



## PARTNERING TO ADVANCE TRAFFIC SAFETY

Rapidly evolving technologies in motor vehicles have the potential to reduce the rates of collision and their devastating consequences. The Partnership for Analytics Research in Traffic Safety (PARTS) is using data and analysis to maximize these benefits.

[PARTS](#) is a consortium enabling government and automotive industry stakeholders to share their data with MITRE for collaborative analysis—to gain greater safety insights than any organization could achieve on its own.

Convened by the National Highway Traffic Safety Administration (NHTSA) and MITRE in 2018, PARTS is based on a public-private partnership (PPP) model that has dramatically improved aviation safety. The creation of PARTS was spurred by the need to better understand the benefits and emerging safety opportunities of advanced driver assistance systems (ADAS) and to prepare the way for automated driving systems of the future.

In recent years, vehicle manufacturers have designed, tested, and begun deploying various ADAS features—such as automatic emergency braking (AEB) and lane-keeping assistance (LKA)—that help to mitigate and correct for human error.

ADAS and the more highly automated vehicles of the future also have the potential to further improve safety for vehicle occupants, pedestrians, bicyclists, motorcyclists, and other travelers sharing the road.

### PARTS 2022 STUDY FINDINGS

**49%** REDUCTION IN FRONT-TO-REAR CRASHES FOR VEHICLES WITH FCW AND AEB

**16%** REDUCTION IN FRONT-TO-REAR CRASHES WITH FCW ALONE

**8%** REDUCTION IN SINGLE-VEHICLE ROAD-DEPARTURE CRASHES WITH LDW AND LKA

**AEB PERFORMS WELL EVEN IN LESS-THAN-IDEAL ROADWAY, WEATHER, AND LIGHTING CONDITIONS**

To realize these breakthrough benefits, we must adopt innovative approaches that accelerate industry-wide safety research. It begins with providing data-driven evidence of the real-world effectiveness of increasingly automated safety features.

That's where PARTS comes in.

## How PARTS Works: A Snapshot

Today, PARTS participants include NHTSA and ten automobile manufacturers representing nearly 80 percent of the U.S. market for sales of passenger cars and light commercial vehicles:

- American Honda
- Ford Motor Company
- General Motors
- Hyundai Motor North America
- Mazda North America Operations
- Mitsubishi Motors R&D of America
- Nissan North America
- Stellantis
- Subaru of America
- Toyota Motor North America.

These automobile manufacturers and NHTSA voluntarily share data with MITRE. An independent third party, MITRE serves as the consortium's program integrator, data steward, and technical analysis partner.

After receiving partners' data, MITRE provides robust security and data protection safeguards. MITRE then integrates, enhances, and analyzes the data and provides anonymized, aggregated results back to the group. All participants receive aggregate results in the form of metrics, interactive dashboards, and even datasets. Individual industry participants also receive custom benchmark results available only to them.

Participants can use the results to take action within their own organizations to advance safety.

## A Research Example

A recent PARTS study illustrates the PPP's power to generate insights that can inform vehicle safety equipment design in the future.

In 2020, the U.S. Department of Transportation (USDOT) funded a study to learn how six ADAS features performed in real-world scenarios. These features included AEB, pedestrian AEB, forward collision warning (FCW), LKA, lane-centering assistance (LCA), and blind-spot management systems.

To support the study, participating automobile manufacturers submitted vehicle feature content for 47 million vehicles—representing more than 90 different models from 2015 to 2020 model years. These data were linked to NHTSA-provided police reports on 12 million crashes from 13 states.

Completed in fall 2022, the study showed that vehicles equipped with FCW and AEB reduced front-to-rear crashes by almost 50%. In addition, the study demonstrated that AEB continues to perform well even when roadway, weather, and lighting conditions are not ideal.

Researchers also concluded that vehicles equipped with active intervention technologies that help drivers stay in their lane—such as LKA and LCA—are effective in reducing single-vehicle crashes that lead to serious injury.

NHTSA is now using these findings to inform new ADAS regulations designed to improve safety on U.S. roads. And participating automakers are using the study results to benchmark the performance of their vehicles and make them even safer in the future.

PARTS' current focus on ADAS lays the foundation for higher levels of driver assistance, connected vehicles, and other real-world advanced technologies in the future.

## Current Studies

To build upon what was learned in previous research, in 2023 USDOT and NHTSA funded a new phase of PARTS. This phase focuses on analyzing crash avoidance technologies to identify where they are performing well, where they are not, and to determine the factors contributing to their overall performance.

In this phase of research, the scope and value of the PARTS datasets will be enhanced by significantly increasing the amount of data previously collected. This includes additional ADAS features from more models and model years, tens of millions more vehicle records, and more crash data (from 13 to 16 states). Researchers will also link vehicle data to nationally representative crash data from NHTSA's Fatality Analysis Reporting System (FARS) and Crash Report Sampling System (CRSS).

Researchers will compare AEB performance by crash characteristics and model years to gain deeper insight into AEB effectiveness. They will also consider attributes such as operational design speed to understand the drivers of performance. Additionally, researchers will revisit the 2022 study and re-analyze the baseline effectiveness of pedestrian AEB, LDW, and LKA using the expanded dataset.

PARTS partners are also exploring the use of vehicle-based telematics to better understand crash risk in the near term, with greater possibilities for how telemetry data can enhance analyses in the longer term. It is envisioned that PARTS will ultimately serve as an authoritative source for accelerated safety insights through the rapid collection of data directly from vehicles.

## Roles of Government, Industry, and MITRE

USDOT works alongside industry participants to oversee and direct the work of PARTS. Within PARTS, NHTSA and automakers work as peers, with each having an equal voice in the strategy, processes, and overall execution of the partnership. USDOT has access only to aggregate results, never to another partner's data or benchmark results.

Along with USDOT, industry partners actively identify and scope research studies, contribute data, and support analyses by providing expertise on the effective use and interpretation of their data. Partners also participate in the exploration of new ideas and prototyping to help inform partnership decisions related to future research.

MITRE's role is threefold. The first is to act as the independent convener and program integrator/manager for PARTS. MITRE also serves as the data steward, providing the secure data environment and infrastructure to protect and manage partner data and results. Lastly, MITRE leads the technical analytic work for the program, to include ingesting sensitive data from partners, processing it, conducting neutral and unbiased analysis, and providing results in a safe and secure manner.

## The MITRE Role:



Program Integrator



Technical Analysis Lead



Data Steward

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