Insurance Institute for Highway Safety
Highway Loss Data Institute

IIHS
1005 N. Glebe Road, Suite 800
Arlington, VA 22201
+1 703 247 1500

iihs.org

March 2, 2018

The Honorable K. Jane Williams
Deputy Administrator
Federal Transit Administration
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Request for Comments on "Federal Transit Administration: Automated Transit Buses and Related Technologies" Docket No. FTA-2017-0024.

Dear Deputy Administrator Williams:

The Insurance Institute for Highway Safety (IIHS) welcomes the opportunity to comment on the current and near-future status of automated transit buses and related technologies under consideration by the Federal Transit Administration (FTA). While autonomous vehicle technologies promise many benefits, and FTA is wise to begin to investigate what this would mean for transit, advanced driver assistance systems (ADAS) have been delivering benefits for years. ADAS technologies form the building blocks of early limited automated driving systems (in particular, SAE level 2 systems) and, as such, increased use of ADAS would both improve safety today and improve the performance of future automated driving systems. IIHS believes that FTA can play an important role in this process for transit by incentivizing the use of ADAS on transit vehicles.

Research from IIHS and the Highway Loss Data Institute (HLDI) has shown that ADAS technologies – such as forward collision warning, automatic emergency braking (AEB), lane departure warning, blind spot detection, and rear automatic braking – are all associated with beneficial effects for passenger vehicles on relevant crashes and insurance claims. While some systems studied by IIHS/HLDI only issue warnings, we have found that systems that act for drivers when they do not respond appropriately to warnings are especially effective. For instance, forward collision warning, when coupled with automatic emergency braking (AEB), is associated with a 50% reduction in front-to-rear crash rates, compared to a 27% reduction for systems that only issue warnings (IIHS/HLDI, 2018), as shown in the attached summary. Lane departure warning and blind spot detection, both types of detection being necessary for higher levels of driving automation, also are associated with benefits in relevant crashes – crashes that also may be important to address on larger transit vehicles. While the effectiveness of ADAS systems has not been as carefully evaluated on large trucks, motorcoaches, or other types of transit vehicles, there is little reason to believe such systems would not be helpful.

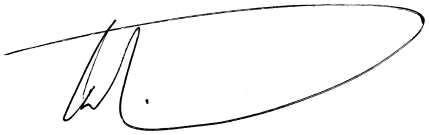
In addition to effectiveness, systems must be widely used to realize a larger societal benefit. Various ADAS systems have become much more widely available on new passenger vehicles. In 2016, 20 automakers representing 99% of passenger vehicles on the market pledged to make front AEB a standard feature on all new vehicles produced after September 1, 2022. Also, despite lower effectiveness, a distinct advantage of warning-only systems is the possibility of retrofitting existing vehicles with aftermarket systems, such as those manufactured by Mobileye.

Another important aspect of ADAS systems, and the automated driving systems that would follow, is drivers' understanding of their use, ability to assist in driving, and limitations. If drivers perceive systems as unhelpful and/or annoying, they may turn them off – nullifying any possible benefit. Our research has demonstrated that many drivers with lane departure prevention systems had the systems turned off, but usage was higher for systems with braking/steering interventions and vibrating warnings (Reagan et al.,

2018). In addition to encouraging use of such systems, supporting fleets' training of drivers in their use is an opportunity for FTA.

In summary, FTA has an opportunity to simultaneously improve road transit safety and the future performance of early automated driving technologies by encouraging the use of existing and effective ADAS technologies, especially AEB.

Sincerely,



Eric Teoh
Senior Statistician

References

IIHS/HLDI. 2018. Real-world benefits of crash avoidance technologies. (enclosed)
Retrieved from http://www.iihs.org/iihs/topics/t/automation-and-crash-avoidance/topicoverview

Reagan I.J., Cicchino J.B., Kerfoot L.B., Weast R.A. (2018). Crash avoidance and driver assistance technologies – Are they used? *Transportation Research Part F,* 52, 176-190.

Real-world benefits of crash avoidance technologies

HLDI and IIHS study the effects of crash avoidance features by comparing rates of police-reported crashes and insurance claims for vehicles with and without the technologies.



Forward collision warning

- ▼ 27% Front-to-rear crashes
- ▼ 20% Front-to-rear crashes with injuries
- ▼ 7% Claim rates for damage to other vehicles
- ▼ 14% Claim rates for injuries to people in other vehicles



Forward collision warning plus autobrake

- ▼ 50% Front-to-rear crashes
- ▼ 56% Front-to-rear crashes with injuries
- ▼ 13% Claim rates for damage to other vehicles
- ▼ 21% Claim rates for injuries to people in other vehicles

Lane departure warning

- ▼ 11% Single-vehicle, sideswipe and head-on crashes
- ▼ 21% Injury crashes of the same types

Blind spot detection

- ▼ 14% Lane-change crashes
- ▼ 23% Lane-change crashes with injuries
- ▼ 9% Claim rates for damage to other vehicles
- ▼ 12% Claim rates for injuries to people in other vehicles



Rear automatic braking

- ▼ 62% Backing crashes
- ▼ 13% Claim rates for damage to the insured vehicle
- ▼ 26% Claim rates for damage to other vehicles

Rearview cameras

- ▼ 17% Backing crashes



Rear cross-traffic alert

- ▼ 22% Backing crashes

Added costs

Lower crash rates are a clear benefit of these technologies, but some features can lead to higher repair costs in the crashes that do happen. That's because sensors and other components are often located on the vehicle's exterior. For example, in the case of forward collision warning without autobrake, the average payment per claim for damage to the insured vehicle goes up $109 for vehicles equipped with the feature.

© 2018, Insurance Institute for Highway Safety, Highway Loss Data Institute, 501(c)(3) organizations