



NHTSA ADS Pilot Program
Comments from New Flyer of America Inc. regarding

[NHTSA's Automated Driving Systems \(ADS\) testing, development, and eventual deployment](#)

Caveat: Our experience is with heavy duty transit and over the road coaches.

1. Potential factors that should be considered in designing a pilot program for the on-road testing and deployment of ADS and HAV.

- A. ADS Level of Automation:
 - Emergency override and/or remote access during the pilot testing is required.
- B. Operational Design Domain
 - Program should consider the testing under both 4G/5G network.
 - Inclusion of a steward, which is someone who monitors the operation of ADS/HAV vehicle whether onboard or remote.
- C. International Standards and Best practices:
 - Program should consider the maximum number of vehicles allowed for pilot testing with certain time, traffic, etc.
 - Program should control the software updates
 - Necessary driver's other training needs to be considered
 - Considerations for V2V and V2I
 - Dealing with transit operations (paying fare, stops, kneeling, outside passenger interface)
- D. Testing and validation
 - Traffic conditions, e.g. density, locations, traffic jam, construction zones should be considered to examining perception and control reliability under various scenarios.
 - Road conditions, e.g. smooth surface vs rough surface, 4-way stop sign, unprotected left turn, delivery truck, bicyclists, etc. should be considered for the on-road testing of ADS and HAV performance.
 - Weather conditions, e.g. foggy weather, snow surface etc. need to be considered to examine the sensor and reliability.
 - Geographical Conditions (terrain, narrow streets).
 - Human factors, e.g. aggressive human drivers, jaywalkers are the factor to examine how ADS and HAV respond with unexcepted situations.
 - Program should define the criteria of the data collection, reporting, storage, data and what is the data constraints required for machine learning.
 - Sufficient Data collection should be collected for evaluating the hardware reliability
 - Forward Collision Mitigation guidance
 - Automatic Lane Change guidance
 - Pedestrian Collision Mitigation guidance



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- ADS decision guidance at hazardous or near crash situation (Human safety as priority than facility, in the event of unavoidable situation, whether any distinctions between individual based on ages, gender, physical, metaconstitutional is impermissible.)
 - System fail-safe guidance
 - Connected Vehicle communication safety standards (J2735 DSRC, J2945 minimum performance for V2V safety)
 - Data recording and reporting standard
 - ADS communication protocol
 - Sensor radio communication interference immunity standard
 - Post deployment sensor certification and re-calibration restriction
- E. Safety Systems
- Program should define the criteria of the data collection, reporting, storage, data and what is the data constraints required for machine learning.
- F. HMI and Access of Controls
- Program should examine the HMI performance and effectiveness the ADS falls back to the human driver in the difficult conditions.
- G. Public education and awareness
- Public awareness and education should also be considered
- H. User Protections during collision or system failure
- Back-up power for sudden power loss, to protect data integrity.
- I. Cybersecurity
- Program should be designed to examine sensor signal interference immunity.
 - Program should define the testing of the data security
- J. System Updates and After-Market Repairs and modifications
- Data should be collected and limited access for any sensor maintenance and re-calibration
- K. User Privacy
- Program should define the testing of the data privacy
- L. Collaboration with Govt Agency and Law Enforcement
- Investigation on crashes
 - Assistance with testing on public roads.
 - Managing road traffic violations with an ADS/HAV.
- 2. Use of existing statutory provisions and regulations to allow for the implementation of such a pilot program.**
- The applicable FMVSS/CMVSS should be the mandatory requirements to meet the minimum safety standards for testing ADV or HAV for commercial vehicle. For the pilot



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- program the exemption should be used to suit the machine driver applications with the proof that the machine driver is a safer driver.
- Buses will no longer require exterior mirrors, they would be replaced with sensors.
- Testing on public roads.



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3. Regulatory relief that might be needed to facilitate the efforts to participate in the pilot program and conduct on-road research and testing.

- Warning devices for ADS, ex. rotating amber light
- New vehicle control and display standard
 - Driver Control Indications no longer required (displays, tell tales, horn etc.) (FMVSS101)
 - Transmission Interlock requirements no longer needed as indicated in FMVSS102
- Mirror regulations no longer required, replaced with sensors. (FMVSS111)
- Driver licensing, state by state province by province jurisdiction.

4. Safety and other analyses that NHTSA should perform in assessing the merits of individual exemption petitions to protect public safety and facilitate the Agency's monitoring and learning from the testing and deployment, while preserving the freedom to innovate.

- Maintenance and repairs completed by qualified and certified technicians to validate design specifications.
- An Engineering team who 'certifies' ADS or HAV vehicles for use on public roads based on listing of vehicle performance capabilities.
- Process for identifying Qualified OEMs
 - Providing description of ADS operation features and limitations
 - Historical safety report
 - Development test report/data
 - Simulation reports
- Closed, controlled test track for evaluation
- Access to public roads for testing evaluation