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Planning for Emerging Technology

THE GOOD AND BAD NEWS ON INCORPORATING AUTOMATED AND CONNECTED VEHICLES IN
SMALL- AND MEDIUM-SIZED COMMUNITIES

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According to Morgan Stanley, complete autonomous capability is expected to be available by 2022, followed by massive market penetration as rapidly as 2026, and the vehicles we know today entirely extinct in another 20 years thereafter (one fleet generation). While this is one particularly optimistic estimate (of many), the exact impact and timeline for implementation of partially or fully automated and connected vehicles greatly influences planning decisions today.

Regardless of expected adoption horizons, planners in small and medium sized communities need to pay close attention to the technology, adapt current modeling and traffic projection analysis to potential changes in activity and land use, start thinking about local regulations (particularly on-site parking requirements and access points) that can and will be altered by new technologies, and develop an understanding of the capital investments that could facilitate adoption of these new technologies. By drawing from a variety of existing planning efforts, this paper provides information that planners need to develop more flexible projects insulated from some of the uncertainty around the timing and impacts of self-driving cars. Such investments that include shifts from infrastructure-heavy projects with a long lifespan to shorter term, immediate impacts may be higher priorities under this alternative future.

Many benefits can be realized with the move to improved vehicle technology. While safety and productivity top the consumer lists, a small community could have narrower streets because parking spots are less necessary (reducing the costs of system capacity expansions). Transit systems can become more personalized and less reliant on set operating schedules, increasing the mobility of citizens.

As with any significant technological change, there are winners and losers. The former typically outweigh the latter, but the potential wealth-transferring impacts are as important for smaller communities to understand as the benefits. For example, small communities could suffer tremendously as professional driving positions are reduced; in many states the largest number of employees statewide are professional drivers -- trucking, delivery, transit, shuttles, taxi, and buses. As a result of automation, millions more jobs may be at risk for those who depend on truck drivers. In smaller areas, entire communities depend on drivers in more rural areas for lodging, fuel, meals, and auto services. With any amount of reduced consumer spending, these local economies will shrink. At the same time, smaller community residents may benefit from simpler commutes to larger employment areas, enhanced housing opportunities, changes to the definition of work schedules and flexibility, the aforementioned reduction in infrastructure costs, and a host of other positive influences.

This paper discusses these issues and provides easy to understand definitions for connected, automated, and connected-automated vehicle technology and also provides basic overviews on how these different, but interrelated technologies work. The advantages and shortcomings of each are defined through a series of illustrations and case studies. A series of checklists and basic guides for incorporating technology advances in small and medium sized community planning efforts (including pedestrian plans, urban core redevelopment plans, transit development plans, and several other standalone planning exercises) is provided. The implementation and planning influences and expected horizons are also discussed. These observations all pull heavily from the lessons derived from ongoing work of the Federal Highway Administration, its Connected Vehicle Pilot program, and activities in several larger regional planning areas.