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The effects of ride-hailing companies on the taxicab industry in Las Vegas, Nevada

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A B S T R A C T

Ride-hailing, or ride-sourcing, companies continue to penetrate the growing market of transportation-for-hire services in major metropolitan cities all across the globe, both revolutionizing travel and redefining the concept of the taxicab experience. Since the fall of 2015, Las Vegas, Nevada, was added to the ever-growing list of metropolises with such ride-hailing companies (RHCs). For cities whose economies are built predominately on the foundations of tourism, questions inevitably have been raised regarding the effects that RHCs have on their respective transportation system operators, in particular, the taxicab industry. In Las Vegas, services such as Uber (Uber Technologies Inc.) and Lyft (Lyft.com) compete directly with the taxicab industry for riders within the resort corridor and across the valley. In this study, a multinomial linear regression analysis used a multi-modal, time-series travel dataset to estimate the effects of RHCs on taxicab ridership. After controlling for a number of explanatory variables, including the total number of monthly visitors, transit ridership, ride-hailing trip counts to/from the airport and several other socioeconomic indicators, the results showed that RHCs do in fact have a negative, and significant, effect on taxicab ridership. A perhaps more profound and counterintuitive finding however was that transit ridership along the resort corridor actually complements (rather than competes with) taxi ridership; this could have significant implications moving forward.

1. Introduction

Ride-hailing also known as ride-sourcing, ride-sharing, vehicle-for-hire, or on-demand ride services – is the act of requesting a ride from a private passenger vehicle by means of the portal of a web application (or *app*) from a handheld smartphone. This type of system is set up and managed by ride-hailing companies (RHCs), such as Uber, Lyft, or DiDi. Ultimately, these RHCs serve as the broker between the ride requestor and the driver, who operates and maintains his/her own private vehicle; services include assigning an available driver to the requested trip and handling all electronic charges and transaction fees. Ride-hailing services have grown exponentially in popularity over the past four years, providing service to a majority of metropolitan regions spanning over 66 countries. Almost overnight, the service has instantaneously redefined the taxicab industry with its user-friendly platform, which includes added convenience, ease of payment, complete door-to-door service, minimal wait times, and comparatively low out-of-pocket cost.

It would be disingenuous, however, not to mention the magnitude of controversy that has surrounded RHCs since their initial conception, and the ongoing litigation battles among taxicab unions, state lawmakers, county commissions, and local city councils

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regarding regulatory statutes imposed on ride-sourcing companies. The opposition argues that such a service is no different from taxis, and that RHCs should be held to the same operating requirements and regulations as taxi companies, including licensing, fare regulation, and vehicle and driver safety standards in order to maintain an equal and fair playing field. Considering that this particular issue regarding RHCs already has been closely examined (Schaller, 2007; Kahn, 1988; Rayle et al., 2014; Cohen and Shaheen, 2016; Shaheen et al., 2016), this study attempts to avoid any further dialogue concerning the legality of ride-hailing services. Instead, this study focuses on the effects that such new service may have on the competitors of RHCs, specifically the taxicab industry in Las Vegas, Nevada.

The origins of ride-hailing can date back to as early as the 1950s, when car-sharing clubs first emerged in the Unites States (Chan and Shaheen, 2012). By the 1990s, when real-time, ride-sourcing projects failed prematurely due to the lack of a widespread presence of a worldwide communications web network, or telecommunication platforms for that matter (i.e., the internet and smartphones). In 2011, Uber, formally called the UberCab (Uber Technologies, Inc.), became the first commercialized ride-hailing service in the San Francisco Bay area, followed by Lyft (Lyft Company) in the summer of 2012; these two services officially introduced direct competition to the traditional ride-hailing services provided by taxis.

Currently, both services (Uber and Lyft) are available in Las Vegas, Nevada, and can be identified easily by the sticker with the company's logo attached to the inside of the front windshield of the vehicle. In other parts of the world, such RHCs may have limited access or are restricted altogether from entering airport pick-up and drop-off terminals, including the potential of being assessed a fee. However, Uber and Lyft vehicles are allowed to enter the departures and arrivals terminals at McCarran International Airport in Las Vegas, and are assigned to designated areas therein, which have signage indicating where within the terminals ride-hailing services may drop off or pick up passengers.

Today, the names Uber and Lyft essentially have become household names. The sudden and rapid growth of these ride-hailing services presents transportation professionals and academic scholars with new opportunities and challenges in areas of scientific analysis that have yet to be explored from planning, engineering, and policy perspectives. Some of the important questions that may be hypothetically posed include the following.

1. From the perspective of the taxicab industry, has ridership decreased significantly? And by what magnitude?
2. What modifications and/or enhancement to service, if any, can the taxicab industry make in order to successfully compete for riders?
3. Have RHCs had negative or positive effects on transit ridership and/or revenue? Whether or not these systems actually complement one another, or compete for ridership, has yet to be systematically determined and collectively agreed upon.
4. From the traffic engineer's standpoint, did Uber and Lyft increase, decrease, or have no significant effect on average daily traffic volumes?
5. What about vehicle-miles-traveled (VMT)? Is there an overall net reduction or increase in observed VMT as a result of RHCs?

Although the primary objective of this study is to measure the effects that ride-hailing services have had on the taxicab industry since being introduced to Las Vegas in the fall of 2015 (question 1 above), the four remaining questions will be further elaborated on in the final analysis of the results and conclusions sections. This was done by controlling a number of measured transportation variables. Using a comprehensive set of time-series data – including monthly transit ridership, average daily highway traffic counts, airport visitor volumes AND ride-hailing counts to/from the airport – along with several other economic explanatory indicators, a multinomial, linear regression model was developed that treated taxicab ridership in Las Vegas as the dependent variable. The ride-hailing trip volumes were collected at the airport thanks in part to the region's legislative policy that requires every RHC driver to register with the city by purchasing an operating license (which is equipped with a unique electronic identifier).

With the observed growing popularity, in conjunction with the continuous exponential evolution of ride-hailing services across the nation, it is vital for transportation agencies and policy makers alike to fully understand, from all angles, the observed effects and implications to the transport system as a result of newly added operators. This study can help assist decision makers in ascertaining even further the extent of the ride-hailing industry and some of the effects, both positive and negative, that could be expected for areas similar to Las Vegas. These include metropolitan areas and economies that receive a significant number of domestic travelers and international tourists on an annual basis.

The ensuing analysis and discussion is only the tip of the iceberg, so to speak, with regard to ride-hailing services. It is an obligation of those who have the ability to conduct such technical analyses to observe, measure, quantify, and estimate the data as well as draw objective conclusions and recommendations for those in charge of making the decisions that affect how a transportation system operates and functions.

2. Literature review

Dr. Susan Shaheen, Co-Director of the Transportation Sustainability Research Center at the University of California, Berkeley, best summarizes the current atmosphere of the ride-hailing industry by concisely labeling the movement as the 'Sharing Economy' (Transportation and Sharing Economy, 2014). With the ever-evolving car-sharing and bike-sharing markets sprouting across the globe (Shaheen et al., 2009, 2013), combined with the growing percentage of individuals who own personal smartphones, ride-hailing services enhances this Sharing Economy, by instigating an overhaul of both the public transit (Murphy, 2016) and taxicab industries (Sun and Edara, 2015; Between Public and Mobility, 2016). In an intercept survey conducted in 2014 by Shaheen et al. in the San Francisco bay area (Rayle et al., 2014), respondents were asked to report on their ride-hailing travel experiences, and the