USDOT Automated Vehicle (AV) Research Activities: Current and Completed Projects

The table below summarizes current and completed research and other activities within the U.S. DOT focused on automated vehicle technology development and evaluation, policy assessment, and impacts estimation. Projects and activities are grouped according to performing agency and, though accurate as of posting, this list is subject to change. This list does not reflect planned research.

Current and Completed AV Research	Description
ITS Joint Program Office	
Development of AV Policy Research Plan	Identify key AV policy issue areas and proposes draft research roadmap for years FY 14 – FY 19.
Review of Federal Motor Vehicle Safety Standards (FMVSS)	Reviews safety standards to identify where there may be challenges to certifying a range of automated vehicle concepts, completed in coordination with NHTSA. See full report: http://ntl.bts.gov/lib/57000/57000/57076/Review_FMVSS_AV_Scan.pdf
Assessment of AV Impacts on Liability and Insurance	Synthesizes how AVs potentially impact current liability and insurance models; summarizes possible risk management or policy strategies.
Assessment of the Federal Role in AV	Evaluates possible USDOT roles in AV, including inventory of existing policy tools, needs and options and their relevance to automation.
ITS Legislative Analysis for AV	Conduct a scan of existing and pending state/local legislation regarding AVs (as well as connected vehicles). Includes review of data privacy laws.
Automation Standards Roadmap Development	Develops a roadmap for the Standards Program, identifying where AV standards and international harmonization activities are required.
Development of Multi-Modal Benefits Framework	Develops a framework for estimating potential safety, mobility, energy and environmental benefits of AV technologies. Includes modeling of benefits and dis-benefits. See full report: http://ntl.bts.gov/lib/55000/55400/55443/AVBenefitFrameworkFinalReport082615_Cover1.pdf
Automated Vehicle Policy Webinar	Hosted webinar on March 1, 2016 focused on policy considerations for the development and deployment of automated vehicles. Over 350 people attended the live webinar; a recording is available at: https://www.pcb.its.dot.gov/t3/s160301_Automated_Vehicles_and_Policy.asp
AV Policy Briefs	Draft a series of 1-2 page summaries of completed research to support communication with external stakeholders.
Stakeholder Outreach and Research Coordination	Includes: NCHRP 20-102, Automated Vehicles Symposium Policy Breakout Sessions (2015/2016), AV Information Sharing Working Group, USDOT State Roundtable (2015), Trilateral (EU/US/Japan) Automation Working Group on Road Vehicle Automation, SIP-adus: Innovation of Automated Driving for Universal Services

Current and Completed AV Research	Description
Federal Highway Administration	
FHWA AV Policy Research Needs Analysis	Identifies key issues for road owner/operators and recommends where FHWA AV policy research is necessary.
Office of Transportation Policy Studies C/AV Research Roadmap	Develops a research roadmap focused on connected and automated vehicles for the FHWA Office of Transportation Policy Studies. Two projects have been selected for funding by HPTS in FY16.
Partial Automation for Truck Platooning (PATH/Caltrans)	Evaluates the performance achievable with truck-based CACC or platooning applications, driver preferences for time gaps, energy savings at preferred time gaps, and benefits for lane capacity, energy and emissions. Also evaluates deployment strategies and challenges for truck platooning applications.
Partial Automation for Truck Platooning (Auburn University)	Defines, tests, and evaluates a technically and commercially viable Driver Assistive Truck Platooning application.
Cooperative Adaptive Cruise Control	Carry out research needed to overcome the technical, institutional, and market barriers to deployment of CACC under alternative timeframes for entry level and full featured systems. See fact sheet: https://www.fhwa.dot.gov/advancedresearch/pubs/16044/16044.pdf
Enabling Technologies Future Forecast	Provides guidance with respect to the underlying enabling technologies common across automated and connected vehicles.
Lane Change/Merge Foundational Research	Conducts foundational research, based upon enabling technologies for automated operation and vehicle-vehicle and vehicle-infrastructure communication, in the areas of: (1) lane change, merging freeway lateral maneuvers; and (2) weaving lateral maneuvers.
Automated Speed Harmonization – Prototyping and Testing	Develop, test, and evaluate an automated speed harmonization application, whereby speed recommendations are provided to automated vehicle systems in order to optimize network performance and smooth the operation of the traffic stream. See full report: https://www.fhwa.dot.gov/publications/research/operations/16023/16023.pdf
Driver Acceptance of Vehicle Automation Applications	Examines critical human factors issues such as workload, situational awareness, and distraction for Level 1 automation applications. Specific research areas include: (1) create virtual simulation environment on Level 1 automation applications and conduct human factors experiments; and (2) conduct test track or closed course experiments to validate simulations and expand dataset.
Universal Automated Community Transport	Develops the foundational research and concept development for firstmile/last mile mobility. The vision for these applications includes travelers with and without disabilities including those with mobility, hearing, vision and cognitive disabilities, and the ability to accommodate their needs (wheelchairs, strollers etc.).

Current and Completed AV Research	Description
National Highway Traffic Safety Administration	
Automated Vehicle Policy Development	Agency statement that provides preliminary guidance to states regarding AVs and discusses agency research and subsequent updates. See: http://www.nhtsa.gov/Research/Crash+Avoidance/Automated+Vehicles
American Association of Motor Vehicle Administrators (AAMVA) AV Best Practices Working Group	Develop best practices guide for member jurisdictions in regulating AVs and driver testing (this project is being funded by NHTSA but conducted by AAMVA).
Human Factors Evaluation of Level 2 and Level 3 Automated Driving Concepts	Investigated user interactions with Level 2 and Level 3 partially automated vehicles. See concepts of operation document: http://www.nhtsa.gov/DOT/NHTSA/NVS/Crash%20Avoidance/Technical%20Publications/2014/812044_HF-Evaluation-Levels-2-3-Automated-Driving-Concepts-f-Operation.pdf See full report: http://www.nhtsa.gov/DOT/NHTSA/NVS/Crash%20Avoidance/Technical%20Publications/2015/812182_HumanFactorsEval-L2L3-AutomDrivingConcepts.pdf
Functional Safety Assessment of Generic Electric Power Steering Systems with Active Steering and Four-Wheel Steering Features	Produce a functional safety description of the combined lateral and longitudinal control system, focused on lane centering, which is specific to the NHTSA definitions of levels 2 to 4 automated vehicle systems. This project focuses on automated lane centering systems operating during normal-driving and crash-imminent situations.
Target Crash Populations for Automated Vehicles	Determines the target crash population that will provide a basis for the estimation of potential safety benefits from the deployment of automated vehicle concept functions at NHTSA's automation levels 2-4.
Naturalistic Study of L2 Automated Vehicle Functions	Establishes an initial understanding of automated vehicle operability through a naturalistic study of cutting-edge, near market-ready, or market-ready automated vehicle functions that could be classified as Level 2 by NHTSA definitions.

NCHRP/AASHTO Policy Roadmap Projects: Selected for Funding To Date

In 2014, the National Cooperative Highway Research Program (NCHRP), in coordination with the American Association of State Highway and Transportation Officials (AASHTO), initiated a project to evaluate the impacts of connected and automated vehicles on state and local transportation agencies. Eight projects have been selected for funding to date (described below), each adapted from projects outlined in NCHRP Project 20-24(98) which developed a research roadmap for connected and automated vehicle issues. Additional project information is available at: http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=3824

Selected 20-102 Projects	
FY 15 ([1]) and FY 16 ([2]) PROJECTS	DESCRIPTION
Policy and Planning Actions to Internalize Societal Impacts of CV and AV Systems into Market Decisions[1]	Identifies challenges to market-based deployment of CV/AV systems and evaluates possible policy/planning actions to address this.
Impacts of Regulations and Policies on CV and AV Technology Introduction in Transit Operations[1]	Develops a primer on regulatory and policy landscape of transit system planning, development, funding and operations to identify where policy changes are necessary to accommodate CV/AV.
Challenges to CV and AV Application in Truck Freight Operations[1]	Identifies key issues and challenges in the regulatory, policy and operations landscape of freight system operations and where policy strategies are necessary to accommodate AV.
Strategic Communications Plan for NCHRP Project 20-102[2]	Develops a strategic communications plan for these efforts to communicate efforts underway.
Road Markings for Machine Vision[2]	Investigates the correlations between machine vision performance and pavement markings. Factors to be considered include pavement marking presence, contrast, retro-reflectivity, uniformity and vehicle speed.
Implications of Automation for Motor Vehicle codes[2]	Develops recommendations for harmonizing motor vehicle laws and regulations related to CV and AV.
Dedicating Lanes for Priority or Exclusive Use by CVs and AVs[2]	Develops guidance on the conditions that appear to be amenable to dedicating lanes for CV/AV users and what policy actions are needed.
Providing Support to the Introduction of CV/AV Impacts into Regional Transportation Planning and Modeling Tools[2]	Provides support to state DOTs and regional MPOs in the form of guidelines and information related to updates needed in their modeling and forecasting tools to account for impacts of AV and CV.