

Local Climate Action Planning as a Tool to Harness the Greenhouse Gas Emissions Mitigation and Equity Potential of Autonomous Vehicles and On-demand Mobility

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This report identifies opportunities for how cities can use climate action plans (CAPs) to ensure that on-demand mobility and autonomous vehicles (AVs) help reduce, rather than increase, greenhouse gas (GHG) emissions, vehicle miles traveled (VMT), and/or inequitable impacts from the transportation system. The overarching question answered by this report is: how can local governments in California use CAPs to harness the GHG emissions reduction and mobility equity potential of on-demand mobility and AVs?

Study Methods

A three-pronged research strategy was employed to answer the research question involving: (1) an analysis of the current literature on on-demand mobility and AVs; (2) a systematic content analysis of 23 CAPs and general plans developed by municipalities in California; and (3) a cross-comparison of findings from the literature and content analysis of plans to identify opportunities for

GHG emissions reduction and mobility equity through adoption of on-demand mobility and AVs.

Summary of Major Findings

1. Cities should consider synergies between autonomous vehicles (AVs) and on-demand mobility during policy and planning discussions about either one. Synergies between AVs and on-demand mobility can help amplify adoption as well as benefits of both while reducing the risk of negative environmental or social impacts. For example, AVs can boost carsharing by eliminating the need for someone to travel to a carsharing facility to access available vehicles, as well as by improving safety and convenience. If AVs are shared and used as a mobility service, concerns about increased traffic, VMT, and, consequently, GHG emissions are significantly reduced. Shared AVs (or SAVs) are also more likely to be accessible to a wider range of users making their widespread adoption possible.

2. Maximizing the environmental and social benefits of AVs and on-demand mobility requires proactive and progressive planning; yet, most cities are lagging behind in this area. A comparison of findings from the literature and analysis of municipal CAPs and general plans shows that the environmental and social benefits of AVs and on-demand mobility will not be realized without a comprehensive strategic vision about what an ideal transportation system should look like, and what steps should communities take to get there. Nevertheless, one clear finding was that few cities were comprehensively planning to integrate AVs and on-demand mobility as tools to achieve climate and equity objectives. Unsurprisingly, the more recent CAPs were more likely to include policy measures related to AVs and on-demand mobility. This reflects the importance of regularly updating CAPs.

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3. Municipal CAPs and general plans in California have adopted several strategies relevant to AVs and on-demand mobility. Since several common TDM strategies, such as programs to encourage carpooling, are applicable to AVs and on-demand mobility, the majority of CAPs included at least a few relevant measures. Innovative measures adopted by CAPs involve measures to encourage TNCs to invest in electric vehicles; programs to promote “Mobility As A Service” or MaaS through apps that offer seamless mobility payment and booking options; and partnerships with ride-hailing companies to connect nearby residents to public transit. As expected, municipal general plans were far less likely to include explicit interventions to ensure that AVs and on-demand mobility help communities reduce GHG emissions. The few plans that did include relevant provisions, focused predominantly on bigger picture ideas, such as supporting R&D for AVs and planning for infrastructure investments and improvements.

4. Several untapped opportunities exist to harness the GHG emissions reduction and social benefits potential

of AVs and on-demand mobility. A comparison of findings from the literature review and analysis of municipal CAPs and general plans in California uncovers untapped opportunities to seize the GHG emissions reduction and social benefits of AVs and on-demand mobility.

Policy Recommendations

Local governments can harness the GHG emissions mitigation and equity potential of on-demand mobility and AVs by: (1) using CAPs as a tool to ensure equitable mobility in a driverless future; (2) providing comprehensive GHG emissions reduction roadmaps for AVs and on-demand mobility to reinforce general plan mobility goals; (3) encouraging travelers to make a long-run shift to shared use of AVs and on-demand mobility; (4) using a combination of transportation and land-use policies to prevent increasing sprawl due to deployment of AVs; (5) stressing the importance of energy efficiency and renewable energy in a driverless future; (6) identifying opportunities to link AVs and on-demand mobility to transit; and (7) incorporating planning tools that respond to the uncertainty related to deployment of AVs and extensive use of on-demand mobility.

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