Using the NYC DOT carshare pilot program as a baseline, the Hunter studio has developed recommendations for the future potential of carsharing in New York City. The studio has designed an ideal carshare program that addresses the goals of: the reduction of car ownership; the prevention of future car purchases; and the improvement of accessibility and carshare usage.

Acknowledgments

HUNTER Studio:
Jeffrey Cain
Kyra Cuevas
David Goldenberg
Alexandra Korol
Ruth Ladouceur
Felicia Park-Rogers
Nathanael Rotsko
Ebony Stanback
Simone Torre
Liran Tzuman
David Viana
Markese Lavell Wider

HUNTER Faculty:
Alex Sommer, Instructor
Dr. John Chin, Program Director

Illustration sources:
Cover by aleksorell
Page 5 by Julia Tim
Page 8 by Wizatnicko
Page 10 by RoseStudio
Page 17 by irinastrel123
Page 23 by skypicsstudio
Page 42 by Julien Eichinger
Page 45 by AutoRaptor

All other maps, images & illustrations were made by Hunter Studio students, unless otherwise specified.

May 21, 2019
# Contents

## Introduction
- Methodology

## Existing Conditions
- Commuting in New York City
- Carshare in New York City
- Carsharing Companies in NYC
- NYC DOT Pilot Program

## Recommendations
- Purpose & Need
- Methodology
- Summary
  1. Increase Awareness of Carshare
  2. Optimal Site Location
  3. System of Vendor Selection/Site Distribution
  4. Design Unique and Recognizable On-Street Reserved Spaces
  5. Increase Enforcement of Vehicles Illegally Parked in Reserved Spaces
  6. Reduce Cost of Carshare
  7. Increase Data-Sharing
  8. Parking Permit Program
  9. Vehicle Buyback Program
  10. Expand Mobility Options

## Appendix
- Citations
- Case Studies
- Supplemental Site Selection Studies
- Survey Report
This CUNY Hunter Master of Urban Planning studio had the opportunity to provide an independent analysis of the New York City Department of Transportation (DOT) Car-share Pilot. The pilot is currently structured towards increasing New Yorkers’ financial and geographic access to carshare and our charge was to evaluate the program. This report delivers programmatic and policy recommendations for the agency’s long-term approach to carshare. The studio’s recommendations were reached through an analysis of the current pilot program, as well as best practices or relevant programs from other cities.

Throughout the pilot period, DOT will be evaluating whether increased access to carshare has any measurable impacts on vehicle miles traveled, car ownership or curbside parking availability. The agency will look to the studio to evaluate larger programmatic issues relating to accessibility, equity, and inclusion. To frame our approach to the studio we asked ourselves:

- **What should success look like on a programmatic basis?**
- **Are there techniques or policies that other cities are using to manage private-public partnerships?**
- **Are there financial or geographic disparities that DOT should consider incorporating into a long-term approach to carshare?**

The studio used its collective knowledge, values and lived experiences, gained through this masters program and throughout our lives, to assess carsharing in general and the DOT carshare pilot specifically. Mobility is a necessary and critical piece of modern life and the studio believes access to carshare, in conjunction with a wider mobility network, can benefit all New Yorkers.
METHODOLOGY

A project as expansive and nuanced as a City-wide carshare program seemed daunting and complex when the studio was first given the task, so we began by establishing a set of values with which we could scrutinize the pilot. Through this process, a mission statement evolved that would encompass our values, shape our research and guide the formation of our recommendations.

Mission Statement: Create an ideal City-administered mobility program that is affordable, convenient, and sustainable to improve the quality of life of all New York City residents.

This statement represents the broadest target the studio was aiming for, but offered little beyond the blanket sentiment. To further define our directive and ensure that the studio’s recommendations addressed the DOT’s requested focus - accessibility, equity, inclusion - and remained consistent with long-term City plans, the studio established the following goals:

- **Reduce Automobile Ownership**
- **Suppress Future Automobile Ownership**
- **Increase Access to Carshare**

In order to deliver on these goals, a set of actionable objectives were formed to be signposts for the studio’s progress. The following objectives reference and support the studio’s and DOT’s goals, values and mission, as well as being the basis for indicators of success:
• Maximize coverage, accessibility, and utilization of carshare throughout all NYC neighborhoods
• Reduce congestion and emissions
• Foster an economically stable and resilient marketplace for carshare operators
• Increase community outreach & partnerships
• Make transportation options more affordable
• Establish parameters for curb use based on curb value

In tackling this preliminary sectioning, the studio observed that different carshare participants would have varying viewpoints about management, facilitation and design of an ideal carshare program. The resulting stakeholder groups acted as distinct lenses through which each would evaluate the carshare existing conditions and steered the studio’s development of the recommendations. Each group was characterized by its mission statement:

**City Program Administrators:**
“Develop public policies and administrative regulations to optimize car-sharing and better meet citywide environmental, mobility, and accessibility goals.”

**Companies:**
“Increase carshare operation and utilization in order to maximize coverage for all of New York City’s diverse residents and neighborhoods.”

**Drivers and Users:**
“Research demographics of carshare users & car-dependent populations in order to understand travel behavior to facilitate recommendations for an ideal carshare program that better suits the mobility needs of NYC residents.”

**Site Designers:**
“Develop public policies and administrative regulations to optimize car-sharing and better meet citywide environmental, mobility, and accessibility goals.”
To further enrich our understanding of carshare, the studio researched best practices and innovative urban carshare programs outside of the New York City area. Our global exploration netted systems across the US, as well as internationally. Each city - from Los Angeles to Boston, Tel Aviv to Sydney - had systematic variations in how they approached location siting, vehicle fleet, pricing and structure of memberships, and partnerships with other organizations. The resulting library of ideas inspired the studio to come up with creative solutions to our diagnosed issues and concerns.

The following report will first establish the existing conditions of carsharing in New York City, and outline the associated issues and benefits. We continue to the purpose and need of carsharing as a viable mobility option. The final section contains our recommendations to DOT for an ideal city-wide carsharing program, which can be used together or broken apart and implemented wherever possible.
COMMUTING IN NEW YORK CITY

New York City is a largely transit-oriented city with low car ownership rates, as compared to other major U.S. cities. Within NYC, only 45 percent of households own a car. Here, 57 percent of residents utilize mass transit to commute to and from work, with only 26.3 percent utilizing privately-owned vehicles for commuting. However, car-ownership rates are not distributed evenly throughout all five boroughs. Car ownership rates are lowest in Manhattan at roughly 23 percent, where neighborhoods are dense, walkable, rich with transit, and abundant with alternative forms of transportation, including bicycling and micro-transit such as small buses and scooters. Car ownership rates are highest in the outer-boroughs of Queens and Staten Island (roughly 64 and 82 percent respectively), where transit options are inconvenient or nonexistent, there are fewer micro-transit options, and where land uses are more suburban in nature.1

NYC residents have relatively short-distance commutes that take a long time to complete. For instance, the average commute of all transit types is 43 minutes long in either direction2, with drivers who commute by transit traveling an average of nine miles per day. The cost of owning a car in NYC is expensive—for instance, the average cost of insurance in Brooklyn is $3,550 per year, and the average cost of renting a parking spot is $430 per month. Throughout the City, parking spots can be rented for anywhere between $100 to $1,000 per month3. On the other hand, carshare costs range from $69 to over $100 per month4. With these figures in mind, carshare presents itself as an affordable alternative to owning a car.
CARSHARE IN NEW YORK CITY

Carsharing is a service that gives members access to an automobile for short-term use - usually by the hour or minute. The cost, consisting of an annual membership and/or per-use fee, includes gas, maintenance, and insurance. These programs can be as simple as a peer-to-peer sharing model, where owners make their unused vehicles available to others, to community based non-profits to international companies operating across many cities. Research from across the country has shown that enhancing access to carsharing supports a reduction in car ownership and vehicle miles traveled among members. These outcomes can help cities address the challenges of curbside parking pressure, congestion, and vehicle emissions.

In addition to different scales, carshare can be operated in a one-way or two-way model:

**One-way** operators, such as Car2Go, allow the user to return the vehicle to any legal parking space within a certain boundary. This model works best in areas lacking in alternative mobility options, but has logistical challenges associated that can limit the operational geographies.

**Two-way** carshare programs operate similar to traditional car rental schemes where a user picks up the vehicle at a specific location and returns it to that same location, but, in this case, the location is a parking facility rather than a rental car lot. This decentralized model makes accessing a vehicle more convenient to the user and operate best as a piece of a larger, multi-mobile network.

Comprising one-third of the entire U.S. carsharing population, NYC has the largest carsharing market within the U.S.\(^5\) However, access to carshare within NYC is geographically limited and unequally distributed as the majority of carshare vehicles are currently located within neighborhoods in Manhattan, Western Brooklyn (i.e. Downtown Brooklyn and Williamsburg), and Western Queens (i.e. Long Island City and Williamsburg). These areas have high residential densities, robust public transit service, and low car ownership rates, which correlates directly with typical carshare user profiles.\(^6\) Demographic data of carshare users skews towards younger, whiter, highly educated, and wealthier populations who are
already less likely to own cars. Furthermore, data suggests that carshare programs are particularly successful in neighborhoods where residents predominantly rely on public transit to travel. This is especially true of two way carshare services.

**EXISTING CARSHARE LOCATIONS**
Identifying locations by key variables and components

**LEGEND**
- Municipal Garages
- Curbside Locations
- Car2go Boundary
- Enterprise Locations

![Map of Existing Carshare Locations](image)
While car ownership rates in Manhattan, Western Brooklyn, and Western Queens are low, populations living within these neighborhoods that do own cars typically use them for non-daily purposes, such as weekend trips, making two-way carshare especially useful. In contrast, the demand for car ownership for daily purposes, like commuting, is highest in marginalized areas such as Eastern Queens (i.e. Far Rockaway), Eastern Brooklyn (i.e. East New York), and the Bronx where access to public transit and other alternative modes, including carshare, is limited or inconvenient. Many of the neighborhoods in these areas are also associated with high poverty rates. Despite the high costs associated with owning a car, populations living in the outer boroughs have the highest car ownership rates throughout NYC. Their car usage patterns also make one way carshare more convenient than two-way carshare.

Within NYC, low-income populations with limited access to public transit must rely on personal vehicles or taxis to complete their trips. As compared to high-income populations, low-income populations spend higher portions of their salaries on transportation. Uneven access to convenient modes of transportation and multi-modal transportation reduces economic opportunities, worsens poverty rates, and heightens social disadvantages.

As carshare can enhance mobility for all New Yorkers, data suggests that one-way and two-way models can each be utilized to cater to targeted demographics. A Vancouver-based study comparing Car2go, a one-way model, to Modo, a two-way model, found stark differences in the user profiles of each company. Households joining Car2go reported an average household car ownership rate of 1.09 and took an average of 5.1 trips per week. Users of Car2go sought to replace ride hailing services and used their personal vehicles for longer trips. After joining Car2go, a 10 percent reduction in car ownership was seen with a household ownership falling to a rate of 0.98. Households joining Modo were less likely to already own a car, more likely to use alternative modes of transportation, and had an average household car ownership rate of 0.68. Modo members averaged 3.8 trips per week and were motivated to use carshare to save money, reduce their carbon footprint, and to travel outside of the city. After joining Modo, household car ownership rates were lowered by 50 percent, falling to an average of 0.36 vehicles per household. Thus, members of one-way services, like Car2go, are more likely to use carshare services as a complement to their current mode of transportation whereas members of two-way services, like Modo, used car-sharing as a substitute for private car ownership.
CARSHARING COMPANIES IN NYC

In New York City, there are currently four companies operating under two main car-sharing models: one-way and two-way. Car2Go is currently the only one-way carshare operator in the city. The two-way carshare operators include Enterprise, Zipcar and Maven. While it may seem like the one-way and two-way models are very different, they share manmimthese carsharing options may seem different, they are operated in very similar ways, as seen in the following paragraphs.

Car2Go

Founded in Germany in 2008, Car2Go (soon to be ShareNow) is the largest carshare company in the world. Their mission is “to improve quality of life for millions of people through flexible, affordable, instant mobility.” Car2Go is currently the only carshare company in New York City operating under a one-way model, allowing its users to pick up and drop off the vehicles at different sites.

Car2go’s available fleet includes vehicles that range from fuel-efficient cars similar to the Smart Fortwo, to luxury vehicles like the Mercedes-Benz CLA, all located in Brooklyn and Queens. Vehicles are charged by either hourly or daily rates. Hourly rates range from $15-$19 an hour, while daily rates range from $89-$129 per day. Members can also choose to be billed by the minute, at a rate upwards of 41 cents per minute. Car2Go does not charge any membership fees.

Members can sign up online or download and use the app. Drivers must have a valid license and are charged a one-time $5 sign up fee but also receive a $10 driving credit for first-time users. Insurance, gas, and 150 miles are included with each transaction. Cars must be booked using the Car2Go app. No reservation is required but users can reserve the vehicle up to 30 minutes in advance once they verify the vehicle through the app. The app is then used to get into the car, using a digital identification code that is sent to the user.
Enterprise    In 2008, Enterprise piloted its first on-campus carsharing program in St Louis then called WeCar, but was rebranded as Enterprise CarShare in 2013. Its mission is: “To capitalize on our longtime focus on customized service in the communities we serve and meet local transportation needs.” Their two-way model system consists of cars that range from compact or midsize cars similar to the Nissan Versa, to luxury vehicles like the BMW 430C Convertible. Enterprise vehicles are in a large number of neighborhoods throughout the City and in all five boroughs. Cars can be rented by the hour at a range of $8-$21 an hour; or at a daily rate of $69-$144 per day. A surcharge applies for members under 24 years of age.

Enterprise carshare charges a $40 annual membership fee and a one-time, $25 application fee. All users must be 18 or over and have a valid driver’s license and a major credit card. Gas, insurance, 200 miles per day, and 24/7 roadside assistance are included with each transaction. Additional miles are 45 cents per mile. The car can be reserved online or through the app. Enterprise Carshare sends you a membership card through the mail that enables you to unlock the rental vehicle.

Zipcar    Zipcar, founded in Cambridge, MA in 2000, operates under the mission that “it is not only possible to live car-free or car-lite—but such priorities make our lives easier, our cities less congested, and our planet more sustainable.” Like Enterprise, Zipcar runs a two-way model, with users picking up and dropping off cars from a fixed location such as a garage or parking lot.

Zipcar vehicles can be found in all five boroughs, and range from compact or midsize cars similar to the Honda Civic, to luxury vehicles like the Mercedes-Benz C300. Hourly rates start at $9.94 per hour, however, users can also choose from monthly or yearly plans. An occasional driving plan is available for $70/year, while a monthly plan is available for $7/month. Users must also pay a one-time $25 application fee and must have a valid driver’s license, a credit or debit card, and be 21 or older (18 years old if a student). Gas, insurance, and 180 miles per day are included with each transaction. Cars can be booked online at Zipcar.com or through the Zipcar app. After approval, your Zipcard is mailed to you and
becomes your key to unlock the Zipcar.

**Maven** Launched in 2016 and backed by General Motors, Maven’s two-way model consists of cars being stored in garages and lots, where drivers pick them up and return them. Maven’s mission is “to move communities forward by taking on the mobility challenges of tomorrow, today.” Cars range from compact or midsize cars similar to the Chevrolet Spark or Chevrolet Malibu, to luxury SUVs like the Cadillac Escalade. Vehicles are located in Manhattan from Tribeca to SoHo, in addition to the Lower East Side. Cars can be rented by the hour ranging from $8-$24 an hour. Maven charges no membership fee or application fee. Members must have a valid driver’s license and must be 18 years or older. Gas, insurance, and 180 miles per day are included with each transaction. Additional miles cost 42 cents per mile. All vehicles must be reserved through the Maven app.

**NYCDOT PILOT PROGRAM**

On March 31st, 2018, NYC DOT premiered a pilot program of on-street, reserved carshare spaces. While carshare had already existed in NYC for some years, carshare vehicles had previously been relegated to private parking facilities, which aren’t available in all neighborhoods. By locating carshare vehicles on-street, the DOT aimed to expand the reach of carshare programs in order to:

- **Lower household transportation costs**
- **Shorten the search for parking**
- **Improve access to services, friends/family, and recreation**
- **Reduce congestion and improve local air quality**

The pilot program designated 228 on-street carshare parking spaces in 14 zones across all boroughs of the City except Staten Island. The designated parking spaces are grouped in pairs and are situated near street intersections. Carshare operators were given flexibility in selecting the locations of their spaces, with the one stipulation that at least 20% of spaces be located in low-income neighborhoods. Additionally, carshare operators were required to agree to certain data sharing requirements with the DOT. Ultimately, only the two carshare operators Enterprise and Zipcar, expressed interest in the pilot and were selected.15
Site visits  
To better understand how carshare operates at street level, the studio designed an evaluation matrix and conducted site visits throughout the 14 pilot zones designated by the DOT. These 43 sites were located across Brooklyn, the Bronx, Manhattan, and Queens - Staten Island does not presently have any on-street carshare. During the site visits the studio made observations on vehicle and parking space cleanliness, utilization of carshare, presence of illegally parked vehicles, visibility of carshare signage, and noted the surrounding land use (see appendix for full report). It was found that, for the most part, sites and cars were kept clean and program signage was present, but in some cases signs were hard to read, inconveniently placed or otherwise inadequate. Additionally, it was found that, on average, only one of the two vehicles assigned to the site was present, although most site visits were conducted on weekends and site visits during the week may have yielded a different outcome. We were alarmed to discover that on almost 40% of visits, at least one non-carshare vehicle was parked in the reserved space and none of the illegally parked vehicles had been ticketed. This shows that the police are either unaware or unable to keep up with enforcement - something that will need to be addressed.

During the site visits, we used the opportunity to survey people in the vicinity of the carshare sites - shop owners, neighbors, carshare users. This informal survey provided feedback about public views of carshare, which were predictably mixed. One respondent used carshare frequently and said it helped them and their family live car-free. Another respondent, a longtime resident of the Red Hook neighborhood, did not support the City giving on-street parking spaces, which they considered a public good, to private companies. Another respondent, who was raised on the Upper West Side and now lives in Park Slope, said they would prefer to take a for-hire vehicle, like Uber or Lyft, rather than driving. In almost all cases though, respondents were unaware or misunderstood the pilot program.

Survey  
While the site visits informed the studio of details of the physical sites, we knew we needed to learn more about how NYC residents interact with and use both private vehicles and carshare. To do so, we created an online survey which was distributed to friends and colleagues. Due to the studio’s limited time and budget, we developed a qualitative survey, which will be a tool for DOT to better understand program participation and aid in their efforts to build a successful on-street carshare program.
The survey was completed by 76 participants residing in neighborhoods across the city and provided valuable insight on the public’s interaction with carshare programs. The survey was completed online by New York City residents age 18 and above between March 30 and April 5, 2019. A summary of our findings is presented below and an expanded look can be found in the appendix.

The survey gathered respondents’ demographics (age, income, driver license, zip-code), vehicle access (car owners, car-less), driving patterns (inside or outside the five boroughs), trip purpose (recreational activities, running errands, etc.) and carshare usage. We then broke-out the data by car owners versus carless individuals in order to understand the differences between the two groups.

<table>
<thead>
<tr>
<th>Demographic Breakdown</th>
<th>% (Count)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>18-24 years old</td>
<td>3% (2)</td>
</tr>
<tr>
<td>25-35 years old</td>
<td>60% (46)</td>
</tr>
<tr>
<td>36-45 years old</td>
<td>28% (21)</td>
</tr>
<tr>
<td>46-65 years old</td>
<td>8% (6)</td>
</tr>
<tr>
<td>older than 65</td>
<td>1% (1)</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
</tr>
<tr>
<td>Less than $50K per year</td>
<td>18% (14)</td>
</tr>
<tr>
<td>$50K - $100K per year</td>
<td>45% (34)</td>
</tr>
<tr>
<td>$100K - $200K per year</td>
<td>22% (17)</td>
</tr>
<tr>
<td>Over $200K per year</td>
<td>7% (5)</td>
</tr>
<tr>
<td>Prefer not to answer</td>
<td>8% (6)</td>
</tr>
<tr>
<td><strong>Borough</strong></td>
<td></td>
</tr>
<tr>
<td>Manhattan</td>
<td>18% (14)</td>
</tr>
<tr>
<td>Brooklyn</td>
<td>50% (38)</td>
</tr>
<tr>
<td>Queens</td>
<td>30% (23)</td>
</tr>
<tr>
<td>Bronx</td>
<td>2% (1)</td>
</tr>
<tr>
<td>Staten Island</td>
<td>0</td>
</tr>
<tr>
<td><strong>Car Availability</strong></td>
<td></td>
</tr>
<tr>
<td>Car owners</td>
<td>38% (29)</td>
</tr>
<tr>
<td>Carless</td>
<td>62% (47)</td>
</tr>
<tr>
<td><strong>Driving License</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>92% (70)</td>
</tr>
<tr>
<td>No</td>
<td>8% (6)</td>
</tr>
</tbody>
</table>
Survey key highlights:

General respondents (n=76):
- 62% said that “More affordable prices / member discounts would encourage them to join, or keep, their carshare membership”
- Some respondents mentioned that they did not know that carshare exists as an alternative transportation option
- Most utilized modes of transportation are subway (18%), walking (17%), for-hire vehicles (14%) and bus (12%)

Carshare users (n=42)
- 42% use carshare because “public transit is inconvenient/unavailable”
- 57% use carshare once per year or less
- 50% use carshare for “recreational activities/vacations”
- 50% mostly travel outside the 5 boroughs

Car owners (n=29):
- 52% mentioned “personal freedom” as the main reason owning a car
- 38% use their car daily
- Main reasons to use a car is for recreational activities/vacations (34%) and running errands (29%)
- 48% mostly travel within the borough they live
- Only 4 respondents, out of 29, would consider selling their car if there was a convenient carshare service in their neighborhood
- 45% are using, or have used, carshare
- 22% use carshare for “recreational activities/vacations”

Car-less (n=47):
- 57% are not owning a car because “alternative transportation modes more convenient”
- 62% are using, or used, carshare
- 55% mostly travel outside the five boroughs
- 62% use carshare for “recreational activities/vacations”
ISSUES

As the NYC DOT carshare pilot currently stands, only two private carsharing companies have chosen to participate. Managing and operating a carshare system can be logistically and financially challenging, and Car Sharing Organizations (CSOs) may not be willing to expand beyond their established service areas or user base. This causes carsharing sites to not be evenly or widely distributed throughout neighborhoods.

As part of the DOT pilot, both Enterprise and Zipcar hold the authority to tow illegally parked vehicles from their spaces while carsharing vehicles are exempt from alternate side parking regulations. All carshare parking spaces have signs designating each space which include detailed curb regulations and a description of the pilot program and the advantages of using carshare. Non-carshare vehicles are not allowed to stop, load or unload in any of the carshare spots. NYPD also has the authority to ticket and tow any vehicle illegally found in a carsharing spot. If a car is found to be illegally parked and incurs a fine or gets towed, the driver is responsible for the fine and/or towing fee. Both carshare companies involved in the pilot program are also held responsible for keeping their vehicles and corresponding spots clean. However, even with these seemingly strict rules and regulations, enforcement of illegally parked vehicles in allocated carsharing spots is a major concern and headache for users. Enforcement as a recurring problem may be a contributing factor in someone’s decision to use (or not use) carsharing as a mobility option.

In New York City, parking is minimally regulated and free parking is ubiquitous in many areas. This leads to a devaluation of the curb wherein much of the population considers free parking a right. Without an accurate value of the curb and parking spaces, NYC residents perceive on-street parking spots, which they are accustomed to using for their personal vehicles, as being taken away for carsharing. In assessing and regulating curb value, a policy should be developed to ensure that residents do not feel that the city is allowing private companies to profit from a public resource and public outreach should communicate carshare’s benefits.
Existing Conditions  |  21

PURPOSE & NEED

Multiple studies indicate that carshare programs encourage users to sell their vehicles and deters them from purchasing new ones. Analyses from 2010 and 2011 have indicated that the average carshare vehicle removes between 9 and 13 privately owned vehicles from the road, enables households to reduce their carbon footprint by 0.84 tons of greenhouse gases per year, and reduces vehicle miles traveled by up to 27 percent. Carshare can also enhance the mobility of individuals that do not have access to private automobiles as evidenced:

**Carsharing can reduce household vehicle ownership because the service can eliminate the need for a private vehicle to complete non-work trips...the shared vehicles eliminate upfront ownership costs, but members still maintain auto access while leading a less car-dependent lifestyle.**

If 10,000 car-owners joined a carshare program, they may opt to sell their private vehicle. As such, as many as 10,000 vehicles could be removed from New York’s streets. As mentioned, the average New York car-owner drives nine miles per day - this would equate to a total of approximately 90,000 vehicle miles traveled (VMT) for these 10,000 users on a day-to-day basis. This equates to an astonishing 32.85 million VMT each year. Since carshare reduces VMT by roughly 27 percent, the overall annual VMT for these users would be reduced by approximately 8.87 million, which, in turn, could result in a reduction of nearly 8,400 tons of greenhouse gas emissions.

- A reduction of 8.87 million VMT is equivalent to traveling around the circumference of the earth approximately 356 times!
- A reduction of 8,400 tons of GHG is equivalent to:
  » The weight of 1,400 African Elephants!
  » Powering a home for 100 years!
  » Extracting 560 barrels of oil!
NYC is home to a wide diversity of populations and geographies with varying transportation needs. In order to meet the goals of reduced car ownership rates and enhanced mobility, a variety of carshare options, including both one-way and two-way services, are needed to meet the requirements of all communities living within NYC. Connecting both one-way and two-way carshare with multimodal trips furthers the convenience and usefulness of carshare, particularly in less transit dense areas. NYC Carshare provides an opportunity to increase access to the benefits of car use while reducing total car ownership.

Intervention in the current DOT pilot program is needed as membership rates remain stagnant and various issues continue to arise. Without change, carsharing may diminish and the potential benefits of the service may not be realized. The population of the city continues to increase along with private and for-hire vehicle (FHV) use. If these trends continue, we will see an increase in greenhouse gas emissions and other environmental concerns. To address these issues and the growing need for a well-functioning mobility system, our studio has created ten recommendations for an ideal carsharing program for the city which are described in detail below. Ideally, these recommendations will be implemented collectively, however they can also be used as individual policies and programs.

Carshare has the potential to accomplish these goals and objectives, but requires programmatic changes and a suite of supporting initiatives in order to succeed. The ultimate studio deliverable is to identify recommendations that, when combined with a larger, more comprehensive set of urban mobility programs, will better address the transportation needs of the City.
INTRODUCTION

The following ten recommendations were cultivated as a response to the existing conditions of carsharing in New York City, case studies of transportation policies successfully executed in other cities, and a need to expand carshare viability throughout the city. Each recommendation encompasses objectives that directly reinforce the mission-driven goals to reduce current and future car ownership, while increasing citywide accessibility to carshare. These recommendations were designed to be most successful when used in conjunction with one another, but also have the capacity to be individually adopted.

It is important to note the scale and scope of this studio was limited by time and access to private company data. Therefore, many of the following recommendations provide the outline for how to evaluate our objectives, but may be absent specific numbers.
**SUMMARY OF RECOMMENDATIONS**

**Recommendation 1: Increase Awareness of Carshare** (Page 27)

In order for carshare to be a viable piece of a multimodal network, more of NYC’s citizens need to be aware of its availability.

**Recommendation 2: Optimal Site Location** (p. 31)

The preexisting carshare sites were largely chosen on the basis of maximizing profits for the carshare operator, rather than maximizing mobility for New York City residents. Carshare site selection should be targeted towards reducing car ownership and increasing mobility for all NYC residents.

**Recommendation 3: System of Vendor Selection/Site Distribution** (p. 34)

Currently there is unequal distribution of carshare throughout New York City. The City should be divided into zones in order to ensure an adequate carshare distribution throughout the city. The right to locate in certain neighborhoods is granted only when CSOs locate in underserved zones.

**Recommendation 4: Design Unique and Recognizable On-Street Reserved Spaces** (p. 36)

Drivers and residents have difficulty distinguishing carshare locations from ordinary parking spots. A distinctive design will inform the community that carshare locations are a community benefit, increase awareness of the carshare program, and reduce enforcement issues.

**Recommendation 5: Increase Enforcement of Vehicles Illegally Parked in Reserved Spaces** (p. 39)

Illegally parked cars compromise the effectiveness of on-street carshare spots. In order to ensure the proper return of carshare vehicles, illegally parked cars must be towed promptly.
Recommendation 6: Reduce Cost of Carshare (p. 40)

The cost of carshare can be an obstacle which hinders low income residents from equitable accessibility and utilization of this form of mobility.

Recommendation 7: Increase Data-Sharing (p. 43)

In order for the City to better understand, plan, and regulate carshare, increased data-sharing between the City and CSOs is imperative. This will not only aid in improving accessibility and road safety, but will also help in managing traffic and creating a more equal distribution of carsharing throughout the city.

Recommendation 8: Parking Permit Program (p. 44)

Over 97% of NYC’s on-street parking is free for the public to use. To better establish the value of this public curb space, NYC should implement a neighborhood parking permit program. Such a program will also provide more equitable access across all neighborhoods to public street space, and encourage households to reduce the number of vehicles owned.

Recommendation 9: Vehicle Buy Back Program (p. 46)

The program will financially incentivize drivers of older and/or less fuel efficient vehicles, to voluntarily retire their vehicles. This will help to reduce overall car ownership and lower emissions.

Recommendation 10: Expand Mobility Options (p. 47)

Many of NYC’s residents lack accessibility to transportation options. The expansion of all mobility in the city would create better connectivity and improve walkability, biking, and public transit in neighborhoods. Creating multimodal hubs at carshare sites would facilitate accessibility and multi-modal transit.
The NYC DOT carshare pilot has struggled with public misunderstanding and a lack of knowledge about the program. Since DOT’s carsharing is only in its pilot stage, much of this failure falls on the program’s limited scope and awareness. However, expanded outreach efforts to the public, elected officials, and community organizations will be necessary for the longevity of the program.

Increasing access to carshare requires broad-reaching support for the program from community leaders and local residents throughout the city. This means support cannot only exist where the program is currently in place, but must be expanded across all boroughs to ensure the highest level of access to the program. On-street carshare is a highly political subject, with residential communities increasingly sensitive to how curb space in their neighborhoods is being utilized. During the site selection process for NYC DOT’s pilot program, political standing became evident when certain communities objected to the assignment of carshare in public parking spots. Most notable was the objection in the borough of Staten Island, which ultimately resulted in zero on-street spots being implemented. While it will be difficult to have universal support of the program, the city should strive to leverage greater support throughout all boroughs.

1. INCREASE AWARENESS OF CARSHARE

The NYC DOT carshare pilot has struggled with public misunderstanding and a lack of knowledge about the program. Since DOT’s carsharing is only in its pilot stage, much of this failure falls on the program’s limited scope and awareness. However, expanded outreach efforts to the public, elected officials, and community organizations will be necessary for the longevity of the program.

Increasing access to carshare requires broad-reaching support for the program from community leaders and local residents throughout the city. This means support cannot only exist where the program is currently in place, but must be expanded across all boroughs to ensure the highest level of access to the program. On-street carshare is a highly political subject, with residential communities increasingly sensitive to how curb space in their neighborhoods is being utilized. During the site selection process for NYC DOT’s pilot program, political standing became evident when certain communities objected to the assignment of carshare in public parking spots. Most notable was the objection in the borough of Staten Island, which ultimately resulted in zero on-street spots being implemented. While it will be difficult to have universal support of the program, the city should strive to leverage greater support throughout all boroughs.
The City should consider establishing a formal public outreach plan. This would include a renewed outreach effort to all community boards to explain the current progress with onstreet carsharing, and explore opportunities to expand the program to new areas. Additionally, the City should meet with local neighborhood, civic, and business associations to provide updates and begin evaluating potential areas for expansion. To help community boards and groups understand the benefits of the program, the City should consider partnering with additional organizations that already have inroads into specific communities. These should include transportation-based organizations such as Transit Center and Transportation Alternatives, but could also include non-transportation related organizations such as parent and/or student organizations, labor unions, professional organizations, volunteer organizations, etc. These groups may all have large memberships and therefore a greater reach into the community. Building coalitions with these groups can develop support among diverse groups of constituents and increase overall community awareness. Finally, many of these organizations have important relationships with local elected officials. If these organizations indicate support for on-street carshare, local elected officials may be more inclined to show support for this program. Nevertheless, robust outreach to all elected officials in the City Council as well as the New York State legislature should be considered.

To establish new partnerships and coalitions with local organizations and community leaders, the public outreach plan should include roundtable workshops, informal open houses, and tables at community events to provide community members with opportuni-
ties to learn more about carshare. The establishment of a DOT Street Ambassadors Team focused specifically on carsharing would also assist in the outreach effort. These Street Ambassadors could talk directly to residents and business owners about carsharing and answer any questions. Carshare companies and NYC DOT can set up information stations in which a carshare representative is available to talk to community members. All of these outreach options would provide the public with opportunities to learn about the benefits of joining carshare, how to sign-up for a membership, how to access discount offers, and how to utilize the service. By increasing engagement with communities, the city can learn about the issues and concerns that these communities have regarding carshare, and will be better prepared to respond.

Care for NYC?
Take a carshare vehicle to work and look at the environmental benefits below!
www.ilovenycarshare.com to sign up

Examples of a carshare program advertisements
Community outreach efforts should also focus on general advertising campaigns that will provide further education about the on-street carsharing program. Advertisement campaigns can have specific themes, such as sustainability, cost-effectiveness, and convenience. These advertisements can be distributed via a variety of mechanisms including informal paper pamphlets, television and radio stations, tabling at community events, on-car decals, social media platforms, LinkNYC kiosks, newsstands, libraries, and local businesses. Having a mix of advertisement themes can attract drivers from a diverse range of neighborhoods and incomes, as well as drivers with a variety of car-use needs.
2. OPTIMAL SITE LOCATION

A critical component of a successful carshare program is the siting of parking spaces in areas that are convenient to users across all neighborhoods of the city. However, there are particular areas of NYC that have a greater need for increased access to carshare. Utilizing ArcGIS, the studio conducted an analysis of various socioeconomic factors to determine the areas that would most benefit from increased carshare access in the City.

Site Selection

To select the optimal locations for reserved on-street parking spaces, two models were created. Both models took into account several factors including income, car ownership, proximity to transit, age, and disability, by census tract.

Model 1: The first model was used to select the optimal locations where car ownership could be reduced. This model highlighted tracts that:

- were located within 1/2 mile from a subway station
- had a median income greater than or equal to NYC’s median income
- had vehicle ownership rates at or above 50%

Census tracts that satisfied all of these criteria were deemed to have the most significant possibility of reducing car ownership, and therefore would benefit from an expanded carshare program.

Model 2: The second model was used to select locations where the needs of the socioeconomically vulnerable could be better addressed. This model highlighted tracts that:

- were located greater than 1/2 mile from a subway station
- had 30% or more of the population living at or below the federal poverty rate
- had a senior population greater than or equal to 10% of the population
- had a disabled population greater than or equal to 10% of the population

Census tracts that satisfied all of these criteria were deemed to have the most significant possibility of assisting and benefiting the socioeconomically vulnerable and those geographically isolated from transit. As a result, these census tracts were identified as optimal locations for an expanded carshare program.
Model 1: SITE SELECTION FOR REDUCING CAR OWNERSHIP
Identifying locations by key variables and components

- High Income
- High Car Ownership
- Proximity to Transit

Model 2: SITE SELECTION FOR VULNERABLE POPULATIONS
Identifying locations by key variables and components

- Over 10% seniors
- Over 30% under poverty
- Over 10% disabled
- Transit Deserts
After completing these models, the studio found that 52 census tracts across all five boroughs contained the optimal sites for carshare. They include: 25 in Brooklyn, 13 in Queens, 7 in Staten Island, 6 in Bronx and 1 in Manhattan.

**On-Street and Off-Street Locations**

The studio proposes that the DOT consider implementing additional carshare spaces throughout the City, not only in the public right of way, but also in multimodal hubs (see Recommendation 4) and in parking facilities owned by the City or another public agency such as NYCHA. With respect to on-street carshare locations, the City currently limits CSOs to having two parking spaces per block in residential areas. The studio proposes that the number of on-street parking locations be increased to four to six spaces per site to further incentivize the reduction of car ownership. It should be noted that in some cases this may take up a half-block of street frontage. Additionally, to properly service each selected neighborhood, whenever possible, carshare spaces in residential areas should be designated within at least a mile of each other.

With respect to municipal parking garages, the DOT pilot currently has 55 reserved carshare parking spaces across 17 City-operated facilities. However, only a small number of the municipal parking garages operate 24 hours a day. For a carshare program to be able to operate successfully within a municipal parking garage, those that use carshare vehicles must be able to pick up and drop off cars at any time of the day, unencumbered. The studio proposes that the DOT focus on implementing additional carshare spaces in garages with 24/7 access.

In addition to municipal garages, the DOT should also consider including all NYCHA developments with parking lots as potential sites for carshare spaces. The addition of spaces at these sites would improve mobility access for a large portion of some of NYC’s most economically distressed residents.
3. SYSTEM OF VENDOR SELECTION & SITE DISTRIBUTION

CSO’s are currently operating in neighborhoods where they have high membership rates. As part of the NYC DOT Carshare pilot, a variety of on-street spaces were offered throughout the city. The bulk of spaces chosen by the two participating companies were in high-income, Brooklyn neighborhoods. While this occurred as part of a pilot program, a comprehensive carshare policy would require CSOs to also locate a greater number of spaces in underserved neighborhoods. Spaces in higher utilization areas should be bundled with spaces in neighborhoods that are currently underserved by CSOs. This will ensure equal distribution of carsharing sites. In order for a CSO to park their car in high utilization areas, the DOT should require that CSOs also offer their services in neighborhoods they may not naturally select without incentivization. Below is an outline of the studio’s proposed zones for New York City. In order for carshare companies to build ten sites in any of the five zones, at least half must be located in Expansion Zone I or II.

New York City Site Distribution Zones:

Discourage New Locations: Mid and Lower Manhattan. Carshare should be discouraged in these areas because there is a wide range of existing transit options in these neighborhoods and an already high rate of congestion.

Existing Service Areas: Upper Manhattan, Western Queens, and Brooklyn. These are locations that existing CSOs were targeting before the pilot, therefore they see these geographies as marketable and successful for carsharing.

Expansion Zone I: Most of the outer boroughs. This is where carshare should be encouraged.

Expansion Zone II: Underserved and transit-desert geographies. This should be the highest priority area, but existing carshare is not likely to expand to this zone without government intervention.

Expansion Zone III: Locations in this zone are the most car-dependent and suburban. CSOs might be hesitant of expanding their services here as there may not be significant potential for success.
In the event that CSOs fail to comply with this new site bundling method, they would then be forced to pay a fine. Any revenue received from this would then be used to subsidize carshare in underserved neighborhoods.

VENDOR DISTRIBUTION
Identifying packages by zone designations

LEGEND
- Discourage New Locations
- Existing Service Areas
- Expansion Zone 1
- Expansion Zone 2
- Expansion Zone 3
4. DESIGN UNIQUE AND RECOGNIZABLE ON-STREET RESERVED SPACES

Currently, the physical design of carshare parking spaces lacks proper differentiation from other on-street parking spots. Signage for carshare lacks visibility making it indistinguishable from other on-street signs. This confusion hinders the public’s knowledge and understanding of the carshare program, while simultaneously preventing future growth. Larger signage, in conjunction with bolder color choices and highlighted parking spots, will increase the discernibility of designated carsharing vehicles and parking spots.

The carshare program’s attempt to reserve a certain number of on-street parking spaces for strictly carsharing vehicles may yield complaints about the privatization of public spaces. However, we argue that this does not have to be the case. In fact, no use of public space is more private than the use of dedicated parking spaces for privately owned vehicles. Reserved spaces for carshare vehicles will increase the turnover of each space and will make it useful for dozens of people, instead of just one or two. Moreover, since each carshare vehicle has the potential to take 9 to 13 privately-owned cars off the road, residents will be able to enjoy more parking spaces in their neighborhood.

The design of carshare spaces will differ depending on the surrounding land uses. The studio has designed four major categories of carshare locations, but any site may use individual design elements as conditions allow. The four different designs for low-density residential, high-density-residential, commercial, and multi-modal hubs. Design of locations in odd or underused locations, such as street triangle locations or sites found below elevated structures such as the Brooklyn-Queens Expressway are also included.

Additionally, visibility measures include temporal factors such as time of day and season of the year. For example, the visibility of signage is made difficult after dark, yet an appropriate light fixture can help both drivers and pedestrians. Elements of sustainability could be implemented into sites as well. Porous asphalt or concrete can be placed on carshare parking spots and the sidewalks adjacent to them. Porous material would promote better drainage that is not always achieved through conventional street drainage. Appropriately colored asphalt can be used to address overheating concerns in hot weather.
The studio believes that an appropriate physical design for carsharing spots can enhance the user experience by maintaining a high-quality of spaces. An ideal physical design has the potential to not only provide visibility to promote carshare operations and safety, but it can also activate parking spaces and sidewalks, include community stakeholders, and promote sustainability and other transportation options. Some locations have the potential to be designated multi-modal stations where bike-racks, benches, and bus stops can work congruously.

To aid in increasing mobility and accessibility, sidewalks adjacent to carshare locations can be utilized as an ADA compliant pedestrian ramp to a carshare vehicle. Though ADA compliant ramps exist on the corners of the street and allow disabled pedestrians to use crosswalks, there are no present ADA connections between current carshare spaces and the sidewalk. To create an at grade connection, an additional pedestrian ramp can be placed adjacent to the carshare spaces in lieu of a typical sidewalk as seen in the image on the right. These pedestrian ramps can be used as a tactile guide for the disabled and or elderly, and could be placed in Naturally Occurring Retirement Communities (NORCs).

All of these measures must be taken with care, as all carshare locations in New York City currently have no distinctive signage, pavement markings, painting, or public amenities. New additions to the street or parking spots might cause distress in communities. To avoid complications, we have developed a matrix for ideal measures for each land use, according to lane width and sidewalk width below:

**Residential streets vs Commercial streets**
- For both land uses, signage should be visible to all street users
- Street furniture such as: lighting, seating, tables, planters, kiosks and bike racks
Branding (City vs Vendors)
- Located on signage, car and street furniture

Multi-use elements
- Street furniture such as: lighting, seating, tables, planters, kiosks. Could be modular, or movable?

Sustainability
- Porous material for carshare parking pad (concrete or asphalt)
- Lightly colored parking spots to reduce the heat island effect

5. INCREASE ENFORCEMENT OF VEHICLES ILLEGALLY PARKED IN RESERVED SPACES

Ease of parking and convenience is critical for drivers transitioning from private vehicle ownership to using carshare. Through the site visits and survey conducted as part of this studio, it was found that 35% of sites had one or more illegally parked vehicles in the carshare spots, while 21% of carshare users ranked convenient parking as a primary reason for using carshare. Improved, increased, and consistent parking enforcement by NYPD of reserved spots is crucial to the success of carshare. Without properly addressing this issue of providing convenient parking for users, drivers will be disincentivized from consistently using carshare in the city. Therefore, in order to maintain a high volume of carshare members, it is important to create a system that is easy for members to use.

Primarily, in order to increase enforcement of illegally parked vehicles, it is pertinent to properly train NYPD and parking enforcement officers to ensure they are aware of the strict rules and regulations regarding carshare parking. There should be an increase to existing coordination between NYPD and carshare companies in order to better enforce and tow illegally parked vehicles. All NYPD and parking enforcement officers should participate in a training to fully understand enforcement of illegally parked carsharing vehicles.
The studio also proposes raising the ticket fee for illegally parked vehicles in carshare spots from the current $115 fee, to $200. An increase in the fee would not only create a sense of strictness and seriousness surrounding the carshare program, but would also detract drivers from illegally parking in the spots. The revenue generated from the increased fee could be used to fund carshare program expansion in the city and/or to subsidize membership, therefore increasing carshare participation.

Another proposal that should be considered for future study is the installation of countdown clocks at carshare parking spaces. This would allow drivers to be aware of how long the reserved spaces will remain unoccupied, opening up the opportunity for other short-term parking uses. Some of the hesitancy of using public parking spaces for carsharing centers around the spaces remaining empty for extended periods of time while the carsharing vehicle is in use. Having countdown clocks at the spaces would allow other drivers to utilize the parking space while the carshare vehicle is away, since they will know exactly how much time they have before they will need to vacate. This could significantly decrease the number of illegally parked vehicles as well as ease the view of using public property for carsharing.

6. REDUCE COST OF CARSHARE TO INCREASE UTILIZATION

While mass transit, walking, and cycling are usually less expensive modes than private automobiles, some trips do require a vehicle. According to 2016 U.S. Census data analyzed by the website Market Watch, transportation costs were the second highest expense for American households, behind housing costs - which were $9,049 and $18,886, respectively.²⁵ This cost is compounded for New Yorkers as transportation costs can be much more than the national average. For example, car insurance for vehicles registered in NYC can be as high as $4,000, compared to $1,173 nationally.²⁶ For households with limited or fixed incomes, or with expenses coming from other areas like medical bills or child/elder care, the additional high cost of transportation can be a serious burden. Reducing this cost will create a more equitable city for all residents.

In many instances, carshare programs can provide an affordable alternative to the privately owned automobile, whose obligation and responsibility fall solely on the vehicle’s
owner. Carshare programs, on the other hand, spread the costs and liability across members, which reduces participants’ liabilities. For example, insurance, fuel, maintenance, the cost of purchasing the vehicle, and any potential parking violations, are all covered by carshare operators. Members pay a yearly fee (ranging from $40-84) and, after that, pay only for the time the member uses the vehicle. Below is a breakdown of carshare costs for companies operating in NYC:

<table>
<thead>
<tr>
<th>Company</th>
<th>Membership</th>
<th>Cost</th>
<th>Mileage Limit*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car2Go</td>
<td>$0 annual fee</td>
<td>$.41/minute</td>
<td>150 miles/day</td>
</tr>
<tr>
<td>Zipcar</td>
<td>$84/year</td>
<td>$10-12/hour</td>
<td>180 miles/day</td>
</tr>
<tr>
<td>Enterprise</td>
<td>$40-50/year</td>
<td>$6.96-8/8/hour</td>
<td>200 miles/day</td>
</tr>
</tbody>
</table>

*Additional fees apply for trip over mileage limit

Because all costs associated with vehicle ownership are the obligation of the private vehicle owner, these sunk costs (costs that have been incurred and cannot be recovered27) influence the vehicle owner to use their vehicle. For example, a vehicle owner may decide to drive, rather than take transit, because the perception of transit is that the fare is something that still needs to be paid for and the vehicle is previously paid for, even though the transit fare is usually significantly less. Since some trips can only be completed using a vehicle, convenient and affordable carshare can be a viable alternative to private automobile ownership.

Although carshare can be less expensive than owning a private automobile, the cost of a carshare membership, plus the additional rental fees, can be a barrier to entry. While coercing carshare vendors into lowering their prices might present a challenge, there are options. Companies can offer a variety of discounts and create cost-saving programs for low-income users including free one-day memberships, free first-time memberships, and reduced monthly costs. A free one-day membership would enable new low-income customers to utilize carshare for an entire day at no cost, enabling them to determine if carshare is a suitable mobility option for their needs. If these users decide to continue using carshare, a free first-time membership would waive any annual or monthly membership
fees. Combined with reduced monthly costs, a discount program of this sort could contribute to increased membership rates and widely expanded mobility and accessibility in low-income neighborhoods, especially for those with limited access to transit. Discounts could be provided to a certain income threshold, particularly for those making at or up to 150% of the federal poverty level.

In addition to paying membership and user fees, carshare user costs are subject to sales tax.\(^{28}\) Currently, carshare rentals are taxed at the same rate as traditional car rentals. This can be as much as 19.88% in NYC, more than double the sales tax.\(^{29}\) Many states and local governments levee additional taxes on car rentals on top of standard sales taxes. In New York State, the additional charge is 6% with another 5% added when the rental car is “delivered”.\(^{30}\) Some attribute this inflation to the fact that most renters are either tourists or not themselves paying for the rental (i.e. employer pays) therefore they do not advocate for a lowering of these taxes or fees.\(^{31}\)

Not all vehicle transactions are taxed at the same rate though. U-Haul truck rentals in New York City, on the other hand, are subject to an 8.875% sales tax.\(^{32}\) This is the same rate as most other purchases (4% state, 4.5% city), including vehicle purchases - the maximum tax an automobile buyer will pay is $725.\(^{33}\) Interestingly, vehicles parked, garaged, or stored in NYC are subject to either a 10.375% sales tax in the outer boroughs or an 18.375% sales tax in Manhattan. Manhattan residents can apply for a waiver of the additional 8% tax.\(^{34}\)

As carshare is meant to benefit local populations as an alternative to owning a vehicle, reducing the tax on carshare to the same level as local sales tax or some comparable level, will lower the overall cost, thereby significantly reducing a major barrier to entry. Offering benefits for low-income communities can potentially increase their membership base and greatly improve mobility. In addition, an obverse policy could be to increase the sales tax on parking in all boroughs and direct a portion of the revenue to make carshare affordable for low-income members. Reducing the cost of carshare - either by reducing the sales tax or offering discounts, subsidies or promotions - will lower the barriers of entry making carshare more accessible.
7. INCREASE DATA-SHARING

Improved data-sharing between all CSOs and New York City is crucial to the success of carsharing. While this might seem like a radical policy, there is strong precedent with other forms of mobility. For many years taxi trip information provided a glimpse into the city’s transportation ecosystem. Detailed information such as where taxis were driving above the speed limit paved the way for opportunities to explore street calming designs. Particularly slow intersections could be assessed with their corresponding times and additional changes to traffic lights could be prescribed.

Mandated through legislation passed by the Taxi and Limousine Commission (TLC), for-hire vehicle (FHV) companies such as Uber, Lyft, Via, and Juno are now subject to providing the City with finely-detailed data. This includes the date, time, and location of pick-ups and drop-offs, the vehicle’s license place number, the trip mileage, itemized trip fare, route, and how much the driver was paid. The city has implemented this regulation in order to use the data to learn more about what is happening on the streets in order to plan accordingly. Between 2017 and 2018, fatal crashes involving TLC-regulated vehicles decreased by half from 32 to 16. This type of data-sharing provides valuable information on how to improve accessibility, manage traffic, improve road safety, and monitor the number of wheelchair-accessible vehicles picking up passengers among others. Carshare should be held to the same standards as the FHVs, as they share a similar role in car-based mobility. This should include data-sharing on where one-way CSOs are utilizing free public street space to park their cars, CSO utilization metrics, and detailed trip metrics similar to that of FHV regulations. With this information, the City will be able to better manage this form of mobility and address any lapses in coverage.
8. PARKING PERMIT PROGRAM

New York City is long overdue for comprehensive parking reform to address issues exacerbated by the city’s overabundance of free parking. As recently as 2018, Council members Ydanis Rodriguez, Mark Levine and Helen Rosenthal sponsored neighborhood-specific and citywide bills for Residential Parking Permits (RPP). Several major U.S. cities including San Francisco, Washington, D.C., and Boston have already implemented such reforms through neighborhood parking permit programs.

These programs better establish the value of public street space, provide more equitable access across all neighborhoods to public street space, and encourage households to reduce the number of vehicles owned. With approximately 97% of the City’s on-street parking spaces currently free to use, there exists a potential for the City to better regulate and evaluate these public spaces.

In order to recommend a fully detailed neighborhood parking permit program, access to specific neighborhood data and community input would be necessary. Given that this data would require its own detailed study, four major U.S. cities were researched to better understand what a NYC program might look like. The cities researched were: Chicago, IL; San Francisco, CA; Washington, D.C.; and Boston, MA.

A NYC residential parking permit program would need to consider permit eligibility requirements, permit fees, household permit limits, and the establishment of a process to define permit zone boundaries.

Eligibility:

As a first step, and consistent with all of the case studies, the City should require proof of New York State residency to receive a residential parking permit. As an additional step, the City may consider requiring vehicles to be registered in-state.

Fees:

Based upon research of other city programs, it is common for cities to charge a nominal fee each year in the vicinity of $25 to $35. San Francisco, an outlier, charges as much as $225 a year for a permit. It is our recommendation that at a minimum, a fee of $25 be charged. A study posted in Transport Policy found that 52.5% of surveyed NYC residents would willing to pay for an average $408 per year. While the City may not want to con-
Consider pricing permits as high as $408, the research does indicate there is receptivity by local residents to pay for their use of public parking spaces. Additionally, the City should consider incrementally raising the price per permit, per household, in order to disincentivize households from parking multiple vehicles on the street.

**Household Limits:**

Furthermore, the City should consider setting a limit on the number of permitted vehicles per household, similar to San Francisco’s limit of 4 vehicles per household. This would help support the City’s goals of reducing car ownership.

**Zone Boundaries:**

Regarding the establishment of zones or program boundaries, the City should consider following San Francisco’s model of varying permit pricing depending upon the zone, with zones that experience the most frequent parking issues paying the highest permit fees. The Transport Policy study found that “pricing becomes more acceptable in neighborhoods where the major parking problem is shortage and crowding caused mainly by local residents instead of parking intrusion by non-residents.” Alternatively, the City may consider following the model of Washington D.C. and Boston in creating a petition-based approval process for creating new permit zones. This model can also be used to expand or even rescind existing zones.
9. VEHICLE BUY BACK PROGRAM

New York City has a goal of reducing 80% of greenhouse gas emissions by 2050. Because the transportation sector is one of the largest contributors to U.S. GHG emissions, NYC must embrace alternative fuel vehicles and remove older vehicles from the streets in order to meet this goal. One way to do this is to create a city-run vehicle buy back program.

Selling an older vehicle can be a long drawn out process as there is not a high demand for them. The studio’s proposed Vehicle Buy Back Program provides a method to encourage drivers of older, fuel-inefficient vehicles to sell their cars in order to reduce the number found on the road. The Vehicle Buy Back program is designed to provide incentives, including monetary payments, to owners of older, more polluting vehicles to voluntarily retire their vehicles. The goal of the program is to reduce emissions by encouraging the accelerated retirement of the older, more polluting vehicles, however the program is not limited to older vehicles.

Owning a private vehicle can be become very costly for an individual with monthly payments, gas, maintenance, parking and insurance. Carsharing takes cars off the road as users begin to realize that they are saving money by utilizing carshare. People who frequently use carshare tend to sell their own vehicles and start using alternate modes of transportation. By administering a vehicle buy back program in conjunction with a City-run
10. EXPAND MOBILITY OPTIONS

Expanding transportation options is more than just moving people from point A to point B. It is also about expanding opportunities to access education and jobs, key portals to economic stability and self-sufficiency. As shown in research of upward mobility done by Harvard, access to transportation options is a key factor for escaping poverty. The report shows that the relationship between available transit options and economic mobility is stronger than those between transportation and crime, elementary-school test scores, or the percentage of two-parent families in a community. Moreover, the report further states that a longer commute time lowers the chances a given low-income family has of moving up the socioeconomic ladder. Improving access to transportation and reducing over-long commute times are critical elements to reducing poverty and improving quality of life.

When looking specifically at New York City, researchers have found that residents of neighborhoods least well served by public transit rely more on personal vehicles. Personal vehicle ownership can be prohibitively expensive in NYC which, for example, has high insurance rates. Additionally, in many neighborhoods, curb-side parking is in fierce demand and parking garages can be prohibitively expensive. Neighborhoods with insufficient access to transportation often have the lowest incomes and the highest rates of unemployment. Supporting more affordable access to vehicle usage for New Yorkers can be part of a raft of solutions for helping New Yorkers with last mile problems or who live in transit deserts. However, this cannot be seen as a recommendation for using carshare for daily commuting. Carshare is best utilized as a piece of larger multi-modal network.
Populations living more than a half mile from a subway station are more likely to have lengthy, inconvenient commutes and limited mobility options to complete non-daily trips. As such, in areas where a vehicle is necessary, carshare can connect users to mass transit and potentially reduce their travel time. Marine Park, for instance, can be considered a “transit desert” as no subway lines go through the neighborhood. It takes approximately 15 to 25 minutes for Marine Park residents to travel by bus to the nearest subway station, the Flatbush Avenue 2 Line station, which is located approximately two miles away. Readily available carshare vehicles could reduce this time to 10 minutes, saving up to half an hour each day. This can add up to a total savings of 2.5 hours per week or 130 hours per year. As such, these users could avert nearly 5.5 days of time spent traveling each year. This time savings represents increased economic stability for the individual, as well as more time spent with children or elderly parents, more time to take care of health and home concerns, and, potentially, less stress.

Mean travel time to work by borough (Population FactFinder)

Literature suggests that carshare programs not only reduce car ownership rates and alleviate congestion, but that carshare can also increase the overall use of alternative transportation modes - such as public transit, walking, and bicycling. Since carshare helps enable users to live car-free, carshare members are more likely to use alternative modes of
transportation. When carshare programs are available, the shift towards increased walking and bicycling is most dominant with carshare users. Therefore, carshare programs are likely to be more successful in neighborhoods with multiple mobility options. By strengthening and expanding mobility options, the City will also strengthen carshare as an alternative to private automobile ownership and will benefit all residents in kind.

The availability of public transit, bicycling and pedestrian infrastructure, in conjunction with carsharing, makes carsharing a successful strategy for cities looking to reduce total car ownership. Carshare can also make necessary vehicle use affordable for more residents, as it is often less expensive than owning a private automobile. Investments in mobility infrastructures can support a holistic environment in which carshare programs can thrive and benefit everyone.
New multi-modal hubs can be built using underutilized sites. These sites will be built on a smaller scale, serving local neighborhood needs. These will bring carshare and bike share to neighborhoods in a less intrusive manner than residential sites, since they will not displace parking in front of homes or apartment buildings. These sites will be located under existing elevated structures, such as expressways and railroads, in underutilized traffic triangles, and on parcels that are underutilized by the city or the MTA.

Carshare hubs can be built under existing elevated infrastructure. Currently, there are nearly 700 miles of elevated infrastructure. These sites typically are used for public parking, or for equipment storage. Many of these sites have parking regulations that are more lenient than their surrounding neighborhoods, so these parking spaces are often used for long-term storage of cars, overnight parking for commercial vehicles, or for parking for cars registered in other states. Furthermore, a good portion of these sites already exist under transit links. About forty percent of the city’s subways are elevated, which includes all of the subway lines such as the: N/Q/R line, L line, J/Z line, G line, B/D,F/M line, A/C/E line, 7 line, 4/5/6 line and 1/2/3 line. These sites can provide benefits to a larger share of the community by using these sites for carshare.
Carshare will not solve all of New York City’s transportation issues, but it is one piece of a larger mobility network. By filling in transportation gaps, reducing residents’ transportation costs, diminishing congestion, and cutting emissions, a city-wide carshare program can help improve the livelihood and mobility of many New Yorkers. However, such a program cannot be successful unless DOT consciously advocates for carshare and conducts more extensive public outreach as educating the public of the benefits and existence of carshare is key to ensuring carshare’s success and expansion throughout all of the five boroughs.

In addition, DOT must advocate for better data-sharing, as the lack of trip data is a significant gap in the overall programmatic framework. Just as data from taxis, Uber and Lyft has informed the City of drivers’ behavior, data sharing by carshare companies will provide a better understanding of carshare usage patterns that can inform future policy decisions.

Coupled with this data, NYC DOT should establish a variety of key performance indicators (e.g., reduction in privately owned vehicles, achieving demonstrable reductions in VMTs and/or GHGs, qualitative evidence of improved mobility for people in low-transit areas, etc) to monitor the success of the program over time. The carshare program must be monitored at regular intervals to further understand emerging trends and patterns.

Through intensive program monitoring and data collection, NYC DOT can be best positioned to determine which of the proposed recommendations are politically, economically, and logistically feasible as well as which recommendations are best suited for implementation on a short or long-term basis. Such data can also enable NYC DOT to formulate a strong argument for improving and expanding carshare throughout all of NYC that can be presented to politicians, community leaders, business owners, and residents overall.

With this in mind, however, the most important overarching issue impacting the feasibility of a city-wide carshare program, and parking throughout NYC in general, is the lack of an accurate curb value. The competition for free parking spaces continues to grow, and without an accurate curb value, NYC residents who own private vehicles will continue to perceive carshare as a mechanism that “takes away their parking.” Thus, a policy that
assigns an accurate curb value, such as a parking permit program, will help ensure that residents do not feel that the city is allowing private companies to profit from a public resource without a realized benefit.

While the expansion of carshare in NYC is not without a variety of unique challenges, which are discussed throughout this report, making improvements to the current program are vital in order to meet the goals of reducing vehicle ownership, suppressing future vehicle ownership, and increasing accessibility. Without these improvements, the challenges of curbside parking pressure, congestion, and vehicle emissions will, inevitably, worsen.
CONTENT

Citations 55
Case Studies 59
Supplemental Site Selection Studies 68
Survey Report 73
1. CITATIONS


9. Ibid.


23 Hunter College Carshare Studio Site Visits, April 2019. New York, NY.
25 Sullivan, Bob. “This Is What Americans Are Really Spending Their Money on.” Mar-
36 Ibid
37 Ibid


48 Design Trust for Public Space, in partnership with NYC Department of Transportation, Under the Elevated: Reclaiming Space, Connecting Communities. March 2015.
BOSTON, MASSACHUSETTS

The city of Boston created the DRIVE BOSTON carshare pilot program in the Fall of 2015. The city of Boston’s goals of the carshare pilot program were for shared cars to be replacements for private vehicles and complements to public transportation, increase residential public parking availability, improve mobility access for the carless, reduce citywide Vehicle Miles Travelled (VMT) and Greenhouse Gas (GHG) emissions and Maximize city revenues (or minimize losses)1.

The pilot program initially was meant to run for 18 months but was extended for an additional year as a result of high vehicle utilization and positive feedback. The city partnered with Zipcar and Enterprise, but eventually, Enterprise would leave the city. The DRIVE BOSTON carshare pilot program was a Two-Way (roundtrip) service with a total of 80 spaces with 49 located in municipal lots/garages and 31 reserved curbside spaces2. The city selected the spaces by considering access to public transportation; average miles households drive each day, and neighborhood car ownership rates, and selected spaces in locations with the most significant benefit for residents that also had the smallest impression on street operations and parking3. The annual fee for spaces beyond the Boston Common was $2,700 and $3,200 for spaces within downtown Boston4. Signage installation was the responsibility of the city and signage were to include car share operator’s logo and be located at every DriveBoston site. The DriveBoston program was a collaboration between these city agencies: Parking Clerk, Department of Transportation, and the Mayor’s Office of New Urban Mechanics5.

Some outcomes of the program include 1 million plus miles traveled by DriveBoston carshare vehicles, a utilization rate just above thirty percent, and an average 23 users per

vehicle per month. The city of Boston planned to expand the program to include 200 car-share parking spaces throughout the city.

**LOS ANGELES, CALIFORNIA**

BlueLA, which started in Los Angeles, CA in 2017, is a carsharing partnership between Blue Solutions and the Los Angeles Department of Transportation. The program is funded by a $1.7 million grant through California Climate Investments, which is a statewide program aimed at reducing GHG emissions and improving public health to disadvantaged communities. BlueLA uses a fleet of all electric vehicles (100 total) and 200 EV charging stations, and is found in the Westlake, Pico-Union, Koreatown, Boyle Heights, Echo Park, and downtown LA neighborhoods. The program is aimed towards serving lower-income families who are unable to afford eco-friendly cars in the hopes of filling the gap of the “green divide,” meaning low-income people have less access to EVs and low-carbon technology. Mayor Eric Garcetti stated, “You can’t do a good environmental program if it doesn’t include everyone, and income should not dictate people’s activism.” BlueLA includes special incentives for low-income users, such as a 25% rebate to those who pay by the minute and a 40% discount which may be applied to the monthly subscription fee. Parking spots are on-street and located near a 24/7 kiosk, each equipped with an electric charger. The car-sharing program is one-way, meaning users won’t need to return the car to the same kiosk where they picked it up from.

---

10 Spacek, Rachel, “New LA car-sharing service aims to serve low-income neighborhoods.”
12 Spacek, Rachel, “New LA car-sharing service aims to serve low-income neighborhoods.”
13 Spacek, Rachel, “New LA car-sharing service aims to serve low-income neighborhoods.”
14 Spacek, Rachel, “New LA car-sharing service aims to serve low-income neighborhoods.”
PORTLAND, OREGON

Portland became the birthplace of car-sharing in the United States in 1998, with the founding of a small local company that eventually became part of Zipcar. Today, car-sharers in Portland have access to five car-sharing services: Zipcar, Car2go, Turo, Getaround and Reach Now.

Portland, OR currently has two types of Car Share programs: Commercial Car Sharing and Peer-to-Peer Car Sharing. Commercial Car Sharing is run by an organization that maintains a fleet of vehicles deployed in various locations. Peer-to-Peer Car Sharing allows car owners to make their personal vehicles available on a temporary basis to others for rent. In return, the car owner gets a substantial portion of the rental revenue from the car sharing company. Peer to peer rental fees vary and are set by the car owner.

ZIPCAR

Zipcar members have access to a fleet of hundreds of new vehicles in designated parking spots throughout the Portland metro area. There are also over 80 cars in the central city area as well.

CAR2GO

Portland is one of 30 cities worldwide with car2go one way service, meaning members access the fleet of more than 200 blue-and-white car2go Smart cars parked throughout the city and rent them by the minute without needing to return them to the starting point.

TURO

Turo is the country’s first peer-to-peer car-sharing service that allows owners to rent out their personal vehicles when they’re not using them to other members who want to rent them for a set time. In addition to outlying neighborhoods and the downtown core, Turo rentals are also available at Portland International Airport.

GETAROUND

Another peer-to-peer car-sharing service, Getaround is a free-to-join, Facebook-linked network currently in six U.S. cities that promises instant approval for membership applicants over the age of 19 with a good driving record.19

REACHNOW

ReachNow BMW carsharing lets members drive BMWs and Mini Coopers for an introductory rate of 41 cents per minute. Drivers use the ReachNow app to locate, reserve and unlock cars that are parked on streets throughout most Portland neighborhoods.20

Portland came up with five goals for their car share program: 1) mobility, 2) accessibility, 3) environmental, 4) equity and 5) quality of life.21

• Mobility: Encourages mode shift to transit, cycling or walking for most trips by allowing individuals to forgo personal vehicle ownership. This helps reduce congestion and VMT.
• Accessibility: Increases the types of travel options available and facilitates the use of more sustainable transportation modes by providing a low-cost alternative to personal vehicle ownership.
• Environmental: Reduces the emission of criteria air pollutants and greenhouse gases that are harmful to the environment and human health by encouraging shifts to more sustainable transportation modes.
• Equity: Provides lower-income populations with access to the convenience of auto travel for occasional trips without the expense of purchasing and maintaining a private vehicle.
• Quality of Life: Increases physical activity and quality of life by enabling users to forgo vehicle ownership and adopt more active modes for most trips where a vehicle is not required.

TEL AVIV, ISRAEL

Auto-Tel is Tel Aviv’s car-sharing program which launched in October 2017. The program includes 260 vehicles and 520 parking spaces, two spaces per vehicle, that have been distributed throughout the city. By enabling the user to rent a car by the minute and to return it to any of the designated parking spaces or any legal parking space throughout the city, the city wishes to reduce car ownership among members as the city of Tel Aviv is heavily congested. For this purpose, the municipality has decided to finance the project with 10 million NIS (about $2.8 million) a year for ten years, in addition to the purchase of the fleet and the payments for the physical infrastructure and technology (software and app). Although it is a publicly funded program, it is being operated by a private company, Car2Go, which was the only company bidding in the municipality tender.

The success of the project in Tel Aviv will be measured by:

- At least 40 members per vehicle.
- Reducing the transportation expenses of members by at least 25%.
- Reducing the annual VMT of members by 25%.
- Reducing vehicle ownership among members by 25%.

TORONTO, CANADA

The city of Toronto has over five carshare operators, three of which are two-way operators and the other two of which are one-way. The two-way carshare operators are comprised of: Enterprise, Maven and Zipcar. The one-way carshare operators are comprised of: Turo and Communauto Flex. Communauto Flex recently replaced Car2go in late 2018, due to the company’s failure. When the operation of Car2go initially began, parking spaces were designated by the city. These spaces were referred to as Green P lots. Communities revolted as soon as Car2go demanded customers to park in any legal space, including residential parking spaces.22 Despite the failure of Car2go, carshare remains to be a fairly popular transportation option in Toronto. Communauto is the longest running carshare company in Canada. Communauto focuses on a free-floating zone, which means the car share pilot can be utilized on any neighborhood in Toronto, excluding blocked out residential zones. Blocked out zones refer to residential areas where parking is over 95% capacity indicated in grey below. However, only one car share vehicle can be placed on each block.

---

to avoid competition or over-saturation. Membership is free, and costs $.41/min, $15/hour, $50 first day and $35/extra day with the cost of fuel included.23

OAKLAND, CALIFORNIA

In 2015, the City Council of Oakland, California adopted a “Car Sharing Policy,” which led to the creation of a “Dedicated Space Car Share Pilot Program.” This program was created to allow for dedicated spaces to be set aside within the public right-of-way, and in municipal garages and lots for the use of carshare vehicles. The City also took on another program called the “Free-Floating Car Share Pilot,” which allows a driver to rent an available carshare vehicle, and complete the trip anywhere in a designated “home zone.” 24

Dedicated Space Car Share Pilot Program

In 2017, the City published the terms and conditions for their “Dedicated Space Car Share Pilot,” which outlines pricing for carshare operators (CSOs) and the permit approval process they must go through. With respect to pricing, the City outlined four components that would determine how much a CSO would pay the City for use of a dedicated parking space. They included: market value, administrative costs, installation costs, and residential parking permit costs (if applicable). The total estimated cost per year per carshare permit was estimated to be between $600 - $3,910 depending upon the site, plus a one-time installation fee of $400. With respect to the permit approval process, the City indicated it would involve documentation of community outreach and support, and the review by City staff to determine the appropriate pricing for the spaces applied for, based on the City’s pre-determined fee schedule.25

Free-Floating Car Share Pilot Program

The “Free-Floating Car Share Pilot” program had terms and conditions that were also finalized in 2017, which outlined pricing and the permit approval process for that program. Since this pilot does not rely on a dedicated space, the permit fee is based on a flat rate per carshare vehicle. For FY 2016-17, the fee was $1,278 per vehicle. Additionally, a CSO would

be required to pay a fee for a Master Residential Parking Permit (MRPP) in areas where a Residential Parking Permit program is in existence. For FY 2016-17, the price for the MRPP was $105 per carsharing vehicle. Similar to the dedicated space program, this program’s permit approval process is very reliant on community outreach, with the City requiring the CSO meet with neighborhood associations and/or business groups to explain their operation.26

While multiple carshare operators were initially interested in the City’s program, only one operator eventually participated. On April 30, 2017, GIG Car Share began its service utilizing the free-floating program. GIG has expanded its service throughout the Bay Area, including Oakland, San Francisco, Alameda, and Berkeley. GIG charges $2.50/mile, $15/hr, or $85/day, and does not charge any signup fees.27

AUSTRALIA

Car Next Door (CND) is an Australian-based peer-to-peer carsharing company that launched in 2012. CND enables users to rent cars from their neighbors by the hour or by the day. CND’s mission is to “free people and the planet from the ‘one person, one car’ mentality,” through making it easy for anyone to turn their vehicle into a shared rental vehicle. In turn, users can save money, reduce waste, and help create greener neighborhoods.28

CND has a Community Plan in which non-profits and community groups, who share the same passion for sustainability, can partner with CND to help achieve their goals. Outside of community organizations, CND landed a major partnership with Hyundai through which the CND app will be installed on all Hyundai cars sold in Australia. This enables every new Hyundai buyer to rent out their car if desired. Lastly, CND also partners with Greenfleet, which is a non-profit environmental organization that restores Australia’s forests. CND claims that when users borrow cars, their carbon emissions are offset through Greenfleet’s forest restoration projects. As of 2018, CND and Greenfleet have planted 12,500 trees as a result of this partnership.29

BREMAN, GERMANY

Breman, Germany is a mid-sized city of 550,000 in an industrial area of Germany. There is a robust transit system as well as infrastructure to support a biking and walking culture. Approximately 40% of the city rely on car transport. Breman began its first car-share program in 1990. They have had reserved street parking stations for carshare vehicles since 2003. Carshare has grown to be a significant program operated out of the sustainable practices office of the city. The city contracts with three private vendors to provide the cars. It is a two-way program. As of 2014 there were approximately 10,000 members. A user survey showed that 44% of the participants had a car when they joined the program and of ended up stopping being a car owner after participating in carshare. The city has begun an incentive program for developers to include carshare stations at their development sites.

In 2018 Team Red, a research time hired on behalf of the European Union, published a comprehensive study of Breman carshare. The study showed that creating intermodal station hubs in dense areas relieved congestion and contributed to higher numbers of intermodal travel in which users engaged in travel that included cars, biking, walking, and transit to complete a trip. The study also showed that carshare led to more localized shopping as carshare users were more likely to perform shopping closer to home by bike and walking rather than owners of private vehicles who were more likely to go further away to shop at large shopping centers.

The study’s key findings include:

- Each carshare car replaces or suppresses 16 privately held cars from the roads accounting for 5,000 fewer cars in the City
- The top reasons for participation in carshare by users are convenience and affordability
- Carshare users have approximately 50% fewer VMTs than private car owners
- Carshare allows more low income people to have the benefits of car use with dramatically less expense
- Proximity, reliability, and connection to intermodal hubs are seen as highly positive and reason for membership in carshare programs
- Carshare contributes to less pollution as there are fewer cars, fewer VMTs, and a newer

30 Hurley, “How Bremen, Germany, Became a Car-Sharing Paradise.”
31 Ibid.
32 Rebecca Karbaumer, “Analysis of Car-Sharing Services and User Behaviour Delivers Interesting Results in Bremen, Interreg VB North Sea Region Programme.”
fleet of lower-emissions vehicles.

- Offering incentives to join carshare at transition moments encourages people at a time of transition, for example moving, retirement, retiring an old car, or job change to participate.\(^3\)

4. SUPPLEMENTAL SITE SELECTION STUDIES

SELECTED NEIGHBORHOODS FOR CAR OWNERSHIP REDUCTION

6 neighborhoods in The Bronx:
Pelham Parkway, Allerton-Pelham Gardens, Van Nest-Morris,
Park-Westchester Square, Woodlawn-Wakefield, Williamsbridge-Olinville,
Eastchester-Edenwald-Baychester

25 neighborhoods in Brooklyn
Cypress Hills-City Line, Stuyvesant Heights, Bedford, Crown Heights North,
Sheepshead Bay-Gerritsen Beach-Manhattan Beach, Canarsie, East New York,
DUMBO-Vinegar Hill-Downtown Brooklyn-Boerum Hill, Carroll Gardens-Columbia
Street-Red Hook, Park Slope-Gowanus, Windsor Terrace, Kensington-Ocean
Parkway, Borough Park, Bensonhurst West, Bay Ridge, Dyker Heights,
Bensonhurst West, Homecrest, Ocean Parkway South, Midwood, Flatbush,
Flatlands, East Flatbush-Farragut, Prospect Lefferts Gardens-Wingate, Madison

1 neighborhood in Manhattan
Upper East Side-Carnegie Hill

13 neighborhoods in Queens
Ridgewood, Middle Village, Glendale, Elmhurst, Jackson Heights, Astoria,
Steinway, North Corona, Forest Hills, Richmond Hill, Jamaica, South Ozone Park,
Woodhaven

7 neighborhoods in Staten Island
Stapleton-Rosebank, Grymes Hill-Clifton-Fox Hills, Old Town-Dongan Hills-South
Beach, New Dorp-Midland Beach, Oakwood-Oakwood Beach, Great Kills,
Annadale-Huguenot-Prince's Bay-Eltingville

SELECTED NEIGHBORHOODS FOR VULNERABLE POPULATIONS

4 Neighborhoods in the Bronx
North Riverdale-Fieldston-Riverdale, Soundview-Castle Hill-Clason Point-Harding
Park, Belmont, Schuylerville-Throgs Neck-Edgewater Park
4 neighborhoods in Brooklyn
   Seagate-Coney Island, Sheepshead Bay-Gerritsen Beach-Manhattan Beach, Canarsie, Flatlands

1 neighborhood in Manhattan
   Lower East Side

7 neighborhoods in Queens
   Old Astoria, Murray Hill, South Jamaica, Pomonok-Flushing Heights-Hillcrest, Bellerose, Murray Hill, College Point

3 neighborhoods in Staten Island
   West New Brighton-New Brighton-St. George, Port Richmond, Mariner’s Harbor-Arlington-Port Ivory-Graniteville

ZONING
   Siting car share spaces in medium and high density residential can increase the number of unique users per car, therefore serving a greater number of households overall. The greater the number of unique users per car, the less there are personal vehicles on the streets. Placing car share spaces in these locations may potentially act in alleviating congestion by decreasing the number of private vehicles per housing complex. Housing complexes, and high density living are common in transit rich areas. We define medium residential density by R6-R7 zones and high density residential zones as R8-R10 zones. Long Island City and Downtown Brooklyn are excellent examples of high density residential zones with the R10 zoning designation. Current carshare operators locate their carshare spaces here.

   Currently, car share spaces are not currently placed in commercial zones. Commercial zones can be defined a commercial overlay, where a residential district has a commercial designation on the ground floor area--similar to Jamaica Avenue between 169th Street and 190th Street in Jamaica, Queens. Commercial overlays may be problematic, as cars are typically metered here. However, car share placement in commercial zones can service one-way carshare operation, as one-way trips are more common in commercial districts which permit everyday activities such as grocery shopping.

   Careful consideration must be taken with high density residential zones. There is no
system in place to guarantee that more unique users will use carshare. To solve this, carshare operators can incentivize unique user ridership by providing a compounding discount for every unique user that uses a car. For example, for every five unique users per car, the hourly price per user can be lowered by a noticeable percentage—so long as the weekly average pay remains the same.

**MUNICIPAL PARKING AND GARAGE SELECTION**

The location of designated parking spaces is an essential aspect of this carshare program. Currently, the majority of the carshare operators locate carshare spaces in neighborhoods that fulfill corporate needs, rather than citywide needs such as bridging a gap in transportation network, or offering services to marginalized populations.

The success and longevity of any carshare program which includes designated curbside parking is dependent on the siting of reserved parking spaces situated in the most useful locations across the city. The geography of the designated curbside parking spaces may look different depending on the area/neighborhood of the city. We define optimal site location by placing carshare locations in neighborhoods which may reduce future carshare ownership, and improve access to those whose mobility options are restrained by socio-economic or physical factors.

**Current DOT Pilot Curbside Parking Spaces:**

The current carshare pilot has approximately 228 curbside parking spaces located in a total of 17 NTA’s (Neighborhood Tabulation Areas). The NTA’s include West Farms-Bronx River and Soundview-Bruckner in the Bronx, Bushwick South, North Side-South Side, Carroll Gardens-Columbia Street-Red Hook, Park Slope-Gowanus, Brooklyn Heights-Cobble Hill, DUMBO-Vinegar Hill-Downtown Brooklyn-Boerum Hill, East Williamsburg in Brooklyn, Morningside Heights, Hamilton Heights, East Harlem North in Manhattan, and St. Albans, Jamaica, South Jamaica, Jackson Heights, and Far Rockaway-Bayswater in Queens. The borough of Staten Island is not part of the pilot program.

**Current Parking Garage Spaces:**

The current carshare pilot has approximately 55 designated parking spaces located in 17 municipal garages located in a total of 15 NTA’s (Neighborhood Tabulation Areas).
The NTA’s include Bedford Park-Fordham North, Belmont, and Pelham Parkway in the Bronx, Sheepshead Bay-Gerritsen Beach-Manhattan Beach, Brighton Beach, Bath Beach, Bensonhurst West, Midwood, and East New York in Brooklyn, and Far Rockaway-Bayswater, Hunters Point-Sunnyside-West Maspeth, Queens Village, Kew Gardens, Astoria, and Steinway in Queens. The borough of Staten Island and Manhattan do not have any reserved parking spaces in municipal garages.

Municipal parking garages can be an integral component to a successful city sponsored carshare program. Thousands of parking spaces are available in municipal parking garages across all 5 boroughs. Increasing the utilization of municipal parking garages across the city will expand the reach and size of the carshare program. The DOT pilot has 55 reserved carshare parking spaces across 17 city-operated facilities. The expansion of the carshare program to include all of the municipal parking garages will significantly improve the carshare program and provide increased coverage of the city.

A significant obstacle to expanding a carshare program which includes designated parking spaces in all municipal parking garages, are the hours of operation. Currently, only a small number of the municipal parking garages are open 24 hours a day, seven days a week and municipal parking fields do not allow overnight parking. For a carshare program to be able to operate successfully within a municipal parking garage, those that use carshare vehicles must be able to pick up and drop off cars at any time of the day unencumbered.

Several municipal garages currently present a particularly exciting opportunity for the unique expansion of the carshare program. These municipal parking garages include: East 149th Street Municipal Parking Garage and Jerome-Gun Hill Road Municipal Parking Garage in the Bronx, Bay Ridge Municipal Parking Garage and Brooklyn Navy Yard in Brooklyn, Delancey & Essex Municipal Parking Garage in Manhattan, Court Square Municipal Parking Garage in Queens, and Saint George Courthouse in Staten Island. All of these parking garages have electric vehicle charging stations. The seven highlighted municipal parking garages have a total of 35 electric vehicle level 2 charging stations and stay open 24 hours a day. The availability of the charging stations and the 24 hours seven day a week operation will enable the rollout of a fleet of electric vehicles based within these parking facilities.
VALUE OF NYCHA PARTNERSHIP:

Expand the Partnership that currently exist between Zipcar and New York City Housing Authority (NYCHA) to include current carshare operators as well as other NYCHA developments. Currently Zipcar has 25 cars situated in parking lots on these 10 NYCHA developments in The Bronx and Brooklyn; Courtland Houses, Marble Hill Houses, Cypress Hills Houses, Marlboro Houses, Davidson Houses, Pink Houses, Fiorentino Plaza, Randall Balcom Houses, Glenmore Plaza Houses, and Throgs Neck Houses.

• Bronx: 89 developments with 44,292 apartments
• Brooklyn: 99 developments with 58,438 apartments
• Manhattan: 97 developments with 53,001 apartments
• Queens: 20 developments with 15,299 apartments
• Staten Island: 10 developments with 4,474 apartments

Zipcar currently provides residents of NYCHA the ability to join free of charge for the first year and provides a twenty dollar credit towards the use of the first ride.

The inclusion of all NYCHA developments with parking lots and available spaces into a carshare program serving New York City will provide access to a transportation option that may not have previously been accessible and also provide alternatives to owning a vehicle. There is great potential many of NYCHA’s largest developments. Not only will the presence of these carshare vehicles located on NYCHA property serve residents of NYCHA, but also residents who live in close proximity to a NYCHA development. Listed below are the largest NYCHA developments in each of the 5 boroughs:

Largest public housing developments per borough:
• Queens: Queensbridge (North and South) Houses (3,142 apartments), the largest development in the city, is also the largest in North America
• Brooklyn: Red Hook East and West (2,878 apartments)
• Manhattan: Baruch Houses (2,391 apartments)
• Bronx: Edenwald Houses (2,036 apartments)
• Staten Island: Stapleton Houses (693 apartments)
3. SURVEY REPORT

Carshare Users Survey Report

Items list

1. What is your age?
2. Do you have a driving license?
3. Do you, or someone in your household, own a car?
4. What is the main reason you own a car?
5. How often do you use your car?
6. For which purposes do you use your car (pick all relevant)?
   • 6a. other
7. Where do you most frequently travel to?
8. Would you consider selling your car if there was a convenient carshare service in your neighborhood?
9. What is the main reason you do not own a car?
10. Do you currently or have you in the past used carshare?
    • 10a. Car owners – Carless breakout
11. What is the main reason you use carshare?
    • 11a. Car owners – Carless breakout
12. How often do you use carshare?
    • 12a. Car owners – Carless breakout
13. For which purposes do you use carshare (pick all relevant)?
    • 13a. other
    • 13b. Car owners – Carless breakout
14. Where do you most frequently travel using carshare?
    • 14a. Car owners – Carless breakout
15. What would encourage you to join carshare / keep your carshare membership?
    • 15a. other
    • 15b. Car owners – Carless breakout
16. Which other modes of transportation do you utilize (pick all relevant)?
    • 16a. Car owners – Carless breakout
17. What is your income level?
    • 17a. Car owners – Carless breakout
1. What is your age?

<table>
<thead>
<tr>
<th>Field</th>
<th>Choice Count</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 - 24 years</td>
<td></td>
<td>2</td>
<td>2.63%</td>
</tr>
<tr>
<td>25 - 35 years</td>
<td></td>
<td>46</td>
<td>60.53%</td>
</tr>
<tr>
<td>36 - 45 years</td>
<td></td>
<td>21</td>
<td>27.63%</td>
</tr>
<tr>
<td>46 - 65 years</td>
<td></td>
<td>6</td>
<td>7.89%</td>
</tr>
<tr>
<td>Older than 65 years</td>
<td></td>
<td>1</td>
<td>1.32%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>76</td>
<td></td>
</tr>
</tbody>
</table>

2. Do you have a driving license?

<table>
<thead>
<tr>
<th>Field</th>
<th>Choice Count</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td></td>
<td>70</td>
<td>92.11%</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>6</td>
<td>7.89%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>76</td>
<td></td>
</tr>
</tbody>
</table>

3. Do you, or someone in your household, own a car?

<table>
<thead>
<tr>
<th>Field</th>
<th>Choice Count</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td></td>
<td>29</td>
<td>38.16%</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>47</td>
<td>61.84%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>76</td>
<td></td>
</tr>
</tbody>
</table>
4. What is the main reason you own a car?

- Public transit is inconvenient/unavailable: 2 (6.90%)
- Personal or family mobility issues: 7 (24.14%)
- Required for work: 4 (13.79%)
- Affordable and/or convenient: 1 (3.45%)
- Personal freedom: 15 (51.72%)

Total: 29

5. How often do you use your car?

- Daily: 11 (37.93%)
- 2 - 3 times per week: 8 (27.59%)
- Once per week: 8 (27.59%)
- Once per month or less: 2 (6.90%)

Total: 29
6. For which purposes do you use your car (pick all relevant)?

<table>
<thead>
<tr>
<th>Field</th>
<th>Choice Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commuting to work/school</td>
<td>14</td>
</tr>
<tr>
<td>Running errands (grocery ...</td>
<td>21</td>
</tr>
<tr>
<td>Taking care of relatives ...</td>
<td>9</td>
</tr>
<tr>
<td>Recreational activities / Vacations (going to the beach)</td>
<td>25</td>
</tr>
<tr>
<td>Other (please type):</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>73</td>
</tr>
</tbody>
</table>

6a. Other:

1. Visiting family and friends
2. Uber
3. Appointments in locations that are difficult to access using public transit
4. I don't use it
7. Where do you most frequently travel to?

<table>
<thead>
<tr>
<th>Field</th>
<th>Choice Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within the same borough in which you live</td>
<td>14</td>
<td>48.28%</td>
</tr>
<tr>
<td>Outside of the borough in which you live</td>
<td>10</td>
<td>34.48%</td>
</tr>
<tr>
<td>Outside of all five boroughs</td>
<td>5</td>
<td>17.24%</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td></td>
</tr>
</tbody>
</table>

8. Would you consider selling your car if there was a convenient carshare service in your neighborhood?

<table>
<thead>
<tr>
<th>Field</th>
<th>Choice Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>4</td>
<td>13.79%</td>
</tr>
<tr>
<td>No</td>
<td>25</td>
<td>86.21%</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td></td>
</tr>
</tbody>
</table>

9. What is the main reason you don’t own a car?

<table>
<thead>
<tr>
<th>Reason</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too expensive</td>
<td>10</td>
</tr>
<tr>
<td>Alternative transportation modes more convenient</td>
<td>27</td>
</tr>
<tr>
<td>Inconvenient parking</td>
<td>7</td>
</tr>
<tr>
<td>Environmental concerns</td>
<td>3</td>
</tr>
</tbody>
</table>
### Field | Choice Count | Percentage
--- | --- | ---
Too expensive | 10 | 21.28%
Alternative transportation modes more convenient | 27 | 57.45%
Inconvenient parking | 7 | 14.89%
Environmental concerns | 3 | 6.38%
Total | 47 |

### 10. Do you currently or have you in the past used carshare?

![Bar chart showing responses to carshare use]

<table>
<thead>
<tr>
<th>Field</th>
<th>Choice Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>42</td>
<td>55.26%</td>
</tr>
<tr>
<td>No</td>
<td>34</td>
<td>44.74%</td>
</tr>
<tr>
<td>Total</td>
<td>76</td>
<td></td>
</tr>
</tbody>
</table>

### 10a. Car owners - Carless breakout:

![Bar chart showing car ownership status]

<table>
<thead>
<tr>
<th>Field</th>
<th>Car owners</th>
<th>Carless</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>13</td>
<td>61.70%</td>
</tr>
<tr>
<td>No</td>
<td>16</td>
<td>38.30%</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>47</td>
</tr>
</tbody>
</table>

### 11. What is the main reason you use carshare?

![Bar chart showing reasons for carshare use]

<table>
<thead>
<tr>
<th>Field</th>
<th>Total respondents that use carshare</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public transit is inconvenient/unavailable</td>
<td>18</td>
</tr>
<tr>
<td>Personal or family mobility issues</td>
<td>2</td>
</tr>
<tr>
<td>Affordable and/or convenient</td>
<td>10</td>
</tr>
<tr>
<td>Personal freedom</td>
<td>12</td>
</tr>
</tbody>
</table>
Appendix

<table>
<thead>
<tr>
<th>Field</th>
<th>Choice Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public transit is inconvenient/unavailable</td>
<td>42.86% 18</td>
</tr>
<tr>
<td>Personal or family mobility issues</td>
<td>4.76% 2</td>
</tr>
<tr>
<td>Affordable and/or convenient</td>
<td>23.81% 10</td>
</tr>
<tr>
<td>Personal freedom</td>
<td>28.57% 12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42</strong></td>
</tr>
</tbody>
</table>

11a. Car owners - Carless breakout:

<table>
<thead>
<tr>
<th>Field</th>
<th>Car owners</th>
<th>Carless</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public transit is inconvenient/unavailable</td>
<td>46.15% 6</td>
<td>41.38% 12</td>
</tr>
<tr>
<td>Personal or family mobility issues</td>
<td>15.38% 2</td>
<td>0.00% 0</td>
</tr>
<tr>
<td>Affordable and/or convenient</td>
<td>15.38% 2</td>
<td>27.59% 8</td>
</tr>
<tr>
<td>Personal freedom</td>
<td>23.08% 3</td>
<td>31.03% 9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13</strong></td>
<td><strong>29</strong></td>
</tr>
</tbody>
</table>

12. How often do you use carshare?

<table>
<thead>
<tr>
<th>Field</th>
<th>Choice Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>0.00% 0</td>
</tr>
<tr>
<td>1 - 3 times per week</td>
<td>7.14% 3</td>
</tr>
<tr>
<td>1 - 2 times per month</td>
<td>35.71% 15</td>
</tr>
<tr>
<td>Once per year or less</td>
<td>57.14% 24</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42</strong></td>
</tr>
</tbody>
</table>
12a. Car owners - Carless breakout:

![Bar chart showing frequency of car ownership and carless breakout]

<table>
<thead>
<tr>
<th>Field</th>
<th>Car Owners</th>
<th>Carless</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>1 - 3 times per week</td>
<td>7.69%</td>
<td>6.90%</td>
</tr>
<tr>
<td>1 - 2 times per month</td>
<td>46.15%</td>
<td>31.03%</td>
</tr>
<tr>
<td>Once per year or less</td>
<td>46.15%</td>
<td>62.07%</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
<td>29</td>
</tr>
</tbody>
</table>

13. For which purposes do you use carshare (pick all relevant)?

![Bar chart showing purposes of carshare use]

<table>
<thead>
<tr>
<th>Field</th>
<th>Choice Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commuting to work/school</td>
<td>13.33% 8</td>
</tr>
<tr>
<td>Running errands (grocery shopping)</td>
<td>18.33% 11</td>
</tr>
<tr>
<td>Taking care of relatives (transporting kids, hospital visits)</td>
<td>5.00% 3</td>
</tr>
<tr>
<td>Recreational activities / Vacations (going to the beach)</td>
<td>50.00% 30</td>
</tr>
<tr>
<td>Other (please type):</td>
<td>13.33% 8</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
</tr>
</tbody>
</table>
13a. Other:

Other (please type): - Text

- Large item runs, i.e., Ikea
- Transporting heavy objects
- Occasions where biking is not appropriate or if I need to go somewhere public transit doesn't serve
- Visiting family and friends
- I don't use car share anymore.
- For work (meetings, etc.).
- Job related field work

13b. For which purposes do you use carshare (pick all relevant)?

Car owners - Carless breakout:

- Commuting to work/school: 27.78% (5), 7.14% (3)
- Running errands (grocery shopping): 11.11% (2), 21.43% (9)
- Taking care of relatives (transporting kids, hospital visits): 5.56% (1), 4.76% (2)
- Recreational activities / Vacations (going to the beach): 22.22% (4), 61.90% (26)
- Other (please type): 33.33% (6), 4.76% (2)
- Total: 18, 42
14. Where do you most frequently travel to using carshare?

<table>
<thead>
<tr>
<th>Field</th>
<th>Choice Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within the same borough in which you live</td>
<td>9</td>
</tr>
<tr>
<td>Outside of the borough in which you live</td>
<td>12</td>
</tr>
<tr>
<td>Outside of all five boroughs</td>
<td>21</td>
</tr>
</tbody>
</table>

Total: 42

14a. Car owners - Carless breakout

<table>
<thead>
<tr>
<th>Field</th>
<th>Car owners</th>
<th>Carless</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within the same borough in which you live</td>
<td>21.43%</td>
<td>24.14%</td>
</tr>
<tr>
<td>Outside of the borough in which you live</td>
<td>28.57%</td>
<td>20.69%</td>
</tr>
<tr>
<td>Outside of all five boroughs</td>
<td>50.00%</td>
<td>55.17%</td>
</tr>
</tbody>
</table>

Total: 13
15. What would encourage you to join carshare / keep your carshare membership?

<table>
<thead>
<tr>
<th>Field</th>
<th>Total respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy parking</td>
<td>16</td>
</tr>
<tr>
<td>More affordable prices / member discounts</td>
<td>47</td>
</tr>
<tr>
<td>Different car models / options</td>
<td>2</td>
</tr>
<tr>
<td>Other (please type):</td>
<td>11</td>
</tr>
</tbody>
</table>

Total respondents: 76

15a. Other:

1. Both affordable prices and Different car models (i.e., cheap and access to trucks or vans for large items)
2. Don’t know about it.
3. If New York was less terrifying to drive in
4. More reliable accessibility
5. I don’t use carshare anymore.
6. Options and variety in routes
7. If I had a license.
8. Safer driving environment
9. availability of cars nearby
10. Available in my area.
11. Don’t know it exist

15b. Car owners - Carless breakout:

<table>
<thead>
<tr>
<th>Field</th>
<th>Car owners</th>
<th>Carless</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy parking</td>
<td>24.14%</td>
<td>19.15%</td>
</tr>
<tr>
<td>More affordable prices / member discounts</td>
<td>48.28%</td>
<td>70.21%</td>
</tr>
<tr>
<td>Different car models / options</td>
<td>3.45%</td>
<td>2.13%</td>
</tr>
<tr>
<td>Other (please type):</td>
<td>24.14%</td>
<td>8.51%</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>47</td>
</tr>
</tbody>
</table>
16. Which other modes of transportation do you utilize (pick all relevant)?

<table>
<thead>
<tr>
<th>Field</th>
<th>Choice Count</th>
<th>Count %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subway</td>
<td>75</td>
<td>17.99%</td>
</tr>
<tr>
<td>Commuter rail (LIRR, Metro-North, etc.)</td>
<td>44</td>
<td>10.55%</td>
</tr>
<tr>
<td>Bus</td>
<td>52</td>
<td>12.47%</td>
</tr>
<tr>
<td>Taxi</td>
<td>37</td>
<td>8.87%</td>
</tr>
<tr>
<td>For-Hire Vehicles (Uber, Lyft, etc.)</td>
<td>57</td>
<td>13.67%</td>
</tr>
<tr>
<td>Bicycle</td>
<td>34</td>
<td>8.15%</td>
</tr>
<tr>
<td>Walking</td>
<td>73</td>
<td>17.51%</td>
</tr>
<tr>
<td>Personal vehicle</td>
<td>23</td>
<td>5.52%</td>
</tr>
<tr>
<td>Carshare (Zipcar, Enterprise, Car 2 Go)</td>
<td>22</td>
<td>5.28%</td>
</tr>
<tr>
<td>Total</td>
<td>417</td>
<td></td>
</tr>
</tbody>
</table>

16a. Car owners - Carless breakout:
## Field

<table>
<thead>
<tr>
<th>Field</th>
<th>Car owners</th>
<th>Carless</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subway</td>
<td>18.54%</td>
<td>17.67%</td>
</tr>
<tr>
<td>Commuter rail (LIRR, Metro-North, etc.)</td>
<td>9.93%</td>
<td>10.90%</td>
</tr>
<tr>
<td>Bus</td>
<td>11.26%</td>
<td>13.16%</td>
</tr>
<tr>
<td>Taxi</td>
<td>7.95%</td>
<td>9.40%</td>
</tr>
<tr>
<td>For-Hire Vehicles (Uber, Lyft, etc.)</td>
<td>12.58%</td>
<td>14.29%</td>
</tr>
<tr>
<td>Bicycle</td>
<td>5.30%</td>
<td>9.77%</td>
</tr>
<tr>
<td>Walking</td>
<td>17.88%</td>
<td>17.29%</td>
</tr>
<tr>
<td>Personal vehicle</td>
<td>13.91%</td>
<td>0.75%</td>
</tr>
<tr>
<td>Carshare (Zipcar, Enterprise, Car 2 Go)</td>
<td>2.65%</td>
<td>6.77%</td>
</tr>
<tr>
<td>Total</td>
<td>151</td>
<td>266</td>
</tr>
</tbody>
</table>

## 17. What is your income level?

![Income Level Graph](image)

<table>
<thead>
<tr>
<th>Field</th>
<th>Choice Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $50K</td>
<td>18.42%</td>
</tr>
<tr>
<td>$50K - $100K</td>
<td>44.74%</td>
</tr>
<tr>
<td>$100K - $200K</td>
<td>22.37%</td>
</tr>
<tr>
<td>Over $200K</td>
<td>6.58%</td>
</tr>
<tr>
<td>Prefer not to answer</td>
<td>7.89%</td>
</tr>
<tr>
<td>Total</td>
<td>76</td>
</tr>
</tbody>
</table>

## 17a. Car owners - Carless breakout:

![Car Ownership Breakout Graph](image)

<table>
<thead>
<tr>
<th>Field</th>
<th>Car owners</th>
<th>Carless</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $50K</td>
<td>24.14%</td>
<td>14.89%</td>
</tr>
<tr>
<td>$50K - $100K</td>
<td>44.83%</td>
<td>44.68%</td>
</tr>
<tr>
<td>$100K - $200K</td>
<td>20.69%</td>
<td>23.40%</td>
</tr>
<tr>
<td>Over $200K</td>
<td>3.45%</td>
<td>8.51%</td>
</tr>
<tr>
<td>Prefer not to answer</td>
<td>6.90%</td>
<td>8.51%</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>47</td>
</tr>
</tbody>
</table>