



Recommendations for vehicle-based approaches to prevent speeding

Accelerating Technology Working Group | December 6, 2023

Speeding is a persistent safety problem that accounts for more than 25% of traffic fatalities each year. Over 12,000 lives were lost in speeding-related crashes in 2021 (Stewart, 2023). Vehicle speeds have increased since the beginning of the COVID-19 pandemic, and these higher speeds have contributed to the alarming increase in traffic deaths the United States has experienced since 2020 (Office of Behavioral Safety Research, 2021). The National Highway Traffic Safety Administration (NHTSA) estimates that speeding-related crashes led to over \$45 billion in costs annually from property damage, medical care, lost productivity, and other effects (Blincoe et al., 2023).

The U.S. Department of Transportation (USDOT) adopted the Safe System Approach as its guiding paradigm for addressing roadway safety (2022). Safer speeds are central to designing a safe system that builds in redundancy and accounts for human vulnerability, as higher speeds increase the likelihood of both crashing and becoming seriously injured when a crash occurs. Safer speeds require designing roads with this objective in mind and setting and enforcing appropriate speed limits that consider all road users. Safer vehicles are another element of a safe system. In addition to protecting their occupants in a crash, safer vehicles are equipped with technology that can prevent or mitigate crashes. This includes technology that contributes to safer speeds.

There are several types of technology that can assist a driver in controlling the vehicle's speed. **Speed limiters**, also known as **speed governors**, prevent the driver from exceeding a fixed speed (e.g., 65 mph). Speed limiters have been used by commercial fleets for years, and in 2022 the Federal Motor Carrier Safety Administration issued an advanced notice of supplemental rulemaking announcing their intention to mandate speed limiters on large trucks.

Other systems warn the driver when the vehicle exceeds a preset speed. Systems designed for teen drivers may mute the audio system or inform a parent, in addition to warning the driver.

Intelligent speed assistance (ISA) takes the speed limit into account. ISA identifies speed limits using a camera that reads posted speed limit signs and/or GPS linked to a database of speed limits. Advisory ISA provides information to the driver by displaying the current speed limit or issuing a warning when the vehicle exceeds it. Some vehicle models in the United States are equipped with advisory ISA, and the systems that include speed warnings typically allow the driver to choose how many miles per hour over the speed limit they can go before an alert is issued.

Other forms of ISA more actively prevent a driver from speeding by providing resistance from the accelerator pedal or limiting power to the engine. Compared with advisory ISA, this type of ISA is rare in the United States. A small number of vehicle models allow the driver to configure adaptive cruise control so that the system automatically reduces the vehicle's set speed when a speed limit reduction is detected. ISA that controls acceleration can be temporarily overridden, usually by pressing hard on the accelerator pedal or pushing a button.

In addition to being built into vehicles, speed assistance capabilities are available through phone apps and aftermarket devices that can be added to vehicles. A number of app-based teen monitoring systems include speed warnings. Aftermarket ISA that actively controls speeds has been installed on commercial and public fleets, including on city- and county-owned vehicles in several locations as part of ISA pilot programs.

The Road to Zero Coalition's Accelerating Technology Working Group is tasked with hastening the uptake of technology that can save lives on our roads. Because of the staggering toll caused by speeding, the Working Group chose to focus its initial efforts on technology to prevent speeding. Stakeholders were consulted for feedback on what actions are needed to encourage the use of vehicle-based approaches to preventing speeding such as speed limiters and ISA. The remainder of this document outlines these recommendations.

1. Promote ISA on privately owned passenger vehicles

ISA has been required on new light vehicle types in the European Union since 2022 and will be required on all new models beginning in 2024 (European Union, 2019), but there is no similar mandate in the United States. Unlike crash avoidance systems such as automatic emergency braking, this technology has not been widely promoted as a safety technology. The National Transportation Safety Board recommended in 2023 that NHTSA require ISA on new passenger vehicles.

Recommendations:

- Market ISA as a “driver assistance” technology.
- Publish and maintain a list of vehicle manufacturers (and specific models/trims) in the U.S. market that already incorporate ISA and what type.
- Urge NHTSA to identify a performance standard for the technology that, at a minimum, warns the driver when the speed limit is exceeded and require it on all new vehicles as standard equipment.
- Urge NHTSA to add ISA to the New Car Assessment Program.

2. Promote ISA and speed limiters to public and commercial fleets

Commercial fleets have been early adopters of technology to prevent speeding. Because fleet managers may be more concerned with prioritizing safety and preventing the costs associated with motor vehicle crashes than personal vehicle owners, they represent an audience that might be especially receptive to introducing ISA and speed limiters. Public fleets have also begun to use ISA. New York City uses it on city-owned light-, medium-, and heavy-duty vehicles (City of New York, 2023), and London uses it on the city bus fleet (Greenshields et al., 2016). Ventura County, California; Somerville, Massachusetts; and King County, Washington, have also recently committed to using the technology (Lyke, 2023; City of Somerville, 2023; Packer, 2023). Widespread use of ISA and speed limiters by fleets can demonstrate to the public that these technologies are beneficial.

Recommendations:

- Incentivize state and city fleets to use ISA by making grant funding available to implement programs. This could include expanding the scope of Safe Streets and Roads for All (SS4A) implementation grant funding to cover ISA and other safer vehicle countermeasures implemented by state or city fleets, promoting supplemental SS4A planning/demonstration grant funding to test out ISA and other connected vehicle technology (V2X) implementations to prevent speeding, or developing other federal government funding mechanisms that can be used by public agencies to implement safer vehicles in their fleets.
- Encourage the federal government to purchase vehicles with ISA or speed limiters for the General Services Administration and U.S. Postal Service fleets.
- Promote ISA to rental fleets.
- Produce and publicize best practices for rolling ISA out to public fleets, including to transit buses.
- Promote fleet experience with ISA and speed limiters—including the experiences of New York City, Transport for London, and commercial fleets—to fleet managers in new forums.
- Educate fleet managers about the existence of aftermarket ISA devices so that they are aware that it is possible to equip older vehicles with this technology.
- Incentivize vehicle manufacturers to make ISA available at the lowest trim level so fleets can purchase it without needing to purchase unwanted upgrades.

- Encourage vehicle manufacturers to offer ISA implementations in which drivers are incentivized to keep them turned on or cannot turn them off or in which activation is centrally controlled by a party outside of the vehicle (e.g., employer, parent).
- Educate insurers and insurance commissioners on the evidence that ISA improves safety outcomes.

3. Promote ISA and speed limiters to high-risk groups

ISA has great potential to curb speeding in high-risk groups. Teen drivers are more likely than any other age group to be speeding when they are involved in a fatal crash (National Center for Statistics and Analysis, 2023). Technology marketed to parents to curb teen speeding can both target a high-risk demographic and reach an audience that might be interested in using it. Ignition interlocks are an effective vehicle-based sanction that prevent recidivism among alcohol-impaired driving offenders, and a similar vehicle-based approach to prevent drivers with a history of aggressive speeding from reoffending should be explored.

Recommendations:

- Promote teen and aftermarket applications of ISA and top-speed limiters to parents. Emphasize the similarity to parental controls available for streaming services, social media, and search engines.
- Examine the feasibility of requiring aftermarket ISA for high-risk speeding offenders or teens who speed during graduated driver licensing, similar to using an alcohol interlock for alcohol-impaired driving offenders.
- Promote the use of aftermarket ISA, including app-based forms, to taxi and ride-hailing drivers.
- Consider technical needs to simplify the use of aftermarket ISA applications. For example, requiring a standard interface on vehicles to attach aftermarket ISA systems, such as is required in the EU for alcohol interlocks, could potentially facilitate their use.

4. Improve public acceptance of ISA

There are concerns about how acceptable ISA would be to U.S. consumers. One concern that drivers have reported about ISA that controls speed is that they will not be able to accelerate in case of an emergency or when the system incorrectly detects a speed limit that is lower than the actual limit. Another issue is the speed tolerance of ISA, or how far over the speed limit a driver can travel before they are warned or their speed is restricted. The ISA mandate in the European Union requires an intervention that is deployed at the speed limit. New York City tested restricting speeds to 11 mph over the speed limit in their ISA pilot, which is the same tolerance used by the city's speed safety camera program. Speed tolerances need to balance safety benefits with the likelihood that drivers will keep the system turned on.

Recommendations:

- Develop myth-busting talking points for common concerns (e.g., about needing to speed in an emergency).
- Encourage NHTSA to fund and conduct outreach to private passenger vehicle drivers to educate them on ISA (e.g., how it works, how to use it). Identify additional partners who can help with outreach efforts.
- Develop guidance on speed tolerances for ISA relative to speed limit, including:
 - Which speed tolerances over the speed limit are acceptable and how that varies by user, environment, intervention type, and vehicle type.
 - The extent to which various speed tolerances would be effective in reducing serious injury crashes and fatalities. This could include analysis of the conditions under which speeding contributes to fatalities.

5. Improve quality of speed limit information

The accuracy of ISA depends on the quality of the speed limit information obtained through GPS-linked mapping and camera recognition of posted speed limit signs. Obscured speed limit signs are an obstacle for systems that use cameras. Some current vehicles with ISA require owners to maintain a subscription to obtain updated speed limit maps, which are needed for the system to function. V2X communications could provide an additional source of speed limit information that would provide redundancy with existing sources.

Recommendations:

- Push updated speed limit maps to vehicles with ISA without requiring owners to pay a subscription.
- Encourage development of V2X, which would allow for a redundant source of speed limit information.
- Examine how ISA could be best incorporated into V2X by deploying it in V2X pilot projects.
- Examine methods for tying ISA into variable speed limit programs so that it has acceptable accuracy with nonstandard speed limit signs and speed limits that can't be mapped.
- Work with the American Association of State Highway and Transportation Officials to educate state departments of transportation on how maintenance issues that can obscure speed limit signs can affect the accuracy of camera-based ISA.
- Standardize sources of mapped speed limit information.

6. Investigate benefits of current ISA systems on passenger vehicles

The safety potential of ISA in passenger vehicles has been established in field studies in which volunteers drive vehicles equipped with ISA systems for a period of time (Ryan, 2018). However, many of these studies are old ones that examined prototype systems in Europe. We don't yet know how current implementations of these systems are working and how they are being used by private passenger vehicle drivers. There has also not been much research yet on intelligent adaptive cruise control systems that adjust the set speed when the speed limit is reduced. Updated evidence could inform system design and integration of ISA with other countermeasures for speeding and bolster the argument for implementation.

Recommendations:

- Determine how often drivers keep currently available ISA and intelligent ACC systems turned on in vehicles that have them.
- Determine effects of current ISA and intelligent ACC systems on speeding behavior, including on types of speeding behavior (e.g., inadvertent speeding, extreme speeding, speeding at speed limit boundaries).

7. Incorporate vehicle-based technology into national conversation on speed

Although safer vehicles are a tenet of the safe system approach, discussions on speed countermeasures often center on roadway design and speed limit setting and enforcement while excluding vehicles. ISA is not mentioned in the National Roadway Safety Strategy as a tool that can be used to achieve safer speeds.

Recommendations:

- Encourage advocacy groups working on speed issues to highlight ISA in their road safety vision.
- Convene a national summit on speed that features vehicle-based countermeasures.
- Encourage inclusion of ISA in the Safer Speeds section of USDOT's National Roadway Safety Strategy.

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