social policy

TRANSPORTATION ALTERNATIVES

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Don't Curb Your Enthusiasm for Bike Share:

THE ECONOMIC IMPACTS OF TRANSFERRING CURB SPACE FROM CAR PARKING TO BIKE SHARE DOCKS

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Executive Summary

In recent years bike sharing has emerged as a functioning transportation concept in which publicly accessible bicycles are made available to people with low cost memberships for an unlimited number of one-way rides within an operating area. In the most common type of service docking stations are located every few blocks to manage inventory and to make retrieval and parking easy for short journeys. These docks are located in a variety of publicly visible places, including former parking spaces.

This study evaluates the economic impact of visitors to commercial districts in New York City that had car parking converted to bike-share parking. The authors examined both reported usage patterns of bike share stations in 7 neighborhoods in New York City and compared the shopping activity that is related to automobile usage and bike share activity. Shopping and consumption behavior is compared to four sites that are currently not served by bike share.

This report finds that bike share is likely to have a positive economic impact on sites near stations due to the high level of local foot traffic generated by the docking stations and a significant propensity to spend by bike share users as was identified by surveys of district shoppers. The project examined 7 stations that hold up to 283 bikes. These stations replaced 41 parking spaces and generated an average of 587.3 bicycle trips per day.

The authors provide a detailed summary of the demographic and structures in each area to provide a more comprehensive overview of the economic and living conditions in each neighborhood. These profiles are based on New York City Housing Data (PLUTO Data) and U.S. Census 2010 data summarized by Census Tract.

Finally, to address the question of shopping behavior and economic impact, the authors developed a survey instrument that explored the particular consumption and shopping patterns of a sample of users in these areas and in control sites.

Based upon the field survey administered by the research team, the authors are able to examine the reported shopping behavior of various types of travelers. Our results confirmed the general field findings that the bulk of shopping and street activity in New York City is facilitated by walking and transit usage. Bike share users have similar

shopping behavior to other users in a district and the districts with bike share facilities experienced increased flow in shoppers due to the use of bike share facilities.

In many urban districts, automobile parking is a dynamic system, where users and providers interact to promote use and mobility. Any user who wishes to park their vehicle considers a number of options and may park on the street or in a parking facility. Therefore, the impact on any changes in street parking should be evaluated in light of the portfolio of parking options that are provided – a reduction in a street space may or may not reduce automobile access to the area.

Due to data limitations, the authors were unable to ascertain the exact level of utilization of automobile parking in these districts, however our reasonable assumptions regarding paid parking utilization provide us with guidance as to the economic value of bike share facilities as compared to automobile parking. Further analysis is warranted and ongoing efforts for data acquisition are in progress by the research team. Given these limitations, the authors examined various economic impacts that can be observed in the districts that modified their mix of mobility options by having bike share added.

In particular, our surveys indicated that bike share users tended to have shopping characteristics that are similar to other urban travelers. In addition, our analysis found that the conversion of a given parking space from automobile use to bike share parking produces an average of 14.7 bike trips per day out of a given 20 feet of curb space.

Our estimates indicate that the conversion of a paid parking spot (20 feet of curb space) to a bike share facility has the potential to increase the total commercial spending from $219.65 dollars a day (if we had 8 turnovers per space per day) to $334.06 dollars per day. This is driven by the increased frequency of movements in and out of the bike share facility and is somewhat offset by the slight difference in spending patterns by mode of travel.

Given that our results are driven off a relatively small sample size of survey participants, the authors encourage further study of this topic and enhanced survey work to identify more strongly the overall patterns of use and shopping that occurs with the introduction of the NYC Citibike system. Furthermore, the growing user base of Citibike users will offer an opportunity to reshape our community in sustainable ways. Retail and commercial business owners would be wise to consider the potential benefit of the Citibike system and may want to consider how they can maximize the benefit of this increased mobility for their customers and provide services to meet their needs.

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Introduction

Bike share exploded all over the world in the last decade with nearly 300 bike share programs and the number keeps growing. [1] Cities are attracted to bike share programs in order to reduce their auto dependence, improve air quality, reduce traffic congestion and lessen car parking demand. As a low-cost, low-carbon activity cycling is one of the most affordable and sustainable transportation modes available to city managers, but it has historically lacked infrastructure and influence in North American cities. Given these properties bike share has the potential to increase demand for bicycling in general by creating a critical mass of bicycle users.

Pucher and Buehler (2009) provides a good overview of the fundamental weakness of New York City as a bikeable city. Clearly, from their work, we can see that New York City has significant ground to gain as compared to much more successful cities with harsher weather conditions - such as Minneapolis. Citibike is a key step in the right direction.

In the summer of 2013 New York City unveiled its long awaited bike share program, dubbed CitiBike after its main sponsor – CitiBank. While public planning for the program was nearly a three year process that engaged many community groups, the actual stations for the 5,500 bike system was able to be installed in a matter of weeks beginning in Spring 2013. For many New Yorkers, this was the first time that they truly took note of the new system. While the system's planners took pains to avoid replacing parking with docking stations, in some locations it was viewed as the best option.

Many small retail businesses were intensely skeptical of these new docks – particularly the ones that replaced parking. Bike share presents an opportunity to disrupt established transport patterns, with businesses having no clear evidence if it will actually be positive. Some retailers even saw the parking that was getting replaced as a lifeline to access their stores. This perception was amplified in the press and media. Indeed, some businesses in the cores of Manhattan and Brooklyn where this service was launched may truly rely on a clientele of drivers who can haul large purchases or find convenience in the location and services of particular establishments. However, the most classic retail operations rely on having larger numbers of people come into proximity to their locations. The closer a site is to large flows of people, the more potential transactional value that can be extracted. If car access was the only requirement for all types of businesses, most of Manhattan would be without significant commerce. The underlying concern is that bike share will undermine the customer base and make business more difficult. The purpose of this report is to see if CitiBike, based on its initial season of operation, has the demonstrated potential to help or harm retail businesses based on its impact to consumer flow and user spending habits. It does this by measuring usage of specific docking

[1] Sood, S

stations that replaced parking in commercial corridors, and then by surveying people present in those locations about their transportation and spending habits.

This study relies on two main data sources: 1) bike stock availability from the CitiBikeNYC.com live station map, and; 2) on-street interviews with street intercepts of people at eleven commercial intersections in Manhattan, Brooklyn and Queens (7 intersections were near bike share stations, 4 did not and were considered control sites). Data was collected during the months of June, July, and August 2013.

Table 1: Population & Land Use Characteristics – Study Areas

Source: 2010 US Census & New York City Primary Land Use Tax Output (PLUTO)

	Census Tract Information	Population	Employment	Income per capita	Income per Household	% White	# Commercial or Mixed Use properties within 400'
Manhattan	2nd Ave & 30th St	8,817	2,397	$ 93,954	$ 181,316	72%	60
	Bayard & Baxter	6,398	67,810	$18,880	$ 33,659	9%	52
	MacDougal St & Washington Sq Park	12,582	15,259	$71,716	$ 90,730	82%	36
	W. 38th St & 8th Ave	6,115	119,348	$50,577	$ 91,328	50%	24
Brooklyn	DeKalb & Hudson	4,799	7,659	$39,791	$ 89,780	35%	7
	Grand & Havemeyer	9,033	1,283	$ 27,355	$ 45,537	45%	37
	Montague St & Clinton St	4,172	16,887	$86,919	$177,863	72%	66
	All Study Sites	**51,916**	**230,643**	$ 57,044	$ 98,203	**51%**	**282**
Control Sites	7th & Flatbush Ave (Brooklyn)	6,066	1,413	$ 49,397	$ 105,330	61%	55
	Queens Blvd & 40th St (Queens)	9,072	10,668	$26,734	$ 45,456	39%	26
	E. 79th St & Lexington Ave. (Manhattan)	7,813	3,190	$ 142,205	$ 238,699	87%	45
	W. 79th St & Broadway (Manhattan)	13,188	7,007	$ 112,643	$ 201,442	83%	37
	All Control Sites	**36,139**	**22,278**	**$86,852**	**$ 154,207**	**67%**	**163**
	All Sites	**88,055**	**252,921**	**$ 69,278**	**$ 121,187**	**70%**	**289**

The Parking Issue

The fundamental purpose of a parking or docking space for bike share is to provide access for the user. Bike share docks and parking spaces have some fundamental similarities and differences. Both docks and parking spaces are limited resources at the city block scale. Fully occupied bike share docks and full automobile parking spaces imply that additional journeys cannot be potentially completed at their intended destination. Likewise, high occupancy serves as a proxy indicator of human activity – the fewer available empty spaces the more people are congregating in that area. The smaller physical size of a bike share dock relative to a parking space could allow for more storage capacity (7 bike docks fit into one standard parking space), but that capacity is only relevant if more people actually utilize the dock.

A fundamental difference between traditional and bike share parking exists at the origin side of a trip. The car ownership model implies that no one besides the official occupants of the vehicle will get transportation utility from the parking space while it is occupied. Thus an occupied space affords no one else the opportunity to start or end a trip. Bike share is different. Shared bikes become available for use by someone else once they are docked (and more similar to mass transit equipment, car share and taxi services as compared to private automobile), thus a docked bike represents a potential origin for any member, not just the one who docked it. Because of this bike share turnover is not an indicator of the same person coming and going, but of people in general flowing through a neighborhood. For bike share the time restriction exists on the traveling side (all trips over 45 minutes have additional fees) thus encouraging efficient travel, but do not present costs once the bike is docked, thus enabling the ability to linger at the destination. In exchange for improved turnover - paid car parking rate provide a disincentive to lingering at a given destination. Under this regime the income from a future customer is viewed as more valuable than the income from a present customer. While higher turnover can lead to more original transactions, it also has the potential to discourage larger or more numerous transactions with the same people. In general, in the parking analysis community, parking pricing is generally seen as a tool to promote change over in parking spaces – to promote economic activity. It is generally not seen as good public policy to encourage the storage of vehicles in prime locations.

Because bike share offers opportunities to linger and therefore the possibility spend more intensely in a district, and because the occupied space is not tied to the individuals who made the trip, bike share could be economically neutral to a local merchant at a value of slightly less than one bike share trip per displaced car trip. Thus there are two initial elements to focus on here that would matter to businesses interested in maximum store/foot traffic: the capacity of individuals at any given time that can be accommodated by that space, and the number of times that the space is reoccupied or turned-over to another user to determine if any thresholds have been crossed. Additional elements covered later on in this paper are the frequency and size of shopping transactions as differentiated by users of different modes.

Parking/Bike Share Dock Capacity Methodology

To evaluate the actual demand for bike share dock space utilization, CitiBike data on bike and dock availability from the first summer of operations was procured by the authors. While the service is still growing and changing, we feel that this data is useful to explore as a first round analysis of bike share usage in New York City. This data represents a useful starting point for understanding this service and how it will be used in New York City – as demand for the system should increase as consumer knowledge about the system and its membership base is still in its infancy.

This study uses raw data scraped in JSON format from the dynamic CitibikeNYC.com station map[2] from the 9 week period from June 30, 2013 to August 31, 2013. This data is collected into a minute by minute count of available bikes at each station in the system, producing nearly 30 million lines of data for the study period. Of this a sample of 7 study stations that had specifically replaced parking in or adjacent to commercial streets were selected for comparison and later surveying. These 7 sites produced 635,000 records of bike share movements. The data source for this study represents the same data that was made available to the general public through the official live map, which has been known to display a smaller population of bicycles than the system operators report. This method would also potentially miss nearly simultaneous docking and undocking events (one person checks out a bike in the same minute that someone else checks one in at the same station). Thus, this could create an additional potential source of undercounting. This further reinforces that in our estimates we will be seeing patterns of usage that are at the low end of the spectrum as opposed to the maximum possible rates. We expect that this data will produce a overall conservative estimate of the circulation of CitiBikes, which in the end supports our argument that the threshold of parking equivalence is generally being met or exceeded. Statistics on bike share activity cited in this report are generated from this source unless otherwise noted.

To analyze this raw data a computer script was written to aggregate changes in the stock of bikes at each dock and report events by the hour. This produces an average number of available bikes, the number of docking events (bike stock goes up), undocking events (bike stock goes down), the number of minutes the station is nearly empty (bike stock is near zero), or nearly full (bike stock is near the station size) within each hour of the study period.

Bike Share Station Capacity and Utilization

Our study examined seven bike share sites - four intersections in Manhattan and three intersections in Brooklyn that contain nearby bike share stations. Collectively those stations contained 283 docks, with stations ranging in size from 27 to 51 docks. All of the study stations removed street parking in or adjacent to commercial zones; some exclusively removed paid

[2] Accessed from http://data.citibik.es, a project of computer programmer Abe Stanway (http://abe.is) that archives map data from the official CitiBike website.

parking. Collectively these 283 docks represented the loss of 41 parking spots and the replacement of these spaces with 283 dock (7 docks per parking space). These numbers show the space advantage of bike share at full occupancy: even if each parking space has a car with a full five passengers (way above any national or regional vehicle occupancy averages) that would only bring in 200 people into the areas in question if the spaces were fully occupied.

System-wide there are more than twice as many docks as there are bikes, which are generally regarded as necessary to maintain circulation. The JSON data files reveals a maximum population of about 4500 bikes and 11,405 docks, placing maximum system-wide recorded dock occupancy at 39%, with the data averaging 33.9% occupancy. Across all hours the study sites maintained an average occupancy of 31.9%, or 90 bikes out of 283 docks. Yet even at this average occupancy the docks are able to accommodate more than twice as many people movements than if the equivalent space was used for car parking at an average passenger occupancy of 1.2 persons per vehicle.

Bike Share Utilization over Time

While the docking stations may be able to fit more people than the parking space this may not be realized due to weak demand over time. In short the argument is that the bikes may not be turning over, while the cars are.

The observed numbers, however, do not agree with that premise. Combined, all seven study stations produced almost 37,000 trips over the study period. A trip in our study is being defined as an undocking event plus a docking event – so ½ of the actual moves – as we assume shopping occurs at either end of a trip – not both. This equates to 587 trips per day or 2.1 trips per dock per day in our study areas. While that number might appear low it carries a car parking equivalence of 12.1 trips per day if we assume an average of 1.2 passengers per car. Thus the average removed parking spot will need to have had nearly 6 times the amount of turnover as the conservatively measured bike share station that replaced it in order to attract the same amount of people to that spot. Across the entire system, which mostly includes spaces where parking wasn't removed, the averaged ridership over our study period equates to 2.4 trips per dock per day, or a 14.3 trip equivalence per parking space per day.

Seasonality

One question that needs further study is the question as to the impact of seasonal changes in weather and conditions on bikes hare usage. One potential concern would be a significant reduction in usage during winter months or during inclement weather. Could the ridership disappear entirely? While the CitiBike system has yet to go through its first winter, experience elsewhere suggests that bike share could still be a net positive effect. With respect to monthly seasonally other bike share systems have shown a 25% decline in ridership between the high point of the summer months and the low point of the winter months. While the entire CitiBike system reported an average of 28,000 trips/day during the 9 week study, usage of the new system actually grew by nearly 50% during the study period, going from an average daily ridership of 21,000 to 31,000. Thus, if we observe similar patterns to the Washington DC Capital Bikeshare, we would expect that winter ridership in NYC for just this first year would be

expected to be about 23,250 trips per day, a figure that still equates to 2.0 trips per dock per day across the entire system. Hour of week seasonality for Citibike is examined in the bike share usage analysis section later in the paper.

Figure 1: Washington DC Capital Bikeshare Usage By Month

Source: http://www.washingtonpost.com/wp-srv/special/local/how-capital-bikeshare-has-grown/

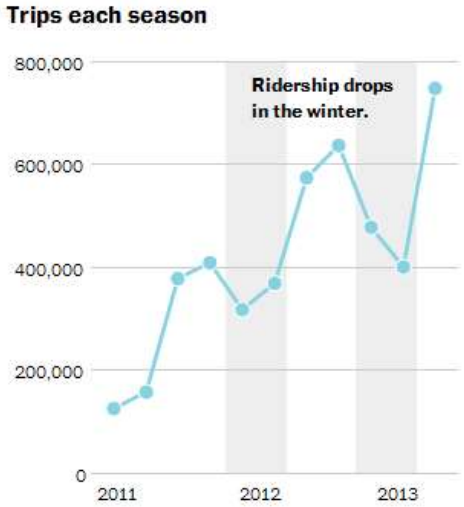


Table 2: NYC Citibike Trip Events by Station

Station & Trip Event Statistics	Manhattan				Brooklyn				
	2nd Ave & 30th St	Bayard & Baxter	MacDougal St & Washington Sq Park	W. 38th St & 8th Ave	DeKalb & Hudson	Grand & Havemeyer	Montague St & Clinton St	All Study Sites	Entire System
	Space Characteristics								
Dock Capacity	39	43	33	51	51	27	39	283	11,405
Average Occupancy	25.0%	28.9%	30.8%	23.9%	41.0%	55.7%	25.2%	31.9%	33.9%
Fmr. Car parking capacity	6	6	5	7	7	4	6	41	-
Avg. minutes empty per day	337	149	289	312	117	98	259	N/A	N/A
Avg. minutes full per day	1	1	2	2	2	25	11	N/A	N/A
Trips per day	137.1	85.0	84.3	126.2	69.4	45.3	39.9	587.3	27,924
Trips per dock per day	3.5	2.0	2.6	2.5	1.4	1.7	1.0	2.1	2.4
Equivalent trips per parking space per day	20.5	11.5	14.9	14.4	7.9	9.8	6.0	12.1	14.3
	Trip Frequency								
Median trips per hour (16 h day)	5.7	3.5	3.5	5.3	2.9	1.9	1.7	24.5	1163.5
-1 Std. Dev. (4h day)	0.8	0.4	0.5	0.2	0	0	0	7.1	374.1
+1 Std. Dev. (4h day)	10.6	6.6	6.6	10.3	6.3	4.0	3.4	41.9	1952.8
Hours/day with:									
Trips<.05 per dock	6.4	10.1	8.6	9.6	15.0	12.0	14.5	7.9	7.2
Trips>.2 per dock	7.5	1.7	3.8	3.6	1.1	1.9	0.2	1.1	2.4

A similar evaluation of paid parking spaces was sought using pay-and-display muni meter data to provide a direct comparison to actual car turnover. However, that data has not been recoverable as of the time of this report and is pending a FOIA request. Nonetheless, the relatively high bike share turnover per equivalent parking space suggests that sustained car turnover is unlikely to override bike share trips. As a point of comparison, a 2010 DOT study of 5th Avenue in Park Slope revealed a car turnover of about one change per hour per space during the peak occupancy hours of 12pm to 4pm with 80% parking space occupancy during that period[3].

Thus a popular business district may experience turnover about a half dozen times per space per day, a figure that was equivalent to our least popular bike share station in the study sample (Montague & Clinton). Furthermore, it is quite possible that those trips wouldn't have disappeared, but instead would have shifted to other unoccupied spaces (paid or free) in the district. Given the fluid nature of parking utilization in urban zones, the question as to if a particular parking event is crowded out by a lack of spaces in the district is hard to answer. Clearly, in many districts the availability of various types of parking (free and paid street parking, private and parking garages and such) provide a portfolio of options that can be exploited in many neighborhoods. That being said, it is important to consider the delicate balance that existing in term of parking demand in urban zones.

Parking Conclusions

Thus in terms of pure foot traffic CitiBike appears more than likely to meet the minimum threshold of self-replacement when a car parking spot is taken for the service. This was accomplished using data that represents the minimum impact of bike share since it undercounts transactions from the early phase of this growing service. With our seven sample sites which all replaced car parking, the average space would have had to turned over an average of 12.4 times each day to match the per person capacity of the measured usage of the docks. What is unclear is the extent that these are new trips or a reshuffling of trips that took place on other modes. Thus the trip data has not been able to show that new commerce will take place, just that retail locations in close proximity to bike share stations can be subjected to more foot traffic. Thus bike share could just be reshuffling commerce, but possibly in a manner advantageous to retailers adjacent to bike share stations.

[3] "New York City Park Smart: Park Slope Pilot Program Update," New York City Department of Transportation, June 17th 2010.

Retail Spending Methodology

While more foot traffic could lead to more commerce, this would only be true if the parked cars are displaced by people who spend at least an equivalent amount to the displaced drivers. To explore the connection between spending habits and travel mode in particular locations affected by bike share a team of researchers from the Social Policy Simulation Center (SPSC) conducted a short survey at 7 bike share locations and 4 control areas (outside of the bike share service boundary) in Manhattan, Brooklyn and Queens. The survey methodology had the advantage of being able to get direct information on mode of transportation to and from specific sites, recent expenditure by the individual, and perceived frequency of shopping visits. No third-party data source could offer information with this level of granularity. It has the disadvantage of limits on the respondent's willingness to answer questions, and high cost of collection leading to a limited survey count. As such, the survey is considered a demonstration, leading to rough but informative estimates of trip and revenue generation. Twenty surveys were administered at each specified intersection where interviewers would ask pedestrians if they would be willing to participate. Interviewers asked questions and recorded the responses about trip purpose, travel modes used, and money spent. Given that most people were on their way to an activity and the surveying interrupted their journey, survey time was kept short and interviewers had to work quickly and fluidly. The data was directly coded from the survey into SPSS for analysis. Table 3 reports on the market size and bike share system metrics for the study and control areas.

Table 3: Market Size and Bike Share Capacity of study and control sites

Capacity	Bike share present Study Sites	No Bike share present Control Sites	All Sites
Market Size (Pop + Employment)	282,559	58,417	340,976
Bike Share Capacity	283	0	283
Displaced Car Capacity (20' curb)	41	0	41
Bike Share Trips per day	587	0	587

For ease of surveying and to respect the privacy of respondents transaction data was collected as categorical data (for example: respondent spent between $50-$100 at 1-3 stores). For calculations, these responses were converted to their median value ($50-$100 → $75, 1-3 stores → 2 stores).

Out of the 142 bike share Study Area respondents 10 (7%) used bike share to arrive or depart from the site. This number is not surprising given the size of the transportation market in the

core of NYC where CitiBike operates. For comparison record high CitiBike usage as reported by the operating company was about 45,000 trips in one day, or roughly 1% of average daily MTA ridership. Within the bike share operating area 25 (17%) respondents drove to or from the site. Given the low counts for each of these key respondents, results are only tabulated at the study-wide level to reduce statistical variance. Median spending values are also reported to reduce the influence of, but not remove, outlier responses. Table 4 provides an overview of the mode of travel by survey respondents split by study versus control sites.

Table 4: Mode Usage of Survey Respondents by Area

Travel Profile	Bike share present Study Sites	No Bike share present Control Sites	All Sites
Journey (One direction of travel)			
Journey Count	284	160	444
Journey by Mode			
Bike Share	4.9%	0.0%	3.2%
Drive	15.1%	10.0%	13.3%
Walk	40.8%	42.5%	41.4%
Transit	32.0%	39.4%	34.7%
Other	3.5%	5.6%	4.3%
Item Non Response	3.5%	2.5%	3.2%
Trips (Journey to site + Journey from site)			
Trip Count (n)	142	80	222
Trip that used Mode	May add up to more than 100% due to multimodal trips		
Bike Share	7.0%	0.0%	4.5%
Drive	17.6%	12.5%	15.8%
Walk	53.5%	61.3%	56.3%
Transit	44.4%	61.3%	50.5%
Other	7.0%	7.5%	7.2%
Item Non Response	7.7%	13.8%	9.9%

Note: Journeys are one way statistics to OR from the site. Trips are two-way statistics to AND from the site. The trip metric catches multimodal individuals.

This data revealed that of all modes in the study 70.4% spent money on the trip when we interviewed them. The median value spent was $32.50. These numbers were the same for drivers in the study area. Outside of the study area only 50% of drivers were on a trip where they were spending money, with the average value being $25. This drop in commerce may be due to the fact the selected and implemented bike share site may well coincides with the main business districts of the city, thus fewer people would be engaged in commerce if interviewed outside of these zones. Respondents who used bike share, whom by definition were proximate to a main business district, were more likely to be spending money during their trip (80%), but at a slightly lower rate ($28.75) than all modes within the bike share service area.

Table 5: Spending Patterns and Retail Revenue Creation by 20' of curb space.

Revenue	Bike Share present Study Sites	No Bike Share present Control Sites	All Sites
% of Trip Mode that Spends Money			
All Modes	70.4%	65.0%	68.5%
Driving	70.4%	50.0%	64.9%
Bikeshare	80.0%	N/A	80.0%
Median $ Spent/Shopper			
All Modes	$ 32.50	$ 36.25	$32.50
Driving	$ 32.50	$ 25.00	$ 30.00
Bikeshare	$ 28.75	N/A	$28.75
Median Revenue generated per 20' curb			
Bikeshare	$334.06	N/A	$ 334.06
Car Parking Comparison (@ 8 cars/day)	$ 219.65	$ 120.00	$ 186.91

The Economic Impact of 20 Feet of Curb Space

Using these results we can calculate the average revenue generated by each 20’ of curb space that would represent one car parking space or 7 bike share docks. We previously calculated that each dock in our study accommodates 2.1 trips per day. If 80% of trips result in a shopping expenditure, and the median value of that expenditure is $28.75, the resulting net revenue would be $334 per day.

If instead a car was parking there we could expect $32.50 for 70% of trips. While only one car can occupy that 20’ of space, it could have more than one passenger. Using an average passenger load of 1.2 people, that space would have to turn-over 10.3 times per day to equal the revenue generated by the bike dock. That kind of parking space turnover would be on the high-end for even the busiest commercial streets.

Table 6: A Comparison of Equivalent Use of 20' of curb space.

Curb usage per 20'	
Car spaces	1
Bike Share Docks	7
Avg Bike Share trips	14.7
Average Car trips	Data Unavailable
Car parking turnover per 20' needed to equal bike share station impact:	
Trip equivalence	12.1
Revenue Equivalence	10.3

New York City:

The Citi bike share program was launched its 5500 bikes program with 330 bike station in Manhattan and Brooklyn on Memorial Day 2013. It is part of phase one of the proposed system that will eventually serve 4 out of the 5 boroughs, excluding Staten Island. Currently, people take 40,000 trips on some of the system's busiest day in less than three months after the program began; reaching the record number of 42,010 trips on August 6th, 2013. Annual members reached 71,395 as of August 13th. [4] A fee for using the system is $9.95 daily, $25 weekly and $95 annually. There have been a total of 1,419,705 trips since the launch of Citibike in New York City. [5]

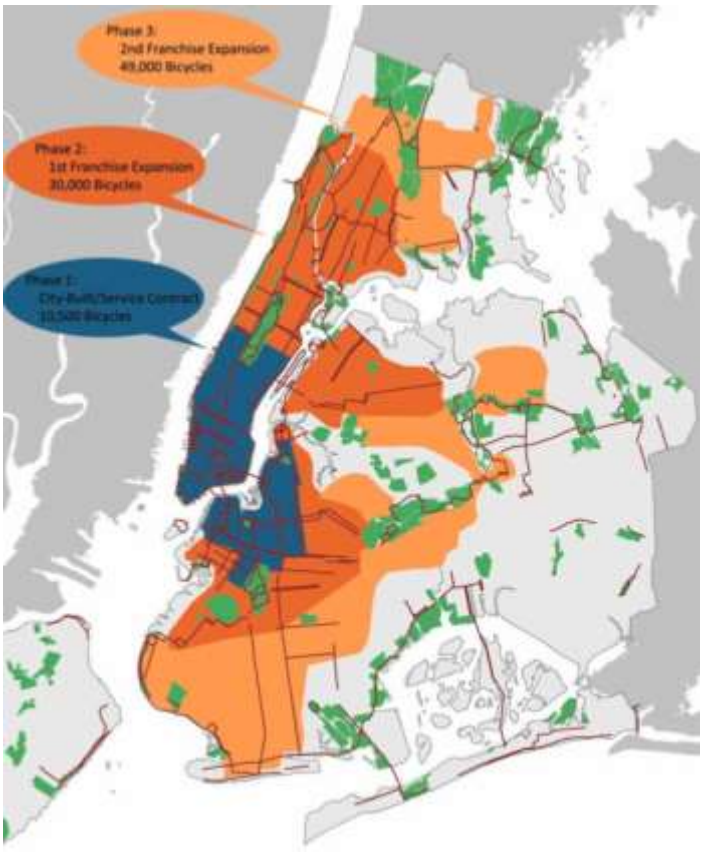


Figure 2: Proposed Phasing (NYCDCP, 2009)

Survey Methodology

The Social Policy Simulation Center (SPSC) conducted a short survey at 7 existing bike share locations and 4 control areas in Manhattan, Brooklyn and Queens. Twenty surveys were administered at the specified intersection where interviewers would ask pedestrians if they would be willing to participate. Interviewers asked questions and recorded the responses. Given that most people were on their way to an activity and our surveying interrupted their journey, survey time was kept short and interviewers had to work quickly and fluidly. The data was directly coded from the survey into SPSS for later analysis. The following locations were chosen as our Bike share survey locations.

[4] Flegenhaimer, M

[5] Citibike

Table 7: Survey Locations

Survey Locations	
Survey Locations with Bikeshare	Survey Locations without Bikeshare - Control Sites
West 38th Street & 8th Avenue	Flatbush Avenue & 7th Avenue
MacDougal Street & Washington Square	Queens Boulevard & 40th Street
Grand Street & Havemeyer Street	Lexington Avenue & E 79th Street
2nd Avenue & East 31st Street	Broadway & W 79th Street
Dekalb Avenue & Hudson Avenue	
Clinton Street & Montague Street	
Bayard Street & Baxter Street	

Location Demographics

A buffer of 0.075 miles was used to pull the demographic data in order to determine the user profile of each location. This buffer distance was chosen in order to avoid overlapping population sampling from nearby bike share stations.

West 38th and 8th Avenue are located in the borough of Manhattan adjacent to an existing bike share location. This bike share location is in the intersection of four Census tracts with total population of 6,115 people with median family income of $91,328 dollars and per capita income of $50,577 dollars. There are a total of 119,348 jobs available in this area.

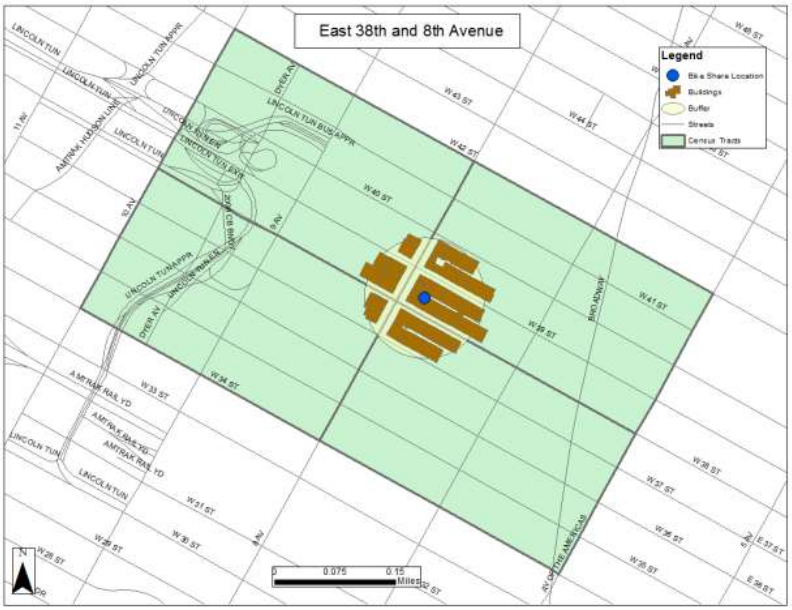


Figure 3: West 38th and 8th Avenue Study Area

This is a busy shopping corridor in the heart of the Garment District. The majority of the structures were built in the 1920’s when the neighborhood was the fashion manufacturing center. Today it is still kept some of its characteristics; with small pockets of dense concentration of specialty shops of dressmaking supplies mixed with small shops and restaurants at the street level and

manufacturing/office space above. As fashion manufacturing continues to decline many of the large manufacturing space becomes a desirable office location for non- fashion companies.

Table 8: West 38th and 8th Avenue Demographics

Demographics		**Structures Primary Zoning**	
Race	Percentage	Type	Number of Buildings
White	59%	Residential	0
Asian	21%	Commercial	5
Hispanic	19%	Manufacturing	47
Black	9%	Mixed Manufacturing & Residential Districts	0
		Total	52

MacDougal Street and Washington Square Park are located in the Greenwich Village section of the borough of Manhattan adjacent to an existing bike share location. This bike share location is adjacent to two census tracts with total population of 12,582 people with median family income of $71,716 dollars and per capita income of $90,730 dollars. There are a total of 15,259 jobs available in this area.

Figure 4: Mac Dougal and Washington Square Study Area

This neighborhood is home to the NYU campus which had a major influence on the neighborhood. Two thirds of the neighborhood is residential with the bulk of the buildings from the early 1900's. The majority of the buildings are row houses or mid-rise apartments.

Table 9: MacDougal and Washington Square Demographics

Demographics		Structures Primary Zoning	
Race	Percentage	Type	Number of Buildings
White	86%	Residential	65
Asian	8%	Commercial	44
Hispanic	6%	Manufacturing	0
Black	2%	Mixed Manufacturing & Residential Districts	0
		Total	109

Grand and Havemeyer Street are located in the borough of Brooklyn adjacent to an existing bike share location. This bike share location is in the intersection of two census tracts with the total population of 9,033 people with median family income of $45,537 and per capita income of $27,355. There are a total of 1,283 jobs available in this area.

Figure 5: Grand and Havemeyer Study Area

The neighborhood is mostly residential with small shops and restaurants at the street level. The majority of the buildings were built prior to the 1950's and a few of them after 2000. Metered parking was present at Havemeyer Street and free parking along Grand Street. Bikeracks and sign posts were overflowing with personal bikes at this intersection.

Table 10: Grand and Havemeyer Demographics

Demographics		Structures Primary Zoning	
Race	Percentage	Type	Number of Buildings
White	63%	Residential	72
Asian	5%	Commercial	0
Hispanic	47%	Manufacturing	0
Black	4%	Mixed Manufacturing & Residential Districts	35
		Total	107

East 30th Street and 2nd Avenue is located in the borough of Manhattan adjacent to an existing bike share location. This bike share location is in the center of a census tract with total population of 8,871 people with median family income of $181,316 and per capita income of $93,954 dollars. There are a total of 2,397 jobs available in this area.

The neighborhood is a major commercial corridor for the area. It consists of mainly four floor walkup apartments that were built before the 1920’s. Newer residential towers built between 1980-1990 popping up and slowly replacing these older buildings to match the increased demand for modern housing. Both of these building types have the mixed use characteristics of storefront at street level and residential above.

Figure 6: East 30th Street and 2nd Avenue Study Area

Table 11: East 30th Street and 2nd Avenue Demographics

Demographics		Structures Primary Zoning	
Race	Percentage	Type	Number of Buildings
White	76%	Residential	19
Asian	16%	Commercial	31
Hispanic	7%	Manufacturing	0
Black	3%	Mixed Manufacturing & Residential Districts	0
		Total	50

Dekalb and Hudson Avenue are located in the borough of Brooklyn adjacent to a bike share location. The bike share location is at the boundary of two census tracts with the total population of 4,799 people with median family income of $89,780 and per capita income of $39,791. There are a total of 7,659 jobs available in this area.

This location is adjacent to the Long Island University Brooklyn Campus and a block away from a DeKalb Avenue station on the B, Q and R lines. Flatbush Avenue is a major commercial corridor in the area with shops at the street level. The neighborhood consist the mixture of large office buildings built within the last decade and smaller 3-4 story

Figure 7: Dekalb and Hudson Avenue Study Area

buildings from the 1930's.

Table 12: Dekalb and Hudson Avenue Demographics

Demographics		**Structures Primary Zoning**	
Race	Percentage	Type	Number of Buildings
White	39%	Residential	3
Asian	13%	Commercial	7
Hispanic	13%	Manufacturing	0
Black	37%	Mixed Manufacturing & Residential Districts	0
		Total	10

Figure 8: Montague and Clinton Street Study Area

Montague and Clinton Street are located in the Brooklyn Heights section of Brooklyn adjacent to a bike share docking station. The bike share location is in the intersection of two census tracts with the total population of 4,172 people with median family income of $177,863 and per capita income of $86,919. There are a total 16,887 jobs available in this area.

The neighborhood consists of a combination of classis and modern architectures of 4-5 story buildings from the early 1900's and 2-40 story buildings that were built after 1960's. Montague Street is a busy shopping corridor that links the neighborhood to downtown Brooklyn.

Table 13: Montague and Clinton Street Demographics

Demographics		Structures	
Race	Percentage	Type	Number of Buildings
White	72%	Residential	5
Asian	15%	Commercial	35
Hispanic	8%	Manufacturing	0
Black	5%	Mixed Manufacturing & Residential Districts	0
		Total	40

Bayard and Baxter Street are located in the borough of Manhattan adjacent to a bike share location. The bike share location is in the middle of a census tract with the total population of 6,398 people with median family income of $33,659 and per capita income of $18,880. There are a total of 67,810 jobs available in this area.

Bayard and Baxter Streets are located in Chinatown neighborhood of the borough of Manhattan adjacent to a bike share location. This intersection of Bayard and Baxter is adjacent to Criminal Courts complex. The majority of the buildings are 4-6 stories and they were built prior to 1920s. The two tall structures 14 and 24 floors belong to the Department of Correction and Department of Citywide Administrative Services which is the major employer and trip

Figure 9: Bayard and Baxter Street Study Area

generator of the area. Parking spaces and sidewalks are occupied in many cases by special vehicles permit to park who work for one of these agencies.

Table 14: Bayard and Baxter Street Demographics

Demographics		**Structures**	
Race	Percentage	Type	Number of Buildings
White	14%	Residential	0
Asian	70%	Commercial	85
Hispanic	9%	Manufacturing	0
Black	11%	Mixed Manufacturing & Residential Districts	0
		Total	85

Figure 10 : 7th and Flatbush Avenue Study Area

7th Avenue and Flatbush Avenue are located in the borough of Brooklyn there is no bike share available at this location, this is a control site. It is adjacent to two census tracts with the total population of 6,066 people with median family income of $105,330 and per capita income of $49,397. There are a total of 1,413 jobs available in this area.

This area consist of housing built prior to 1930s mostly 3 to 4 story walk up apartment buildings with storefront at the street level. This is a busy shopping corridor near the 7 Ave stop on the B and Q train.

Table 15: 7th Avenue and Flatbush Avenue Demographics

Demographics		Structures	
Race	Percentage	Type	Number of Buildings
White	62%	Residential	123
Asian	7%	Commercial	0
Hispanic	13%	Manufacturing	0
Black	22%	Mixed Manufacturing & Residential Districts	0
		Total	123

Queens Blvd and 40th Street are located in the Sunnyside neighborhood of the borough of Brooklyn. There is no bike share at this location, this is a control site. It is in the proximity of three census tracts with the total population of 9,072 people with median family income of $45,456 and per capita income of $26,734. There are a total of 10,668 jobs available in this area.

This intersection is located right at the 40th Street Station of the elevated 7 subway line. The majority of the structures is 1-3 floors and was mostly built prior to 1930s. The area is mostly residential. Commercial activity is observed at the end of the street opposite from the elevated tracks.

Figure 11: Queens Blvd and 40th Street Study Area

Table 16: Queens Boulevard and 40th Street Demographics

Demographics		Structures	
Race	Percentage	Type	Number of Buildings
White	53%	Residential	57
Asian	27%	Commercial	0
Hispanic	29%	Manufacturing	0
Black	2%	Mixed Manufacturing & Residential Districts	0
		Total	57

Figure 12: E 79th and Lexington Avenue Study Area

East 79th and Lexington Avenue are located in the borough of Manhattan, there is no bike share at this location; this is a control site. It is in the middle of a census tract with the total population of 7,813 people with median family income of $238,699 and per capita income of $142,205. There are a total of 3,190 jobs available in this area.

East 79th and Lexington Avenue is an upper class residential neighborhood with high-rise apartment buildings and townhouses. Lexington Avenue is the main shopping corridor in the area; it is a combination of upscale shops and restaurants. It is also a transit hub for the 4, 5 and 6 trains.

Table 17: 79th Street and Lexington Avenue Demographics

Demographics		**Structures**	
Race	Percentage	Type	Number of Buildings
White	90%	Residential	63
Asian	5%	Commercial	29
Hispanic	5%	Manufacturing	0
Black	2%	Mixed Manufacturing & Residential Districts	0
		Total	92

West 79th and Broadway are located in the borough of Manhattan, there is no bike share facility at this location; this is a control site. It is in close proximity of two census tracts with the total population of 13,188 people with median family income of $201,442 and per capita income of $112,643. There are a total of 7,007 jobs available in this area.

West 79th and Broadway is an upper class residential neighborhood with high-rise apartment buildings with stores at street level. Broadway is the main shopping corridor in the area; it is a combination of upscale shops and restaurants. It is also a transit stop for the 1 train.

Figure 14: West 79th and Broadway Study Area

Table 18: West 79th and Broadway Demographics

Demographics		**Structures**	
Race	Percentage	Type	Number of Buildings
White	88%	Residential	34
Asian	6%	Commercial	18
Hispanic	7%	Manufacturing	0
Black	2%	Mixed Manufacturing & Residential Districts	0
		Total	52

Conclusions

Examining the impacts of bike share usage based upon the early adopters and the activity that we observe in the user base, we find that bike share users are relatively likely to also be shoppers in a given district. Our analysis indicates that bike share users produce more shopping activity per linear foot of curb space in the business districts we examined as compared to auto parking. This is consistent with a greater level of turnover in terms of vehicles from bike share docks.

In addition, further detailed research could provide us with information regarding the long term effects on businesses located near bike share docks and to how bike share promotes economic growth, development and sustainability in a given urban zone.

Based on our estimates, a bike share dock increases shopping activity in a region relative to an auto parking space when comparing the value of each foot of curb space. A bike share dock provided on average 2.1 trips per day per dock – or 14.5 trips per 20 feet of parking space. Assuming a 12 hour business day, that implies a turnover rate of 1.2 vehicle per hour. Thus, to provide the same amount of street traffic activity, a paid parking spot would have to turnover consistently on roughly an hourly basis for the whole business day. Therefore, given existing rates of utilization of bike share docks, the existing usage pattern appears to be providing more economic activity than the parking that it replaced. This effect has a high likelihood of increasing over the next few years as the bike share system matures and trip frequency increases.

Given that bike share docks are fixed capital and have a roughly 50% utilization rates (total bikes/total spots) there exists significant upside potential to use the existing stations in more intense ways. As bike share utilization expands and ridership grows (as is seen in existing data), it is highly likely that these zones will experience increased bike share traffic with little to no additional negative impact on regional parking. This presents us with an opportunity to increase economic activity in an area at little to no cost for the region.

Summary of Characteristics Based on Survey Participants' Responses

Demographics

The SPSC team conducted a Bike Share survey with 222 participants in July-September 2013. Seven of the locations were at bike share stations and the other four were examined as control sites. Twenty surveys were conducted at each location.

Demographics were recorded based on observation of the survey takers, survey participants were not asked these question. Survey respondents tended to be male, white, and young. Fifty-four percent of our survey participants were male and 45% were female. The majority of our survey participants were white and most of them were between the ages of 18-45. These results are in line with the data that has been reported in the media regarding the demographics of the neighborhoods that are served by the Citibike system.

Table 20: Demographics of Survey Respondents

Survey Participants Characteristics	**Survey Participants**		**New York City**	
Gender	Number	Percentage	Number	Percentage
-Male	120	54%	3,882,544	47%
-Female	101	45%	4,292,589	53%
-Item Non-Response	1	1%	N/A	N/A
Total	222	-	8,175,133	-
Race/Ethnicity	Number	Percentage	Number	Percentage
-White	128	58%	3,597,341	44%
-Black	46	21%	2,088,510	26%
-Asian	12	5%	1,038,388	13%
-Hispanic	26	12%	2,336,076	29%
-Other	8	4%	1,124,993	14%
- Item Non-Response	2	1%	N/A	N/A
Total	222	-	8,175,133	-
Age	Number	Percentage	Number	Percentage
Under 18 years	5	2%	1,994,870	24%
18 – 25 years	58	26%	642,585	8%
25 – 35 years	55	25%	1,392,445	17%
35 – 45 years	45	20%	1,154,687	14%

45 – 55 years	29	13%	1,107,376	14%
55 and older	29	13%	1,883,170	23%
Item Non-Response	1	1%	N/A	N/A
Total	222	100%	8,175,133	100%

Arriving Travel Mode/ Bike share/ Origin

The majority of the responders arrived on foot (40%) or by transit (37%) to our survey locations. 15% of our survey participants used cars, six (3%) arrived by Bike Share, and six (3%) arrived by bike. 84% of the people surveyed were from New York State, 8% from the State of New Jersey and 7% from other states or countries around the world.

Table 21: Survey Participants by Mode of Travel

Survey Participants' Characteristics	Number of Surveyed Participants	Percentage
Arriving Modes		
-Bike Share	6	3%
-Walk	89	40%
-Automobile	33	15%
-Transit	83	37%
-Taxi	4	2%
-Private Bike	6	3%
-Other	1	<1%
Total	222	-
Bike Share		
-Bike Share User	14	6%
-Non-Bike Share User	205	92%
- Item Non-Response	3	1%
Total	222	-
State		
-New York	187	84%
-New Jersey	18	8%
-Other	15	7%
-Item Non-Response	2	1%
Total	222	-

Purpose of Trip/ Eating/ Shopping

The majority of the responders' trips were either work related or fall into the other category (like errands, school), 16% of the participants reported that their main purpose of visiting the area in question on recorded day was shopping.

54% of the participants were eating in the area but only 40% were shopping. The highest percentage of the services visited/used was food services (42%)

Table 22: Survey Respondents – Reason for Trip & Eating Behavior

Survey Participants' Characteristics	Number of Surveyed Participants		Percentage	
Purpose of Trip				
-Recreation	17		8%	
-Tourism	9		4%	
-Shopping	36		16%	
-Work	63		28%	
-Family	13		6%	
-Other	79		36%	
-Item Non-Response	5		2%	
Total	222		-	
Eating				
-Will be Eating in Area	120		54%	
-Will not be Eating in Area	91		41%	
-Item Non-Response	11		5%	
Total	222		-	
Shopping				
-Will be Shopping in Area	88		40%	
-Will not be Shopping in Area	134		60%	
Total	222		-	
Destinations Visited	**Yes**		**No**	
	Number	Percentage	Number	Percentage
-Medical Service	24	11%	198	89%
-Food Service	88	40%	134	60%
-Professional Service	12	5%	210	95%
-Clothing	23	10%	199	90%
-Other retail	26	12%	196	88%
-Personal	10	5%	212	95%
-Other	13	N/A	N/A	N/A

Departing modes

Departing modes closely mimic the arriving modes, 42% of the respondents were departing on foot, and 34% used transit, 3% used bike share.

Table 23: Departure Mode

Departing Travel Arrangements	Number of Surveyed Participants	Percentage
-Bike Share	8	4%
-Walk	94	42%
-Automobile	26	12%
-Transit	75	34%
-Plane	2	1%
-Bike	5	2%
-Other	2	1%
-Item Non-Response	10	5%
Total	222	-

Bike Share Members in Survey

Out of the 222 survey participants 14 (6%) were bike share users. 2/3 of them are annual members. 22% of the bike share members taking 30 trips a month. Although some of the recorded Bike Share users had claimed to be members, in the Bike Share system they are just users. In the Bike Share system users are only recorded to be members when they are signed up as an annual user.

Table 24: Bike Share Membership

Survey Participants' Characteristics	Number of Surveyed Participants	Percent
Surveyed Participants (N=222)		
-Bike Share Users	14	6%
-Non-Bike Share Users	205	92%
-Item Non-Response	3	1%
Bike Share Membership (N=18)		
-Annual	12	67%
-Weekly	1	6%
-Daily	5	28%
Frequency in Bike Sharing per Month (N=18)		
-Three Trips	2	11%
-Four Trips	2	11%
-Eight Trips	1	6%
-Twelve Trips	2	11%
-Thirty Trips	4	22%
-Sixty Trips	2	11%
-Item Non-Response	5	28%

Shopping Behavior

40% of the survey participants responded that they will shop in the area on this trip. Of the respondents who indicated that they will be shopping, 78% of them said that they will visit between 1-3 stores. Of the survey respondents who will shop, 50% of them indicated that they will spend $50 and below. Table 24 report the general shopping behavior reported by respondents

Table 25: Shopping Behavior by Users

Survey Participants' Responses	Number of Surveyed Participants	Percent
Shopping (N=222)		
-Will be Shopping in Area	88	40%
-Will not be Shopping in Area	134	60%
Number of Stores Visited (N=222)		
1 – 3 Stores	74	33%
3 – 5 Stores	13	6%
6 – 8 Stores	4	2%
9 or more Stores	4	2%
Item Non-Response	127	57%
Amount Spent on Shopping (N=222)		
$50 and below	47	21%
$50 - $100	27	12%
$100 - $200	10	5%
$200 and above	10	5%
Item Non-Response	128	58%

Eating Behavior

To further examine consumption behavior, the authors questioned users as to their intention to eat during the survey trip. 54% of the survey respondents indicated that they will be eating in the area with the highest percentage of respondents (22%) said that they will spend between $5-10 on eating.

Table 26: Reported Eating Behavior

Survey Participants' Responses	Number of Surveyed Participants	Percent
Eating (N=222)		
-Will be Eating in Area	120	54%
-Will not be Eating in Area	91	41%
-Item Non-Response	11	5%
Amount Spent on Food (N=222)		
$5 and Below	12	5%
$5 - $10	49	22%
$10 - $20	29	13%
$20 - $40	10	5%

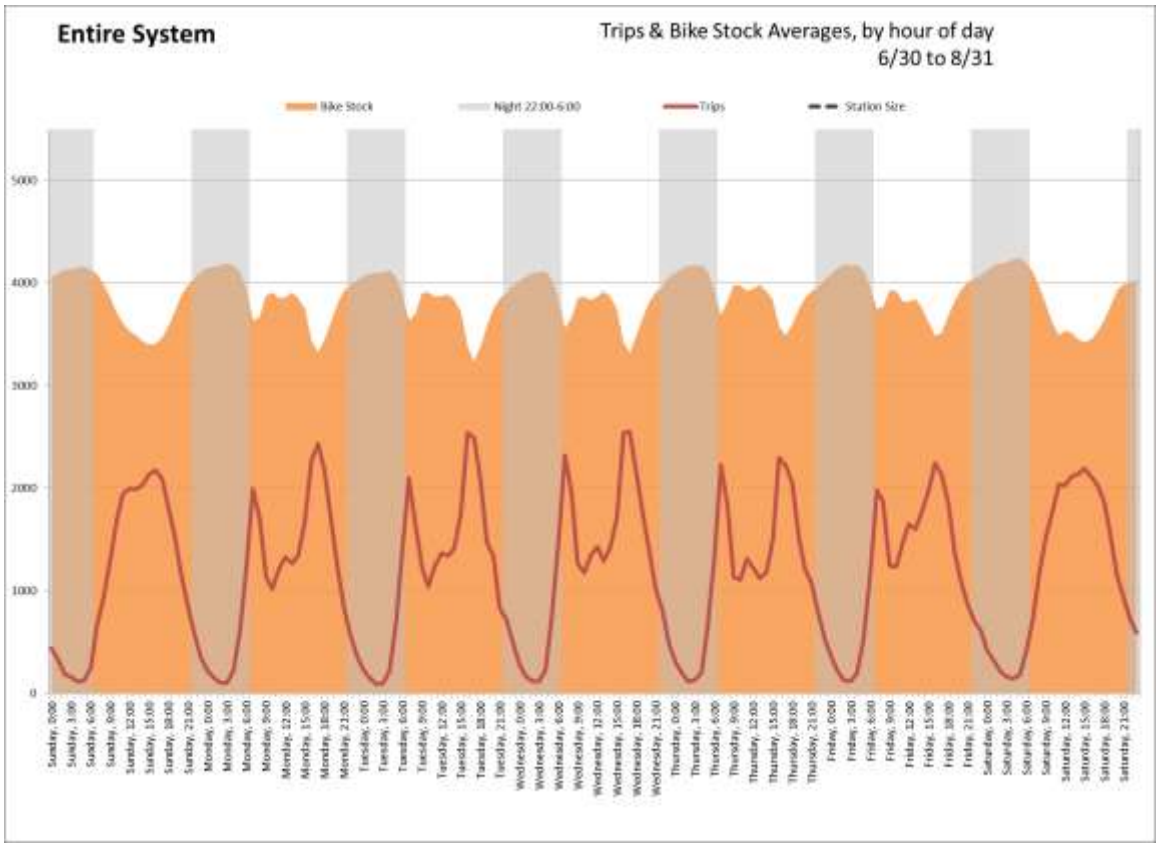
$40 and above	22	10%
Item Non-Response	100	45%

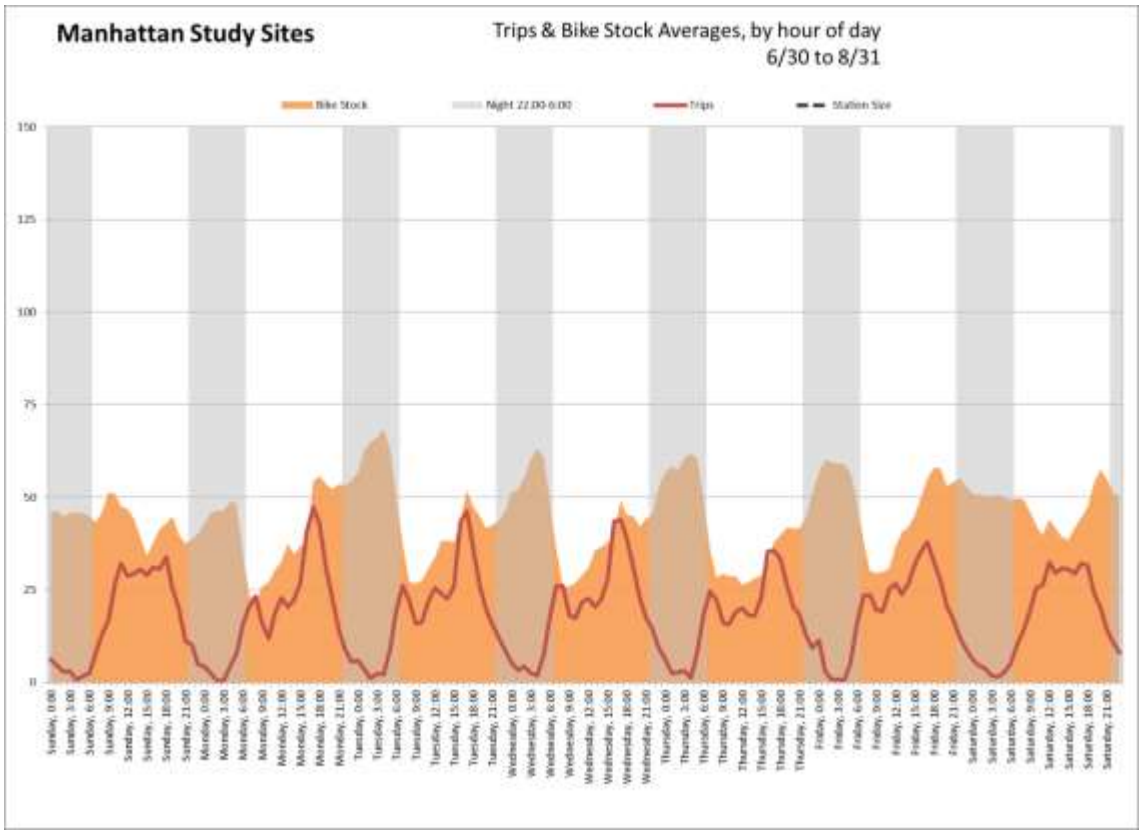
Bike Share Usage Analysis based on Scraped Data

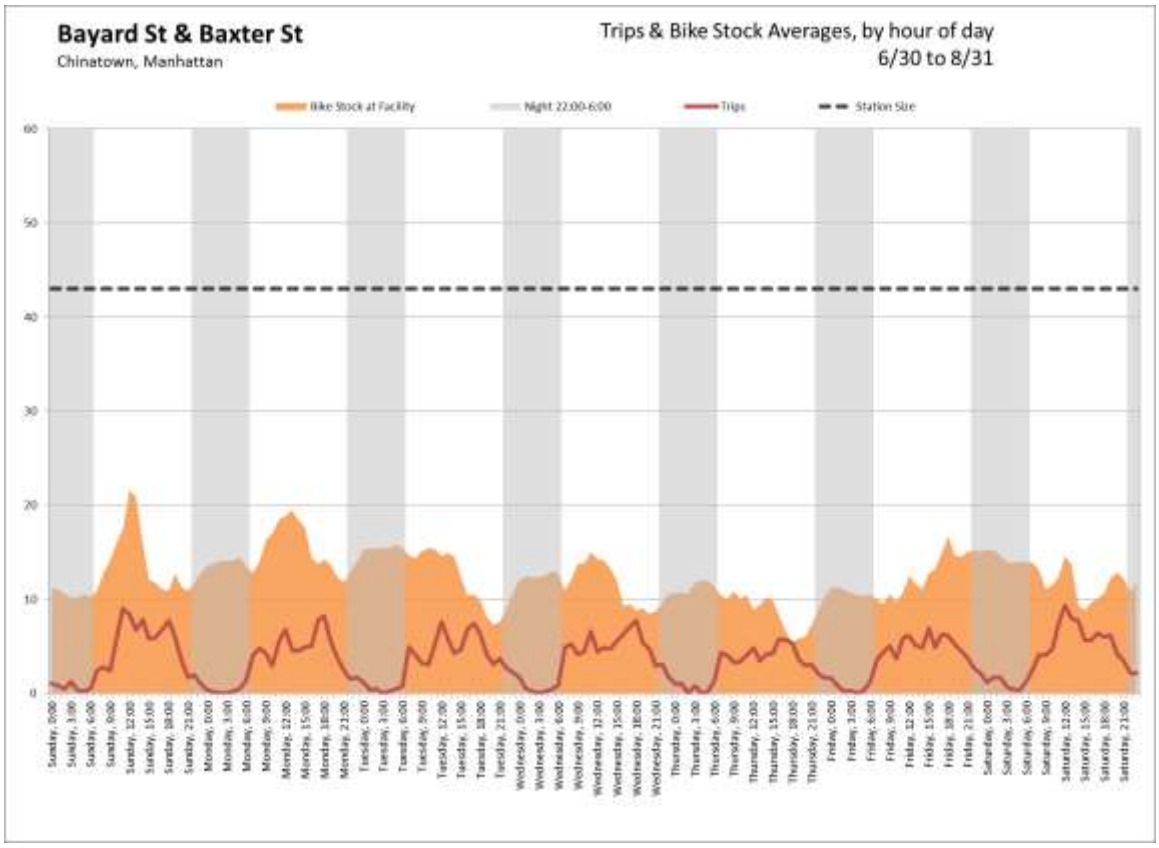
The authors examined bike share usage by hour of day and day of week to see if there are any significant and stable patterns of behavior in the data. The following charts provide us with a sense of the variation by time of day for each of the bike share sites examined and also for the Citibike bike share system as a whole. Presented below is a representative weekly chart for each bike share site by hour of day. We provide both the station size and the stock of bikes to evaluate the balance of trade in bikes between stations. We also analyzed the trip activity that occurs at each station. Based on this data we are able to estimate the total activity by hour of day for stations in the system.

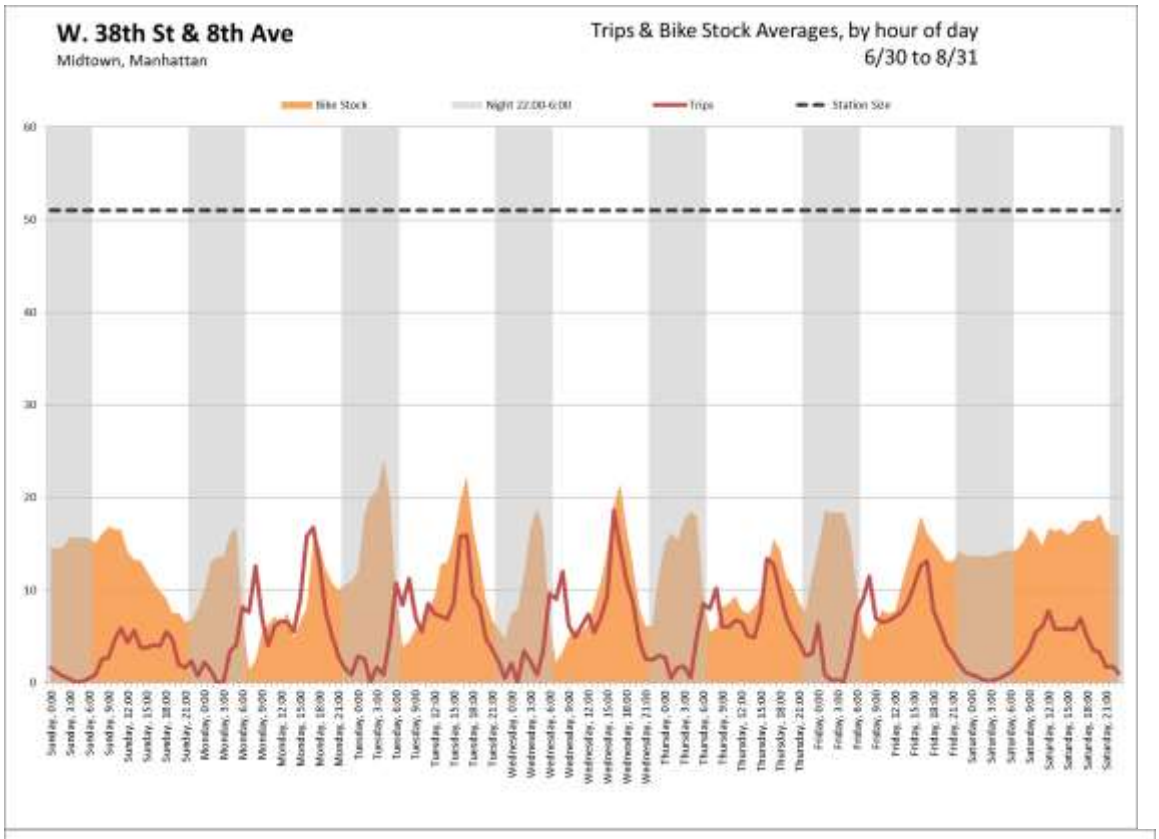
The bike share data exhibits a strong seasonality pattern with pronounced peaks in demand for bike occurring in the morning and afternoon rush hours on the weekdays and a single peak period of usage during the weekend days. The authors tested the stability of the pattern and we found that the data had a time trend, with increasing usage over time during the study period – adding roughly ½ a trip for each additional hour since the inception of the program. In addition, the seasonality pattern on an hourly basis by week was generally stable. Overall, modeling the data found roughly 82% of the variation in the bike share data could be explained by a trend over time and the hourly seasonality.

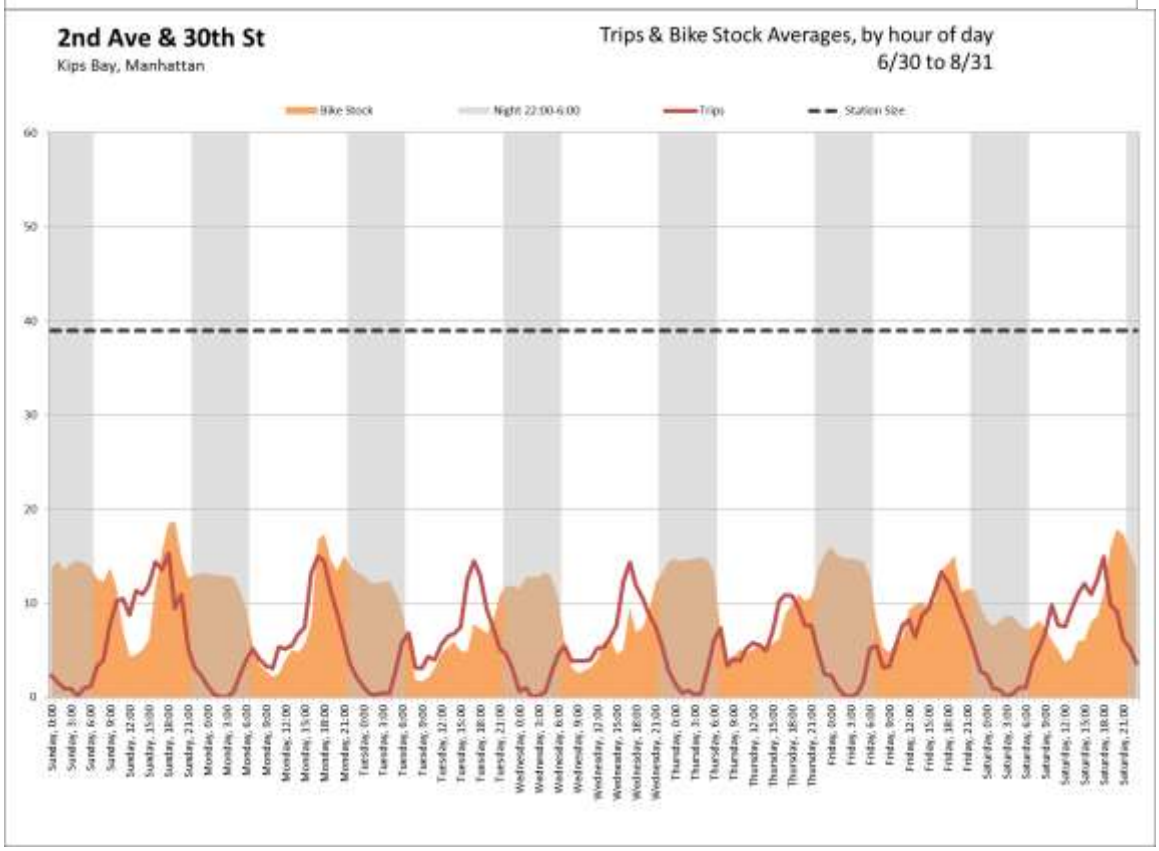
The strong hourly seasonality showed peak usage of bike share during the daytime hours and during key shopping hours.

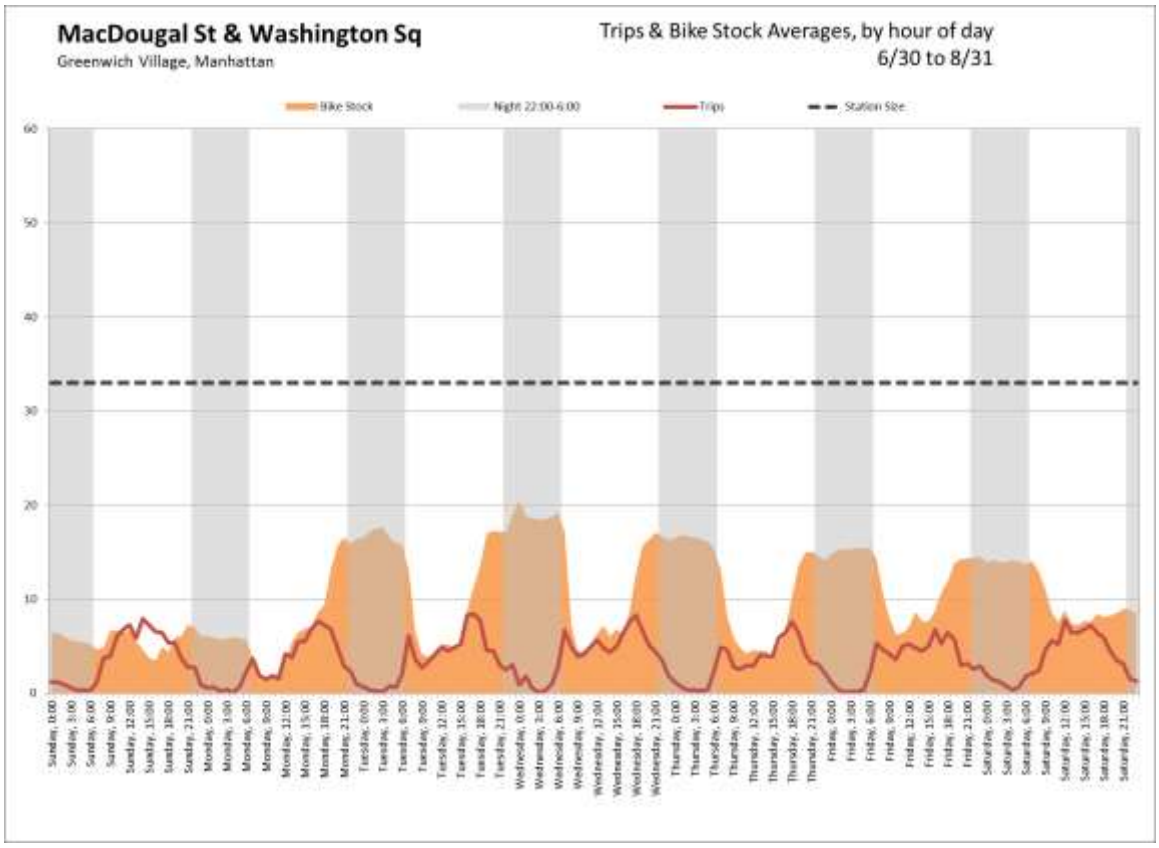

Entire System
Trips & Bike Stock Averages, by hour of day
6/30 to 8/31
Bike Stock
Night 22:00-6:00
Trips
Station Size
5000
4000
3000
2000
1000
0

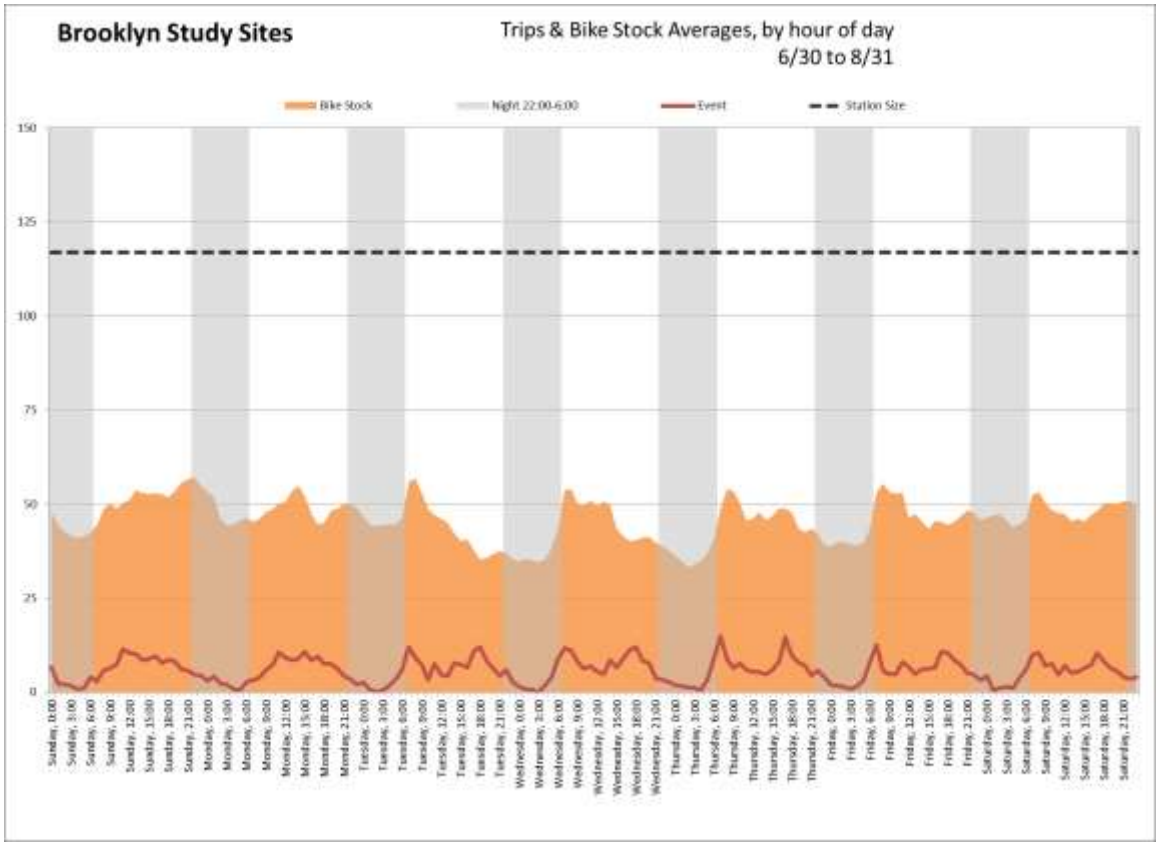

Manhattan Study Sites
Trips & Bike Stock Averages, by hour of day
6/30 to 8/31
Bike Stock
Night 22:00-6:00
Trips
Station Size
150
125
100
75
50
25
0

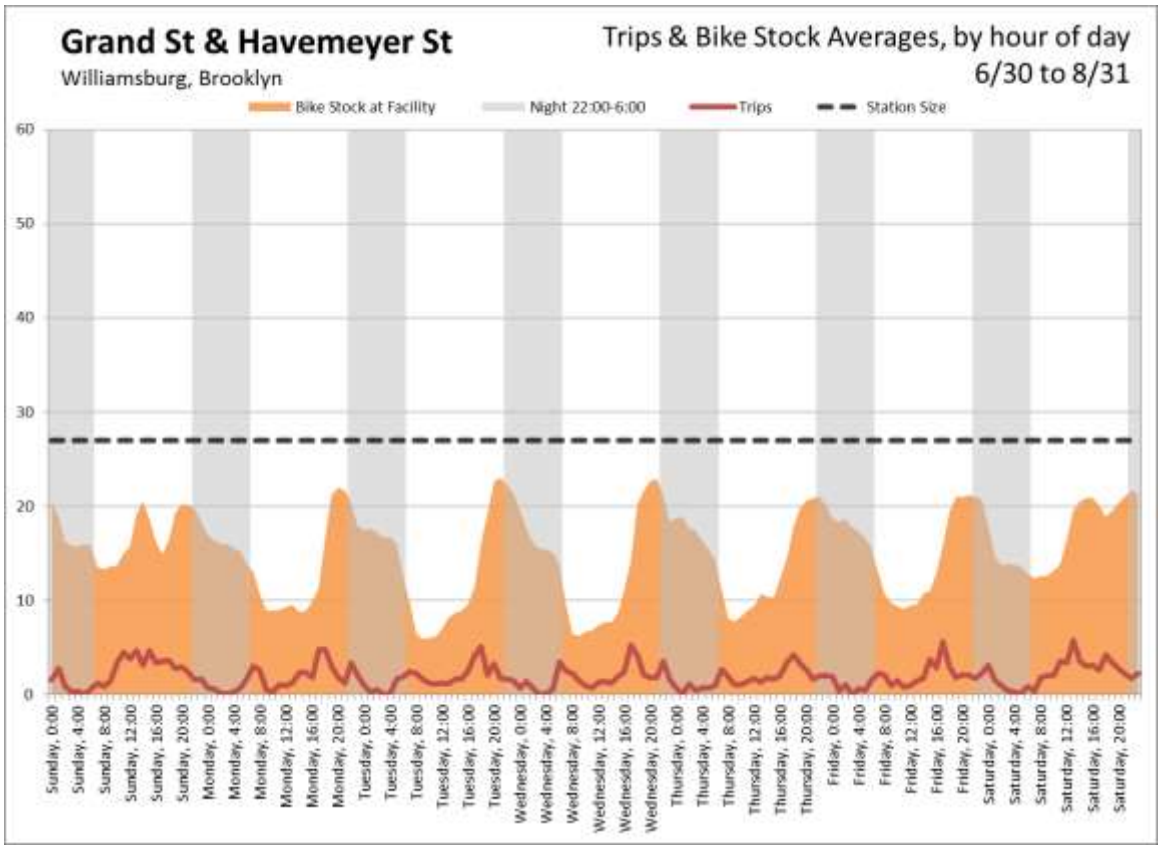

Bayard St & Baxter St
Chinatown, Manhattan
Trips & Bike Stock Averages, by hour of day
6/30 to 8/31
Bike Stock at Facility
Night 22:00-6:00
Trips
Station Size
60
50
40
30
20
10
0


W. 38th St & 8th Ave
Midtown, Manhattan
Trips & Bike Stock Averages, by hour of day
6/30 to 8/31
Bike Stock
Night 22:00-6:00
Trips
Station Size


2nd Ave & 30th St
Kips Bay, Manhattan
Trips & Bike Stock Averages, by hour of day
6/30 to 8/31
Bike Stock
Night 22:00-6:00
Trips
Station Size


MacDougal St & Washington Sq
Greenwich Village, Manhattan
Trips & Bike Stock Averages, by hour of day
6/30 to 8/31
Bike Stock
Night 22:00-6:00
Trips
Station Size
60
50
40
30
20
10
0


Brooklyn Study Sites
Trips & Bike Stock Averages, by hour of day
6/30 to 8/31
Bike Stock
Night 22:00-6:00
Event
Station Size
150
125
100
75
50
25
0


Grand St & Havemeyer St
Williamsburg, Brooklyn
Trips & Bike Stock Averages, by hour of day
6/30 to 8/31
Bike Stock at Facility
Night 22:00-6:00
Trips
Station Size
60
50
40
30
20
10
0
Sunday, 0:00
Sunday, 4:00
Sunday, 8:00
Sunday, 12:00
Sunday, 16:00
Sunday, 20:00
Monday, 0:00
Monday, 4:00
Monday, 8:00
Monday, 12:00
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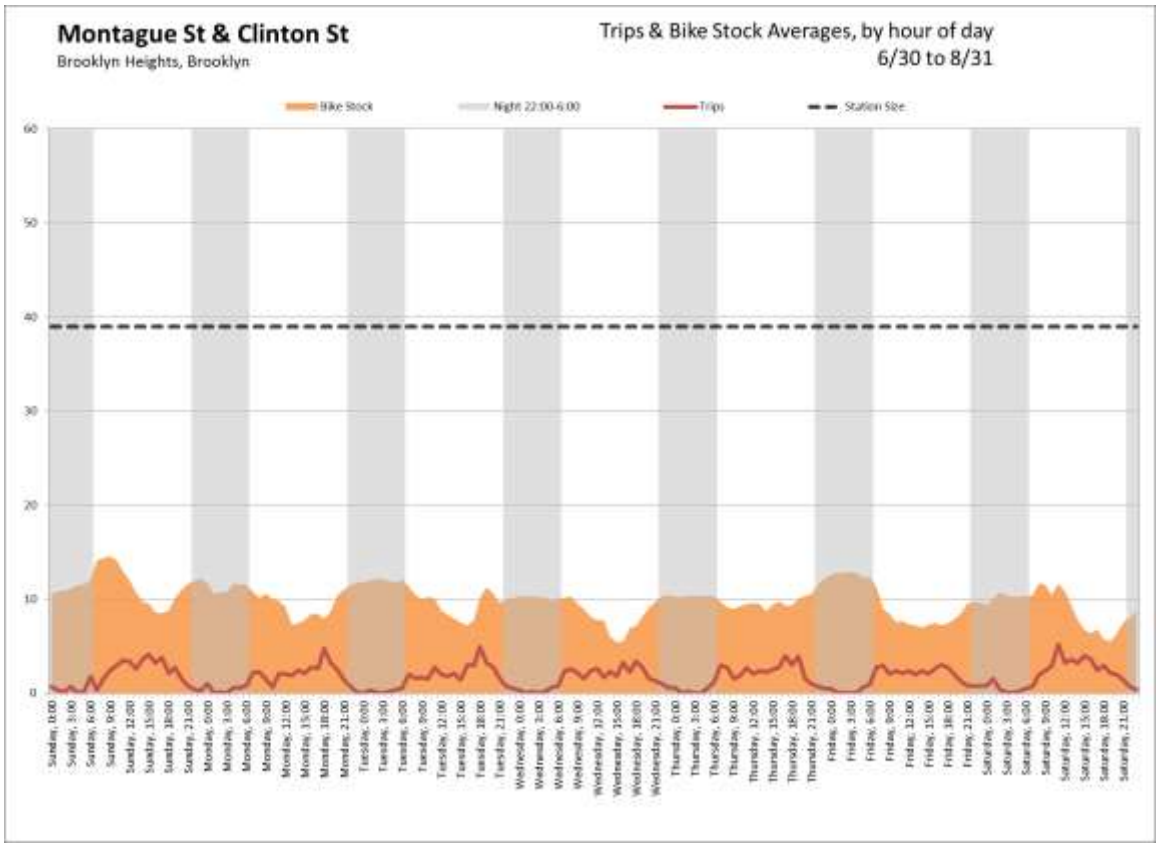
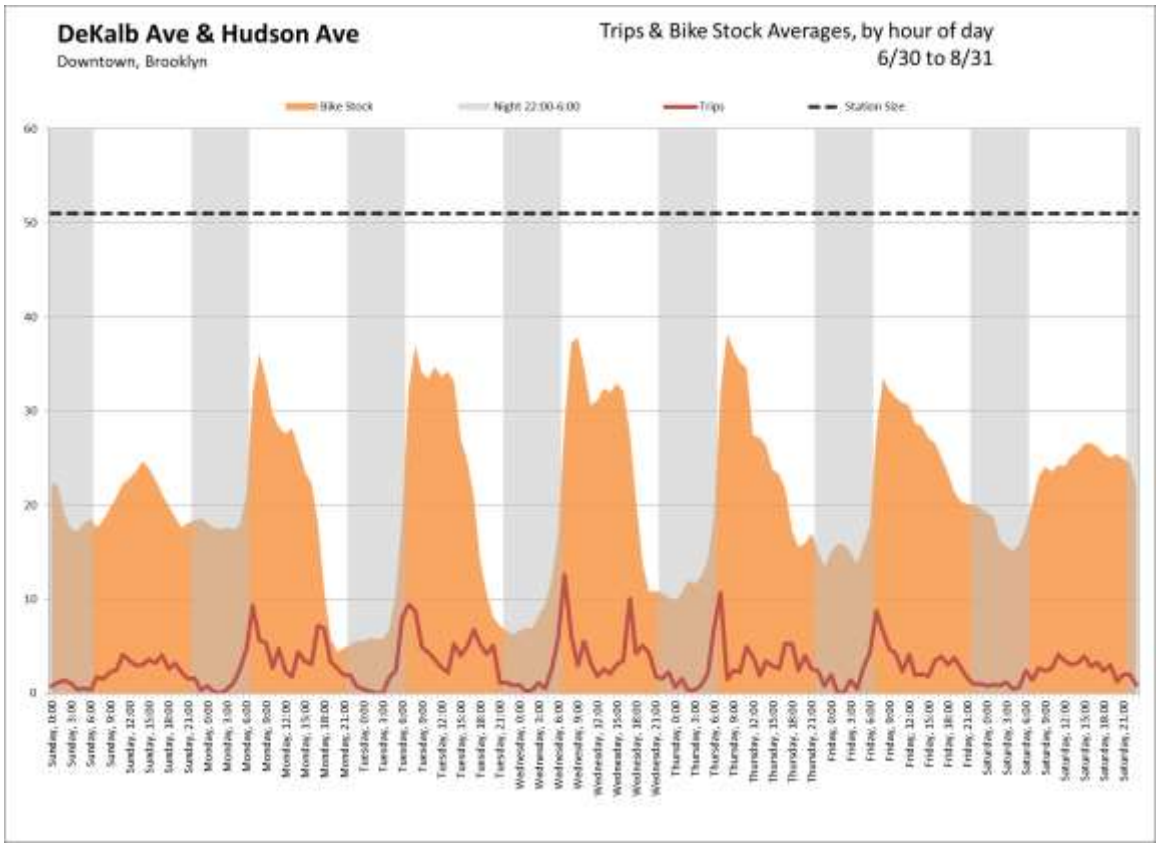
Saturday, 16:00
Saturday, 20:00


Montague St & Clinton St
Brooklyn Heights, Brooklyn
Trips & Bike Stock Averages, by hour of day
6/30 to 8/31
Bike Stock
Night 22:00-6:00
Trips
Station Size
60
50
40
30
20
10
0


DeKalb Ave & Hudson Ave
Downtown, Brooklyn
Trips & Bike Stock Averages, by hour of day
6/30 to 8/31
Bike Stock
Night 22:00-6:00
Trips
Station Size
60
50
40
30
20
10
0

APPENDICES

Appendix A – Survey Questionnaire

NYC Bike Share Project Survey | 2013

The City University of New York and Transportation Alternatives

Script:

Hello, my name is _____. I am from The City University of New York and am studying travel behavior in local communities in NYC. I am taking a survey today that will not track your name nor your identity; do you have a couple of minutes to answer a few questions?

NYC Bike Share Project Survey | 2013

The City University of New York and Transportation Alternatives

Survey Questions

1. How did you get to this area? Bike Share/Walk/Car/Transit/Taxi/Other: Motorcycle/Private bike
2. Are you a bike share member? Yes / No
3. What type of membership you have? Annual/Weekly/Daily—Only ask if bike share users
4. How often do you use Bike share? _____
5. What is your home zip code? _____
6. What is the purpose of your trip today? *Circle all that apply.* Recreation? Tourism? Shopping? Work? Family? Other?_____ *If the answer is yes to shopping continue to questions below.*
7. Will you be eating in the area today? Yes / No
8. Will you be shopping today? Yes / No
9. How are you getting to your next destination? *Record mode*_____
10. What is your next destination? _____

If they are shopping: **"Because you are locally shopping today I would like to ask you a few questions about your shopping and traveling habits in the area."**

11. How many stores do you think you may visit today?
    A. 1-3 B. 3-5 C. 6-8 D.+9
12. How much do you plan to on spend shopping on your visit today?
    A. Under $50 B. $50-$100 C.$100-$200 D.+$200
13. How much do you plan to spend on food today in the area?
    A. Under $5 B. $5-$10 C.$10-$20 D.$20-$40 C.+$40
14. What kind of businesses will you visit? *Circle all that apply.*
    a. Medical services (doctor, nurse, chiropractor)
    b. Food services (grocery, liquor, convenience, restaurant, food truck, fast food, coffee, bars)
    c. Professional services(lawyer, financial services, accountant)
    d. Clothing (shoes, clothes, discount store, vintage)
    e. Other Retail (souvenirs, antique, hardware, house ware, gardening, collectibles, book store)
    f. Personal (hair, nail, tanning, tattoo)
    g. Other _____
15. How often do you shop/ visit this area per month?_____
16. How often did you shop/visit this area prior to bike share per month?_____
17. How far did you bike today? _____

Thank you for your participation, this concludes our survey for today. Would you like to be contacted in the future? The results will be available at the Transportation Alternative website in November.

Email: _____

THE CITY UNIVERSITY OF NEW YORK College of Staten Island

TRANSPORTATION ALTERNATIVES Your advocate for bicycling, walking and public transit

NYC Bike Share Project Survey | 2013

The City University of New York and Transportation Alternatives

Observer:_____

Location: _____

Date& Time:_____

Survey#: ___

Gender: M / F

Age: A. Under 18

B. 18-25

C. 25-35

D.35-45

E. 45-55

F. +55

Race: A. White

B. Black

C. Asian

D. Hispanic

E. Other

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