

# **PARTS:** **Market Penetration of Advanced Driver Assistance Systems (ADAS)**

*December 2021*

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# ADAS Penetration Rates

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## Overview

The Partnership for Analytics Research in Traffic Safety (PARTS) is a partnership between automobile manufacturers and the United States Department of Transportation in which participants voluntarily share applicable safety-related data for collaborative safety analysis.

The goal of this government-industry initiative, which is operated by an independent third party, is to gain real-world insights into the safety benefits and opportunities of emerging advanced driver assistance systems (ADAS) and automated driving systems (ADS).

As of December 2021, participating automobile manufacturers have submitted vehicle equipment data for approximately 47 million passenger vehicles sold in the United States—representing 93 different models from model years 2015–2020 and covering seven vehicle segments. Vehicle equipment data allows for the identification of various ADAS features that were present on the vehicle at the time of manufacture. This data is then merged with police-reported crash data provided by the National Highway Traffic Safety Administration and used to analyze the effectiveness of ADAS features in real-world conditions.

The eight participating automobile manufacturers who have provided vehicle data are General Motors, Honda, Mazda, Mitsubishi, Nissan, FCA, Subaru, and Toyota. Because PARTS industry partners account for a large share of the U.S. automobile market, PARTS vehicle data can provide an improved understanding of how quickly ADAS systems are penetrating the U.S. car market.

Penetration rates are reported for the following ADAS features:

- **Automatic Emergency Braking (AEB):** Detects potential collisions with a vehicle ahead and automatically brakes to help avoid a collision or lessen the severity of impact.
- **Pedestrian Automatic Emergency Braking (PAEB):** Detects potential collisions with a pedestrian ahead and automatically brakes to help avoid a collision or lessen the severity of impact.
- **Lane Departure Warning (LDW):** Monitors the vehicle's position within the driving lane and can alert the driver as the vehicle approaches or crosses lane markers.
- **Lane Keeping Assistance (LKA):** Provides momentary steering support to assist the driver in preventing the vehicle from departing the lane. LKA only intervenes when lanes are clearly marked and the lane edge is approached. Does not include lane centering systems.
- **Blind Spot Warning (BSW):** Detects vehicles in the blind spot while driving and notifies the driver of detected vehicles. Some systems provide an additional warning if the driver activates the turn signal.

ADAS penetration rates shared below represent a partial view of the U.S. automobile market. Vehicles in the PARTS study may not be representative of the entire market.

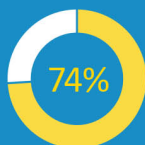


## Key Findings

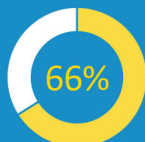
ADAS penetration has significantly risen for the five features reported and has reached between **61%** and **74%** on model year 2020 vehicles in the PARTS study set.



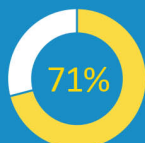
**AEB** saw the largest increase, from **5%** in 2015 to **74%** in 2020.



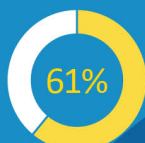
**PAEB** increased from **2%** in model year 2015 to **66%** in model year 2020.



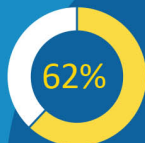
**LDW** went from **<12%** in model year 2015 to **71%** in model year 2020.



**LKA** went from **<1%** in model year 2015 to **61%** in model year 2020.



**BSW** increased from **29%** in model year 2015 to **62%** in model year 2020.

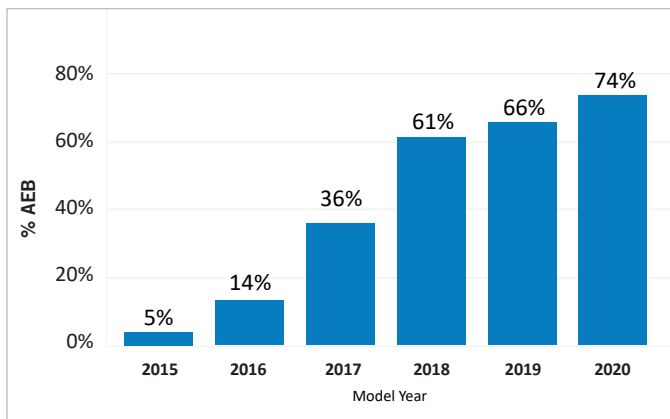


*Model Year Data: 2015 - 2020. MY2020 data is partial only.*

## Automatic Emergency Braking (AEB)

Among makes and models in the PARTS study set, AEB penetration increased from 5% in model year 2015 to 74% in model year 2020.

Model Year	Vehicle Count	AEB Count	Percentage
2015	8,119,546	434,875	5%
2016	7,769,513	1,083,750	14%
2017	8,128,592	2,941,983	36%
2018	8,209,102	5,022,611	61%
2019	8,470,132	5,626,176	66%
2020	6,275,108	4,652,250	74%

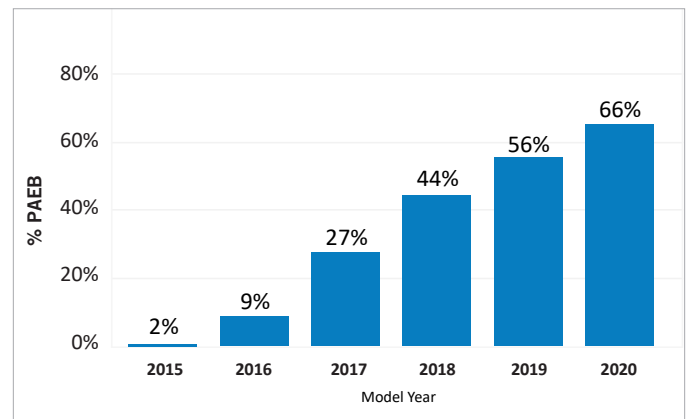


Forward Collision Warning (FCW) is a related system that alerts the driver to a potential collision ahead but does not activate the brakes. Among makes and models in the PARTS study set, FCW has similar penetration rates to AEB in recent model years.

## Pedestrian Automatic Emergency Braking (PAEB)

Among makes and models in the PARTS study set, PAEB penetration increased from 2% in model year 2015 to 66% in model year 2020.

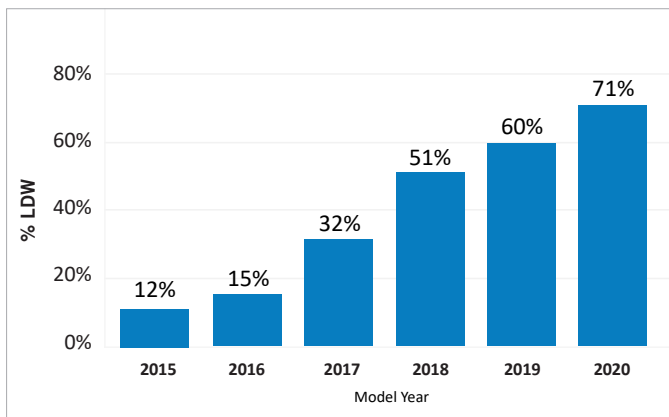
Model Year	Vehicle Count	PAEB Count	Percentage
2015	8,119,546	181,222	2%
2016	7,769,513	697,602	9%
2017	8,128,592	2,222,781	27%
2018	8,209,102	3,593,822	44%
2019	8,470,132	4,782,160	56%
2020	6,275,108	4,159,119	66%



## Lane Departure Warning (LDW)

Among makes and models in the PARTS study set, LDW penetration increased from 12% in model year 2015 to 71% in model year 2020, running somewhat ahead of the related Lane Keeping Assistance.

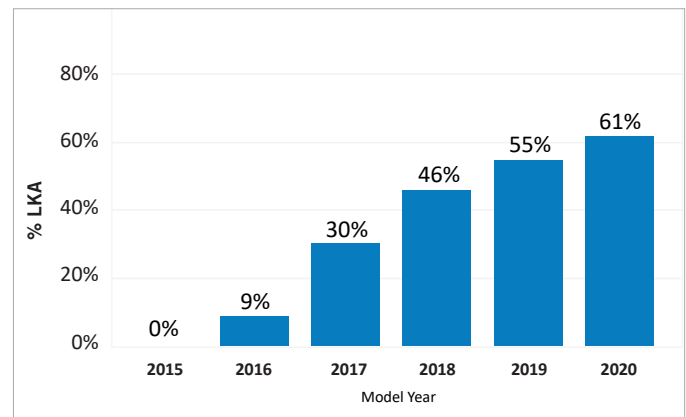
Model Year	Vehicle Count	LDW Count	Percentage
2015	8,119,546	992,456	12%
2016	7,769,513	1,188,305	15%
2017	8,128,592	2,628,763	32%
2018	8,209,102	4,164,138	51%
2019	8,470,132	5,088,070	60%
2020	6,275,108	4,460,693	71%



## Lane Keeping Assistance (LKA)

Among makes and models in the PARTS study set, LKA penetration increased from <1% in model year 2015 to 61% in model year 2020.

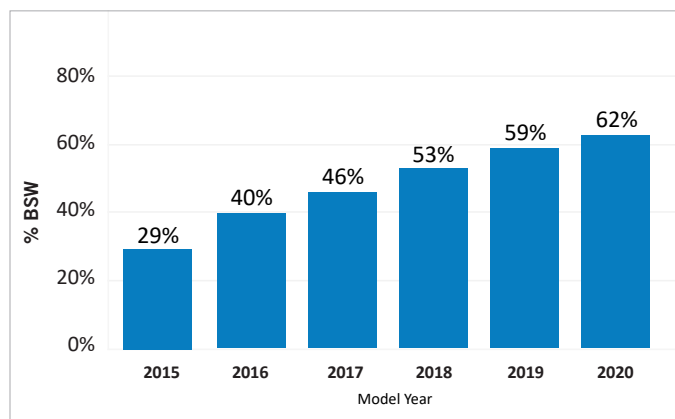
Model Year	Vehicle Count	LKA Count	Percentage
2015	8,119,546	36,824	0%
2016	7,769,513	730,834	9%
2017	8,128,592	2,455,622	30%
2018	8,209,102	3,806,840	46%
2019	8,470,132	4,694,033	55%
2020	6,275,908	3,799,042	61%



## Blind Spot Warning (BSW)

Among makes and models in the PARTS study set, Blind Spot Warning penetration increased from 29% in model year 2015 to 62% in model year 2020.

Model Year	Vehicle Count	BSW Count	Percentage
2015	8,119,546	2,367,544	29%
2016	7,769,513	3,104,234	40%
2017	8,128,592	3,733,293	46%
2018	8,209,102	4,345,893	53%
2019	8,470,132	5,017,990	59%
2020	6,275,108	3,877,751	62%



## Notes

- Reported ADAS penetration rates represent a partial view of the U.S. automobile market, both in terms of manufacturers and models. Vehicles in the PARTS study may not be representative of the entire market.
- Manufacturers identified the vehicles that met the ADAS definitions; specific performance criteria were not applied.
- Vehicles include passenger vehicles in the following segments: small cars, midsize cars, large cars, small SUVs, midsize SUVs, large SUVs and pickups, and minivans.
- MY2020 vehicle data is partial.
- Makes and models included in the study set include:
  - FCA:** 200, Giulia, 300, Charger, Challenger, 500X, Renegade, Compass, Wrangler 2-dr, Durango, Cherokee, Grand Cherokee, Wrangler Unlimited, Stelvio, Ram 1500, Ram 8500\_10000, Ram gt10000, Gladiator, Pacifica
  - GM:** Malibu, Regal, Impala, LaCrosse, Equinox, Terrain, Envision, Acadia, Enclave, Traverse, SRX, XT5, Sierra, Yukon, Tahoe
  - Honda:** Accord, Civic, CR-V, Fit, HR-V, Insight, ILX, MDX, Odyssey, Passport, Pilot, RDX, TLX, Ridgeline
  - Mazda:** Mazda3 Hatchback, Mazda3 Sedan, Mazda6, CX-3, CX-30, CX-5, CX-9
  - Mitsubishi:** Outlander Sport, Eclipse Cross, Outlander
  - Nissan:** Versa, Sentra, Altima, Maxima, Rogue, Murano, Pathfinder, Armada, Titan, Frontier
  - Subaru:** Impreza, WRX, Crosstrek, Legacy, Outback, Forester, Ascent
  - Toyota:** Corolla; Prius; C-HR; Camry, IS, Avalon, ES, LS, RAV4, NX, Highlander, RX, 4Runner, GX, Tundra, Tacoma, Sequoia, Sienna

