

PERFORMANCE-BASED PLANNING FOR CONNECTED AND AUTOMATED VEHICLES

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Connected and automated vehicles are coming fast, along with important challenges for planners. This presentation will sort out the connections (and distinctions) between “connected” and “automated” vehicles, and offer suggestions about how to handle the specific needs of each technology in an effective performance-based planning process.

Vehicle-to-vehicle and vehicle-to-infrastructure technologies have the potential to deliver important safety, mobility and environmental benefits. USDOT is offering many technical resources to encourage and facilitate the installation of connected infrastructure. At the same time, numerous companies are developing and deploying various levels of vehicle automation, and fully autonomous vehicles are moving from the laboratory to public highways. Significant shifts in travel behavior may result as these technologies mature, with important implications for what investments should best be made in the future.

Unfortunately, there is very little “real world” data to extrapolate from as we attempt to determine whether supportive investments will be relevant or useful, when such investments should be made (especially to support autonomous vehicles), or how to quantify the magnitude of benefits or the time frame in which they might be realized. The complex and uncertain future presents a major planning challenge.

Laboratory and limited field tests have demonstrated specific potential benefits from connected vehicle infrastructure investment, and these investments could deliver benefits rapidly as more and more vehicles are equipped with compatible technology. On the other hand, fully automated vehicles, heavily under development by auto manufacturers and information technology firms, are highly visible, but the ramifications of their widespread deployment are poorly understood. They may have few consequences (simply delivering an easier and safer way to drive). But they could also have potentially revolutionary implications for the transportation system as a whole, by changing how we provide transit or taxi services, how we manage parking requirements (and “zero occupancy” cars cruising around as they wait for their next passenger), or perhaps even how many private vehicles households need to maintain. The good news is that we probably don’t need to make radical changes to our plans in the short run. The bad news is that we may be called upon to address unexpected emerging trends in a big hurry later on.

Fortunately, there are planning tools available to help navigate these challenges successfully. In particular, most agencies can benefit by systematically employing a performance-based process to set goals, measure progress, and adjust plans as new data become available. The aim is to develop a comprehensive and realistic vision of the future transportation system and revisit it regularly as new information becomes available. Establishing specific planning goals based on community values and visioning, identifying effective performance measures, and gathering sufficient data will equip planning agencies to evaluate emerging technologies and respond promptly to new developments.

Such a process is not just beneficial for handling vehicle automation. By expanding the limited set of mobility performance measures that have historically been applied to highway and transit planning, and using them to stay abreast of system performance as new technology arrives and new travel behavior emerges, planners will be well-equipped to approach the uncertain future with confidence. No one today can precisely identify everything that needs to happen to maximize the benefits of connected and automated vehicle technology, but by establishing an effective and agile planning process, agencies will be able to make the best and most timely decisions as new challenges emerge.