

Intelligent Speed Assistance Test and Rating Protocol

DRAFT Version I

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CONTENTS

OVERVIEW	3
TEST ENVIRONMENT	4
Speed limit signs	4
TEST VEHICLE PREPARATION	4
General	4
Instrumentation.....	4
ISA settings	4
TEST PROCEDURES	5
Assessment 1: System default setting	5
Assessment 2: Speed limit information function.....	5
Assessment 3: Speed limit advisory function (25 mph speed limit)	6
Assessment 4: Speed limit advisory function (45 mph speed limit)	6
RATING SYSTEM.....	7
REFERENCES	8

OVERVIEW

This document describes the Insurance Institute for Highway Safety (IIHS) protocol for testing and rating intelligent speed assistance systems. It is available from the *Test protocols and technical information* section of the IIHS website.

In 2024, a total of 11,288 deaths, or 29% of all U.S. motor vehicle fatalities, occurred in speed-related crashes. Eight percent of the property-damage only crashes and 13% of crashes with injuries or fatalities included in the National Highway Traffic Safety Administration's (NHTSA) Crash Report Sampling System (CRSS) in 2023 involved speeding — defined as exceeding the speed limit, driving too fast for conditions, or racing. CRSS is a sample of police-reported crashes involving all types of motor vehicles, pedestrians, and cyclists. NHTSA estimates that the economic cost of speed-related crashes was about \$46 billion in 2019 (Blincoe et al., 2023).

In a 2024 national telephone survey conducted by the AAA Foundation for Traffic Safety, 50% of drivers said they had exceeded the speed limit by 15 mph on a freeway in the past month, and 37% reported exceeding the speed limit by 10 mph on a residential street (Zhang & Steinbach, 2025).

Intelligent speed assistance (ISA), sometimes also called intelligent speed adaptation, describes systems that support drivers in maintaining the speed limit. ISA systems use either GPS devices linked to speed limits or on-board cameras that “read” speed limit signs. The systems alert the driver or intervene in real time when the vehicle exceeds the limit.

Advisory ISA warns drivers when they speed. Active ISA intervenes to discourage or prevent speeding, either with accelerator feedback that makes it harder, but still possible to speed, or by limiting power so drivers can accelerate up to but not over the speed limit. Active ISA systems typically have an override option to allow drivers to temporarily surpass the top speed, such as when they want to pass.

Field assessments have found that using ISA is associated with significant reductions in speeding (Ryan, 2018). The largest research effort studied several thousand Swedish drivers using different ISA interventions for more than a year and found that all types resulted in decreases in speeding violations (Biding & Lind, 2002). A study of frequent U.S. speeders who volunteered to drive with a system that provided speed warnings when they exceeded the limit by 8 mph found robust reductions in speeding over the threshold during the treatment phase compared with the baseline established at the beginning of the experiment (NHTSA, 2014).

A 2025 IIHS survey found that more than 60% of U.S. drivers would accept a system that issued audible and visual warnings when they exceed the speed limit, and about half would accept a system that actively slowed the vehicle (Reagan & Cicchino, 2025).

This protocol describes the test procedure for evaluating ISA systems that help drivers maintain appropriate speeds. The test procedure promotes systems that balance effectiveness and consumer acceptance.

Performance requirements are based on

- System availability and system settings at ignition,
- Speed limit display requirements, and
- Warning requirements when the speed limit is exceeded.

TEST ENVIRONMENT

Testing is conducted on a closed track to eliminate the need to exceed the speed limit on a public road. The course is straight and flat, and the surface is in good condition, free of potholes, bumps, and cracks that could cause the test vehicle to pitch excessively. Testing is not conducted during periods of inclement weather. Inclement weather includes, but is not limited to, rain, snow, hail, fog, smoke, and ash. Peak wind speeds must be below 22.4 mph (10 m/s) to minimize test vehicle disturbance. Testing is completed during daylight hours when ambient illumination is greater than 2,000 lux. To prevent glare from the sun from causing issues with camera-based vehicle sensors, the sun position must be at least 15 degrees above the horizon if the test vehicle is driving into the sun.

Speed limit signs

The minimum size of the speed limit signs used for testing should be 24 inches by 30 inches (61 cm by 76 cm) as described in Table 2B-1 of the Manual on Uniform Traffic Control Devices (Federal Highway Administration, 2025). The signs should be placed approximately 12 feet (3.66 m) from the edge of the travel lane and approximately 5 feet (1.52 m) above the ground as described in Appendix B of the MUTCD.

TEST VEHICLE PREPARATION

General

Prior to testing, IIHS ensures that:

- The tires are in good condition and inflated to the manufacturer's recommended cold-inflation pressure. If more than one recommendation is provided, the tires are inflated to the lightly loaded condition.
- The windshield is clean of debris with no visible damage.
- The vehicle's software is the most up-to-date version available.
- The vehicle has no fault codes visible to the driver that may affect the testing.

Instrumentation

The vehicle is equipped with multiple cameras to record synchronized video footage. The cameras record views of the forward roadway with the speed limit sign visible and the location(s) where visual alerts are presented (i.e., the instrument panel, heads-up display, and/or center console). The cameras' microphones record audible alerts. Adhesive measurement tape is attached next to the speed limit information icon to measure its size.

ISA settings

For vehicles with adjustable ISA settings, testing is conducted with the offset, or tolerance for exceeding the limit, on the default or highest setting, depending on how the system functions. To determine the setting to use, turn the vehicle on and select the highest speed limit offset. For instance, if the speed limit options are 5, 10, or 15 mph over the speed limit, set the system to 15 mph. Turn the vehicle completely off and then turn it back on again. The speed limit offset used for testing is the setting that remains after this procedure.

TEST PROCEDURES

Assessment 1: System default setting

This test verifies that the system defaults to ON at each ignition cycle.

1. Turn the vehicle on and determine whether the speed limit function can be turned off.
2. If the system cannot be turned off, the test is complete.
3. If the system can be turned off, deactivate the system and switch off the ignition.
4. Restart the vehicle and determine whether the ISA system has returned to the ON state.
5. Repeat Steps 1–4 three times.

Assessment 2: Speed limit information function

This test confirms whether the vehicle detects and displays speed limit signs and how the vehicle responds when it identifies a new speed limit that is lower than the preceding one. For this test, two speed limit signs, one with a higher limit than the other, are positioned on the test track at least 500 ft (152 m) apart. The higher limit should be encountered by the test vehicle first.

1. While seated in the driver seat, verify that the ISA system is turned on and that the speed offset is set based on the ISA settings procedure outlined earlier in this document. Verify that adaptive cruise control (ACC), if available, is also switched off.
2. Accelerate to the initial test speed (the higher of the two posted speed limits).
3. Maintain the test speed while approaching the first speed limit sign.
4. Drive past the first speed limit sign.
5. Continue toward the second speed limit sign, with the lower posted speed limit.
6. Drive past the second speed limit sign.
7. The test concludes after the vehicle passes the second speed limit sign.
8. Repeat Steps 1–7 three times.

Assessment 3: Speed limit advisory function (25 mph speed limit)

This test evaluates the system response when a vehicle travels 5–9 mph, 10–14 mph, and 15 mph or more above the posted speed limit on roads with a 25 mph speed limit.

1. While seated in the driver seat, verify that the ISA system is turned on and that the speed offset is set based on the ISA settings procedure earlier in this document. Verify that ACC, if available, is also switched off.
2. Accelerate to a speed of 30–34 mph, as indicated on the speedometer. Maintain this speed throughout the test.
3. Drive past the 25 mph speed limit sign.
4. The test concludes 30 seconds after the vehicle passes the speed limit sign.
5. Repeat Steps 1–4 three times.
6. Repeat Steps 1–5 at test speeds of 35–39 mph and 40–44 mph.

Assessment 4: Speed limit advisory function (45 mph speed limit)

This test evaluates system response when a vehicle travels 5–9 mph, 10–14 mph, and 15 mph or more above the posted speed limit on roads with a 45 mph speed limit.

1. While seated in the driver seat, verify that the ISA system is turned on and that the speed offset is set based on the ISA settings procedure earlier in this document. Verify that ACC, if available, is also switched off.
2. Accelerate to a speed of 50–54 mph, as indicated on the speedometer. Maintain this speed throughout the test.
3. Drive past a 45 mph speed limit sign.
4. The test concludes 30 seconds after the vehicle passes the speed limit sign.
5. Repeat Steps 1–4 three times.
6. Repeat steps 1–5 at test speeds of 55–59 mph and 60–64 mph.

RATING SYSTEM

The rating system will be determined after an initial round of testing.

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