



American Association of
Motor Vehicle Administrators

Automated Vehicles - Technical Assistance for North Carolina

Agenda item #13

February 28, 2020

OUR VISION

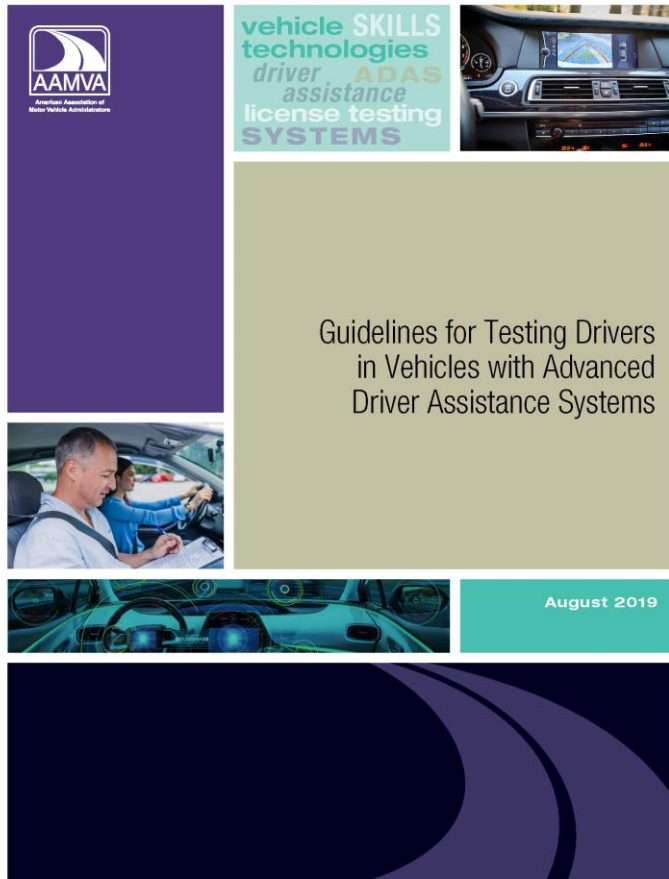
Safe drivers

Safe vehicles

Secure identities

Saving lives!

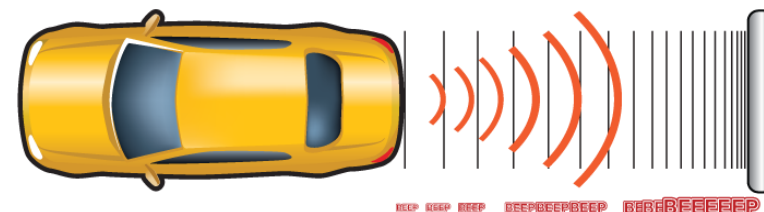
- AAMVA's Guidelines for Testing Drivers in Vehicles with Advance Driver Assistance Systems (ADAS) – August 2019
- Examples of ADAS technology in use today
- Inconsistency in terminology
- Consumer understanding of technology
- Impacts for driver testing, driver's manuals and examiner training
- Impacts for driver education
- Data collection



- To assist jurisdictions prepare to incorporate ADAS into driver testing programs
- Guidance developed by the IDEC and TMS, in consultation with the Autonomous Vehicles Working Group

This document provides Universal Considerations for Driver Testing and Examiner Training:

- Sensor operation,
- Functionality,
- Driver's manuals,
- Knowledge tests,
- Scoring skills tests,
- Automatic failures,
- Examiner training materials, and
- Updating testing materials.



Addresses the difference between:

- **Safety Critical Technologies** – may prevent or reduce the severity of a crash (e.g., rear or other cameras, alerts, lane departure warning, emergency braking assist). Should be permissible and not be disengaged during the testing process.
- **Convenience Technologies** – provide conveniences for the driver (e.g., parking assist feature or adaptive cruise control). Not permitted during testing.

Is divided into two major sections:

- 1. Vehicle Warning System Technologies** notifies the driver with a warning, by sound, light or vibration, about vehicle position, or that a crash is about to occur, or provides an alert that there is a problem or malfunction.
- 2. Vehicle Assistance System Technologies** assist the driver in avoiding a hazard or crash. Some automatically make adjustments to the operation of the vehicle and some assist the driver in making adjustments, such as braking or steering.

Each technology discussed provides:

- a description of the technology,
- how the technology works,
- whether it is a safety or convenience technology,
- considerations for testing (knowledge and skills),
- guidance for skills testing and examiner training, and
- considerations for driver's manuals.



Examples of ADAS Technology In Vehicles Today

- **Back-Up Warning**

- Uses rear sensors to scan for objects behind the vehicle and alerts the driver if an object is detected.



- Safety critical technology
- Applicants should check their mirrors, over their shoulder and cameras
- Permitted during testing
- Update driver's manual and examiner's manual



- **Back-Up Camera (rear)**

Helps see objects directly behind the vehicle by showing a wide view behind the vehicle while backing. Some cameras show a wider view than others.



- Safety critical technology
- Applicants should check their mirrors, over their shoulder and cameras
- Permitted during testing
- Update driver's manual and examiner's manual

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- **Parking Sensors**

Alerts the driver to the position of objects around the vehicle as they park. Listen for the rate of the warning sounds - a constant tone means the vehicle is close to an object.



- Safety critical technology
- Applicants should check their mirrors, over their shoulder and cameras
- Permitted during testing
- Update driver's manual and examiner's manual

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- **Blind Spot Monitor and Warning**

Warns the driver of other vehicles driving in their blind spots through display of a symbol, sound or vibration. They may provide an additional warning if a driver uses their turn signal when there are other vehicles in another lane.



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- Safety critical technology
- Applicants should scan their mirrors, over their shoulder and blind spot monitors
- Permitted during testing
- Update driver's manual and examiner's manual



- **Lane Departure Warning**

Alerts a driver when they are drifting out of their lane using visual, vibration or sound warnings. This feature can help alert a driver to steer back to the center of their lane if they mistakenly drift, helping to prevent a crash.



- Safety critical technology
- Applicants should demonstrate proper visual lead and steering control to stay within their lane
- Permitted during testing
- Update driver's manual and examiner's manual

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- **Automatic Emergency Braking**

This feature can sense slow or stopped traffic ahead and urgently apply the brakes if the driver fails to respond.

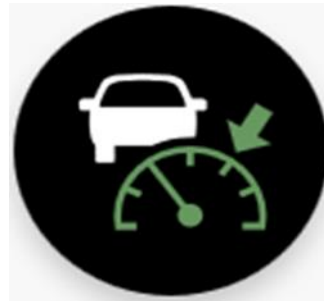


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- Safety critical technology
- Applicants should be able to identify hazards in time and begin slowing or stopping the vehicle in a timely manner to avoid striking hazards
- Permitted during testing
- Update driver's manual and examiner's manual

- **Adaptive Cruise Control**

Can increase or decrease the vehicle's speed to maintain a following distance set by the driver. Advanced versions can even slow and stop the vehicle in traffic jams, then accelerate automatically.



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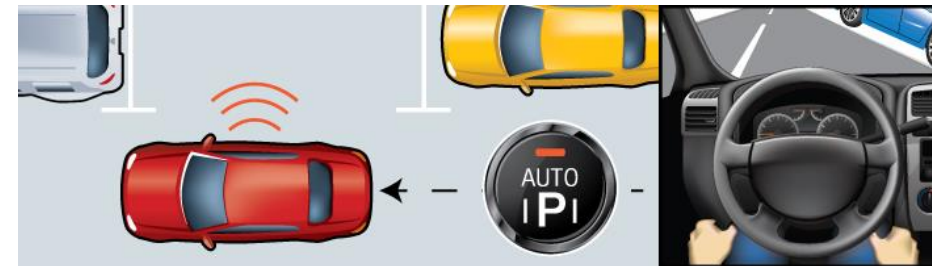
- Convenience technology
- Applicants should demonstrate all behaviors for safety controlling vehicle speed
- Not permitted during testing
- Update driver's manual and examiner's manual

- **Automatic Parallel Parking**

Helps guide the driver into a parallel parking spot after searching and may find a viable option . The driver is still responsible for braking and monitoring the environment .



- Convenience technology
- Applicants should demonstrate all behaviors for safety parking the vehicle
- Not permitted during testing
- Update driver's manual and examiner's manual



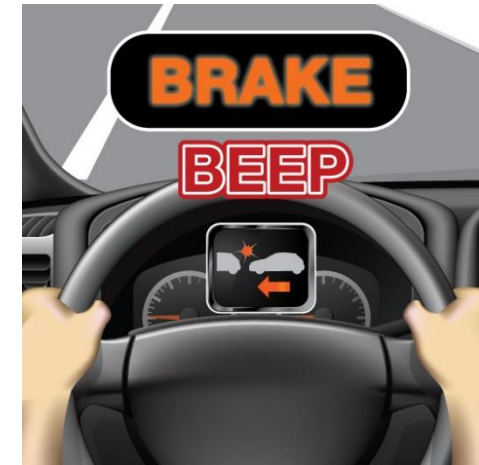
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- Drivers may not understand the purpose and limitations of the specific technology.
- Over confidence, dependency and complacency in what the specific technology can do.
- Possibility of increased distractions from some technology (e.g., infotainment screen).
- A recent report identified that drivers are likely to engage in secondary tasks.



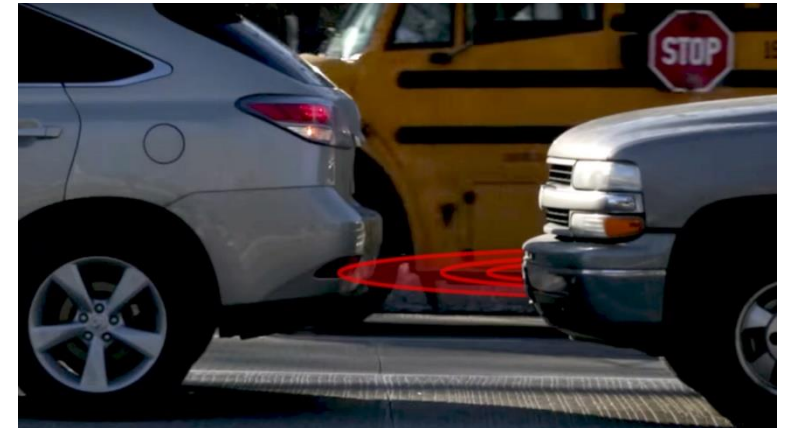
Source: Motor Verso

- Sensory inattention/overload/blindness.
- Unfamiliarity - drivers may not always drive a vehicle equipped with technologies or may borrow or rent.
- Use of different naming conventions for same type of feature by manufacturers.
- Driver's manuals will need to address these consumer issues.



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- Terminology used by manufacturers varies widely.
- Often prioritizes marketing over clarity.
- A recent report provided common naming that is simple, specific and based on system functionality.
- Meant to aid in reducing driver confusion and define the functions of ADAS in a consistent manner.
- Terms not meant to replace manufacturers names but help identify key functions and provide clarity.



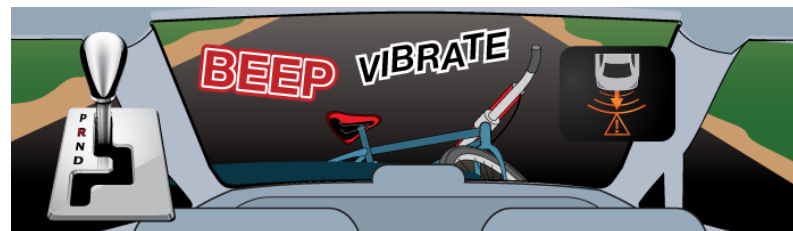
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- Understand how ADAS impacts the driver testing program.
- Identify what technologies are permitted during skills testing.
- Recognize when and how driver behaviors and responses to certain technologies should be scored.
- Necessary for examiners to continue to validate the severity of each situation as they do today.
- Examiners will need to examine and base their decisions on the outcomes of the test and grade the actions of the applicant, not the vehicle.



Source: Adobe Images

- Back-Up Warning
 - Does not fully demonstrate the applicant's ability alone to safely monitor and maneuver the vehicle during backing.
 - Intended to provide an additional monitoring resource to mirrors and head checks.
 - Applicants should not become complacent and dependent on backup warnings alone.
 - Should be permitted for use during testing.
 - The applicant should check their mirrors and head checks in conjunction with the use of the back-up warnings.
 - If the back-up warning activates, the examiner must determine if the vehicle is close enough to be a danger (no different than current scoring procedures).



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- Forward Collision Warning Systems
 - Does not fully demonstrate the applicant's ability alone to properly control the vehicle on the roadway and maintain a safe following distance.
 - Should be permitted for use during testing.
 - The applicant should always be cautious, check traffic regularly, and keep a safe following distance from the vehicles ahead.
 - If the warning activates and they do not perform the behavior correctly (driver response), the applicant should be scored for not doing so.
 - The warning may also alert the applicant to an object or vehicle suddenly entering the path of travel. In this action, the applicant may not have made a behavioral error; thus, the applicant should not be penalized.



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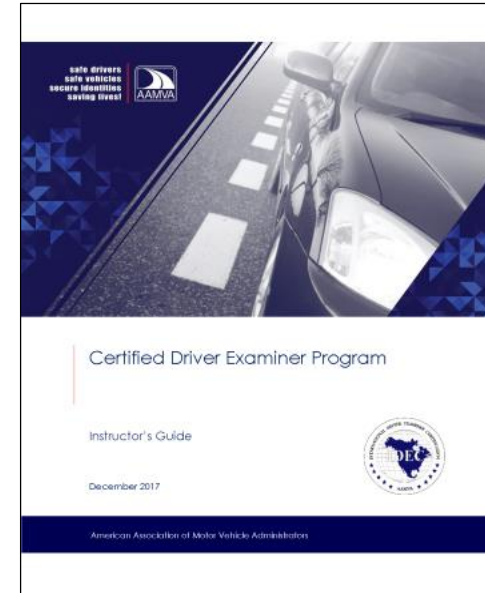
- Automatic Parallel Parking

- Does not demonstrate the applicant's basic skills to parallel park a vehicle correctly in the parking space.
- Should NOT be permitted for use during testing.
- An applicant should fully demonstrate the basic skills for parallel parking a vehicle or other types of backing maneuvers.
- Training materials and instruction should be updated to indicate automatic parallel parking should not be permitted for use during testing.



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- Update the AAMVA NMDTS and CDL:
 - Driver's Manual
 - Knowledge Test Item Pool
 - Skills Tests
 - Examiner's Manual
- Update the AAMVA IDEC CDE and CCE training materials and resources.
- Provide updates to the Guidelines for Testing Drivers in Vehicles with ADAS document on an annual basis.
- Jurisdictions need to use these to enhance their driver testing and examiner training programs.



- Educated drivers to understand the purpose, benefits and limitations of specific ADAS technologies.
- Understand the appropriate use of ADAS.
- Identify different types or major categories of ADAS available in vehicles today.
- Describe how to minimize the distractibility of the ADAS.
- Emphasis on technologies assist the driver; they do not replace the driver.
- Emphasis on remaining engaged in the “Driving Task”.
- Too many technologies to cover “HOW” to use them all.
- Basic understanding of how ADAS technology functions in general terms (e.g., warnings and assist).



Source: Adobe Images

- Focus on attitudes (affective learning domain) on the use of ADAS.
- Direct learners to resources to learn more (e.g., MyCarDoesWhat.org).
- Emphasize the importance of the “Owner’s Manual”.
- Provide hands on training in use of ADAS.
- Coordination between driver license and driver education agencies for consistency in driver testing and driver training.



- Distribution of updated driver's manual.
- Item analysis of updated ADAS driver knowledge test questions.
- Item analysis of ADAS skills testing criteria, including comparison of tests in vehicles with and without ADAS.
- Pass / fail rates of tests in vehicles with and without ADAS.
- Track skills test examiners for behaviors scored and pass / fail rates for tests in vehicles with and without ADAS.
- Identify and implement continued maintenance of driver testing system to incorporate ADAS in the testing and licensing process.



Questions?