Assessment, Evaluation, and Approaches to Modification of FMVSS that may Impact Compliance of new Vehicle Designs Associated with Automated Driving Systems

January 2018

NHTSA
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

Agenda

- Goal
- Technical Translations
- Current Research Context
- Research Phasing and Process
- Stakeholder Engagement
- Introduce VTTI Team

Goal

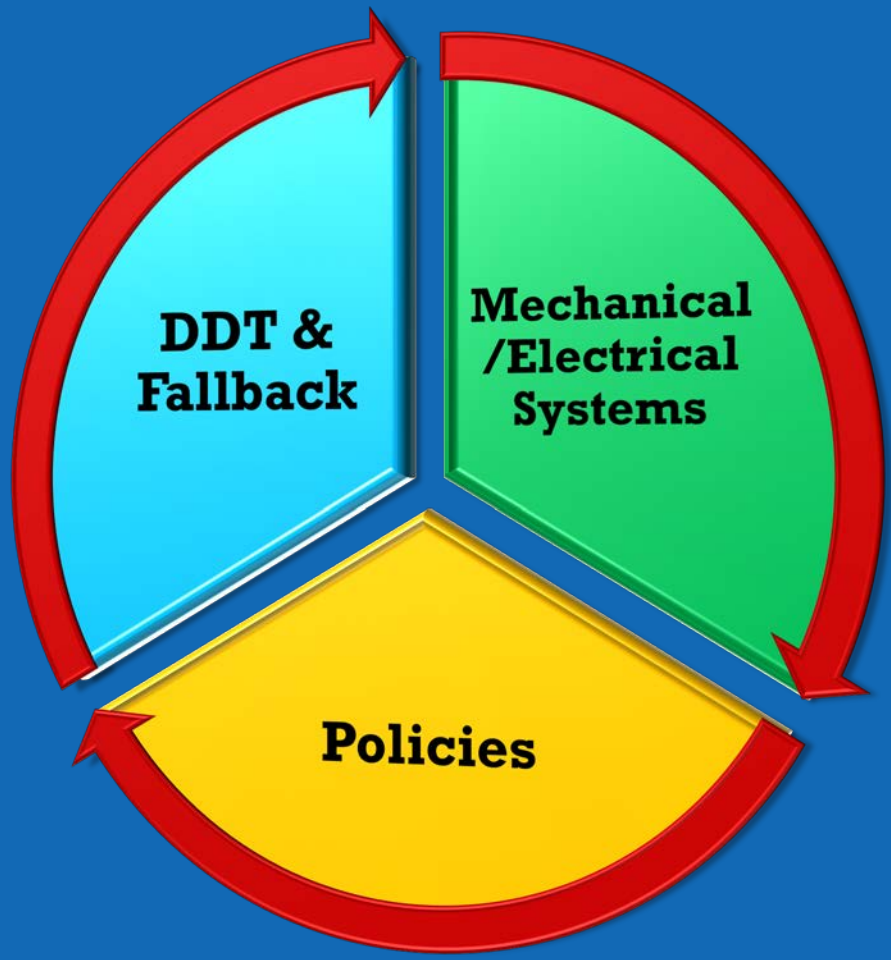
Provide NHTSA findings and results needed to make informed decisions regarding Technical Translations of FMVSS that address the challenges of self-certification and compliance verification of innovative new vehicle designs precipitated by Automated Driving Systems (ADS).

Technical Translations

- Develop translations that address the challenges of innovative new vehicle designs that are also inclusive of current conventional designs.
  - Adapt regulations text and test procedures to encompass new vehicle designs.
  - Translations need to be concept/design agnostic.
  - A translation will not impact or change the safety intent of a standard.
  - A translation will not impact or change current minimum safety performance measures.

Translating for the Body versus Translating for the Brain

- FMVSS "are regulations written in terms of minimum safety performance requirements for motor vehicles or items of motor vehicle equipment" (49 C.F.R. §571).
- Currently: Body and Brain tested independently
  - FMVSS sets "body" performance requirements to support the ability of a human driver's "brain" to complete the Dynamic Driving Tasks (DDT) and any DDT fallback.
    - Vehicle Brakes = Body (FMVSS 135)
    - Human driver = Brain (Driver Licensing; e.g., obeying stop signs; KSA)
- Current Research Scope: **Translate for Body (New Design)**



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Research Phasing

- **Phase I Priority (initial) Research**
  - NHTSA will identify initial FMVSS including potential gaps that can be investigated over the initial 12 months.
- **Phase I Short Term Research**
  - This phase would cover short term efforts that would entail the technical translations that could be identified, developed, research tested and evaluated within an 18 month time period.
- **Phase II Long Term Research**
  - This phase would cover the modification that would take longer and are more complex than Phase I Priority 12 and Phase I Short Term

Straight Forward — Technical Translations — Complex

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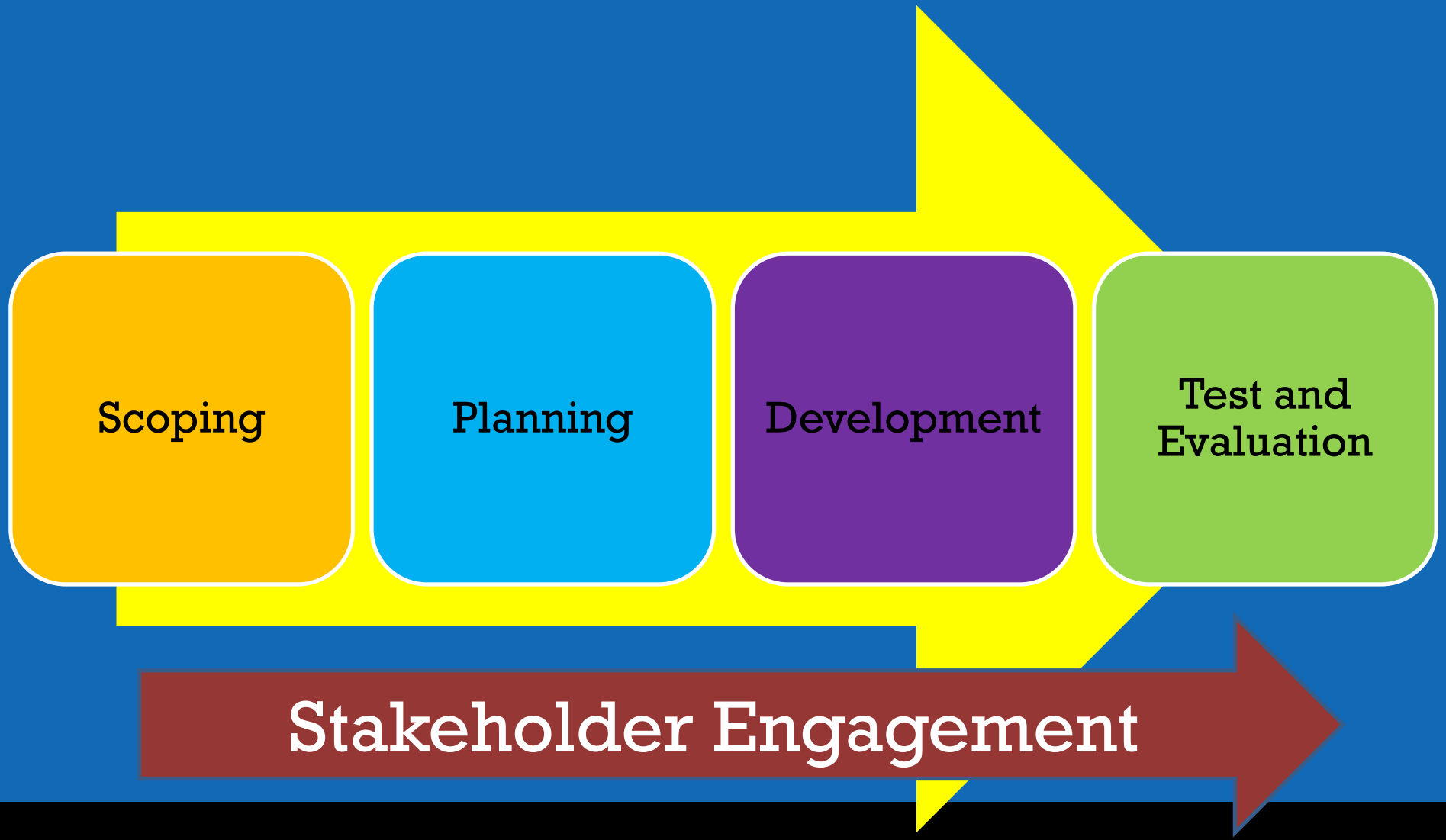
Research Process



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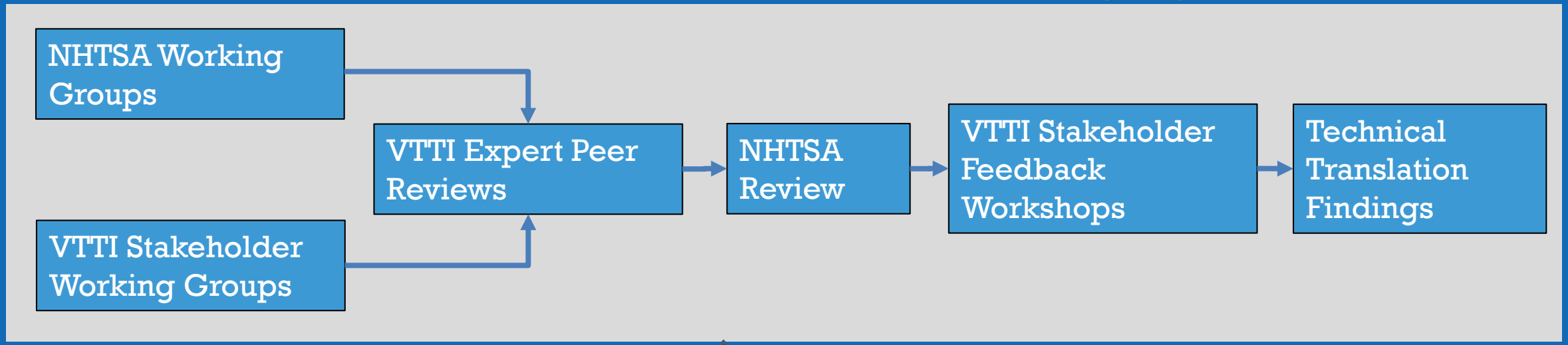
Stakeholder Engagement Process

Technical Translation Research Engagement



NHTSA Stakeholder Outreach

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Category	Vehicle Feature
Entry/Egress	Conventional Doors
	Unconventional Doors
External Communication	Auditory Indicator
	Exterior Illumination
	Stop Lamp
	Taillamps
	Turn Signals
	Wireless Intent Communication
Seating Configuration & Occupant Protection	Conventional Seating
	Unconventional Seating
User Communication	Mounted Displays (Outside View/Media)
	Panic Button (ICE) (Voluntary)
	Portable Device Destination Input
	Portable Device User Communication
	Portable Device Window/Comfort Input
	Telltales
Vehicle Control	Accelerator/Brake Pedal
	Bidirectional Vehicle Motion
	Parking Brake System (Human Activated)
	Shifter
	Steering Wheel
Visibility	Headlamp
	Hood
	Mirror
	Rear Visibility System
	Sun Visor
	Window
	Window Defog/Defrost
	Windshield (<70% Transmissivity)
	Windshield Wiper

ADS-DV Framework

- 6 Categories/30 Features
- 4 Concept vehicles
  - Conventional
  - Transitional
  - Unconventional
  - Low-Speed Unconventional

VirginiaTech Transportation Institute
Core Team

Myra Blanco, Ph.D.
PI & Program Manager

Michelle Chaka, M.S.
Co-PI & Crash Avoidance Lead

Clay Gabler, Ph.D.
Co-PI & Crashworthiness Lead

VTTI's FMVSS Expert Group

William Hollowell, Ph.D.
Joseph Kanianthra, Ph.D.
Priya Prasad, Ph.D.
George Soodoo, M.B.A.
Kenneth Weinstein, J.D.

Research Team Members

Industry Group

GM, NISSAN

Research Institutions

Booz | Allen | Hamilton, SwRI

Test Facilities

DRI Dynamic Research, Inc., mga research corporation

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