Method

Toward a better understanding of the levels of driving automation, a facilitated collaboration session was conducted with subject matter experts from MITRE, the Insurance Institute for Highway Safety (IIHS), and the National Highway Traffic Safety Administration (NHTSA). The purpose of this session was to create a “meta-research” exchange to assess the engineering efficacy of using levels of vehicle autonomy for developing performance and design parameters, operating standards, and safety control mechanisms for automated driving systems. Two questions were posed to the group to generate thoughts and ideas:

• “Level 3 Autonomy – On the Path or a Fool’s Errand?” Why or why not?
• “What is known; what still needs to be learned?”

Findings

For all practical purposes, there are arguably two categories of automation —

1. no automation of driving tasks and
2. some automation autonomy to some degree based on the:
   • human task(s) to be performed automation,
   • environmental context within which they are to be performed, and
   • degree and the way a human is to perform oversight and control of the automation function.

This second category carries with it too many potential variations to meaningfully parse into discrete levels. The empirically-based consensus of the group was that while SAE autonomy levels might be useful for framing informal discussions regarding general characteristics of automated driving systems, they do not provide sufficiently meaningful distinctions for engineering purposes.

There may be operational safety risks associated with automated driving tasks where the human needs to actively monitor or be prepared to assume control even with some warning due to complacency, miscalibrated trust, skill degradation, and loss of situational awareness.

Conclusion

Current research strongly supports movement away from considerations of autonomy-level definitions, as they tend to be overly technology-centric; empirical research suggests focus should be on human-machine teaming scenarios specifically aligned to defined operational purposes or missions.