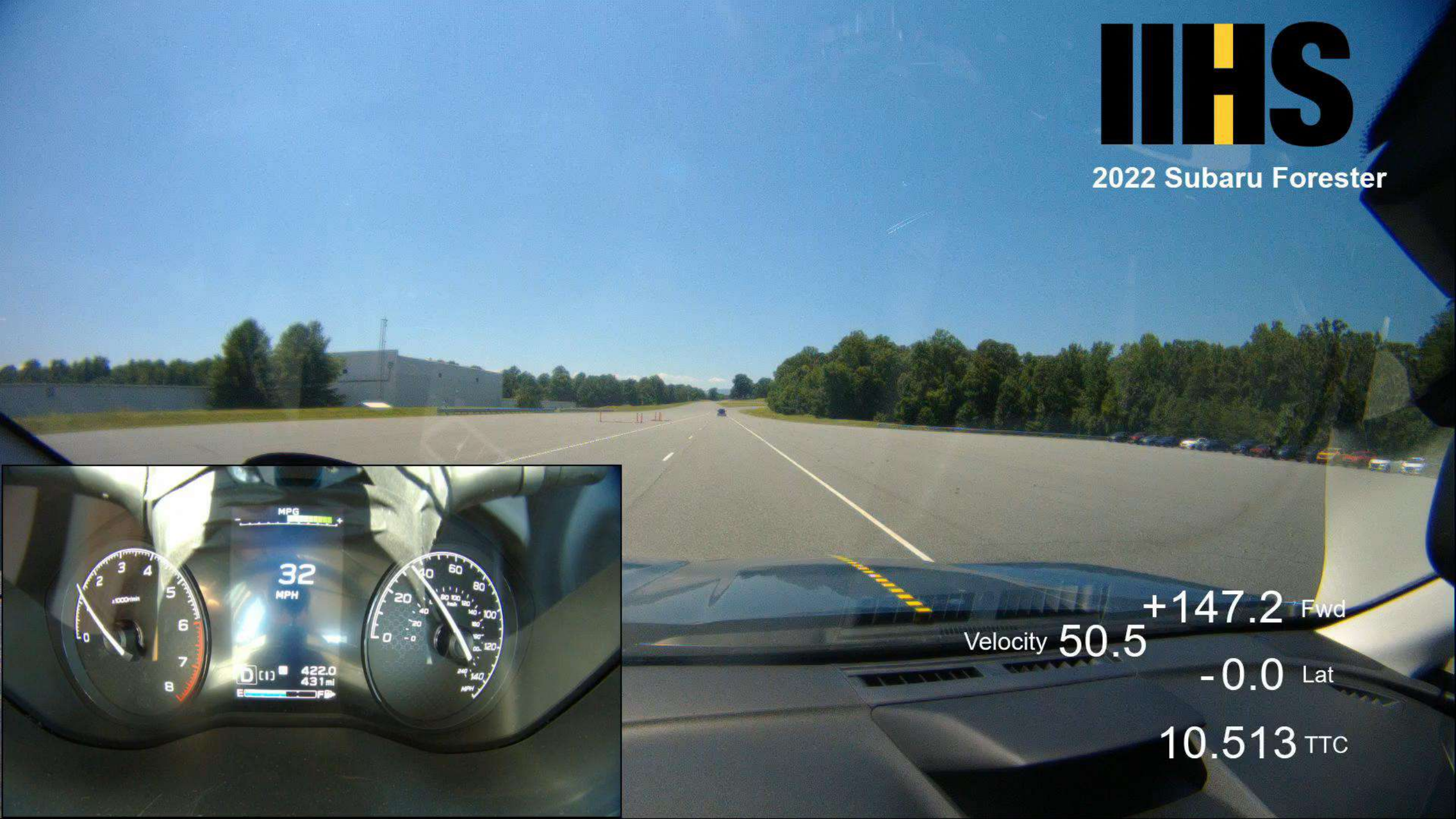

IIHS
2022 Subaru Forester
43
MPH
431.2
440mi
+138.1 Fwd
Velocity 69.6
-0.0 Lat
7.155 TTC


IIHS
2023 Chevrolet Equinox
+289.8 Fwd
Velocity 0.0
+0.0 Lat
0.000 TTC
0
MPH

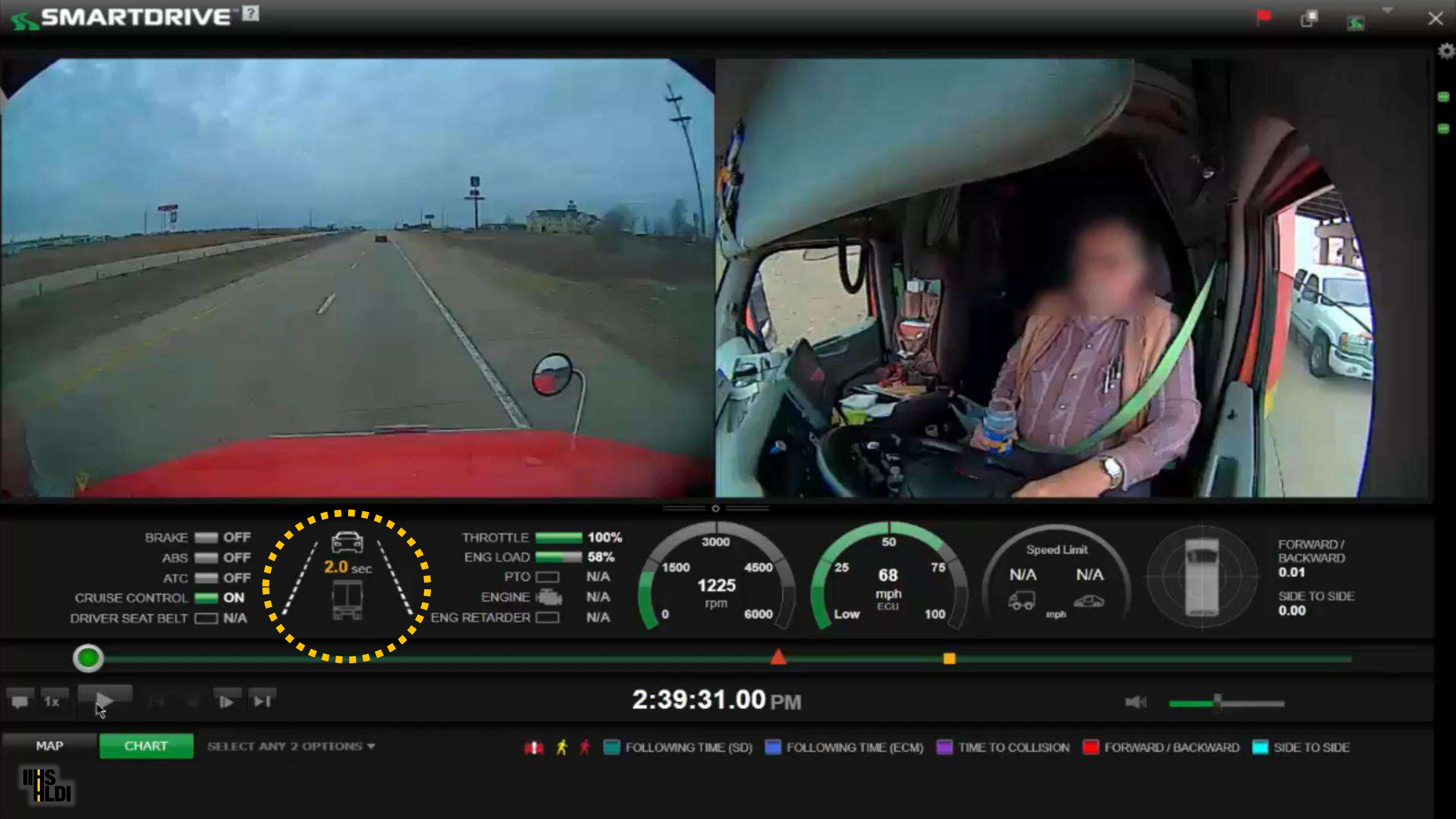

IIHS
2023 Hyundai Tucson
Velocity 0.0
+284.3 Fwd
-0.2 Lat
0.000 TTC

Ratings for small SUVs

G Good A Acceptable M Marginal P Poor

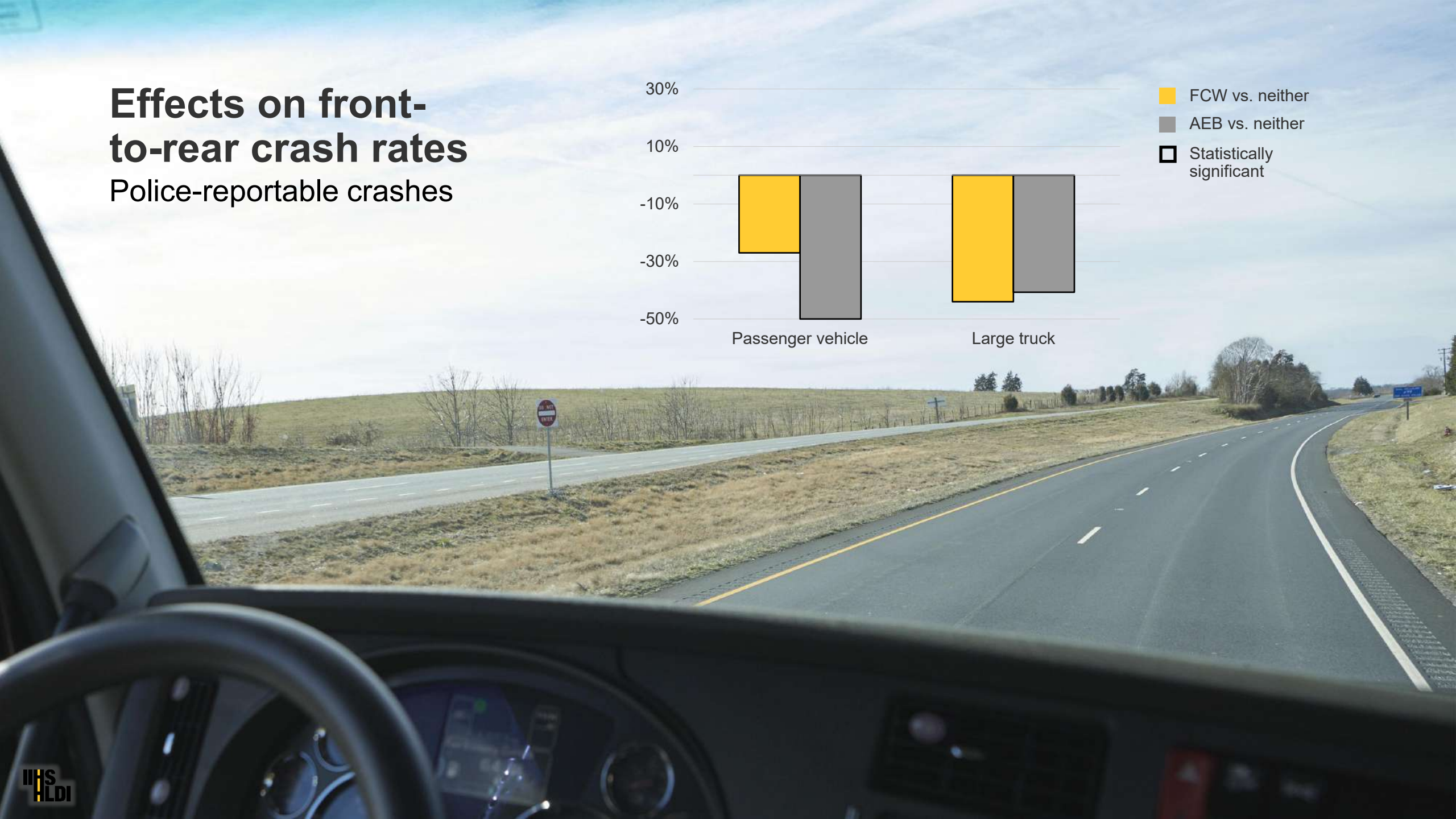

IIHS
2022 Subaru Forester
MPG
32
MPH
422.0
431 mi
Velocity 50.5
+147.2 Fwd
-0.0 Lat
10.513 TTC

Effectiveness of front crash prevention systems on large trucks


SMARTDRIVE
BRAKE OFF
ABS OFF
ATC OFF
CRUISE CONTROL ON
DRIVER SEAT BELT N/A
2.0 sec
THROTTLE 100%
ENG LOAD 58%
PTO N/A
ENGINE N/A
ENG RETARDER N/A
3000
1500
4500
1225
rpm
0
6000
50
25
68
mph
ECU
75
Low
100
Speed Limit
N/A
N/A
mph
FORWARD / BACKWARD
0.01
SIDE TO SIDE
0.00
1x
2:39:31.00 PM
MAP
CHART
SELECT ANY 2 OPTIONS
FOLLOWING TIME (SD)
FOLLOWING TIME (ECM)
TIME TO COLLISION
FORWARD / BACKWARD
SIDE TO SIDE

Effects on front-to-rear crash rates

Police-reportable crashes



Large truck AEB testing

30 mph into stationary target

August 2020

Partial driving automation


RES/+
SET/-
[S]
[ ]

Does your vehicle have partial driving automation?

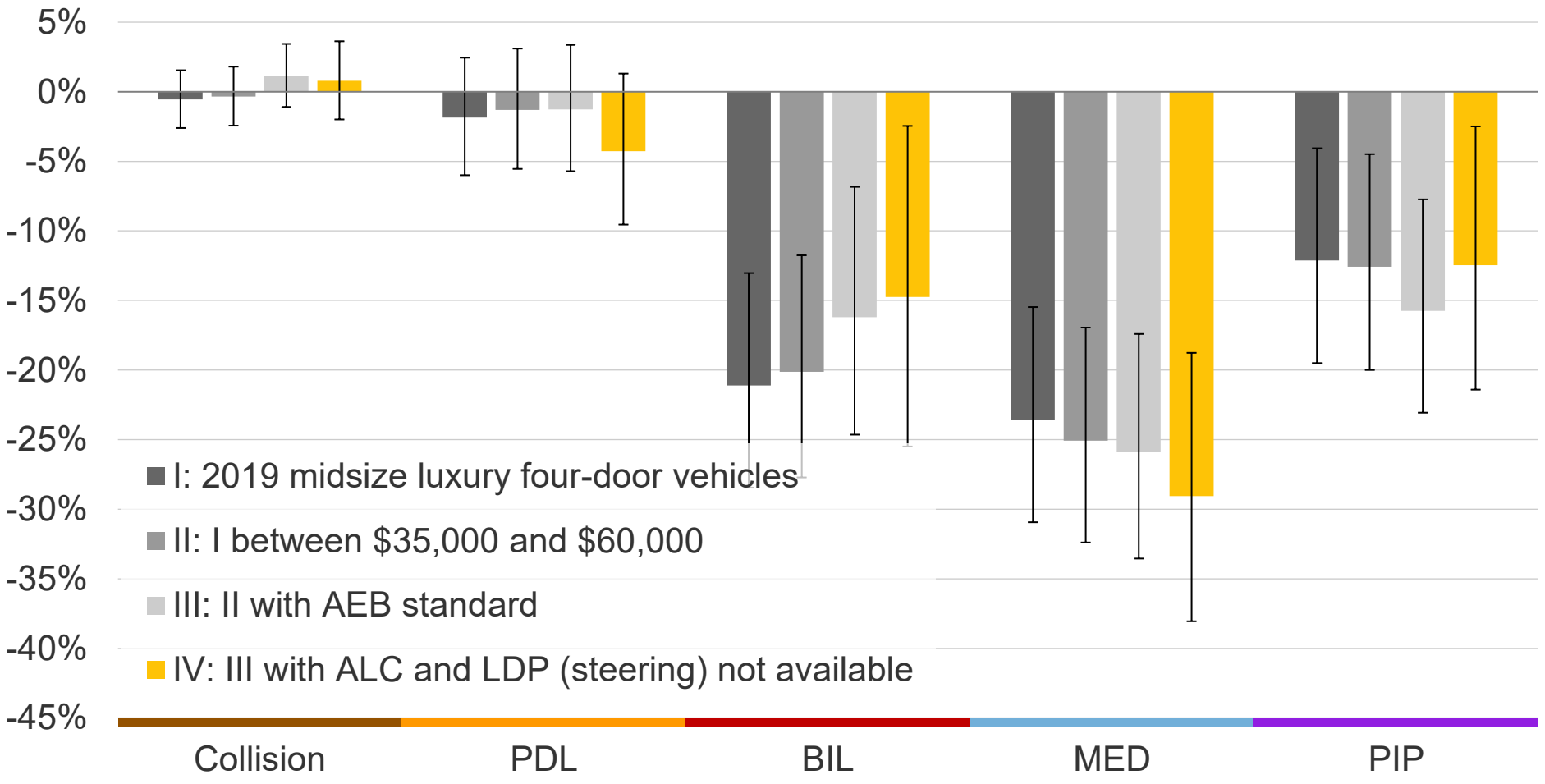
Does your vehicle have partial driving automation?

- A. Yes
- B. No
- C. I don’t know

Partial automation loss results

Estimated differences in claim frequency

2019 Tesla Model 3 vs. different control groups, data since 4/11/2019



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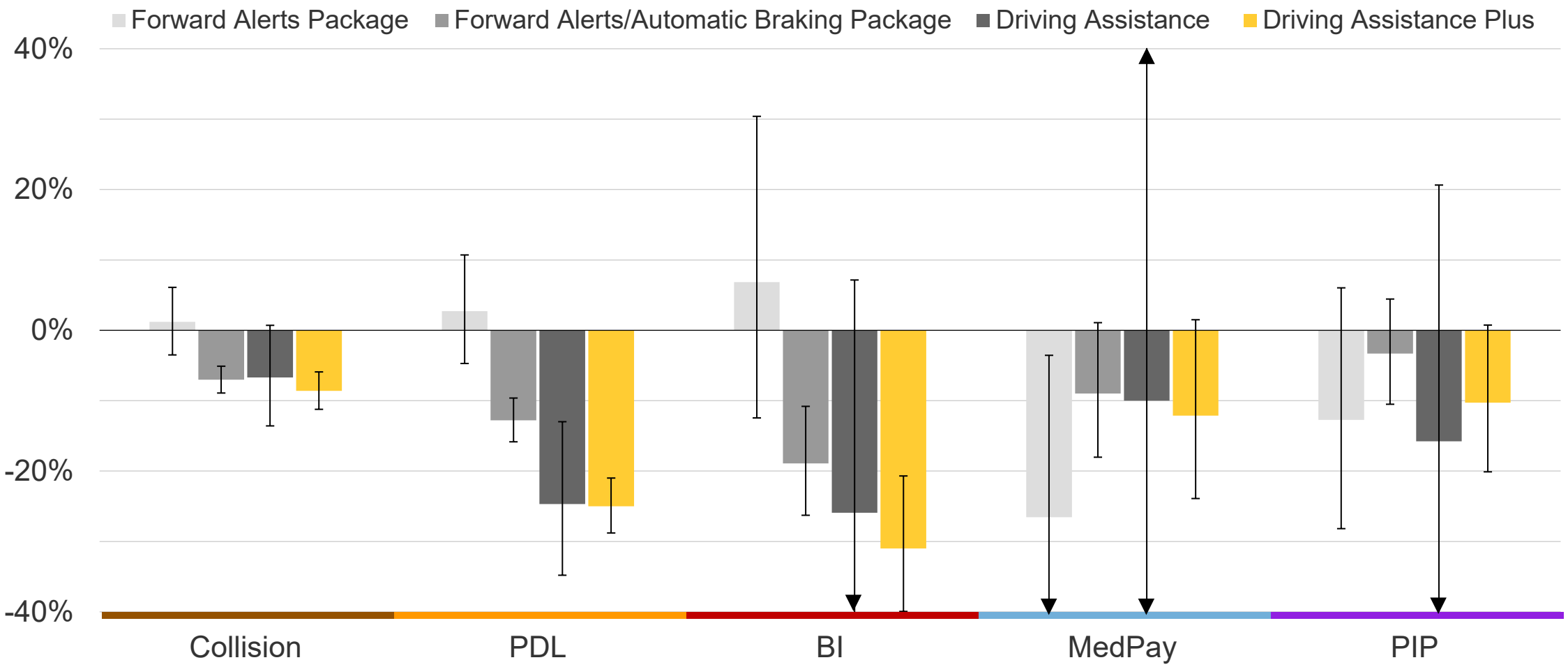
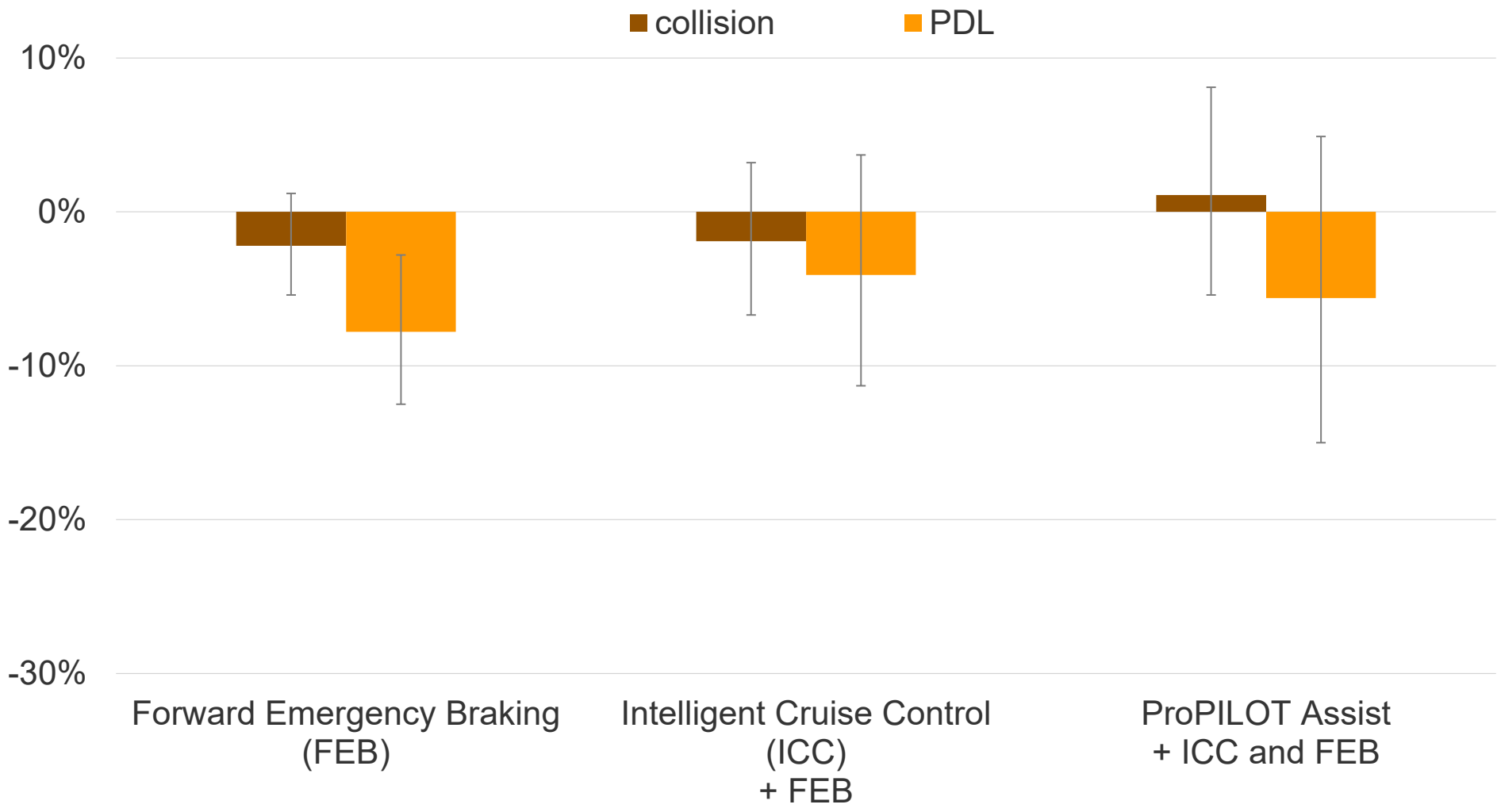
Changes in claim frequency with BMW front crash prevention

December 2021 analysis of model years 2013-17



Changes in frequency with Nissan front crash prevention system

April 2021 analysis of 2017-19 Nissan Rogue



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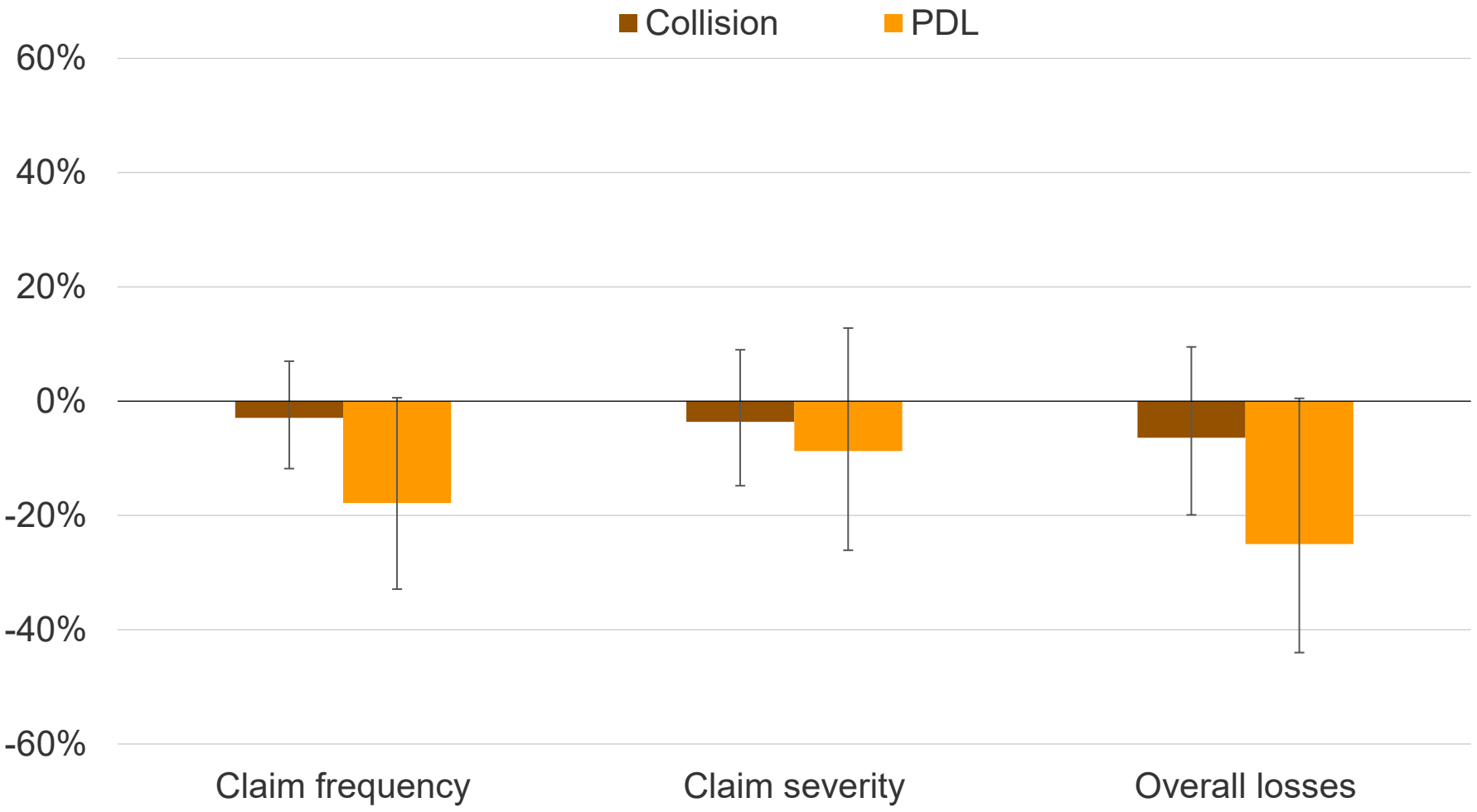
2018-20 Cadillac CT6 Super Cruise bundle changes in loss results

Through calendar year 2021




iSpot.tv
00:00
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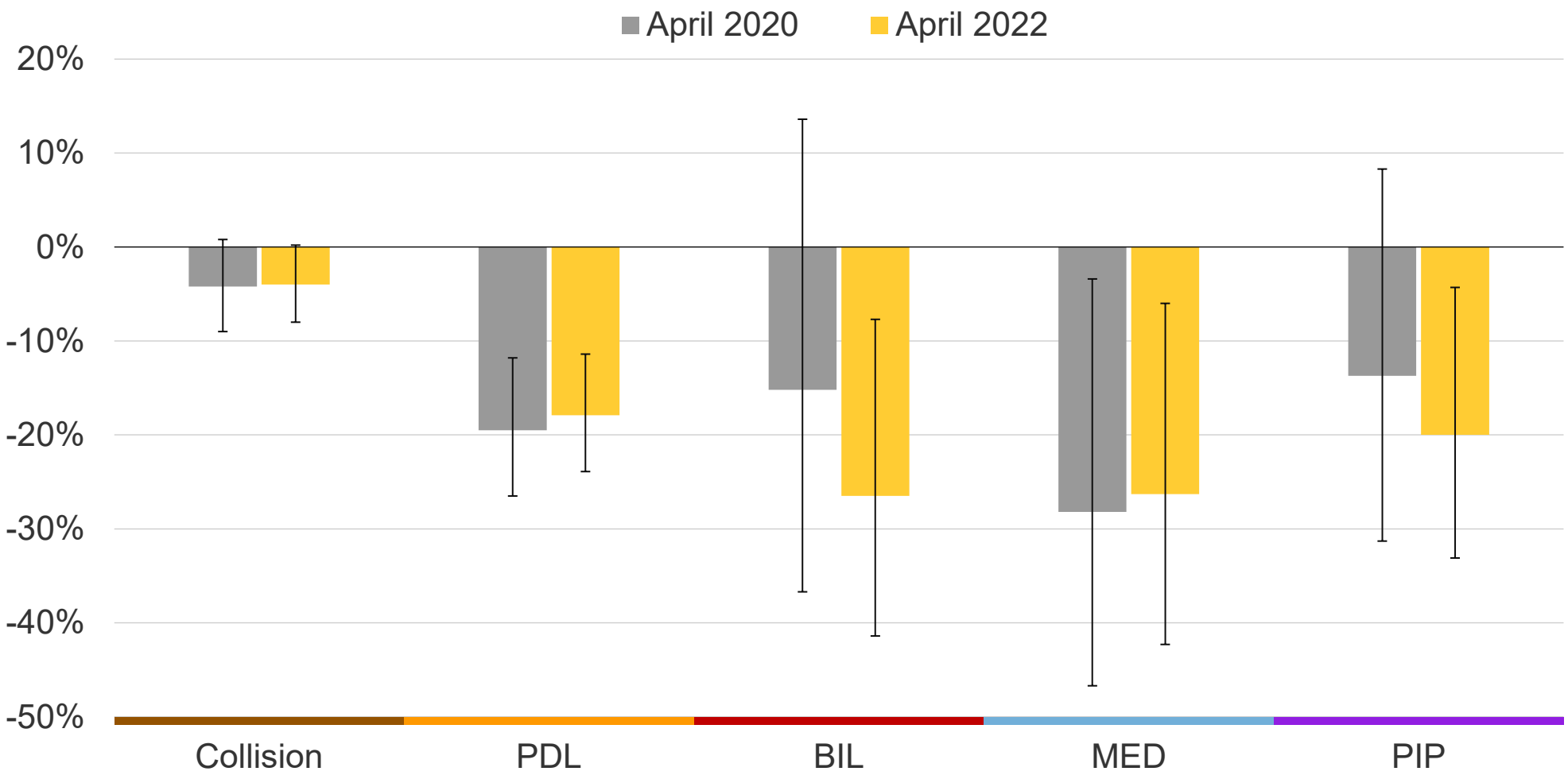
Super Cruise retention rate

- $2,200-$2,500 optional feature
- 3-year trial
- $25 per month or $250 per year
- 20% of 18,000 subscribed after 3-year trial in 2024
- GM predicts $2 billion annual revenue within 5 years

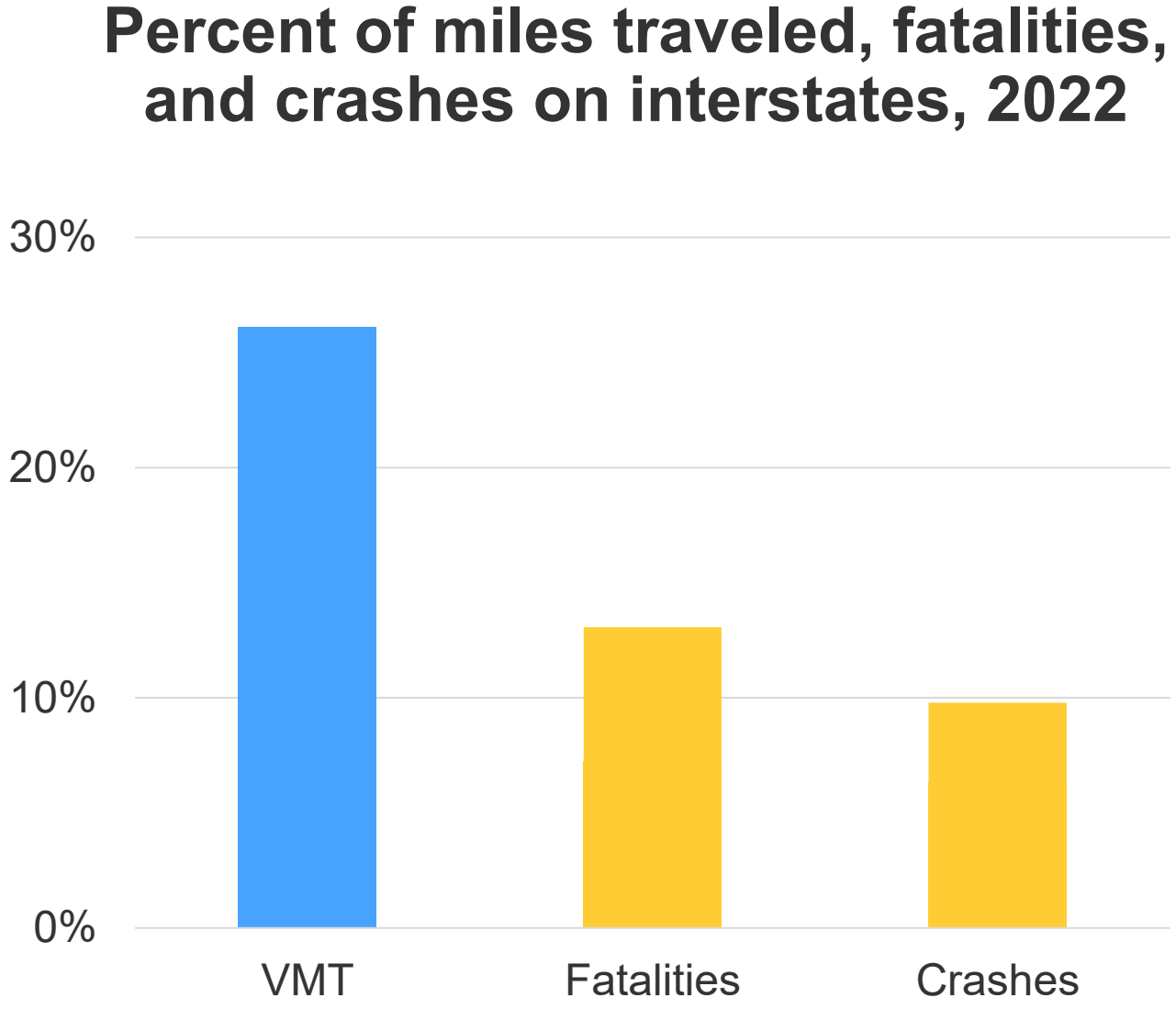
Changes in claim frequency with Audi Traffic Jam Assist

Analysis of 2017 Q7 and A4



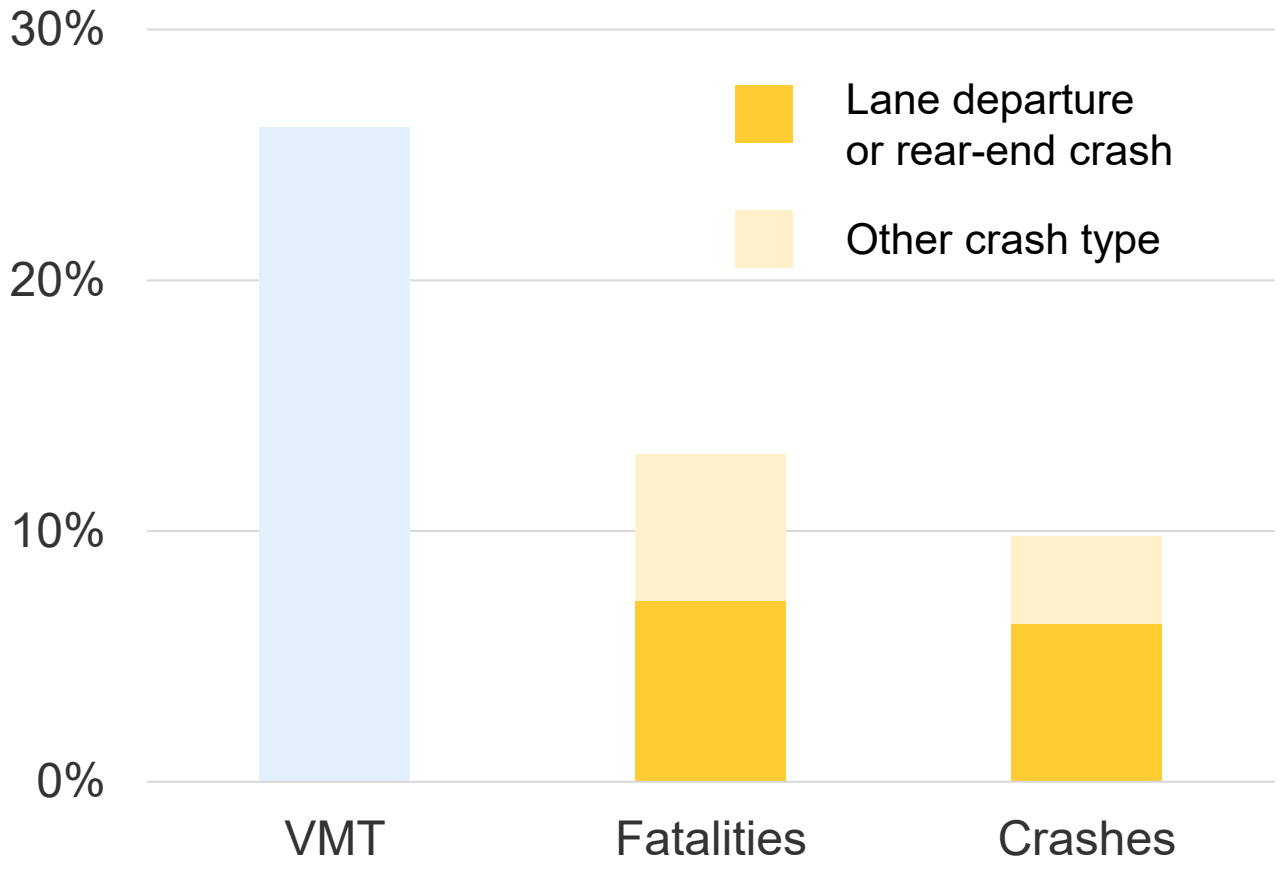
Partial automation effects in police-reported crashes

Interstate highways are among the safest roads



Only 7% of fatalities and 6% of crashes were addressable by partial driving automation systems limited to interstates

Percent of miles traveled, fatalities, and crashes on interstates, 2022



Examined crash effects on limited-access highways

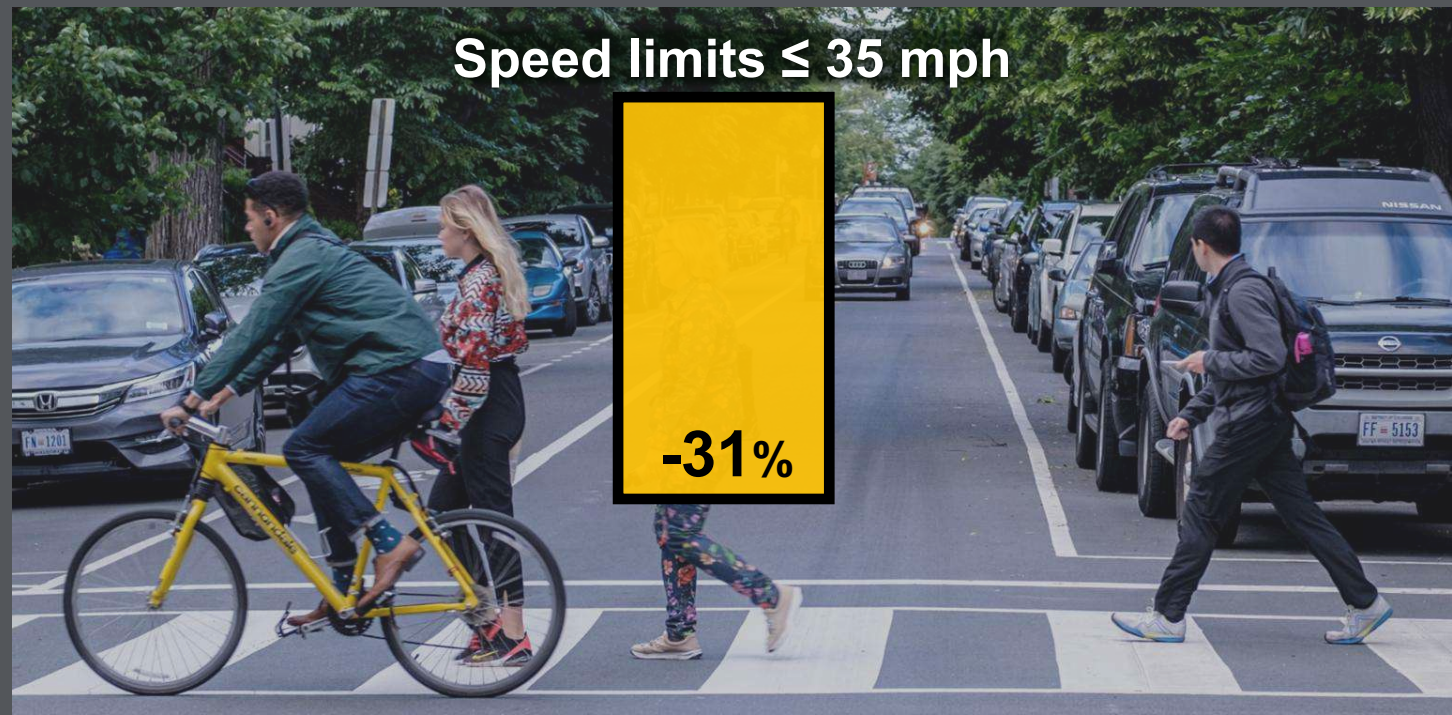
Examined crash effects on limited-access highways

and roads with speed limits ≤ 56 kph

Examined
lane departure crashes

and rear-end crashes

Lane departure crash rate reductions for Nissan vehicles with partial driving automation



☐ Statistically significant

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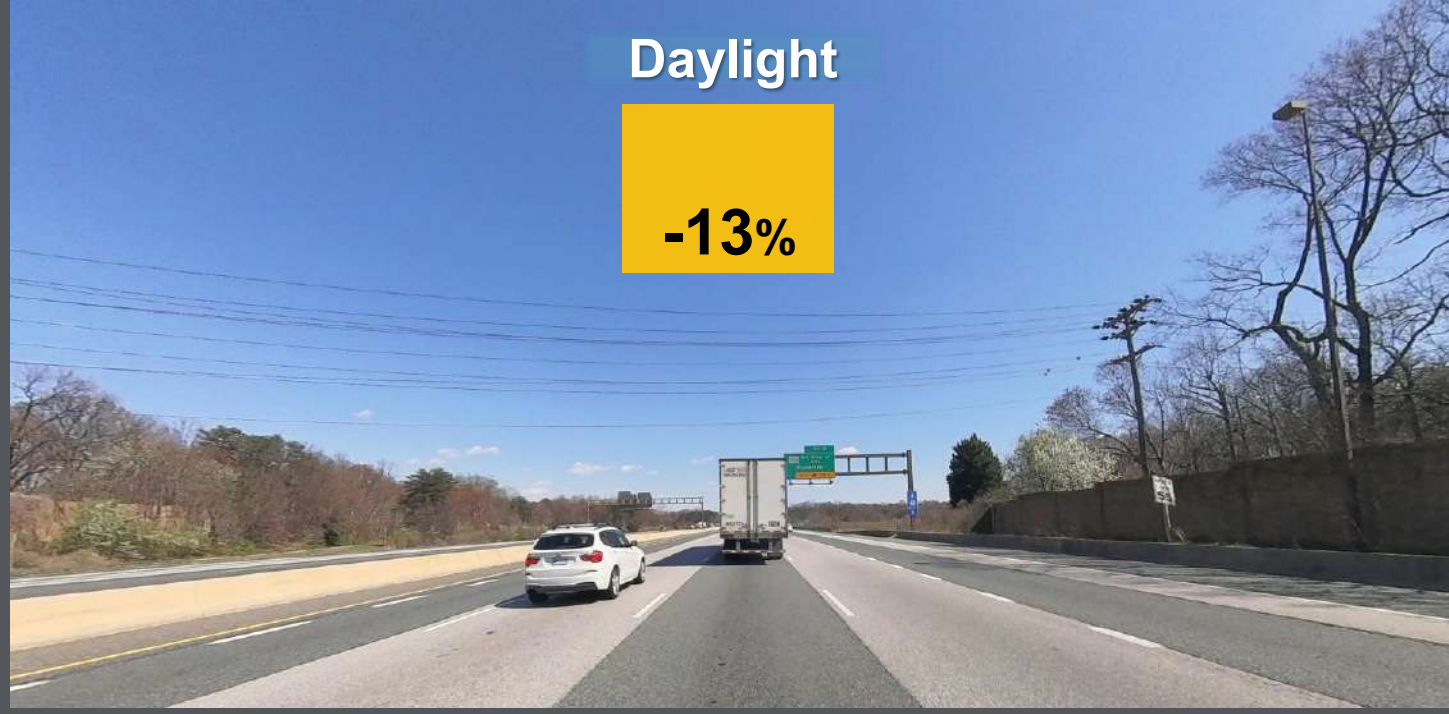
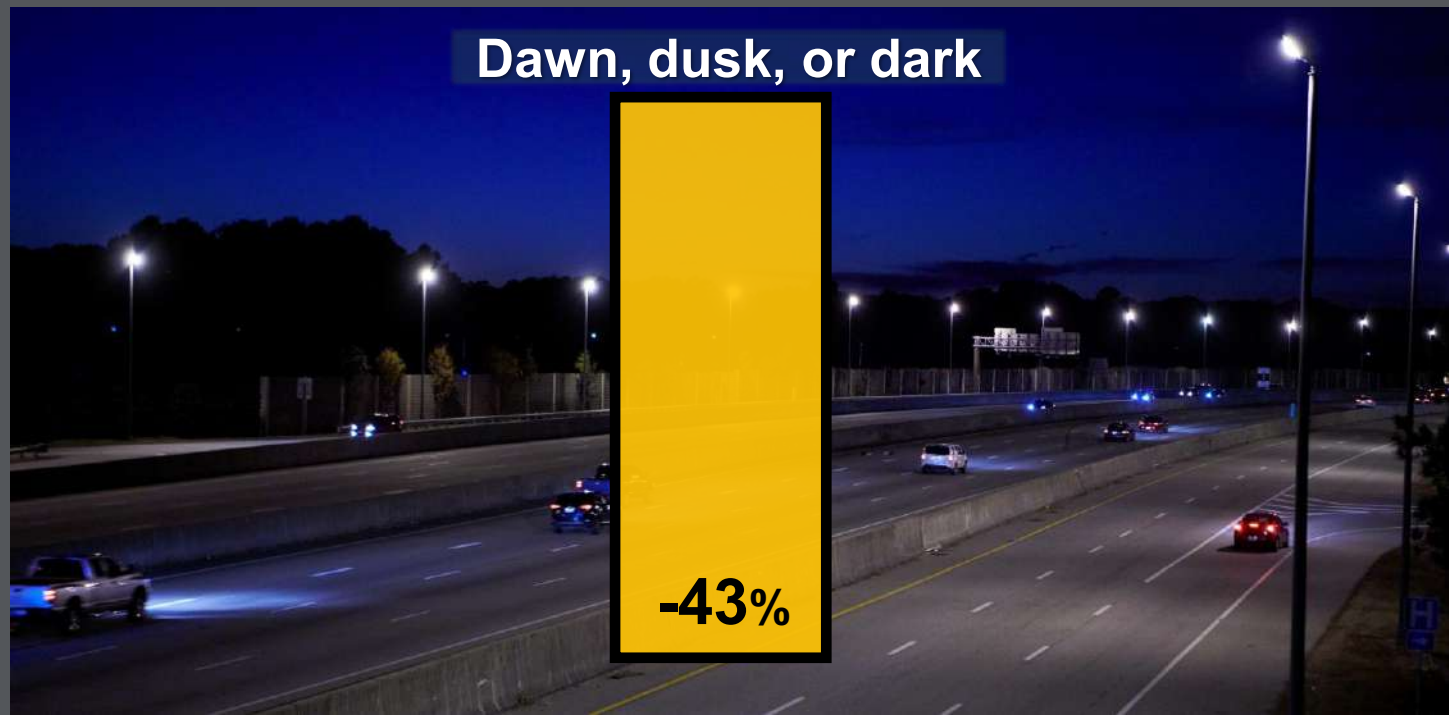
GOOD
POOR
Deer targets at 200 feet
Headlights on the Rogue were rated
A
Acceptable or
P
Poor

Lane departure crash rate reductions for Nissan vehicles with partial driving automation on limited-access highways





Statistically significant

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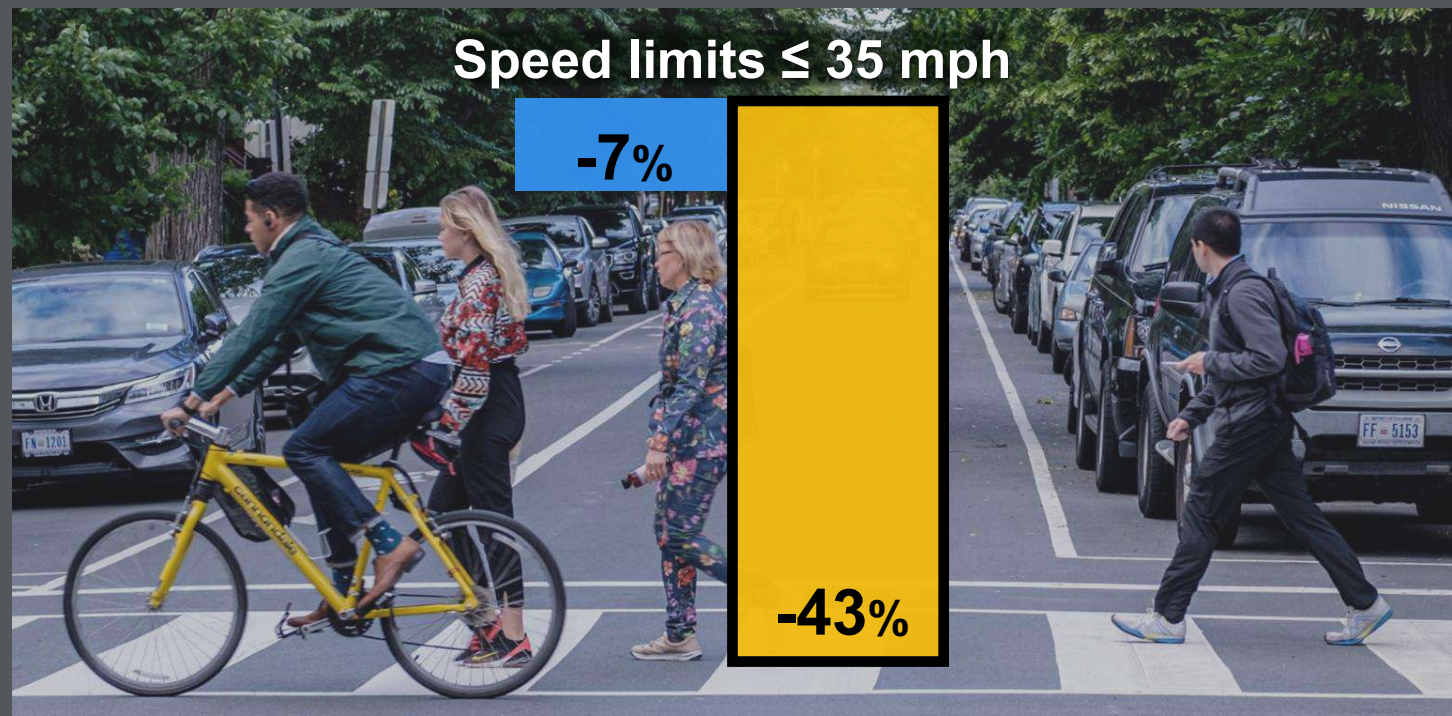
Rear-end crash rate reductions for Nissan vehicles with adaptive cruise control and partial driving automation



■ Statistically significant

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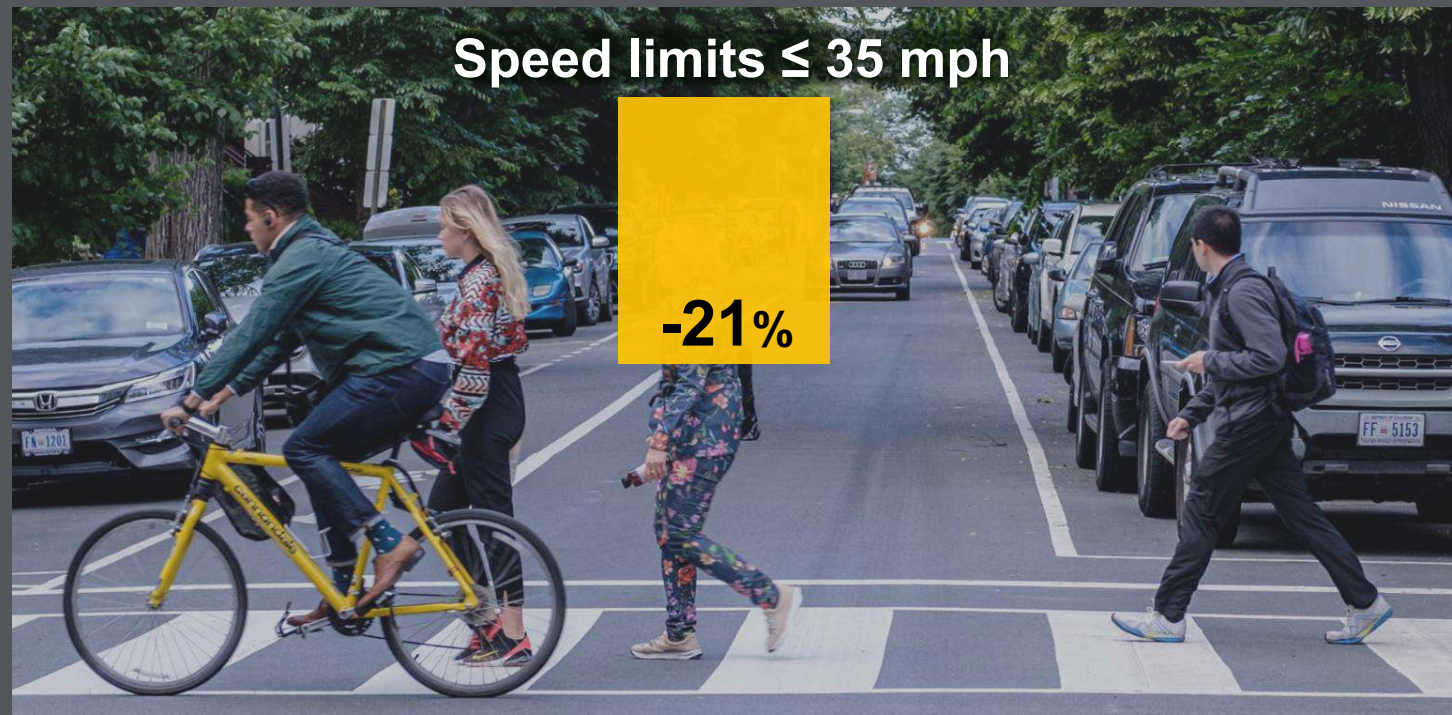
Lane departure crash rate reductions for BMW vehicles with partial driving automation



■ Statistically significant

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AEB was more capable on BMW models when paired with ACC

Without ACC
Radar system
Operated up to 35 mph

Advanced

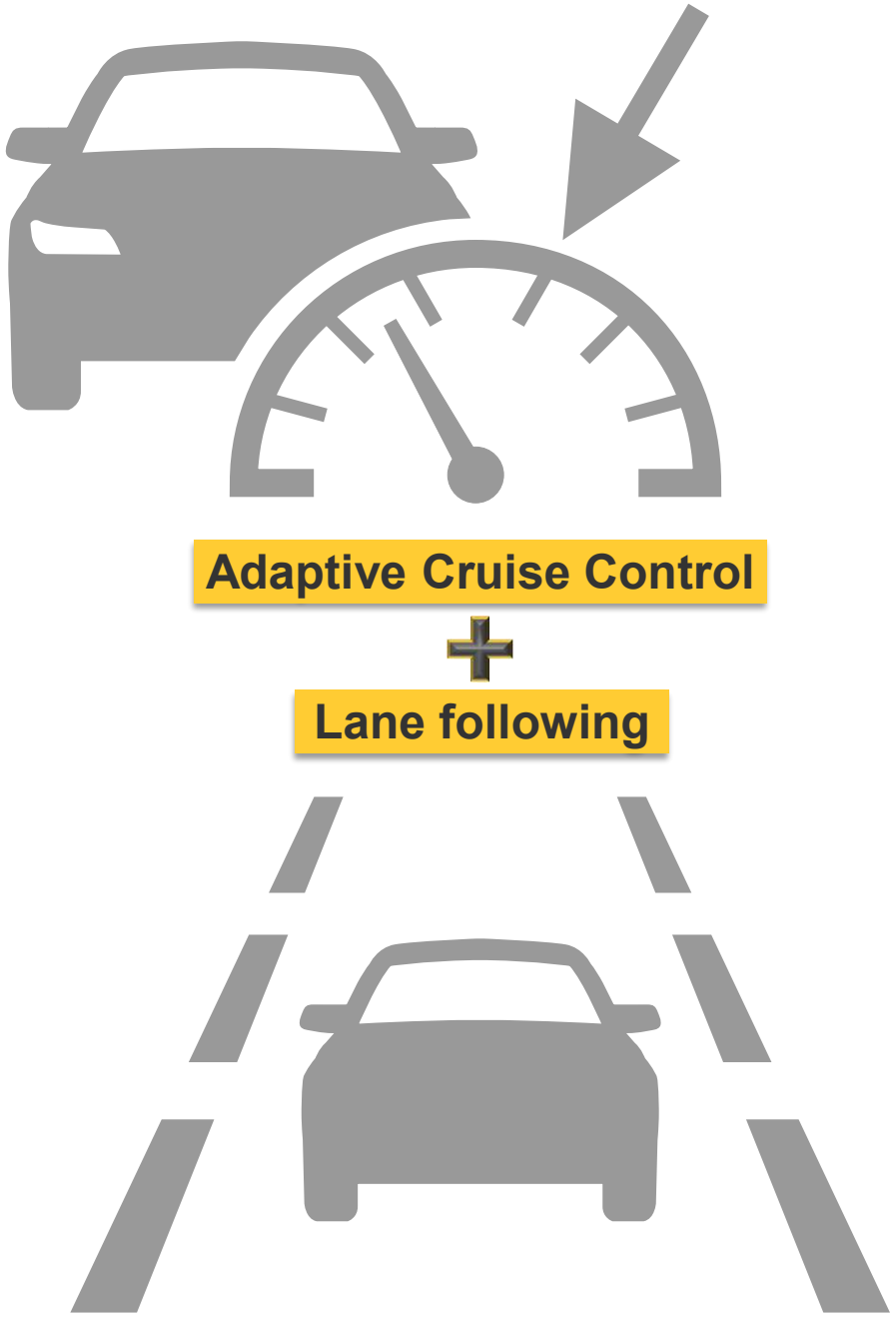
With ACC
Fusion system
Operated at full speed range

Superior

Partial driving automation

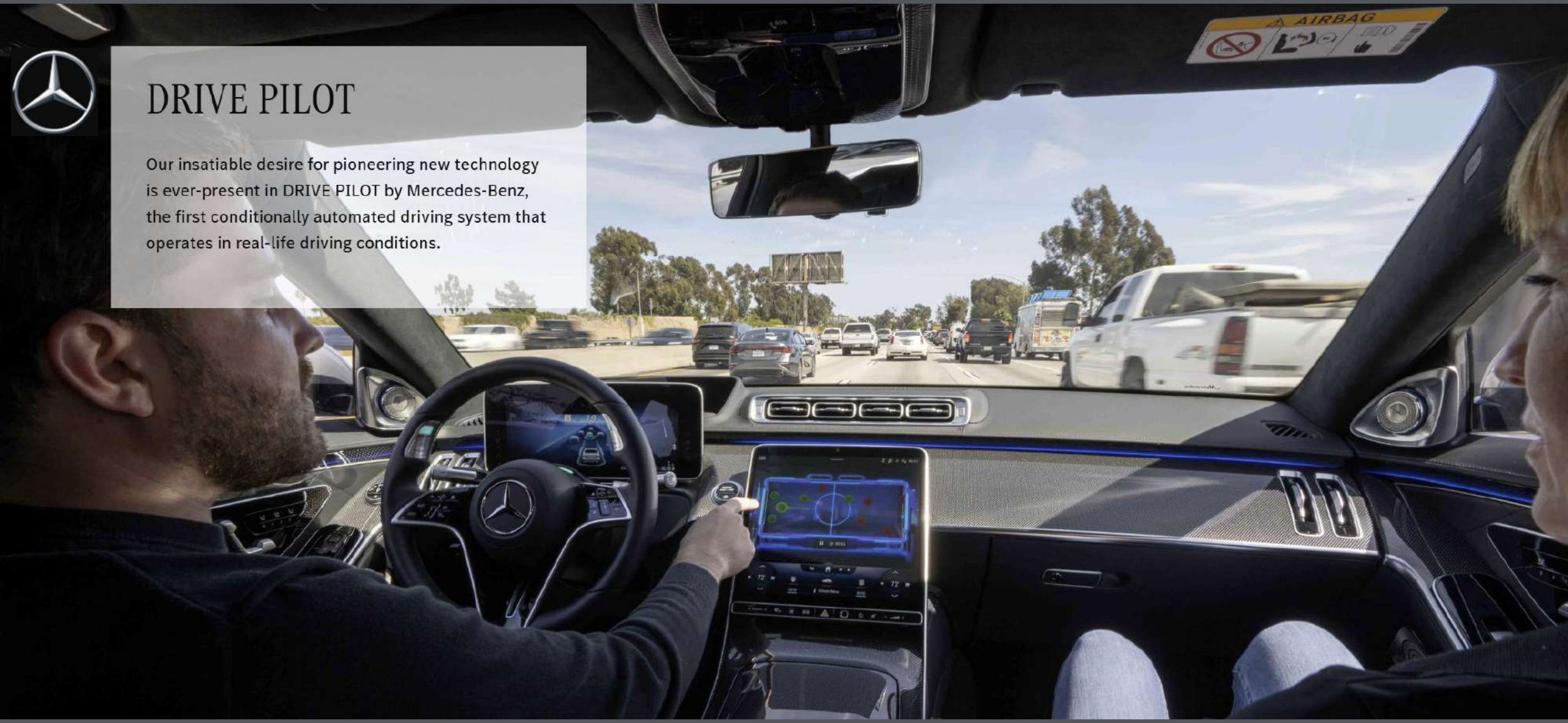
is a

convenience feature



Automation information

Mercedes-Benz Drive Pilot

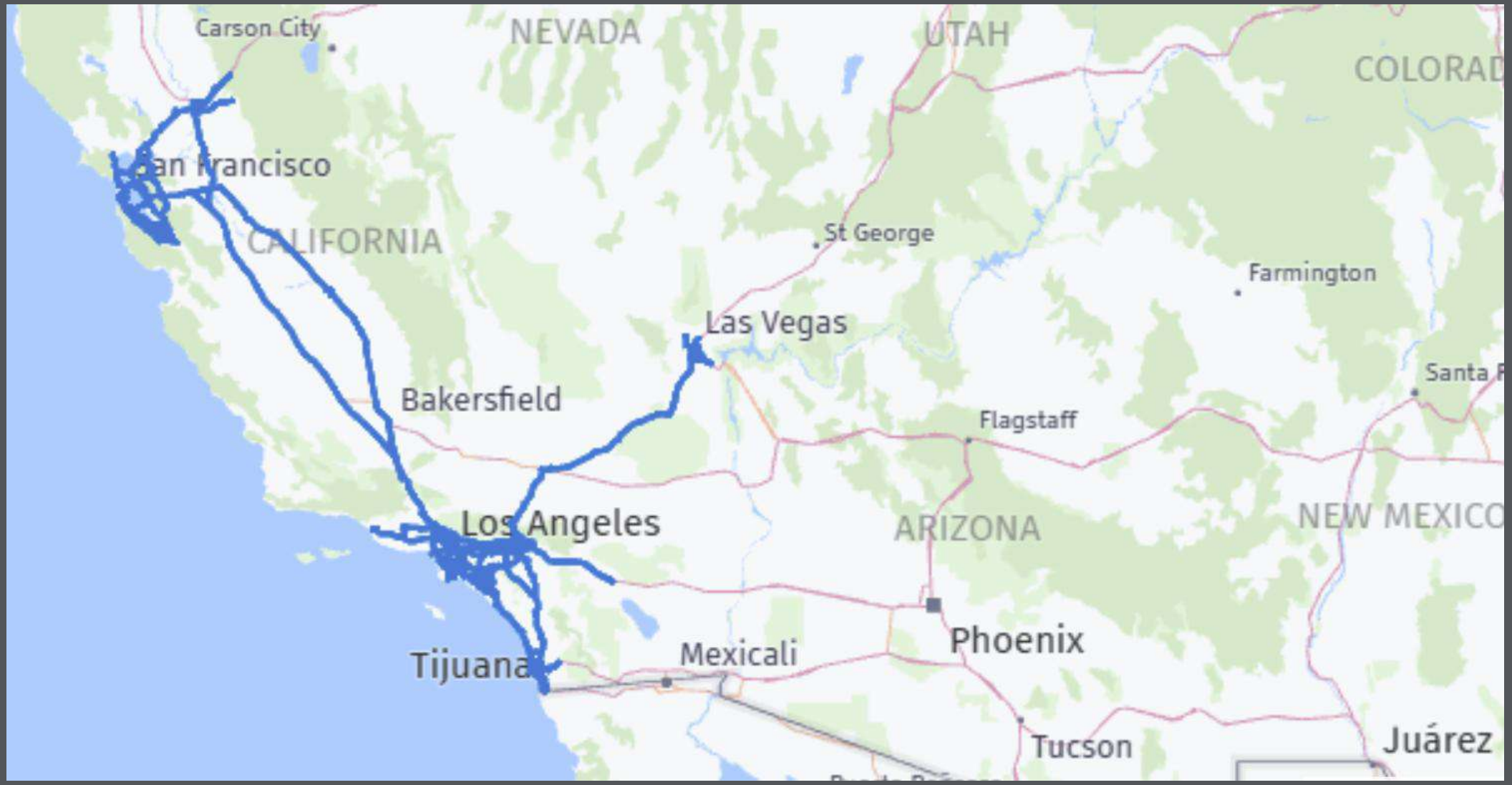



DrivePilot is the next groundbreaking
innovation for Mercedes-Benz

Mercedes-Benz Drive Pilot

Mercedes-Benz Drive Pilot

Certified roadways



- Operational in moderate to heavy traffic with speeds under 40 mph

Mercedes-Benz Drive Pilot

Costs

S-class
Starting at $117,750

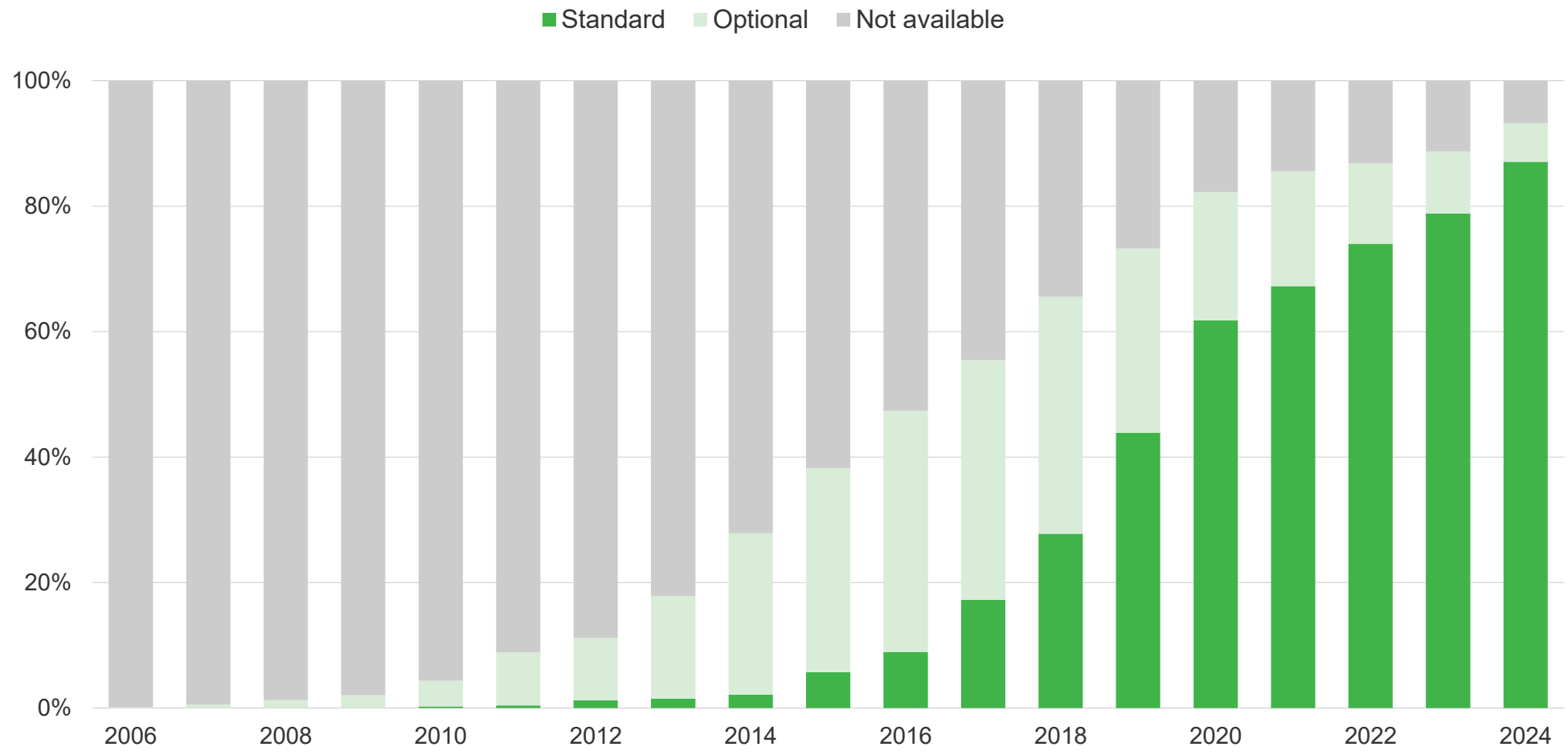
EQS
Starting at $104,400

- Drive Pilot additional subscription cost of $2,500 per year

Phase-in of collision avoidance systems

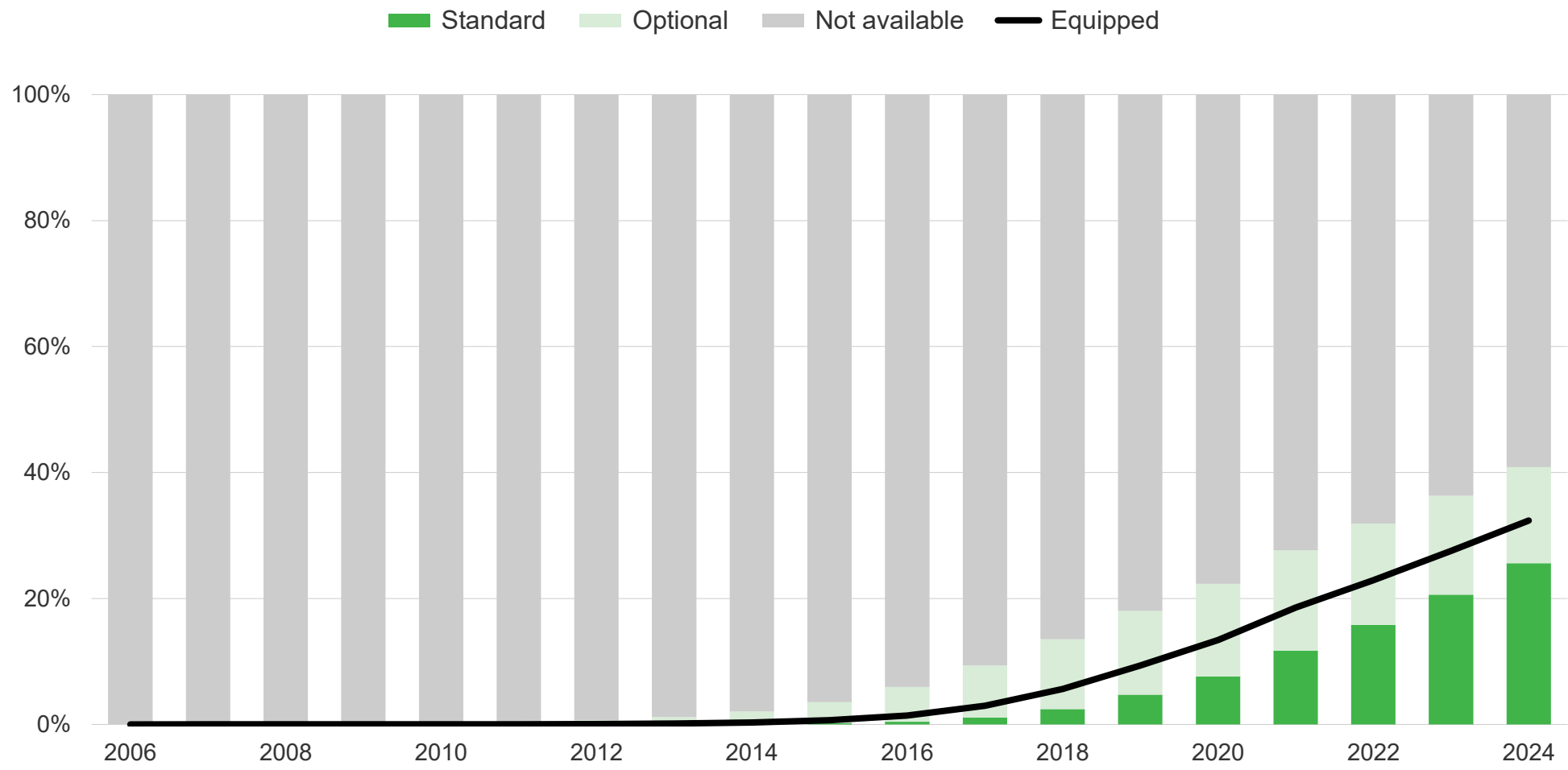
New vehicle series with front automatic emergency braking

By model year



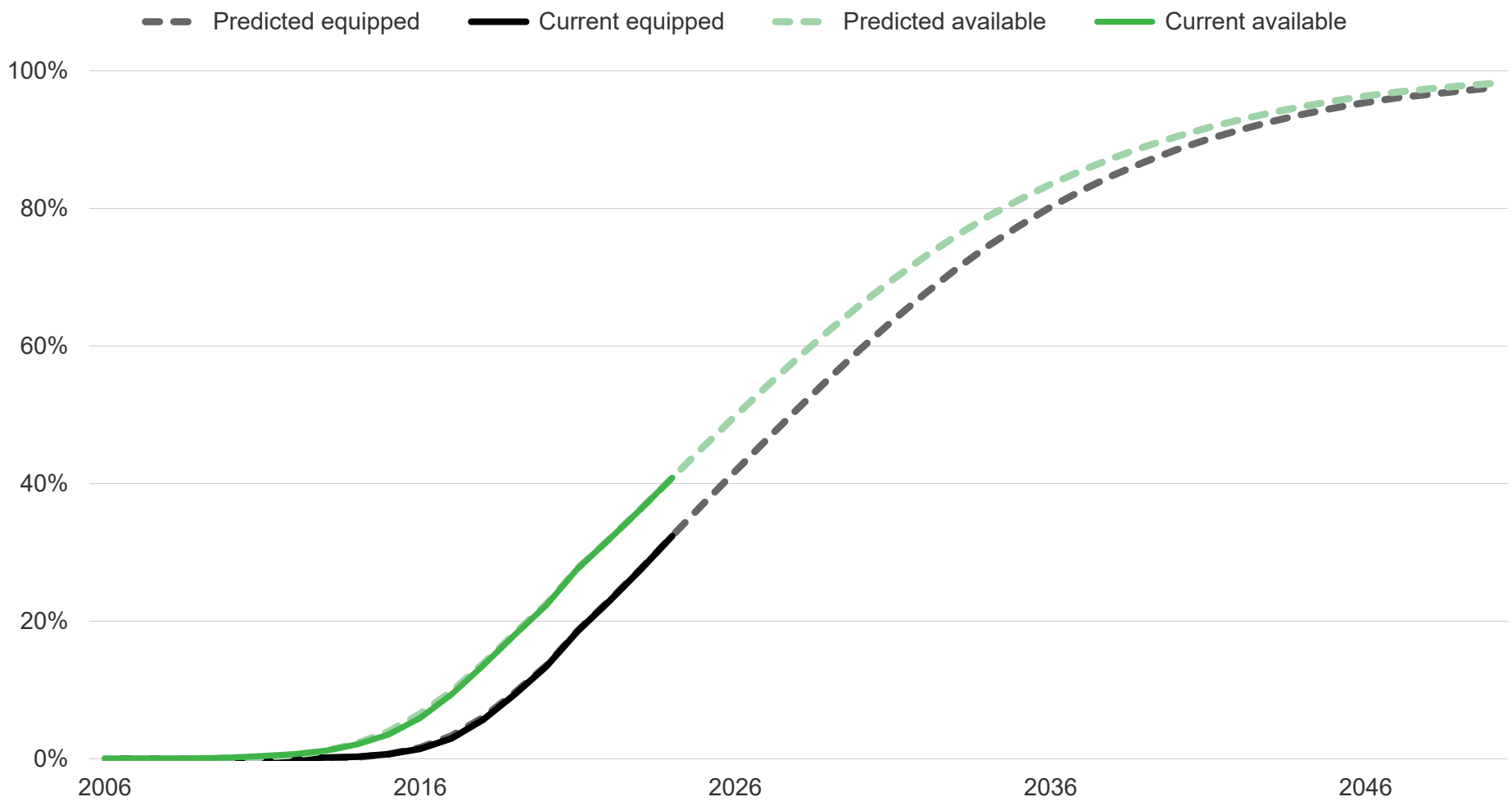
Registered vehicles with front automatic emergency braking

By calendar year

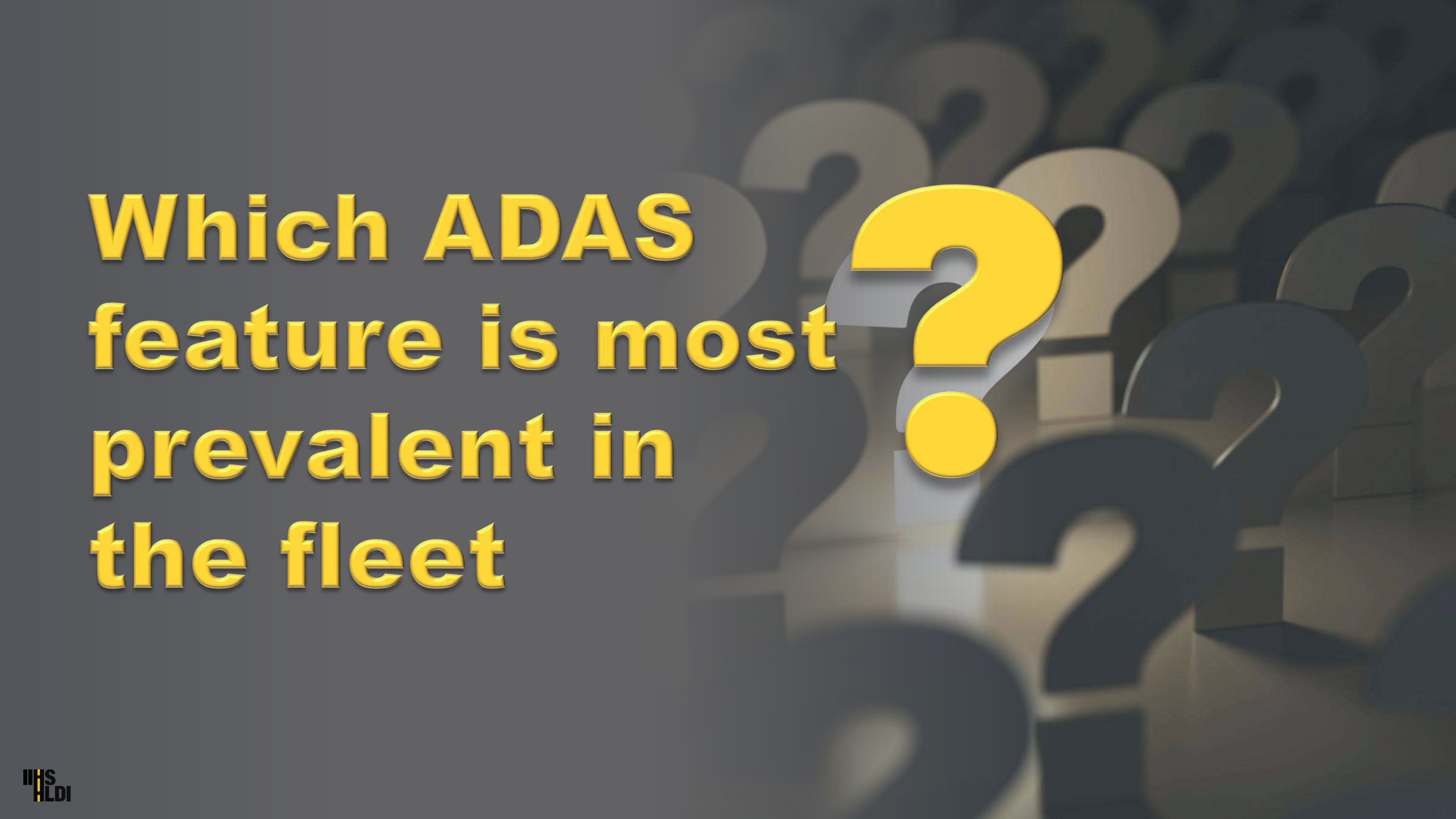


Predicted percentage of registered vehicles: front automatic emergency braking

By calendar year



Which ADAS feature is most prevalent in the fleet

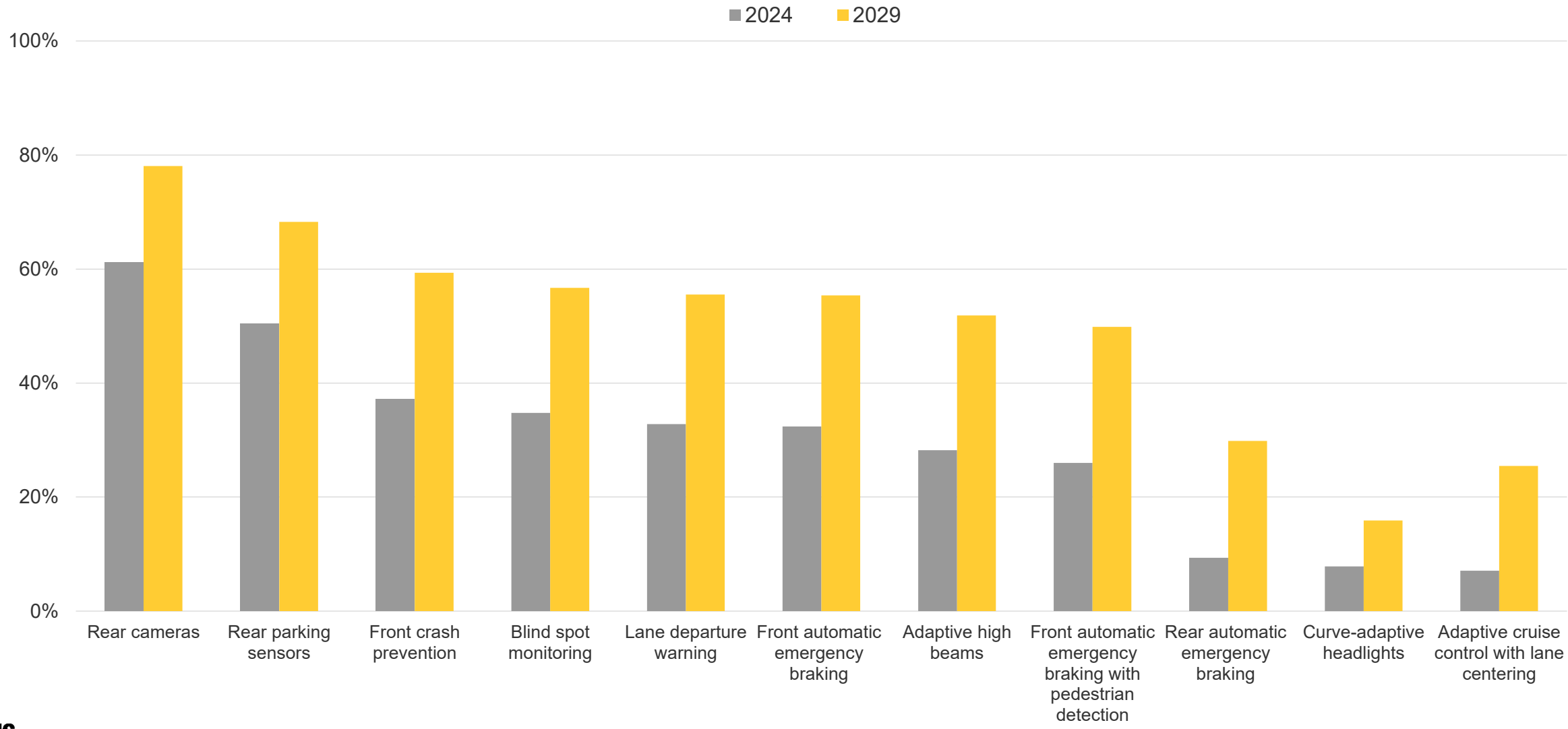


Which ADAS feature is most prevalent in the fleet?

- A. Automatic emergency braking
- B. Adaptive headlights
- C. Blind spot monitor
- D. Front AEB
- E. Front crash prevention
- F. Lane departure warning
- G. Rear camera
- H. Rear parking sensors

Estimated registered vehicles by feature

Calendar years 2024 and 2029



IIHS HLDI

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Highway Loss Data Institute

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THANK YOU

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