Automated Driving Systems (ADS) Policy Development for Commercial Vehicle Operations

U.S. Department of Transportation
Federal Motor Carrier Safety Administration

March 10, 2021

Automated Vehicles Comprehensive Plan – Jan. 11, 2021

Building upon the principles stated in AV 4.0, the Automated Vehicles Comprehensive Plan defines three goals to achieve USDOT's vision for Automated Driving Systems (ADS).

1. Promote Collaboration and Transparency
2. Modernize the Regulatory Environment
3. Prepare the Transportation System

- U.S. DOT is seeking public comments on the AV Comprehensive Plan
- (Federal Register Notice, DOT-OST-2021-0005 - comment period closes 3/22/2021)

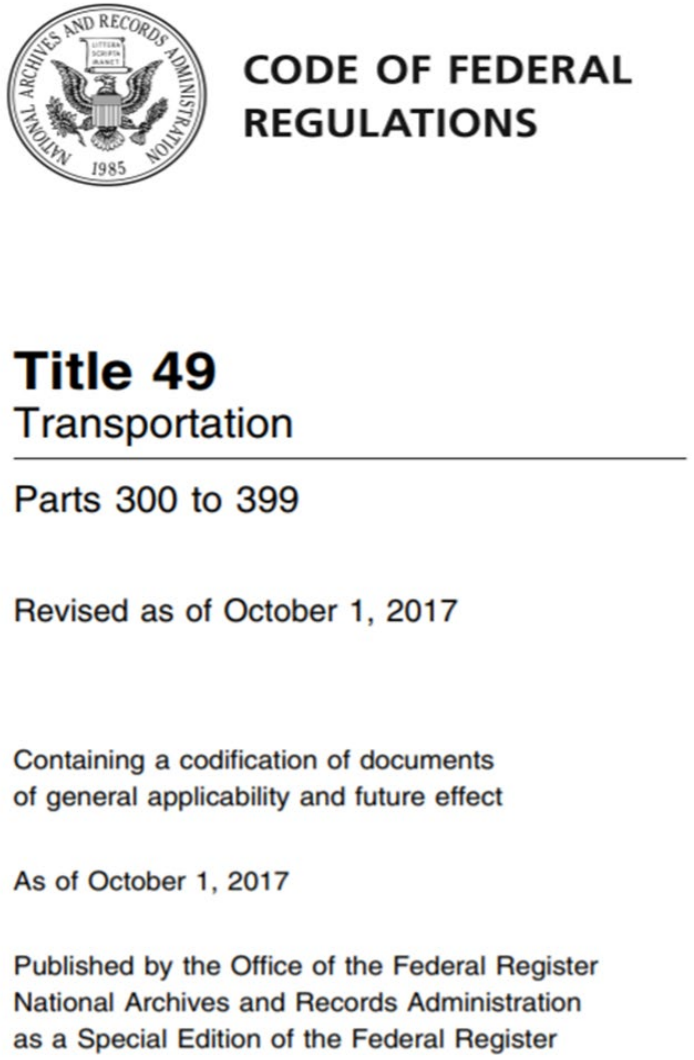
DOT's AV 4.0

- On February 6, 2020, the Department published "Ensuring American Leadership in Automated Vehicle Technologies: Automated Vehicles 4.0," (AV 4.0) – 39 comments received.
- Builds upon "Preparing for the Future of Transportation: Automated Vehicles 3.0," (AV 3.0) and "Automated Driving Systems 2.0: A Vision for Safety," (AV 2.0)
- Expanded the scope to all on-road transportation systems;
- Committed to making the regulatory process more nimble to help match the pace of private sector innovation

2019 – FMCSA's Advance Notice of Proposed Rulemaking (ANPRM)

- Safe Integration of Automated Driving Systems—Equipped Commercial Motor Vehicles
- Published: May 28, 2019
- Docket Closed: August 28, 2019
- Summary: FMCSA requested public comment about Federal Motor Carrier Safety Regulations (FMCSRs) that may need to be updated, modified, or eliminated to facilitate the safe introduction of automated driving systems (ADS) equipped commercial motor vehicles (CMVs) onto our Nation's roadways.
- FMCSA received 180 comments on the ANPRM, 122 from individuals and 58 from organizations.

ANPRM – Looking at the FMCSRs potentially affected



CODE OF FEDERAL REGULATIONS

Title 49
Transportation

Parts 300 to 399

Revised as of October 1, 2017

Containing a codification of documents
of general applicability and future effect

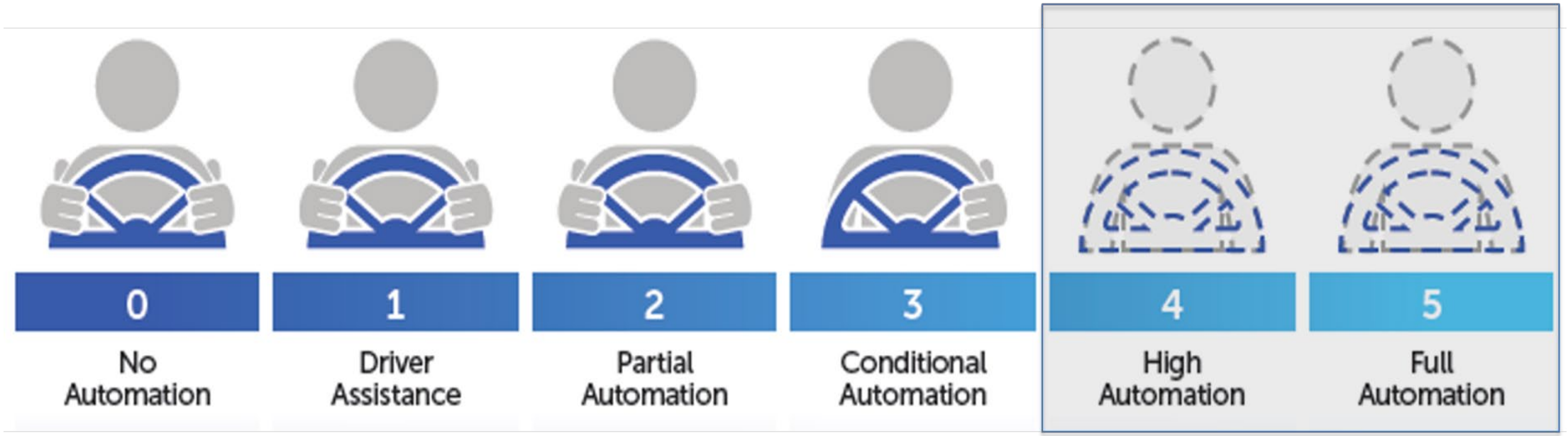
As of October 1, 2017

Published by the Office of the Federal Register
National Archives and Records Administration
as a Special Edition of the Federal Register

- Licensing and Driver Qualifications (Parts 383 & 391)
- Safe Driving (Part 392)
- Parts and Accessories (Part 393)
- Hours of Service (Part 395)
- Inspection, Repair and Maintenance (Part 396)
- Hazardous Materials (Part 397)

Levels of Automation of Greatest Interest: No Driver at the Controls

- **SAE Level 4, High Driving Automation:** The vehicle is capable of performing all driving functions under certain conditions. The driver may have the option to control the vehicle.
- **SAE Level 5, Full Driving Automation:** The vehicle is capable of performing all driving functions under all conditions.



2020 Draft – Notice of Proposed Rulemaking (NPRM)

- FMCSA proposed amending and revising certain Federal Motor Carrier Safety Regulations (FMCSRs) to ensure the safe introduction of automated driving systems (ADS)-equipped CMVs onto the Nation's roadways.
- The proposed changes to the commercial vehicle operations, inspection, repair, and maintenance regulations would prioritize safety and security, promote innovation, and foster a consistent regulatory approach to ADS-equipped commercial motor vehicles (CMVs).
- NPRM was at OST in prior administration but not published.

Current Status

- FMCSA Deputy Administrator reviewing draft.

Research with FMCSA Technology Office

Variability Analysis of FMVSS-121 Air Brake Systems: 60-mi/hr Service Brake System Performance Data for Truck Tractors (Jan 2021)

- The data used were retrieved from tests performed under the controlled conditions specified for FMVSS 121 air brake system compliance testing. The report also explores factors affecting FMVSS-121 stopping distance and stopping distance variability, such as brake type, weight, wheelbase, and tractor antilock braking system (ABS).

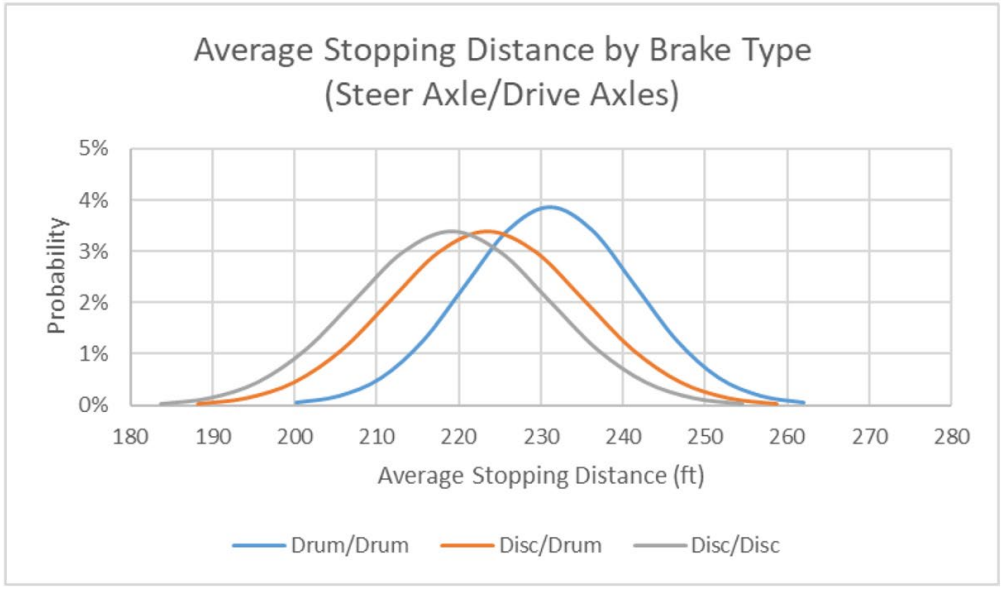


Figure 6. Chart. Probability distribution of stopping distances for various brake types derived from test data parameters.

Research with FMCSA Technology Office – Current Work

Brake Variability – 2021 Track Testing

- Investigating variability in (2) - five-axle tractor semitrailer's brake performance due to variations in brake friction specification, brake condition, and brake performance of the tractor and trailer.
- The initial testing will look at the following variables: brake friction materials (OE (RSD) and aftermarket), brake burnish condition (green/burnished), gross combination vehicle weights (65,000 lb/80,000 lb), and vehicle speed (20/40/60 mph).
- Incorporates evaluation/development of ORNL Real Time Dynamic Brake Assessment Model

Real Time Dynamic Brake Assessment

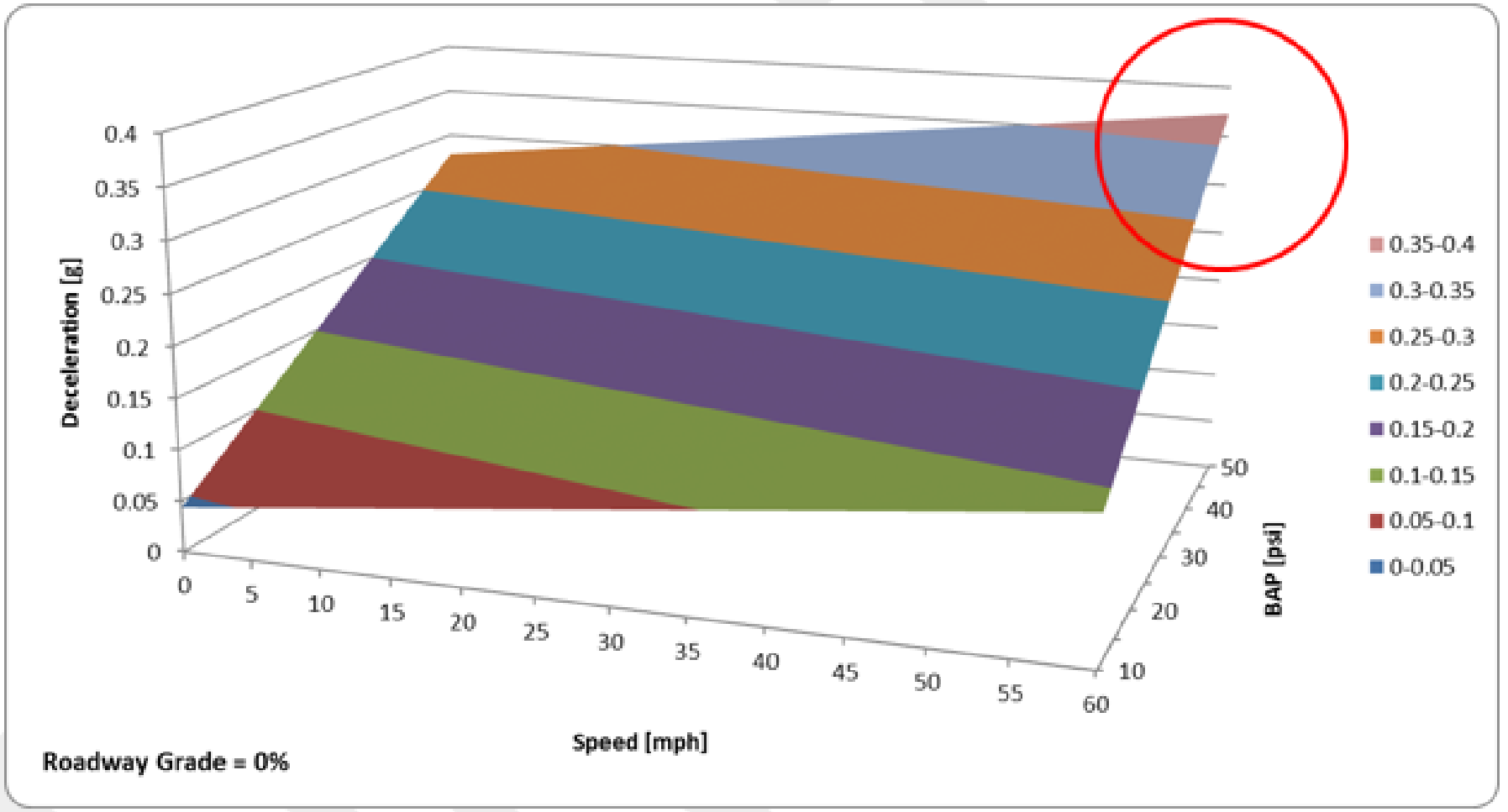


Figure 63 Deceleration Model as a Function of Speed and Brake Application Pressure

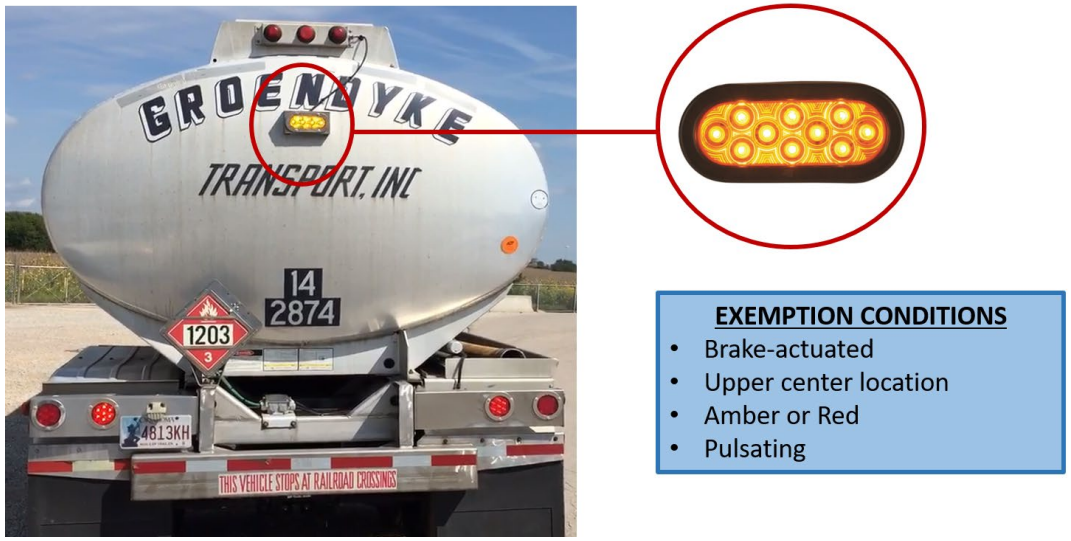
ADS Sensor Performance Testing

Figure 2. Installation Locations of Cameras, RADAR, LIDAR and rear amber light.

Rear Radar Activated Warning Lamp Research

Research into rear facing radar activated emergency warning lamp to reduce rear impact collisions.

- FMCSA has granted a number of temporary exemptions for rear brake activated warning lamps to tanker carriers (Groendyke) and tanker industries (NTTC)
- Previous FMCSA research into “Enhanced Rear Signalling” (2006)
- Utilizing FMCSA 2014 Prevost Motorcoach for development work.



EXEMPTION CONDITIONS

- Brake-actuated
- Upper center location
- Amber or Red
- Pulsating

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