Policy Memo

Autonomous vehicles and land use

June 11

To: Scott Haggerty, chair of governing Commission of Bay Area Metropolitan Transportation Commission

From: Shen Qu, Policy Advisor

Date: 6/11/2019

RE: How Bay Area should be planning for autonomous vehicles?

Summary

This memo is one of the series of policy analysis about autonomous vehicles for Bay Area. It trys to answer how the autonomous vehicles will affect urban land use, and What the MPO and cities should be planning to seize this opportunity and address the challenges.

Background: Explains the current and projected status of AVs.

Technology

Industry: Waymoo and others Uber and Lyft Taas

Academia (Gandia et al. 2019)

Government USDOT, Ca DMV

What are the crutial effects? What are the crutial response for land use?

Changes: Discusses how AVs could influence demand for transportation and, in turn land use. For this analysis, use both theory and research.

focus on relevant changes

(Milakis, Van Arem, and Van Wee 2017) Many substantial implications of autonomous vehicles are not considered in this memo, such as safety, liability, and etc. [riple effects]. This analysis focus on the impact on land use, wich have short-term and long-term influences. The short-term influences include che change of parking, urban design, affected by travel demand and behavior

The long-term influences include the reconstructure of urban forms and spatial distributions.

essence

Four stage

Theory: bid-rent theroy, utility maximize.

Research: Identifies the benefits and costs of these possible outcomes.

focus on Characteristic:

cut off labor cost,

round-the-clock services.

full ridesharing by realtime matching

Time cost (Singleton 2019)

Methodology

high risk in use sufficient principle, and likelihood principle. another option is convariance principle.

Internet, Air Transport system, TNC

inference:

Behavior and land use (Soteropoulos, Berger, and Ciari 2019)

(Hawkins and Nurul Habib 2019)

previous reaserch had give many estimation of the change on road capacities, parking lots, curve space.

use cost and transaction costs - full match

deals fail

The short-term Respose

(Legacy et al. 2019)

Presents policy and planning options for mitigating or otherwise addressing the possible land use effects.

designating pilot area

housing,

parking,

urban design

The strategic planning

long-term effects (Milakis 2019)

Discusses how the MPO and cities may need alter the tools and analyses they use to consider AVs.

Zoning, Division, and partion, not uniform

Conclusion

overestimated and under estimate

from link to node

CA should play a leading role. responsibility

Notes

References

Gandia, Rodrigo Marçal, Fabio Antonialli, Bruna Habib Cavazza, Arthur Miranda Neto, Danilo Alves de Lima, Joel Yutaka Sugano, Isabelle Nicolai, and Andre Luiz Zambalde. 2019. "Autonomous Vehicles: Scientometric and Bibliometric Review." *Transport Reviews* 39 (1). Taylor & Francis: 9–28. https://doi.org/10.1080/01441647.2018.1518937.

Hawkins, Jason, and Khandker Nurul Habib. 2019. "Integrated Models of Land Use and Transportation for the Autonomous Vehicle Revolution." *Transport Reviews* 39 (1). Taylor & Francis: 66–83. https://doi.org/10.1080/01441647.2018.1449033.

Legacy, Crystal, David Ashmore, Jan Scheurer, John Stone, and Carey Curtis. 2019. "Planning the Driverless City." *Transport Reviews* 39 (1). Taylor & Francis: 84–102. https://doi.org/10.1080/01441647.2018.1466835.

Milakis, Dimitris. 2019. "Long-Term Implications of Automated Vehicles: An Introduction." Taylor & Francis. https://doi.org/10.1080/01441647.2019.1545286.

Milakis, Dimitris, Bart Van Arem, and Bert Van Wee. 2017. "Policy and Society Related Implications of Automated Driving: A Review of Literature and Directions for Future Research." *Journal of Intelligent Transportation Systems* 21 (4). Taylor & Francis: 324–48. https://doi.org/10.1080/15472450.2017.1291351.

Singleton, Patrick A. 2019. "Discussing the 'Positive Utilities' of Autonomous Vehicles: Will Travellers Really Use Their Time Productively?" *Transport Reviews* 39 (1). Taylor & Francis: 50–65. https://doi.org/10.1080/01441647.2018.1470584.

Soteropoulos, Aggelos, Martin Berger, and Francesco Ciari. 2019. "Impacts of Automated Vehicles on Travel Behaviour and Land Use: An International Review of Modelling Studies." *Transport Reviews* 39 (1). Taylor & Francis: 29–49. https://doi.org/10.1080/01441647.2018.1523253.