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# An Assessment of the Sharing Economy and Its Policy Solutions Through the Lens of Sustainability

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**An assessment of the sharing economy and its policy solutions through the  
lens of sustainability**

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In partial fulfillment of a Bachelor of Arts Degree in Environmental Analysis  
2017-18 academic year at Pomona College, Claremont, California

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## **Abstract**

*This senior thesis in environmental analysis explores the promise of sustainability of the sharing economy, its shortcomings from this positive potential, and possible policy solutions to help it reach its fullest, positive potential. At its core, the sharing economy enables shared access to goods and services that would otherwise sit in idle or underutilized capacity – popular platforms such as Uber, Lyft, Airbnb, and craigslist all fall within the sharing economy. By enabling affordable and convenient access to goods that would otherwise sit idle, the sharing economy encourages maximal use of a good that already exists rather than seeking out the production of new goods to meet demand. Unfortunately, as it grows, the sharing economy moves away from this key environmental promise because of two central challenges: first, a shift away from maximal resource use, the central pillar of its promise of sustainability, and second, negative side effects that arise from a lack of regulation of the decentralized economy. Therefore, appropriate public policy is needed to both regulate the decentralized economy to minimize negative behaviors and to encourage the positive behaviors of the sharing economy.*

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## Introduction

In the context of increasing concern for global climate change, the American model of consumption has become environmentally unsustainable – a child born in the United States will create 13 times as much environmental damage over the course of their lifetime than a child born in Brazil, 35 times more than a child born in India, and 53 times more than a child born in China (Scheer and Moss 2016). Especially for emerging and developing economies,<sup>1</sup> there is a broad understanding that they cannot afford to develop the same way the United States (or the rest of the developed world) has – it is simply too resource-intensive and environmentally-taxing. Therefore, various scholars and policymakers alike have engaged in dialogues surrounding alternative modes of economic development and activity – what alternative economic models redefine the way we consume goods and services? What does “sustainable development” look like?

The sharing economy could be one of these alternative economic models or answers to sustainable development. At its core, the sharing economy enables sharing of goods and services that would otherwise sit in idle capacity, which in theory maximizes the efficiency of resources by redefining terms of consumption and ownership (Heinrichs 2013). Various scholars define the “sharing economy” differently, making it difficult to come to a general consensus and common understanding of what the sharing economy is. For the purposes of this thesis, the sharing economy will be broadly defined as shared access to private goods and services in idle or underutilized capacity. This definition of the sharing economy builds upon three underlying principles: to tap into the idle capacity of private goods, to facilitate sharing among strangers by

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<sup>1</sup> In terms of development, the terms “emerging” and “developing” country are commonly accepted to refer to specific parts of the world; therefore, they were used to establish a common understanding of a certain kind of country. However, this rhetoric implies a larger hierarchy in the world of international development, and therefore is sometimes avoided by developmental scholars (Silver 2015). Its use here is not intended to imply any hierarchy; rather, it is intended establish a common understanding.

developing trust, and to develop a critical mass (Botsman and Rogers 2010). Additionally, shared access is granted through two types of sharing: shared use and shared ownership.

The key environmental promise of the sharing economy is the maximization of resource use and consumption on a large scale. By enabling affordable and convenient access to goods that would otherwise stand idle, the sharing economy encourages maximal use of a good that already exists rather than seeking new goods to meet demand. This resource efficiency maximization may seem trivial on a small scale, but as sharing reaches a larger scale, it could ultimately drive down overall material demand, reduce overall resource consumption, and push toward a sustainable transition (Botsman and Rogers 2010; Frenken 2017; Martin 2016). The sharing economy enables this large scale of sharing by facilitating sharing among strangers. Although sharing is not a new phenomenon and dates back to prehistoric times, sharing has historically occurred only among friends, family, and members of a trusted community and on small, localized scales (Belk 2010). The advent of the Internet and the rise of the sharing economy enables sharing beyond personal networks by sharing among strangers and therefore opens up a large, positive potential for redefining patterns of consumption on an impactful scale (Belk 2014).

Unfortunately, it is unclear if the sharing economy will be able to fully live up to its potential. Because it is a relatively new phenomenon, scholarly work on the sharing economy is still being conducted, and very few works to date have been able to fully assess the sharing economy. Nevertheless, as the sharing economy increasingly enters the spotlight as the subject of controversy due to allegations of unsafe and exploitive working environments, critical questions about its trajectory and implications for sustainable development as well as its real-world impacts must be asked. How are resource-sharing platforms such as Uber, Lyft, and Airbnb

transforming the way we move and live? Should Airbnb hosts face the same regulations as a hotel? How can the government regulate a self-employed taxi system like Uber and Lyft, in which drivers are considered independent contractors and use their own personal cars?

As the sharing economy grows and expands, it is unclear if its efforts to tap into idle capacity will ultimately be able to deliver on its promise of maximal resource use. Ride-sharing platforms such as Uber and Lyft can be considered to be more responsive taxi systems whose focus is to match user demand with rides, not to maximize use of an excess supply of idle cars. Therefore, while they could have positive impacts on private car ownership rates, they may not deliver a full promise of sustainability depending on how one frames ride-sharing services. Additionally, these ride-sharing platforms are innovative and attractive because they increase efficiency in transportation experiences by making the system more responsive to users needs. However, the attractiveness of these ride-sharing platforms potentially places public transportation systems at risk by potentially having a substitution effect on public transit rather than a complementary one. By providing a competitive alternative, the transportation sharing economy could detract from maximum resource efficiency by encouraging automobile use over more efficient modes such as buses and rail systems.

A similar phenomenon is emerging in the accommodation sector. Airbnb and other accommodation-sharing platforms have an attractive sustainable promise of facilitating the use of temporarily empty rooms or houses by guests that otherwise would have stayed in a hotel. By shifting this demand away from hotel structures, temporary Airbnbs could decrease the number of new hotels that need to be built to begin with in the long run. By maximizing the use of preexisting structures, these temporary rentals save resources associated with construction and operation of hotels. However, some Airbnbs have been so lucrative and popular that hosts are

beginning to designate entire properties as permanent rental homes specifically for Airbnb users, or in essence, a small-scale, independently-run hotel. These “permanent” Airbnbs could detract from the temporary Airbnb rentals that are actually following through with their promise of maximal resource use, thereby moving the sharing economy away from its positive potential of maximal resource efficiency rather than toward it. Additionally, Airbnb is attractive to users because it can sometimes be a more affordable lodging option; however, this increased affordability might encourage travelers to take trips they might not have otherwise, increasing the carbon footprint of travel (“New Study: Airbnb Community Generates \$312 Million in Economic Impact in LA” 2014).

Furthermore, the sharing economy in its implementation today is leading to unintended, negative effects due to a lack of regulation of the decentralized economy. The sharing economy challenges the dominant economy by providing a decentralized alternate – people now have the option to stay in someone else’s home rather than in a global, name brand hotel (Martin 2016). Unfortunately, this decentralized economy can be dangerous if unregulated – the negative pressures and side effects are most visible in the labor and housing markets (Slee 2015). For example, some critics have argued that the decentralization of the sharing economy places workers at risk because it minimizes historic labor protections. Because sharing economy platforms do not directly hire any of their workers, the implication of having “independent contractors” in the sharing economy absolves companies of any legal responsibility toward their employees and therefore to labor rights (Chen 2015). Additionally, the absence of formalized rules and protections have also placed users at risk – personal anecdotes of racial discrimination while using various sharing economy platforms have raised questions of equal access and treatment within the sharing economy (Frenken and Schor 2017). Because many of these impacts

arise from an unregulated, decentralized economy, stronger regulation of the sharing economy could solve for these negative implications.

This thesis will analyze these two central challenges of the sharing economy: can it live up to its full, positive potential as a sustainable development solution, and how can the negative side effects in its implementation be reduced or even eliminated? It is divided into three main sections: the first chapter is an exploration of the history and present state of the sharing economy, as well as a contextualization of sharing economy within dialogues about sustainable development, race relations and tensions, workers' rights, and gentrification. The second chapter will focus on the complex challenges of the sharing economy, relying on case studies of the transportation and accommodation sectors specifically to illustrate the two central challenges. Finally, the third chapter will provide an overview of various policy approaches and solutions to the sharing economy's challenges.

## History and Context

Scientists are overwhelmingly in agreement that human overconsumption drives global climate change, evidenced by sharp increases in greenhouse gas emissions as well as excess waste and material pollution (Bindoff et al. 2013; Ivanova et al. 2016; Pearce 2014). The production byproducts of material goods have contaminated our water, soil, and air, often at the expense of marginalized communities both within the United States and on a global scale. Furthermore, the tendency to just throw things out when they are no longer needed, in conjunction with adequate waste management infrastructure, contributes to a large waste problem, leaving mountains of landfill full of perfectly usable goods, floating islands of plastic and waste in the ocean, and literal tons of garbage being exported out of the United States to other countries (Botsman and Rogers 2010). This culpability of overconsumption is not equally distributed – a child born in the United States will disproportionately cause much more environmental damage over the course of their lifetime than a child born in Brazil, India, or China (Scheer and Moss 2016). Although the rest of the world dreams of achieving an American standard of living, it is becoming increasingly clear that our level of consumption is environmentally unsustainable, and the need for a new economic model of sustainable development has emerged.

The need for a new economic model for sustainable development is potentially answered by the sharing economy. The sharing economy is built upon three underlying principles: to tap into the idle capacity of private, underutilized goods, to facilitate sharing among strangers by building trust, and to develop a critical mass (Botsman and Rogers 2010). Humans have shared resources with each other dating back to prehistoric times; however, it was not until the rise of new-age technology and the Internet that sharing was able to expand to larger scales.

Historically, people only shared with trusted members of their own community – friends and family – but through the sharing economy, strangers now borrow, lend, rent, sell, and gift things to each other on a whole new level (Belk 2010, 2014). Considering the sustainable promise of the sharing economy, and in light of increasing concern for our environment, the sharing economy emerges as a promising sustainable development solution.

It is important to contextualize the word “sustainable” and to clarify what sustainability means for this thesis; while sustainability is often traditionally thought to only apply to environmental and ecological issues, this analysis relies on the theoretical framework of the triple bottom line within sustainability. The triple bottom line framework examines three different legs of sustainability: social, environmental, and economic – it is sometimes referred to as the 3 Ps for people, planet, and profit (Slaper and Hall 2011). In understanding the complex interdependencies and dynamics between society, the economy, and the planet, the triple bottom line takes the stance that development ought to be ecologically sustainable, socially equitable, and economically sound. Therefore, any development approaches cannot be labeled as sustainable simply based on its ecological impact; it ought to also uphold social and economic sustainability (Hacking and Guthrie 2008). Although this is formally a senior thesis in environmental analysis, the social and economic impacts as well as the environmental impacts of the sharing economy will be considered to better understand the potential for sustainability through all three lenses.

Sharing within the sharing economy occurs across two media: shared use and shared ownership. Some authors have included shared lifestyles as a part of the sharing economy – for example, cooperative living or shared workspaces (Botsman and Rogers 2010). However, this thesis will not include cooperative lifestyles in its assessment of the sharing economy, because

cooperative lifestyles face different challenges and caveats from the sharing of goods and services, and therefore require different policy responses. Therefore, it is best addressed in a separate analysis of the problems and potential solutions.

Shared use, also known as collaborative consumption, can be thought of as coterminous sharing of goods – although one party ultimately holds permanent ownership over the good or service, many different users can be granted temporary access to the good at different times. For example, say Robert owns a car that he does not use often, and Amanda does not have own a car but needs to get from point A to point B. A car-sharing platform could facilitate the shared use of Robert’s car – Amanda could use Robert’s car to reach her destination when Robert is not using it. This could occur without any cost to Robert, since he was not using his car to begin with, and in fact, presents Robert with the opportunity to benefit slightly by receiving some compensation for lending his car to Amanda. As this network grows, eventually a person trying to get from point A to point B may not see a need to own a personal car; instead, (s)he may rely on the sharing economy to reach his/her destination. This kind of sharing emphasizes use over ownership, and redefines the relationship between consumers and the goods and services they consume (“Peer-to-Peer Rental: The Rise of the Sharing Economy” 2013).

Real world examples of shared use include ride-sharing, car- and bicycle-sharing, accommodation-sharing, and peer-to-peer renting. Platforms such as Uber and Lyft have dominated the ride-sharing sector, in which car owners drive personal cars around like taxis and share the seats in their car to other riders. Alternatively, through ride-sharing services such as Car2Go, GetAround, and Zipcar, users can share entire cars, mimicking the traditional car rental sector. Cities across the United States and the world such as Washington D.C. and Amsterdam have also seen incredible success with bicycle-sharing programs, which similarly allows users to

borrow entire bicycles on temporary loan (Baumgaertner 2017). Coterminous sharing can extend beyond transportation – platforms such as Airbnb and Couchsurfing have enabled the sharing of accommodations and residences, and platforms such as Zilok facilitate peer-to-peer loans of different kinds of goods, from tools and equipment to wedding rentals.

Shared ownership, on the other hand, is more of a sequential sharing of goods – access to private goods in idle capacity is granted permanently by complete transfer of ownership. For example, say that Holly purchased a stand mixer a few years ago in hopes of trying her hand at baking. Unfortunately, after trying to make a few cakes, Holly realized she is an incredibly poor baker, and her stand mixer idly sits in the back of her cupboard in her kitchen. Through the sharing economy, Holly could sell her stand mixer to David, an aspiring pastry chef with dreams of opening a bakery in the near future. David is likely able to purchase the stand mixer at a lower cost than buying the machine new, and Holly is able to make some of her money back, providing an incentive for both parties. Additionally, the stand mixer that once sat idle in the cupboard now is being put to use, thereby maximizing the use of the good.

Sequential sharing relies on redistribution networks, and users can transfer ownership either in exchange for money (or other goods) or for free. If there is no compensation, this form of one-sided sharing is more commonly referred to as the gift economy, but because the defining aspect is the sharing of ownership regardless of compensation, the sharing economy still encompasses the gift economy. Platforms such as craigslist, Freecycle, and Poshmark facilitate peer-to-peer exchanges, while thrift stores (such as Goodwill or thredUP) place an intermediary between the different owners. This form of sharing has existed for a long time, but the introduction of information technology has enabled this kind of sharing on a whole different scale, and has also reduced negative stigmas associated with second-hand use and ownership.

However, it is different from the circular economy because the sharing economy focuses on the use of goods rather than resources. Unlike the circular economy, which focuses on recycling resources by thinking about how to close the manufacturing loop by reusing the materials that make up existing physical goods, the sharing economy works to maximize the efficiency of that product before potentially handing it off to the circular economy for recycling. By keeping a good in use for as long as possible before it is converted into new material, less energy and resources are required – therefore, from a sustainable perspective, it is important to first keep the good in the sharing economy for as long as possible before handing it off to the circular economy.

The sharing economy's first underlying principle of idle capacity is key to its sustainable promise: by putting otherwise idle goods to use through shared use and ownership, the sharing economy combats overconsumption by encouraging maximal resource efficiency. The sharing of private goods is also a key aspect of this maximal resource use: the sharing economy works by expanding access to private goods to more public audiences. Private goods are defined as both rival and excludable, meaning that one person's consumption of the good affects another person's consumption and that it is possible to prevent someone from enjoying the benefits of the good if he/she has not paid for it ("Public Good and Private Good: Difference | Economics" 2017). The fact that goods in the sharing economy are private is what makes this maximal resource efficiency significant; because it involves goods that are rival (if Robert is using his car, Amanda cannot in that moment) and therefore traditionally only accessible to the direct owner, expanding its use during idle capacity (allowing Amanda to use Robert's car when he is not using it) makes a private good more public in use and therefore allows the good to be used to its maximum utility.

However, for the sharing economy to work smoothly, users must trust strangers and the goods they share. In order to build and facilitate trust among these users, many platforms rely on rating or review systems to create a self-regulating feedback loop and keep borrowers and lenders accountable to each other (Koopman, Mitchell, and Thierer 2014). Users also have to buy into a belief in the commons and communal responsibility to a certain extent – without trusting that other users will not exploit the shared good or service, it is difficult to ensure it will meet a certain level of quality. For the sharing economy to work smoothly, every user must agree to some sense of responsibility to the resource even if they do not personally own it, similar to Elinor Ostrom’s proposed solution of shared governance to the “tragedy of the commons” (Ostrom 1990). Therefore, the sharing economy must attempt to leverage social trust in each other and a sense of communal responsibility for users to feel confident participating.

Finally, the sharing economy relies on a critical mass to be successful – unless there are enough lenders or sellers and renters or buyers, the system will not work. The concept behind the sharing economy first gained popularity during the aftermath of the global financial crisis between 2008 and 2010 – Americans were strapped for resources and the concept of gaining access to a good without having to pay the full price tag of ownership was appealing to many middle-class consumers (“All Eyes on the Sharing Economy” 2013). Since then, the sharing economy has increasingly gained traction as Millennials shift toward more minimalistic lifestyles enabled by the shared access to goods (Marr 2016). The sharing economy in 2014 was estimated at approximately \$14 billion, with projected growth to nearly \$335 billion by 2025 (Yaraghi and Ravi 2017). Sharing economy platforms such as Uber, Lyft, and Airbnb have become household names, and the concept of sharing with strangers is no longer a radical thought but rather a mainstream practice. However, as the negative consequences of the sharing economy emerge,

public support for the sharing economy may decline and hinder growth toward this critical mass. Therefore, in order to maintain this underlying principle, it is important to carefully and critically assess the sharing economy's trajectory through all three lenses of sustainability and take the necessary actions to help it reach its fullest, positive potential.

As the challenges of the sharing economy continue to emerge with its rapid growth, regulatory bodies need to explore different policy approaches in search of the best solution. The sharing economy has been a transformative and disruptive new entrant to many traditional markets – Uber and Lyft challenge the traditional relationship between a rider and a taxi, while Airbnb redefines the ways in which visitors view accommodations and the hotel industry – and therefore provides unexpected challenges to industry regulators when negative implications arise. Many cities and local governments, such as San Francisco and Portland, have considered and tried a variety of different policy responses, ranging from bans, imposition of existing industry regulations on new entrants, and requirements for more transparent and open information sharing (Miller 2015).

The need for proper regulation is all the more important in light of the sharing economy's growth potential – the Brookings Institution estimates the sharing economy will grow from \$14 billion in 2014 to \$335 billion by 2025 (Yaraghi and Ravi 2017). As these negative consequences become increasingly apparent to the public, support for the sharing economy may be undermined – companies under public fire for many of these issues, such as Uber, have seen a real decline in demand for their services because of these impacts (LaFrance 2017; della Cava 2017). Unless these negative impacts are resolved or mitigated, the sharing economy may not be able to reach a level of growth needed for critical mass. Therefore, it is imperative that these issues be resolved for the sharing economy to reach its fullest, positive potential.

Even if the sharing economy is able to reach the necessary critical mass, these unintended consequences will not only equally scale in size, but also become increasingly embedded in the institutional operation of these platforms and businesses, normalizing the negative implications. Furthermore, some of these sharing economy platforms intentionally challenge and reimagine the status quo, meaning any corrective measures must come from external actors or regulations rather than from within. Therefore, it is imperative that action be taken by policymakers to mitigate these negative effects and to re-orient the sharing economy toward its fullest, positive potential of a sustainable transition.

Unfortunately, the nature of the relationship between the sharing economy actors and the regulators has been mostly adversarial, since sharing economy platforms have not been proactive in reaching out to regulatory bodies in an attempt to address the negative implications and regulatory bodies have failed to be responsive to the rapidly changing industry (Cannon and Summers 2014). This adversarial relationship potentially hinders the discovery of the best policy solution that not only protects consumers but that also encourages the growth of the sharing economy toward its fullest, positive potential.

## **The Challenges of the Sharing Economy**

As the sharing economy grows and expands, it is beginning to encounter additional roadblocks that could prevent it from reaching its fullest, positive potential. As more platforms and companies join the sharing economy, the practical definition of the sharing economy has begun to shift away from the central pillar of its sustainable promise: maximal resource efficiency. Furthermore, the lack of regulation of this emerging, decentralized economy has led to negative implications that may hinder the sharing economy's growth and expansion toward its fullest, positive potential.

This section will delve deeper into the problems the sharing economy is facing through in-depth case studies of two of the most prominent sharing economy sectors: transportation (e.g. Uber and Lyft) and accommodations (e.g. Airbnb and Couchsurfing). In the transportation sector, the platforms that are gaining the most traction as a "sharing economy platform" may not actually be able to deliver on their sustainable promises. The discrepancy between Uber and Lyft's promises of sustainability and the actual impact of the services provided reflects a dangerous shift away from the sharing economy's underlying principles, while allegations of worker abuse and exploitation demonstrate some of the dangers of the decentralized economy. Additionally, as Uber has been increasingly under fire in the media for these negative side effects and has subsequently seen a visible drop in its user base, it is a prime example of how these challenges can and do prevent the sharing economy from reaching the growth needed to fulfill its potential (LaFrance 2017; della Cava 2017). In contrast, car-sharing services such as Zipcar and Car2Go as well as bicycle-sharing programs have maintained the central spirit of the sustainable sharing economy by emphasizing the sharing of idle capacity for maximal resource efficiency.

In the accommodation sector, the unregulated decentralized market of temporary rental homes threatens equal access and increases housing market pressures as permanent rental homes becomes more lucrative. While platforms such as Airbnb, Couchsurfing, and VRBO have made traveling more accessible for many by providing cheaper and more personalized, flexible accommodation options, they also run the risk of threatening the stock of long-term housing as well as rent-controlled units, thereby increasing gentrification pressures in many popular tourist destinations. Furthermore, personal anecdotes as well as academic studies point to evidence of discrimination based on race or ability that may unfairly limit the accessibility of accommodations in the sharing economy, thereby reversing historic gains in equality in the rental housing market (Edelman, Luca, and Svirsky 2016; Grant 2017; McAteer 2017; Vedantam 2017; Wang 2017). Most of these challenges stem from the lack of regulation of this emerging, decentralized market, suggesting that future policy could help correct some of these negative implications.

### *Transportation*

The transportation sector within the sharing economy can be categorized into two different kinds of services: car- or bicycle-sharing and ride-sharing. Car- or bicycle-sharing platforms encourage coterminous sharing of goods by enabling users to borrow them in their entirety on temporary loan. Ride-sharing services, on the other hand, focus on sharing the car in use by placing more of an emphasis on sharing the ride rather than the entire car itself. While both types of services have similar promises of sustainability, ride-sharing services seem to struggle more in maintaining the central spirit of the sustainable sharing and delivering on this sustainable potential – therefore, the majority of this section will focus on the challenges the ride-sharing sector faces in particular.

Car- and bicycle-sharing platforms often provide temporary loans of company-owned cars or bicycles in their entirety – for example, Zipcar and Car2Go both have company-owned cars that they lend out to its users, and a variety of bicycle-sharing companies have a central supply of bicycles that users can borrow from the company itself. Car-sharing services can be conceptualized as a more efficient version of a traditional car rental company – by reducing transaction costs (whether it be how far one has to go to pick up a car or bicycle or the number of employees required to facilitate the renting process), these services can offer more flexible and cheaper rental options (Henten and Windekilde 2015).

Ride-sharing services, on the other hand, focus on sharing the car in use by placing more of an emphasis on sharing the ride rather than the entire car itself. Platforms such as Uber and Lyft focus on this facilitation of shared, coterminous use of a personal, private car among peers. The two platforms operate on similar structures: users employ a mobile application to call a driver, who will be driving his or her own personal car, to go from a desired pick-up location to a desired drop-off location for a fee. Users can often choose between two different levels of service: “pooled,” true ride-sharing services that pick up multiple passengers headed to and from similar destinations (for example, uberPool or Lyft Line), or exclusive-ride services that bring the user directly to their destination (for example, uberX or Lyft). Rather than traditional taxis, whose drivers may need to either continuously drive around in hopes of running into a customer or to idly wait at a high-demand location such as an airport or hotel lobby, these ride-sharing platforms directly match drivers (the supply) with users who need a ride (the demand) and can therefore increase the efficiency of the entire ride-sharing system. In fact, a study comparing uberX to the traditional yellow cab in New York City found that uberX drivers spend a larger portion of their time and miles driven with a customer in their car (Cramer and Krueger 2015).

This possibility of increased efficiency allows Uber and Lyft to provide more competitive prices than traditional taxis – drivers have to spend less time making the same amount of business, and thus can charge less accordingly.

Car-sharing services have a sustainable potential to decrease individual, private car ownership rates, which would reduce the use of materials and energy for vehicle production and maintenance. Additionally, with potentially fewer cars on the road, greenhouse gas emissions associated with transportation could decrease. The initial impacts are promising: a study in 2015 on car-sharing services such as Zipcar in the United States as well as Canada found that for every ridesharing car driven, four to six auto owners *sold* their cars (Shaheen 2015). The impact is even more pronounced for car-sharing platforms for businesses, in which the shared car is used for business purposes – two in five corporate members surveyed sold or postponed purchasing a vehicle due to joining Zipcar. Furthermore, overall public transit and non-motorized modal use (such as buses, rail, and walking) increased with an increase in users of car-sharing platform, suggesting that car-sharing can encourage the use of public transit (Shaheen 2015).

For ride-sharing platforms, an initial sustainable promise is the facilitation of what is essentially carpooling – allowing multiple riders to share one car toward common destinations. By widening the network of potential car sharers and thereby making it easier for users to share cars, the sharing economy could encourage carpooling and more efficient car usage patterns on a large scale (similar to how high-occupancy vehicle lanes on highways encourage ride-sharing by rewarding cars with more passengers). This could have a positive impact environmentally by lowering greenhouse gas emissions, and could also reduce congestion and traffic in high-density cities. Additionally, even exclusive-ride trips with only one rider can make a similar promise of sustainability as car-sharing platforms do in terms of personal car ownership. Ride-sharing

platforms such as Uber and Lyft also potentially reduce the need for individual car ownership by making it possible to reach destinations without a personal car (Manjoo 2014). Preliminary research of ride-sharing usage in San Francisco found that users who rely on ride-sharing platforms such as Uber and Lyft own fewer vehicles and travel with more companions when compared to traditional taxi users – 43 percent of ride-sharing users did not own cars, compared to 35 percent of frequent taxi users and 19 percent of overall city population, and the average number of passengers in a ride-sharing vehicle was 2.1, compared to the matched taxi sample average of 1.1 passengers (Rayle et al. 2016).

Furthermore, the sharing economy has the potential to complement public transit systems by providing the final connectivity between public transportation stations and the rider's ultimate destination, also known as first- and last-mile connectivity (Spector 2016). By filling in this vital gap between public transit and the user's final destination, ride-sharing platforms could encourage greater use of public transportation and further encourage resource efficiency.

Unfortunately, because the attractiveness of car- and ride-sharing is strong enough to potentially attract users away from taxis and even private vehicle use, it may also attract users away from public transit and other non-motorized modal forms of transportation altogether (such as walking or biking). This raises a common question in the transportation sector of the sharing economy: does the sharing economy complement or compete with public transit?

Despite the sharing economy's potential to complement public transit as well as preliminary studies that point to this complementation, other studies that suggest the sharing economy has an equally strong potential to have an opposite, substitution effect. A comprehensive study of the growth of ride-sharing in New York City found the increase in ride-sharing users outpaced the decline in Yellow Cab riders – since mid-2016, ride-sharing platforms

have added an average of 7 million passengers per month, whereas Yellow Cab ridership has declined by approximately 2 million passengers per month (Schaller 2017). While these new users of ride-sharing platforms could be ones who would have otherwise taken a Yellow Cab or their personal vehicles, this large difference also suggests that some users are being drawn away from bus, subway, and other non-motorized transit modes (especially in New York City). This substitution effect on public transit is further suggested by a reversal from transit-led to ride-sharing-led growth in New York City travel starting in 2014 – as ride-sharing ridership continues to grow, bus and subway ridership have actually seen declines in the past few years despite historically leading travel growth in the city (Schaller 2017). These findings have dangerous implications for the future of public transit in relation to the sharing economy – unless its complementary role can be encouraged over its substitution effect, the sharing economy could undermine efforts to reduce resource efficiency by drawing users and money away from more efficient and more sustainable transportation modes such as buses and light rail.

Since the sharing economy is such a new phenomenon, researchers have been unable to project the exact nature of the relationship between the sharing economy and public transportation systems. However, many are attempting to characterize the relationship not as an “either or” situation, but instead as a duality that can coexist. Many users are beginning to use ride-sharing platforms together with public transit, choosing to use public transit services one way and ride-sharing platforms on the return trip. Others are using Ubers and other ride-sharing platforms to address first- and last-mile connectivity; in fact, Miami, Florida attempted to encourage this complementation by offering a public-private partnership between Uber and its metro system (Wagner 2017). While ride-sharing platforms might be drawing users away from current public

transportation systems, with the correct public policy and infrastructural incentives, they have the potential to make such systems more accessible and more appealing.

Another major challenge the ride-sharing sector faces is the danger of an unregulated, decentralized economy. Critics have questioned Uber in particular for its rapid growth and large profit margins, which many speculate is only possible due to its exploitation of labor and avoidance of costly regulations most traditional taxis are subject to (Isaac 2014). Because Uber officially contracts its drivers, its drivers are considered independent contractors (i.e. self-employed workers) who have the flexibility to determine their own hours. However, this also means Uber drivers are not technically Uber employees, and the company is able to skirt many labor laws and regulations created to protect workers' rights (and therefore able to save itself millions of dollars by avoiding the cost of employer-financed health insurance, overtime pay, and other employee protections) (Scholz 2017). Additionally, because drivers are using their own personal, private vehicles, Uber has been able to avoid regulations on car safety, maintenance, or accessibility (Slee 2015).

Furthermore, although Uber feeds its drivers a promise of impressive earnings due to a flexible pricing model and increased demand, Uber drivers have said that has simply not been the case. In 2014 and 2015, the company went so far as to say its median driver could make close to six figures in New York City or San Francisco (Griswold 2014; Slee 2015). Unfortunately, numerous journalists and researchers alike who have attempted to ground-truth these claims by investigating exactly how much an average Uber driver truly makes have come up empty-handed, calling this claim a "unicorn." Many critics have pointed out that Uber's median incomes of \$90,766 in New York City and \$74,191 in San Francisco are based on drivers working *more* than 40 hours a week (Slee 2015). Thus, these flashy numbers could be very

misleading because many Uber drivers may be working part-time (aka not more than 40 hours a week) as a supplement to another job. Additionally, while these drivers who are working more than 40 hours a week are willingly making the choice to work hours longer than a traditional eight-hour work day, the lack of overtime pay means they may not be appropriately compensated for this additional work. Furthermore, an analysis of Uber's labor market in 2016 found that a driver in any city *other* than New York and San Francisco would be making much less, because drivers in New York City and San Francisco on average have significantly higher hourly earnings (anywhere between 12 to 32 percent more) (Hall and Krueger 2016).

A 2015 study on Uber drivers in 20 cities found their average hourly wage to be \$17.50 – however, when subtracting out the cost of gas, car insurance, and maintenance, drivers say earnings could fall anywhere between \$10 and \$13 an hour, a wage that falls below minimum wage in some cities (such as Seattle, which voted in a \$15 minimum wage in 2014) (Harris and Krueger 2015). One driver in Seattle reports quitting his full-time position in favor of Uber's flexible hours and attractive wages, yet ended up working 15-hour shifts and earning less than the equivalent of \$3 an hour after paying for gas, various car expenses, and other necessary investments. Furthermore, he claims that Uber and Lyft investigate any drivers who attempt to speak out about their driving experiences and poor labor conditions in an effort to penalize them, effectively using intimidation tactics in an attempt to preserve their reputation (Chen 2015). While this report may be an extreme case, it highlights the absence of any protective measures against the dangers of exploitations in the ride-sharing sector.

Another danger drivers are left to handle on their own as “independent contractors” is harassment, especially sexual harassment toward female Uber and Lyft drivers. While more “traditional” workplaces often have explicit procedures for addressing harassment, drivers for

ride-sharing services do not get the same safeguard. Countless female drivers have shared stories of unwanted approaches and aggressions by riders late at night, ranging from unwanted touching, propositions for sex, and slander (Beckman 2017). Although drivers can rate these passengers poorly and report them to the ride-sharing platform, they often do not get more than a standard response from the company. Furthermore, only Lyft stated that such behavior would result in a permanent ban from their platform, indicating a certain level of tolerance for this sort of behavior on Uber (Lenthang 2017). Additionally, without any other feedback mechanism, it is impossible for drivers to know if they are about to pick up a rider who has previously harassed his or her driver.

While the decentralized nature of the sharing economy has provided flexibility for both its workers and its consumers, the implications for labor rights and wages are dangerous. Critics believe that platforms such as Uber and Lyft capitalize on unemployment pressures by giving the unemployed or underemployed an option barely attractive enough to make some money, but not quite enough to equate a secure and steady job (Scholz 2017). Without the normal labor protections in regards to issues such as minimum wage, workplace harassment, insurance, eight-hour workdays, and paid overtime, workers are placed in a vulnerable position and are easily exploited. Furthermore, the use of drivers' personal cars absolves a ride-sharing company from responsibility for a variety of safety and liability issues. All of these issues raise questions of responsibility as well as labor protections in the sharing economy, where relationships and roles are not as clearly defined.

The lack of regulation of the ride-sharing sector also negatively impacts users due to an absence of minimum safety requirements. Because drivers use their own, personal cars, the safety of the car itself is difficult to assess for riders. Although some platforms require cars to be

made after a certain year, it is impossible for riders to check if the car is up to certain minimum safety standards (for example, do the brake pads need replacement), potentially placing users at risk. Additionally, just as drivers are at risk of harassment by riders, users are also at risk of harassment by drivers, especially because there are limited requirements to become an Uber or Lyft driver. An internal leak of Uber's customer service system found 6,160 individual customer support tickets with a hit for the phrase "sexual assault," 5,827 individual tickets with a hit for the search "rape," and 3,524 tickets with a hit for the word "assaulted" (Warzel and Bhuiyan 2016), revealing the prevalence and severity of the issue.

### *Accommodations*

Despite the potential for accommodating-sharing platforms to maximize accommodation use, the unregulated market is moving toward a dangerous new model of hotels and temporary housing. Not only does this place increasing stress on existing housing pressure in popular cities such as Paris and San Francisco, the unregulated market also gives way to unequal access and discrimination that reverses historic gains in rental housing market equity. Furthermore, the lack of personal ownership and belief in the commons can lead to uncontrolled negative externalities, which can harm neighbors and other players not even directly involved in the sharing economy.

As a concept, temporary rental platforms such as Airbnb and Couchsurfing have the potential to maximize the use of existing buildings and decrease the need for hotels, which would reduce the use of materials and energy for hotel construction and operation. In fact, according to Airbnb, their guests staying in Los Angeles over a one year period resulted in an estimated energy savings equivalent to 1,270 homes, water reduction of 18 Olympic-sized swimming pools, and greenhouse gas emissions reduction of 2,190 cars ("New Study: Airbnb Community Generates \$312 Million in Economic Impact in LA" 2014). However, the unregulated

lucrative nature of temporary rental platforms has incentivized some hosts to convert residences into permanent Airbnbs, essentially creating new, privately-owned and independently-run hotels. The ratio of Airbnb listings to the number of Airbnb hosts points toward this trend of commercial use of Airbnb – in London, United Kingdom, 41 percent of Airbnb listings belong to hosts who list more than one rental, and in Vancouver, Canada, the concentration is even more extreme: 1,215 units (more than a third of the city’s listings) were controlled by just 381 hosts in 2015 (Edwards 2016). These “permanent” Airbnbs are not only dangerous because they fall outside of existing regulatory structures for hotels and temporary lodging, but because they also place increasing pressure on already stressed rental housing markets.

Airbnb and other accommodation-sharing platforms have the potential to alleviate pressures of increasing prices in the housing market – by giving hosts an opportunity to earn some money off of the idle capacity of their house or apartment, accommodation-sharing opens up a new potential revenue stream. In fact, an Airbnb spokesperson reported that 19 percent of hosts from ten of the largest cities in the United States said their income from hosting has helped them avoid eviction or foreclosure (Edwards 2016). Additionally, a report by Airbnb asserts that Airbnb can help support revitalization around the world, particularly in rural areas by encouraging tourism. By pumping revenue into rural areas and encouraging tourism and business that may in turn incentivize more goods and services to the area, the accommodation-sharing platform creates new economic opportunity around the world (Airbnb 2017).

However, the increasing trend of commercialization of Airbnb units suggests many Airbnbs are simply not being used as such – rather, hosts are capitalizing on the rising popularity of Airbnb to turn large profits by using them as commercial rental units. This trend toward “permanent,” commercial Airbnbs is placing pressure on already stressed rental markets in

popular cities such as San Francisco, New York, and Seattle, especially considering accommodation-sharing platforms are likely most popular in densely-populated urban centers. The conversion of long-term rental units into Airbnb listings, often by absentee landlords, reduces the availability of rent-controlled housing units. In cities such as San Francisco, whose vacancy rate is already one of the lowest in the country, the conversion of a rent-controlled home of elderly tenants into rental units for vacationers on Airbnb and VRBO led to anger and protests (Trefny 2014). This increasing bottleneck of available long-term rental units places added pressure onto an already stressed housing market.

As a result of a decreasing supply of available long-term housing, studies have shown that the rising popularity of accommodation-sharing platforms has pushed general housing prices up. A study from the University of Massachusetts Boston found that Airbnbs had a direct impact on increased housing prices in Boston (Merante and Horn 2016), and a preliminary study from researchers at the Massachusetts Institute of Technology, the University of California - Los Angeles, and the University of Southern California found that a ten percent increase in Airbnb listings leads to a 0.42 percent increase in rents and 0.76 percent increase in house prices (Barron, Kung, and Proserpio 2017). While these numbers may seem too small to be significant, they signal a dangerous potential for Airbnb to continue to contribute to increasing housing prices, especially as the sharing economy grows and expands.

In addition to housing market pressures, Airbnb has also come under fire due to studies pointing toward racial discrimination against black guests and hosts. Airbnb allows hosts to view guests' names and pictures when they request to book a listing, which helps build a human connection and a sense of trust that better enables sharing among strangers. However, this information also opens up an opportunity for discrimination – a Harvard Business School study

tested this potential for discrimination by sending out approximately 6,400 Airbnb requests across five cities using identical guest profiles except for the guest's name. The researchers selected two sets of names – one distinctively African-American and the other distinctively White. The study found that guests with distinctively African-American names only received a positive response 42 percent of the time, in comparison to 50 percent of the time with identical guests with distinctively White names. Furthermore, African-American guests were 16 percent less likely to be accepted as a guest (Edelman, Luca, and Svirsky 2016). Additionally, because users can also view the host's name and picture to build trust in the accommodation they are choosing to stay at, this opportunity for racial discrimination works the other way against black hosts. A study that compares black hosts to non-black hosts of Airbnb rentals in New York City found that non-black hosts are able to charge approximately 12 percent more than black hosts for the equivalent rental (Edelman and Luca 2014), suggesting that Airbnb hosts of minority backgrounds are also harmed by discriminatory biases.

Academic research aside, users have reported personal anecdotes of racial discrimination when using unregulated platforms such as Airbnb. In February 2017, after finding out the guest was Asian, an Airbnb host cancelled a reservation at her mountain cabin near Big Bear Lake, California at the last minute, leaving the guest stranded in an intense winter storm (Wang 2017). A black guest shared his experience of getting the police called on him and his friends in 2015 while staying at an Airbnb in Atlanta because the neighbors assumed they had broken into the home (Grant 2017). In Amsterdam, an Airbnb host threw a black woman down the stairs after an apparent disagreement (McAteer 2017). Countless other stories like these exist – the hashtag #AirbnbWhileBlack has given black lodgers a space to share stories of discrimination and harassment while using the sharing economy service, and a number of minority entrepreneurs

have launched their own accommodation-sharing platforms in an attempt to create safer alternatives for travelers of color (Haidrani 2017).

Personal anecdotes and academic studies also suggest that Airbnb is not equally accessible to guests with disabilities, raising a need for broader discrimination safeguards based on all aspects of identity, not just race. First, there is the simple issue of whether Airbnb listings are even wheelchair accessible to begin with. Although exact numbers are difficult to find because there is no centralized database of all Airbnb listings, numerous users with accessibility needs have complained of the lack of truly accessible accommodations. Some listings that claim to have wheelchair access are simply not accessible, and the deceptiveness and lack of verifiability leaves disabled guests in a vulnerable position (Golding 2014). Additionally, even listings that might be wheelchair accessible through the front or back door of the lodging fail to consider the accessibility of rooms within the house – an Airbnb host and user complained of being unable to access the restroom or bedroom once inside ("Disabled access" 2016). This issue of accessibility has similarly inspired the creation of Accomable, which is an accommodation-sharing platform focusing specifically on disability-accessible properties (McGlensey 2016).

Furthermore, a recent study by Rutgers University found that guests who disclosed disability needs were less likely to be accepted as guests. The researchers of the study sent out 3,847 lodging requests on Airbnb from fictitious travelers, some who identified as being blind or having cerebral palsy, dwarfism, or spinal cord injuries. They found that hosts approved 75 percent of guests who did not mention having a disability but only 61 percent of those who said they had dwarfism, 50 percent of guests who said they were blind, 43 percent for those with cerebral palsy, and 25 percent with a spinal cord injury (Ameri et al. 2017). These discrepancies did not change much among Airbnb hosts who advertised their lodging as wheelchair accessible,

nor after hosts were required to adopt a nondiscrimination policy in September 2016 that forbids discrimination based on race, religion, national origin, or disability (Martin 2017).

Finally, the sharing of accommodations can sometimes lead to negative externalities that negatively impact neighboring residents when guests do not honor a sense of communal responsibility. The sharing economy relies on trusting borrowers will honor a sense of responsibility to a good or service they do not own, yet outside of the threat of receiving a poor rating, there is no official mechanism to ensure this responsibility is honored. Landlords and neighbor tenants have complained about Airbnb guests who use temporary lodgings to party or to engage in activities they would not otherwise engage in in their own homes, leading to negative externalities such as excessive noise or overrunning community pools that impact neighboring residents. Not only does this negatively impact players who may not be directly involved in the sharing economy, it also unfairly holds hosts accountable for the actions of their guest that they technically cannot control. In fact, Airbnb is facing a lawsuit based around this central question: who is accountable for these negative externalities (Pettersson 2017)? Unless safeguards are placed to increase accountability and ensure a sense of communal responsibility, accommodation-sharing platforms will continue to suffer from these negative externalities.

In both of the transportation and accommodation sectors of the sharing economy, two central challenges are hampering the sharing economy's trajectory toward its fullest, positive potential. First, the sharing economy is struggling to execute on a central pillar of its sustainable promise. By possibly detracting away from more efficient modes of transit or lodging, ride- and accommodation-sharing platforms are moving away from the underlying principle of maximal resource use. Second, despite the positive implications of ride-sharing and accommodation-sharing platforms, the dangers of an unregulated, decentralized economy threaten the actors

involved in the sharing economy, including users, drivers, and hosts. Negative implications such as exploitation of labor, lack of safety protection, increased housing pressures, and discrimination based on race or ability can and should be addressed with appropriate policy regulations to help the sharing economy reach its fullest, positive potential.

## Potential Policy Solutions

Policy solutions to the sharing economy are challenging to find because they should achieve two important and potentially contradictory goals. First, they should regulate the decentralized economy to minimize negative behaviors, including those that detract from the sharing economy's positive potential as well as those that defeat the purpose of the sharing economy (Miller 2015). Actions may include protecting the legitimate interests of the employees of the sharing economy by formalizing the labor structure, protecting users by setting safety standards and quality control measures, and being more proactive in preventing opportunities for discrimination. In addition, a system of taxes or monetary-based penalties could discourage undesirable applications of the system. Second, policies should encourage the positive behaviors of the sharing economy that maximize resource efficiency and deliver on its sustainable promise. Policies that encourage positive outcomes may need to help existing market players adapt to the changing industry dynamics and develop a positive relationship with disrupting market players to give new players room to innovate and push the sector toward growth. Additionally, the sharing economy's growth thus far has demonstrated that consumers will only change their behavior toward more sustainable practices if it is made as easy and as beneficial as possible for them (Hamari, Sjöklint, and Ukkonen 2016); therefore, the trajectory of the sharing economy could benefit from policies that further encourage sustainable behavior beyond the existing economic incentives for consumers.

Because the sharing economy falls within a regulatory gray zone, many cities have experimented with different policy solutions to address many of the challenges of the sharing economy. Some local governments have tried to avoid all the challenges of the sharing economy by banning sharing economy platforms all together. For example, a handful of cities, states, and

countries around the world such as London, Vancouver, the entire state of Oregon (except Portland), and Italy have banned platforms such as Uber or Lyft (or made operations so difficult the company pulled out, as Uber did in Austin, Texas in May 2016) (Cox 2017; Craggs 2017). Many other ride-sharing platforms have experienced difficulty breaking into specific markets where taxi lobbies have held on to previous agreements and monopolies, such as at airports – for example, in July of 2015, Ubers and Lyfts were not allowed to pick up passengers from many large airports across the country including Chicago O’Hare, Seattle-Tacoma, Los Angeles International, and Atlanta (Sumers 2015). Similarly, Airbnbs and other temporary accommodation rentals are considered illegal in certain places – most notably New York, whose governor signed into law a ban on short-term rentals on home-sharing sites in October 2016 (LaGrave 2017) , although enforcement of this policy is much more difficult because transactions can occur under the table.

Considering the positive potential of the sharing economy, especially in terms of sustainability, banning it is *not* the best policy solution, nor are protectionist policies that shelter existing industry players from new entrants (Kaplan and Nadler 2015). The sharing economy is founded upon innovative improvements in specific market efficiencies (beyond environmental impacts) that could improve the entire industry as a whole. In fact, dynamic competition should be encouraged because it spurs innovation and helps industries remain responsive to changing consumer demands (Koopman, Mitchell, and Thierer 2014). If regulated correctly and kept on a positive trajectory, the innovative nature of the sharing economy could help push traditional markets to become more responsive, efficient, and sustainable (Edelman and Geradmin 2015). Furthermore, the positive potential of the sharing economy should not be ignored or disregarded simply because it faces a few roadblocks in its path toward that potential.

Thus, instead of bans, policy solutions should be modeled on other cities that have tried to embrace the changing economic model and regulate for its negative impacts. Policies that work to minimize the negative implications of the sharing economy could include measures to ensure user protections as well as driver protections, increased accountability, and systems that penalize undesirable applications of the sharing economy. Policies that minimize the negative implications of the sharing economy are beneficial for the sharing economy as well as its growth toward its sustainable promise because unless addressed, these negative implications will cripple the sharing economy's growth. As many of these negative impacts entered mainstream media narratives, companies such as Uber have felt the backlash – the trend #DeleteUber caused the application to lose nearly 500,000 users in one day after an unrelenting stream of revelations about the company's business practices and workplace culture (LaFrance 2017). In fact, a study on consumer attitudes toward Uber found that the percentage of users who were “very or extremely unlikely to consider doing business with the ride-hailing service” rose from 13 percent to 32 percent in light of the recent news about the company. Consumers' changing attitude toward Uber has translated into a loss of market share in the industry as competitor Lyft's shares have increased, and suggests these negative implications are having real impacts on the sharing economy's user base (della Cava 2017).

Measures that protect users as well as drivers within the sharing economy include protections against discrimination, quality control and minimum safety standards, requirements for universal services, and a formalization of the labor structure. The rating and review system used on many sharing economy platforms is an effective way to build trust among strangers. However, it could also help overcome embedded biases and reduce the potential for racial discrimination, according to a study from Washington University in Saint Louis on racial

discrimination within accommodation-sharing platforms. Researchers followed a similar methodology as the Harvard Business School study and initially found similar results – fictitious Airbnb guests with stereotypically African-American names are 19 percent less likely to be accepted compared to guests with typically white names (Vedantam 2017). However, the researchers found this discrepancy was statistically eliminated when both fictitious users had past reviews (regardless of if reviews were positive or negative), suggesting that the predisposition for discrimination arises from incomplete information about the guest. When hosts do not have complete information about a guest, they may jump to their own conclusions based on explicit or implicit biases based on race. However, if they are directly given enough information about the guest’s behavior (such as previous reviews, both positive or negative), they no longer have to make this assumption themselves, and the likelihood for discrimination is lower (Ebsworth-Goold 2017). The study’s findings suggest a restructuring of the trust-building mechanism Airbnb relies on could minimize the potential for racial discrimination – for example, incentivizing hosts to write reviews for new users or asking new users to provide a reference or two to vouch for them when they start off so that guests are not judged solely on their name and picture.

The rating and review feedback loop is also a powerful, self-regulating tool for the industry by keeping drivers or hosts accountable to users (as well as the other way around) – in fact, some have called it a “secondary invisible hand” in regulating the industry (Koopman, Mitchell, and Thierer 2014). However, this system of quality control can only go so far as to protect users from problems they are able to anticipate or experience – for example, a user can give a driver who makes them feel unsafe a poor rating, but it is practically impossible for a user to know if the car they are riding is actually unsafe (for example, has worn brake pads that need

replacement) and therefore cannot give a rating to reflect this danger. Therefore, especially because users tend to devalue dangers they cannot see or anticipate (very few users will be concerned about if their Airbnb accommodation has an appropriate fire escape route when booking), minimum safety requirements are especially important in addressing such dangers (Edelman and Geradmin 2015). Similarly, users are unlikely to be concerned about universal services unless they themselves have accessibility requirements – Uber users who do not use wheelchairs are not likely to be concerned about whether the Uber they just called is wheelchair-accessible. Therefore, policies ought to require a certain percentage of sharing economy services offered to be universally accessible. However, as opposed to hotels that simply need to design a certain percent of their rooms to be accessible according to Americans with Disabilities Act standards, the sharing economy relies on privately owned goods and services. Therefore, this requirement will likely need to be paired with a rewards program that incentivizes accessible services, such as a subsidy for Uber drivers that own wheelchair accessible cars (Edelman and Geradmin 2015).

On the driver side, similar protections ought to be put in place to help safeguard labor rights that are currently under threat. Formalizing the contractor relationship between a company and its drivers by placing it under a statutory employee framework, which treats contractors as workers for specific regulatory purposes (usually for taxation laws), could help drivers establish a legal right toward “portable” benefits such as overtime pay and other labor protections (Chen 2015). Even giving drivers the legal right to unionize and collectively bargain could ensure drivers have the ability to organize for their own needs and protections without imposing inflexible and inappropriate top-down regulations onto the industry. However, all of these possible solutions will likely be faced with resistance from ride-sharing platforms, which have

historically relied on avoiding such regulations to earn a larger profit. A federal court case on a Seattle law that attempts to give ride-sharing drivers the explicit right to collectively bargain may set a precedence for the scope of labor protections and obligations of ride-sharing platforms (Mulvaney 2017).

As the sharing economy transforms traditional industries and presents new regulatory questions, it also presents an opportunity to assess the value of current regulations – do these regulations protect consumers, or are they a result of other policy influences such as regulatory capture or other vested interests by predecessors? For example, the need for new user protection policies in ride-sharing gives regulators an opportunity to assess the true effectiveness of current requirements for taxis in the industry – do required driving trainings for taxi drivers in New York make drivers safer and improve consumer safety (Edelman and Geradmin 2015)? If so, ride-sharing drivers should also be subject to the same minimum safety standards; however, if not, regulators should try to understand why such policy emerged in the first place. If it becomes clear that such a policy is a form of protectionist policy that aims to raise the barrier of entry, such policies should be eradicated for all players (Kaplan and Nadler 2015). For example, France's *Loi Thevenoud* policy that requires drivers to return to a home base before picking up a new passenger, instead of allowing them to drive directly to high traffic areas (which would be beneficial for both drivers and riders), unnecessarily targets ride-sharing platforms and ought to be removed (Edelman and Geradmin 2015).

Data transparency and accountability are also large opportunities for improved policy regulation of the sharing economy. The sharing economy is built upon the foundation of leveraging technology and data – using big data to build more responsive transportation or accommodation systems is what makes the sharing economy innovative and attractive (Marr

2016). Therefore, regulators should consider leveraging these data to encourage transparency and accountability. Metrics-based regulation could help ensure safety on platforms while keeping regulations flexible and appropriate for the circumstances – if, for example, a ride-sharing platform is able to share accident and insurance claim data of its drivers and demonstrate a good track record, regulators could lower insurance requirements for that company (Cannon and Summers 2014). Similarly, an accommodation-sharing platform could share specific data about their listings with regulatory bodies to ensure all listings comply with any rental policies (if for example, the city does not allow rentals beyond a certain number of days). Such data-based regulations could also encourage more positive working relationships between regulators and sharing economy players – because there is still a need to protect user privacy, regulators and platforms would need to work together to strike a balance between transparency and privacy (Kaplan and Nadler 2015).

Finally, policies that minimize negative implications should include systems of taxation or penalization that discourage undesirable applications of the sharing economy. As discussed earlier in this thesis, temporary Airbnbs are favored over “permanent” Airbnbs. Therefore, policies that restrict “permanent” Airbnbs or make them more costly for the host could help discourage these undesirable applications. For example, Paris, one of Airbnb’s most popular destinations, has implemented a variety of restrictions on Airbnbs to encourage more responsible short-term rentals. Hosts are allowed to rent their own homes for up to 120 days before they must apply for a change-of-use permit, and any hosts renting a residential property they do not live in must also register the property as a commercial property (Coldwell 2016). Domestically, the city of Seattle approved a new flat tax on Airbnbs as a first step toward regulation in November 2017. To try to discourage “permanent” Airbnbs, hosts renting out their entire accommodation would

be taxed \$14 per night, whereas hosts only renting parts of their accommodation pay \$8 per night (Nickelsburg 2017). In both of these examples, local governments have found ways to discourage undesirable behavior (in this case, “permanent” Airbnbs that essentially act as privately-run hotels) without banning the sharing economy entirely.

Given the sharing economy’s positive potential, policy should also encourage the positive behaviors of the sharing economy. Few cities thus far have been able to proactively implement encouraging policies, which would include embracing changing industry dynamics and facilitating partnerships built upon innovation. However, incumbent players in traditional markets can and should work to adapt to the changing industry dynamics, especially because many of the technologies that enable the sharing economy are easily accessible and replicable. For example, MetroCab Boston introduced a mobile application that allows users to order cabs and pay with credit card, just like they could with Uber and Lyft, allowing the traditional player to compete within the new sharing economy. Similarly, the hotel chain Marriott is partnering with boutique hotels around the world through its “Autograph Collection,” allowing customers to stay at smaller-scale, more personalized lodging options similar to Airbnbs (Cusumano 2014). Rather than avoid the innovation of the sharing economy, traditional players ought to adapt and focus on their unique advantages (such as how a hotel can provide a type and level of service, such as room service, Airbnbs are often unable to provide). Policy that incentivizes this adaptation will acknowledge the permanence and added value of sharing economy players, and encourage incumbents to adapt sooner rather than later.

Local governments can also encourage the incorporation of the sharing economy through public-private partnerships that emphasize the positive behaviors of the sharing economy. For example, the car-sharing platform Car2Go relies on a public-private partnership with its host

cities (such as Seattle, New York City, Denver, or Washington D.C.) to provide convenient and efficient services to its users. The membership-based company allows its members to rent cars scattered around the city from its mobile application – users are able to unlock the cars from their smartphones, and drive the car to their desired destination. However, unlike traditional car rental systems, users are able to park the car and leave it at their final destination rather than having to return it to a home base. The system relies on a partnerships with the city that allows Car2Go cars to park on public streets for free, giving members the flexibility to pick-up and drop-off their shared rental cars wherever they like (within the platform’s boundaries) at no cost to the user (“Parking in Seattle” 2017). Similarly, Uber has worked with a variety of different local governments to encourage Uber’s complementation of public transit – for example, Uber held a promotional period in May 2016 where uberPool trips to and from any Expo Line Station in Los Angeles were subsidized; similarly, in Miami in August 2016, uberPools to and from any Metrorail station during train service hours were only \$3 (“Drive Less, Explore More with Metro + UberPOOL” 2016; “Taking Transit Just Got Easier” 2016).

Finally, one of the biggest takeaways for sustainability efforts from the sharing economy is that changing user behavior patterns toward more sustainable behavior only happens if such behaviors are made convenient for users. Most users do not use uberPOOL or LyftLine simply because they think carpooling and ride-sharing is good for the environment; they also use these services because they are cheap and convenient. In fact, studies about the motivations of sharing economy users find that while environmental motivations play a role in intention to participate in the sharing economy, economic and social motivations also play a big, if not bigger, role (Böcker and Meelen 2017; Hamari, Sjöklint, and Ukkonen 2016). Therefore, policies aiming to encourage the sustainable behaviors of the sharing economy should work to make these

behaviors cheap and convenient. For example, sequential sharing is one of the more sustainable applications of the sharing economy. It maintains the core of the sustainable sharing economy principles – by transferring ownership between someone who no longer values the good or service to someone who does, it becomes more likely for that good or service to get more use out of it and therefore reach maximal resource efficiency. Therefore, this form of sharing should be highly encouraged through policies that facilitate these kinds of exchanges – for example, a government-facilitated collection program could make it easy and convenient for users to capitalize on existing sharing platforms such as Goodwill or craigslist. Instead of taking an old couch sitting on the curb to the landfill, trash and recycling services could instead take it to a local Goodwill at little to no cost to the previous owner, allowing that couch to easily be shared again rather than thrown away.

As the sharing economy continues to change the ways in which we traditionally move, live, and interact with goods, services, and each other, it will also continue to present new policy challenges. Rather than relying on old regulatory frameworks that do not apply to these new challenges, regulators ought to take this opportunity to revisit the effectiveness of previous policies and create better, more responsive policies. Policies should work to minimize the negative implications of the sharing economy discussed in the challenges section of this paper, while also encouraging the positive behaviors of the sharing economy. As cities continue to experiment with different policy approaches, local governments can build off these previous attempts at regulating the sharing economy and its unique challenges.

## Conclusion

The sharing economy is a relatively new phenomenon that transforms the ways in which we consume goods and services. Within the context of increasing concern for global climate change, the sharing economy model could be an essential adaptation to the way our society consumes goods and services because it holds a promise of decreased overall material demand due to increased sharing and maximal resource use. Especially for developing countries that are still shaping their own path toward modernization, the sharing economy provides an opportunity for such economies to “leapfrog” directly into a more sustainable model. Therefore, fully understanding what a successful implementation and regulation of the sharing economy looks like is key to a sustainable transition. However, while it has the potential to be this sustainable development solution for overconsumption, it faces a handful of notable roadblocks that draw away from this positive potential. A variety of policy solutions could address these challenges, and a number of local governments have already experimented with many of these solutions to mitigate the negative implications of the sharing economy. Yet, because the sharing economy is constantly transforming traditional industries such as the taxi and hotel industry, its long-term impact and the best policy solutions are still to be understood.

Future research in this field will need to explore the long-term environmental, social, and economic impacts of the sharing economy. Although this thesis hints toward initial trends and impacts, it is too early to tell the true impact of the sharing economy. Additionally, future work could refine some of the policy solutions outlined the previous section of this thesis, focusing specifically on the feasibility of proposed solutions. Especially considering the resistance some sharing economy platforms are putting up against cities’ policies, the exact dynamics between the existing industry players, the new sharing economy players, regulators, and consumers will

need to be explored and untangled, and the case of legality and economic feasibility will need to be made. Finally, future researchers could try to envision new methods of coping and adapting for existing industry players, essentially helping design the new economy with sustainability goals in mind.

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