Poster List

1. **The Evolution, Usage, Trip Pattern and VMT Impact of Taxis and Ridesourcing Services by Xiatian (Summer) Wu**

Given the rapid adoption of ridesourcing services (RS), it is critical for transportation planner and policymakers to understand their impacts and keep policies up to date. This study contributes to the literature by using representative samples captured in the 2001, 2009 and 2017 National Household Travel Surveys to explore how taxis and ridesourcing (T/R) services have evolved and shaped people's travel behavior pre- and post-disruption at the US national level. It characterizes and visualizes trip purposes and asymmetries in demand for T/R services in trip and tour level. It shows that RS has greatly increased the demand for flexible and optional activities. Tours involving T/R grew from 0.4% of all tours in 2009 to 1% of all tours in 2017. In 2017, one-third of all tours containing T/R also included transit. These results point to a complicated relationship between car ownership, mode choice, and T/R use, with T/R both complementing and substituting for public transportation and active travel. Moreover, a propensity score matching method was implemented to match RS non-users, occasional users, and frequent users in terms of observable sociodemographic traits. The results suggest car owners who become frequent RS users generate less VMT, but those who only become occasional users actually generate more VMT. Moreover, though unsurprisingly, increasing RS use uniformly increases VMT generation among those without prior access to cars. We estimate that overall, RS generated a net increase of 3.6 million daily VMT, or 1.3 billion annual VMT, compared to a case in which all NHTS 2017 respondents were non-users of RS.

2. **Equitable Optimal Location of Bikeshare Stations: A Case Study in Chicago by Xiaodong Qian**

Bikeshare systems have attracted great research interest ranging from bikeshare planning analyses to operational improvements (e.g., rebalance or station optimization). However, research considering equity issues in the operations of these systems is still lacking. To fill this research gap, this study developed an optimization model to find the optimal location of bikeshare stations addressing equity considerations. Based on a set of candidate station locations, the model estimates the potential demand (i.e., bikeshare trip productions and attractions) and its distribution, and evaluates the performance over a set of objectives (e.g., maximization of annual revenue, accessibility improvements) to find the equitable distribution of stations. The authors developed a genetic algorithm to solve the model. The study uses the Divvy bikeshare system in Chicago as a case study and compares the solutions of the model with the system's expansion (new stations added) in 2016. When selecting accessibility as the main objective, the results indicate the need to provide stations in disadvantaged areas. On the contrary, under revenue maximization, the network of stations is smaller and provides less accessibility, especially to disadvantaged communities. The results show the importance of considering accessibility or other equity constraints to develop an inclusive, equitable and sustainable transportation system.

3. **Influencing Factors and Heterogeneity in Ridership of Traditional and App-based Taxi Systems by Tho Le**

The growth of app-based taxi services has disrupted the urban taxi market. It has seen significant demand shift between the traditional and emerging app-based taxi services. This study explores the influencing factors for determining the ridership distribution of taxi services. Considering the spatial, temporal, and modal heterogeneity, we propose a mixture modeling structure of spatial lag and simultaneous equation model. A case study is designed with 6-month trip records of two traditional taxi services and one app-based taxi service in New York City. The case study provides insights on not

only the influencing factors for taxi daily ridership but also the appropriate settings for model estimation. In specific, the hypothesis testing demonstrates a method for determining the spatial weight matrix, estimation strategies for heterogeneous spatial and temporal units, and the minimum sample size required for reliable parameter estimates. Moreover, the study identifies that daily ridership is mainly influenced by number of employees, vehicle ownership, density of developed area, density of transit stations, density of parking space, bike-rack density, day of the week, and gasoline price. The empirical analyses are expected to be useful not only for researchers while developing and estimating models of taxi ridership but also for policy makers while understanding interactions between the traditional and emerging app-based taxi services.

4. **Exploring the Role of Attitude in The Acceptance of Self-Driving Shuttles by Yan Xing**

Self-driving vehicles, as a revolution in mobility, are emerging and developing rapidly. However, public attitudes toward this new unproven technology are still uncertain, however, given the promise of substantial benefits on one hand but significant disruptions to the current system on the other. Given the significant influence of attitude toward a new technology on the intention to use it, the question arises as to why some people are in favor of this technology whereas others are not. Additionally, questions about the key attitudes influencing self-driving technology acceptance, where these attitudes come from, and how they interact with each other have not yet been addressed. This study aims to explore these research questions based on survey data collected from people who live or work in the West Village (WV) area of the University of California, Davis (UCD) campus after a shared, self-driving electric, and level-4 self-driving shuttle was piloted in this area. Structural Equation Modeling (SEM) was employed to explore interactions between attitude elements. The results show that affect, the core of the concept of attitude, strongly explains the acceptance of self-driving technology. A higher level of affect could be formed by strengthening an individual's trust and confidence in self-driving technology. Additionally, trust works as an important mediator between perceived risk, usefulness, and ease of use on both affect and intention to ride self-driving vehicles. Perceived risk captured more security and functional concerns of respondents, reflecting uncertainty around current self-driving technology. The model identified important bi-directional influences between trust and affect. Significant effects of mental and physical intangibility were also shown, but each works differently on cognitive beliefs. Individuals' socio-demographic, lifestyle, and mobility characteristics also exert influences on attitude and self-driving technology acceptance.

5. **Evaluating the Costs and Distribution Structure in Last-Mile Deliveries Under Short Time-Windows by Anmol Pahwa**

The substantial growth of e-commerce in the last decade has brought along a continuous increase in last-mile operations, especially deliveries to residential areas. Although bringing prosperity for the carriers, the ever-increasing consumer demand and time sensitivity of deliveries make the last-mile more demanding and competitive. To sustain in the market, carriers optimize and update their decisions, one of which is the combination of facility location–a strategic decision–and vehicle routing, including fleet size and mix–an operational decision. These decisions result in the commonly known Location-Routing Problem (LRP). In general, there is a tradeoff between the facility location cost and operational cost. Generally, the further away the facility is from the service region, the lower the facility rental or purchase costs are (resulting in logistics sprawl in many markets); however, with delivery vehicles having to travel longer distances the operational cost increases. This paper uses Continuous Approximation (CA) techniques to model last-mile parcel delivery operations to understand the impacts of and tradeoffs between facility location, fleet characteristics and time-windows on a one-to-many last-mile delivery structure. The authors use the Los Angeles, California region as a case

study for the analyses. The results show evidence of the costs and impacts derived from the need to be sited closer to the service region under shorter delivery time-windows.

6. **The Adoption of Shared Mobility Services and Its Impacts on the Use of Public Transportation and Other Travel Modes by Grant Matson**

How is the use of public transportation changing at the time shared mobility solutions are becoming more common in urban areas? Does the use of ridehailing reduce public transit ridership, or can it be used as part of urban mobility solutions as a strategy to reduce private vehicle use? This poster builds on the California Panel Study of Emerging Transportation Trends, a longitudinal study with data collected in 2015 and 2018 in California. We focus in particular on the adoption and frequency of use of ridehailing (e.g. Uber X, Lyft Classic) and shared ridehailing (e.g. UberPOOL, Lyft Share), and discuss the impacts that their use has on the use of public transportation and other travel modes. Approximately 15% of respondents did their last Uber/Lyft trips using shared ridehailing. About half of both ridehailers and shared-ridehailers would have driven a personal car or carpooled with others if the service was not available. Ridehailing also contributes to attract passengers from taxi services as well as other modes including walking and bicycling and the use of public transportation. Shared ridehailing is found to more often replace for the use of public transportation, also due to the lower costs of these services which makes it increasingly attractive among younger travelers. Shorter trips are found to more often reduce the amount of individuals' walking and bicycling.

7. **How Automated Vehicles Affect Human Health? Simulating Travel, Safety, and CO2 Emission Impacts of Highly Automated Vehicles by Elham Pourrahmani**

This presentation evaluates the potential human health impacts from autonomous vehicles (AVs) scenarios in the the San Fracisco, Bay Area. The study concentrates on impacts derived from AVs' effects on travel demand, safety, and environmental emissions. It combines an extensive literature review about the extent of such effects, expert judgement, and results from activity-based travel modeling, to quantify the human health impacts of AVs using the Integrated Transport and Health Impacts Model (ITHIM). The results show significant opportunities for road traffic injury reductions, as well as mitigation of environmental emissions. However, reduced physical activity from the mode shift to passenger vehicles (from active travel) could increase the cases of human health issues (e.g. diabetes and lung cancer).

8. **Effects of Neighborhood Environments on Perceived Risk of Self-Driving: Evidence from the 2015 and 2017 Puget Sound Travel Surveys by Kailai Wang**

Autonomous vehicles (AVs), with an expectation of improving road safety, are closer to becoming a reality. A large number of people are still concerned about how AVs would operate in real-life driving environments. The present paper investigates the factors that affect people's views of the interactions between AVs and other road users based on a large sample from the 2015 and 2017 Puget Sound Travel Surveys. We specifically highlight the effects of the neighborhood environment and road infrastructure. We estimate a generalized ordered logit model to demonstrate the extent to which certain neighborhood environment and road infrastructure features affect individuals' safety perceptions of AVs, controlling for demographics, daily travel patterns, and general interest in riding AVs. The results reveal that designated bicycle facilities are positively associated with individuals' safety perceptions related to AVs. We find that residents from neighborhoods with more pedestrian facilities are more likely to express higher levels of concern on AVs' capabilities to react to the environment. Our results also suggest that people living in mixed-use neighborhoods are more confident in sharing the road with AVs. The findings provide useful implications for effective policy

interventions and infrastructure provisions that may affect the market penetration rates of AVs while keeping up the standards for other road users, such as bicyclists and pedestrians.

9. **Impact of Value of Travel Time Variations on the Cost of Travel in the Context of a Travel Fee by Junia Compostella**

Travel time influences the relative cost of travel choices making SOV modes seem “cheaper” and POOL modes “more expensive”. We analyze this variable in the policy context; we investigate the effects that a hypothetical "road fee" might have on the Value of Travel Time Savings (VTTS): equity effect and effect on ridesourcing providers.

10. **Adoption of Carsharing and Autonomous Shuttle in The Sustainable City, Dubai (2019) by Alimurtaza Kothawala**

The Sustainable City is a sustainable, net-zero development in Dubai inspired by the West Village Community. This research focuses on assessing transportation sustainability in the TSC with the aim to benchmark sustainable performance and also inform new mobility initiatives like electric carsharing program and the use of public transportation. Online travel surveys were used to collect travel information of residents and employees of the TSC in April 2019. In addition to their travel patterns, preferences for carsharing programs and their experience with an autonomous shuttle deployed on-campus were also collected. The poster summarizes learning from this study.

11. **Travel Patterns and Potential for Smart Transportation in Isfahan (Iran) by Niloufar Yousefi.**

Smart transportation is a new approach in transportation planning and one of the main basis for the smart cities. Regarding the importance of the subject and the present difficulties that Isfahan is confronting with in the transportation aspect, presenting the smart transportation pattern seems to be necessary for this city. The present study tries to assess and evaluate smart transportation by considering the other features of the smart cities. To express the indices that cover the smart transportation dimensions, six components including economics, government, citizens, transportation, life, and environment are considered to achieve the research aims. Each of the components have criteria and sub-criteria, and compiling the survey is designed in the sub-criteria level.