



How Will Autonomous Vehicles Change Local Government Budgeting and Finance?

Benjamin Y. Clark, Ph.D.

Automobile travel is evolving fast. Transportation network companies (TNCs) like Lyft and Uber are already changing driving behavior and car ownership, and soon we'll be surfing the oncoming wave of autonomous vehicles (AVs). A growing body of research is exploring the impacts that these emerging travel modes will have on transportation networks, but fewer researchers are examining the secondary effects. In addition to changing things on the road, AVs will also reshuffle things off the road—things like city development patterns, parking demand, and land valuation—potentially leading to strains on government finances.

These findings illustrate why city officials should not wait until they're in a reactive stance, but prepare for the future of AVs with policy changes.

Using TNC's as a stand-in, Benjamin Clark of the University of Oregon examined the potential secondary effects of AVs in order to project changes in parking, curb zones, and city services. TNCs are viewed by many as a clear precursor to AVs because in many ways they operate as AVs will—it is just that right now TNCs have drivers, but will not in the future. Thus we can make some assumptions that how people use TNCs will mimic AVs in many ways.

"City officials can be proactive in shaping their cities into what they want them to be, rather than have to shape the city around what a new mode of transportation imposes on them," Clark said.

This report—the first comprehensive empirical study of the TNC/parking relationship—uses a mix of econometric modeling, cost accounting, and case studies to illustrate these projections.

REFRAMING THE CONVERSATION AROUND PARKING

What are the effects of TNCs on parking revenue? This NITC report examines these effects in the City of Seattle, as well as effects on curb space use and on-street parking occupancy levels. The Seattle case study showed that Lyft and Uber are already contributing to a decrease in parking, with its attendant impacts on city revenue. Clark uses cost accounting as a foundation for examining how the cost of government services may change over time when AVs replace drivers of government-owned vehicles. In particular, he took a closer look at how AVs could change the cost curve for municipal trash collection.

The changes are only expected to increase over time. Growth in ridership of TNCs in Seattle has averaged about 8% a month between 2013–2017.

1. If no policy change are made, parking revenue is likely to decrease by about one percent for each one thousand additional TNC trips taken.
2. With no policy changes, on-street parking occupancy will decline by about 12 percent for each additional one thousand trips.
3. Cities can use this as an opportunity to reclaim the public right-of-way for other curb uses.

Currently, most "smart parking" pricing programs aim for no more than 85 percent occupancy, which allows for a free space on every block and reduces the cost of travel time spent searching, congestion, and, ultimately, CO2 emissions. As demand decreases, rather than leaving price as the optimization mechanism, Clark suggests that cities might want to consider optimizing availability by remov-

ing some parking from the neighborhood and repurposing it for new uses of the public space.

FOUR APPROACHES TO CURB SPACE RE-USE

Flex Zones: Flexible uses of curb space that accommodate the needs of a given street. For example safe bike lanes, reliable transit lanes, curbside deliveries, passenger pick-up opportunities, green stormwater infrastructure, and small public spaces or managed parking.

Transit-Conscious Planning: Giving transit vehicles (buses, light rail, and streetcars) priority in the rights-of-way. For example, leaving a few parking spaces open near the curb for a designated “right-turn pocket” will allow buses to confidently turn and for traffic to flow as usual.

Reconfiguring Access and Loading Zones: Trucks, taxis, and TNCs cause delays in the curb lane, so negotiating those boundaries is important. Designating loading spaces at high-traffic destinations, while keeping business hours in mind, can help limit these delays.

Considering Tradeoffs: Charging people for a parking permit may seem negative at first glance, but if these permits only allow people to park in specific areas at specific times, then dense neighborhoods and downtown cores will be freed from the hectic nature of unavailable parking and frustrated drivers, making retail and business experiences more pleasant.

HOW WILL AUTOMATION IMPACT CITY SERVICES?

The research examines the impact of automation on city services through the lens of trash collection, analyzing data from a number of North Carolina cities. Looking at side-by-side comparisons of three scenarios, from most optimistic to most pessimistic, Clark offers a range of

what the fiscal impacts might be as cities have the potential to utilize AV technology for garbage collections. Results suggest that the cities which currently employ very little automation for trash collection because of street design will likely see the greatest benefits to AV advances. Automation is not new to refuse collection, but AVs have the potential to create flexibility in operations in ways that current technology does not afford.

ABOUT THE AUTHORS

This research was conducted by Benjamin Y. Clark of the School of Planning, Public Policy and Management at the University of Oregon.

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THE FULL REPORT and ONLINE RESOURCES

For more details about the study, download the full report **How Will Autonomous Vehicles Change Local Government Budgeting and Finance? A Case Study of Solid Waste, Drop-off/Pick-up Zones, and Parking** at <https://nitc.trec.pdx.edu/research/project/1174>

For other researchers looking to explore questions around parking demand, the dataset used in this project is publicly available at: https://doi.org/10.15760/TREC_datasets.03 p

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