The Expansion and Viability of Dynamic Ridesharing on a Worldwide Scale

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The National Center for Sustainable Transportation Undergraduate Fellowship Report

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A National Center for Sustainable Transportation Research Report

September 2016

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Table of Contents

Introduction ................................................................................................................................. 1
Background ................................................................................................................................. 1
Methods and Results ................................................................................................................... 1
Discussion and Conclusions ..................................................................................................... 6
References .................................................................................................................................. 9
Introduction
Dynamic ridesharing services (DRS) such as Uber and Lyft have risen rapidly in the United States during the past 7 years. The services, otherwise known as Transportation Networking Companies (TNC), connect travelers with available nearby drivers through a phone application. As a new form of transportation, TNC’s have the ability to change the way people go about short distance travel, however, it is not yet known to what extent DRS will shape transportation in the future. In a previous study, 5 colleagues and I sought to detail the viability of Uber and Lyft in the state of California to further understand the effects of TNC’s. We collected data directly through Uber and Lyft apps and websites to determine the wait times, cars available, and increase in fare calculation for 36 cities throughout the state, varying in population densities. This report is an extension of DRS in California and ventures into other parts of the world while applying similar approaches in collecting data through the TNC apps currently operating and leading in varying countries. While assessing the viability of TNC’s as an alternative form of transportation, I will also discuss the social implications tied to the rapid expansion of dynamic ridesharing.

Background
My previous work with the DRS research in California showed a clear correspondence between population density and the availability of the services. Although the sample size of 36 cities is small, the cities were specifically chosen to vary in location, and population density. Overall, the research showed high density cities such as San Francisco, Los Angeles, and San Diego, had TNC cars available at virtually any time of day along with a short wait time. The study looked at the two main companies in California, Uber and Lyft, comparing them in terms of geographical availability, wait times, and number available of drivers. With both companies combined, the sample size population, one third of the total CA population, was able to access a TNC vehicle through either app. Essentially, the study found DRS services are viable in high density regions in California but are less reliable in those with smaller populations.

Since California is the pioneer of DRS services, specifically the Silicon Valley, I sought to understand the growth of these services in other parts of the world and how they would compare to their viability in California.

Methods and Results
With over 1000 data entries collected in the California study, I began my new research by running regressions to determine the relationships between the differing variables to guide what significant variables I would be looking for in other regions of the world. As shown by Figure 1 below, the average wait time in any of the 36 cities of the California study is shown to be 7.9 minutes. The following averages are those relative to the overall average wait time. Therefore, The average wait time during rush hours is 8.7 minutes, showing an
overall increase, and vice versa as the number of cars increases. Interestingly, the average wait time for Uber is 30 seconds higher than that of Lyft, likely due to higher demand from Uber customers.

Figure 1. Total Average Wait Times by Variable

I researched Uber’s worldwide expansion from its start in 2009 to date given its high demand as of June 2016 when the California DRS study was done. In 2012, three years after Uber’s launch, their services were only available in the San Francisco Bay Area and New York City area. Figure 2 illustrates Uber’s exponential growth in locations where Uber operates as of June 2016. There are over 77 countries with at least one city with Uber availability and over 500 cities total, allowing at least 40% of countries worldwide access a TNC vehicle (1). I reached out to both Uber and Lyft for data on total TNC cars, average number of rides per day, and total vehicle or passenger miles, however they were unable to release such information. With little information released to the public, I relied on information from I could access from the apps and websites.
On December 24, 2015, Uber reached 1 billion trips worldwide since it’s first ride in 2010. Only 6 months later, in June 2016, Uber reached 2 billion trips (1). The drastic doubling of total trips in a mere 6 months opposed to the first 6 years of operation depicts the rapid rise and expansion of the DRS company and customers. However, Figure 3 compares the assumed number of trips made worldwide and the trips made by Uber alone in 6 months.

Figure 3. Uber vs Total Trips During 6 Month Span (*assumed number of trips. Source: Lew Fulton; personal communication)

Uber is one of many TNC that is thriving and growing. I found the most used TNC apps by region. I focused on South America’s EasyTaxi, China’s KuaidiONE (DIdi Kuaidi), and SouthEast
Asia’s GrabTaxi apps, which are the leading apps per respective region. Europe’s leading app is Uber and Africa has TNC’s in very few cities.

- Figures 4, 5, and 6 illustrate the precise geographical availability of each of these apps as of August 2016. I created these maps by outlining the areas where a TNC could be hailed from the respective app through the direct use and information provided by the apps and websites.

![Figure 4. EasyTaxi Availability in South America](image)

![Figure 5. KuaidiONE Availability in China](image)
Additionally, I gathered the top used TNC’s per country in the respective regions, including the market shares, shown by Table 1 below.

Table 1. Market Shares of top Apps per Country in September 2015

<table>
<thead>
<tr>
<th>Country</th>
<th>App</th>
<th>MS</th>
<th>Country</th>
<th>App</th>
<th>MS</th>
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<td>1.76</td>
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<td>GrabTaxi</td>
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</table>

*Companies have merged in respective country after Sept. 2015

The inability to access India’s top apps, OlaCabs and Meru, in the United States, made information on DRS in India less available. However, Uber has a total of 31 locations in India (1), meanwhile Meru only operates in 24 of India’s busiest cities (3) and OlaCabs is India’s top TNC with the highest marketshare, as shown in Table 1, with over 450,000 drivers across 102 cities (4), making it Uber’s main competitor.
Furthermore, TNC’s appear to be partnering with fellow and competitor TNC’s to expand their services rapidly. I found that although Lyft has not expanded to various parts of the globe as Uber has, Lyft has partnered with the top TNC’s such as KuaidiONE in China, GrabTaxi in Southeast Asia, and OlaCabs in India (4). Through these partnerships, Lyft has expanded in helping fellow partners compete with Uber’s global expansion. Ultimately, most TNC’s throughout the world are competing with Uber, who is expanding rapidly, resulting in an overall expansion and growth of all TNC and users.

Discussion and Conclusions

My research consisted of tying together the overall growth of DRS, regardless of apps, with the social and economic implications of a rapidly increasing form of transportation driving travelers away from conventional taxis. I’ve created maps to illustrate where in the world one could hail a TNC vehicle. By compiling all the maps and highlighted areas, it is visibly clear that the highest populated cities have access to at least one TNC at any moment, similar to the DRS California study. Although there is more yet to come from TNC’s in the future, as of now I have determined that the use of these services are fairly accessible in any major city in the world.

The partnerships of the major TNC’s have made all the difference in the extreme growth of DRS. For example, China’s KuaidiOne (Didi Kuaidi), formerly Didi, has merged with Uber in August 2016 after failing to compete with China’s top ridesharing app. Due to this merge, Didi Kuaidi now holds “over 99% market share in China in its category” (5). Additionally, Lyft’s partnership with GrabTaxi allows users from both apps to access a vehicle in the places where both TNC’s are available. What this means is that users can travel to different parts of the world and easily access TNC vehicles wherever they go without the hassle of downloading multiple apps. However, as a result of major TNC’s such as Didi Kuaidi, Uber, Lyft, and GrabTaxi, becoming more viable, the usage of conventional taxi services decreases. The convenience of the apps, lower fares, more services, and reliability of TNC’s continue to draw people away from taxis. The lower fares are great for users but harm the business of local competitors.

With TNC’s as a new phenomenon relative to conventional taxi services, it is unclear whether they will continue to grow at the rate they have in the recent years, ultimately beating out taxis in the long run.

Although TNC’s are considered dynamic ridesharing services, though they are not yet viable as literal ridesharing, but more as a mere alternative form of transportation. As shown by Figure 3, while 2 billion trips is a huge number for TNC’s, it is insignificant in comparison to the overall worldwide trips. Perhaps with the expansion and increase in overall TNC customers, the carpooling service provided my most major TNC’s will grow to be more viable and increase actual ridesharing, and, ultimately, decrease car ownership in the future. As of now, DRS is an affordable alternative to conventional taxi services, though the current growth and expansion.
References