Room C Breakout: Blanco/Weast

- Moderators: Myra Blanco and Jack Weast
- Note Takers: Simone Wilson and Ryan Wee
- Rapporteur: Kelley Coyner

Question 1: What are appropriate definitions of 'safety' in a measurement context, including whether it may be a system measure, a component measure (hardware, software, etc.), a behavior/performance measure, or some combination of these?

- Scope: Level 4+
- Avoidance of unreasonable risk in a predictable manner
  - Use ISO 26262 definition as a starting point, but the standard needs to be expanded to ADS
- ODD based
- The measurement should be at the system and behavior level

Question 2: Is there a need for widely-adoptable measurement methods for ADS-equipped vehicle safety? Are there risks in not pursuing such methods? If so, what are some examples?

- Yes, but it should be ODD based
- National level framework
  - Consider regional needs

Question 3: What are possible safety measurement methods (simulation, test track, on-road, etc.)? What are possible safety metrics (miles driven, pass/fail vs. formal model, etc.)?

- Methods and metrics should be ODD-based
- Methods
  - Public Assurance: Visible and measurable tests (test tracks and on-road)
  - Simulation: Development Tool vs Safety-Assessment
- Metrics
  - Develop a high level safety goal
  - Establish a criteria
  - Criteria should have a set of valid metrics
  - Metrics will be connected to a method

Question 3

- **Step 1 - Binary Test**: **Basic Driving Metrics** (**Use only portions based on the ODD**)
  - Use similar metrics to the state regulated testing (e.g., Stoplight, Stop sign)
  - The procedure should be clearly specify (e.g., if vehicle ODD includes nighttime it should be able to perform the given task at night and day)
- **Step 2 - Exercise the ODD Safety Operator**
  - Workout Routines: Setup by ODD and ensure that tasks the ADS will encounter could be responded to (consider OEDR, Failure, etc. see Testable Cases framework)

Question 4: Are there emerging best-practices around pre-deployment safety measurement methods? Around post-deployment measurement methods? (including the methods and metrics described above).

- Pre-Deployment Methods Best Practice
  - Include information for the public, this could be done with a tool similar to the VSSA
    - The information needed is housed by the organization that publishes the VSSA-type document
  - Collaboration on Testable Case Framework (NHTSA) and scenarios as a starting point
  - On-road testing with a Safety Operator
- Post-Deployment
  - ODD-Based crash and infractions database
  - “How’s my Driving?” Consumer incident-based database

Question 5: Should measurement of human response to ADS-equipped vehicle safety be a part of the calculation and, if so, in what way?

- Outside of the scope of our discussion
  - Fallback Ready User (L3)
- This is not needed for non-passenger vehicles (freight, goods only vehicles)
- Occupant request to terminate ride (L4+ Features Engaged)
  - When occupant requests control it engages into a Minimal Risk Condition process
  - Human Outside of the Vehicle of Interest (VRU)
  - This will be based on the safe definition of predictable avoidance of minimal risk design

Question 6: What are possible next steps?

- Other topics that might need further discussion
  - What is the role of the infrastructure?
  - Data/Performance
    - What type of data is relevant for pre/post-deployments?
    - Wants vs Needs
    - Who owns this data?
    - Who has access to the data (e.g., law enforcement)?
  - Metrics
    - Identify the metrics appropriate for a given set of criteria
    - How to validate those metrics?
  - Delineate guidance of what is the scope of this next set of metrics
    - Producer/Manufacturer: Self-certification type assessments
    - Government: Would FMVSS-type compliance verification happen in a similar?
    - One-time vs Continuous: Which metrics will fall under each of these categories. The safety performance could potentially be continuously measured. Define what falls under each metric

Question 6: What are possible next steps?

- Other topics that might need further discussion (cont.)
  - Map of other activities/standards to avoid duplication
  - Map existing metrics from VSSA and research
  - How to define a near-miss/crash?
  - Look at pre/post-crash assessment landscape
  - Look at what are the simulation state of the art and benefits/limitations
- How we get the framework developed
  - Reasonable time for this development?