08 Appendices

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APPENDIX A: SUMMARY OF DATA SOURCES

Assessing the total number of bicyclists in New York and potential market demand for bicycling is particularly difficult as typical transportation counting methods such as registration are not available for bicycles. Further complicating matters, bicycles do not require specific facilities or land set-asides for parking, and are not counted in many transportation surveys. This report relies on the following data sources for its estimates about bicycle use in New York City.

US Census Journey to Work Data (2000):
The 2000 US Census supplies the majority of demand data used in this report. "Journey to Work" data is gathered as part of the Decennial Census sample characteristics or "long form" which surveys approximately 1 in every 6 households. It is conducted by the US Census Bureau. US Census data on bicycling is limited because data is collected on trips taken for commuting purposes only. Trips undertaken for errands, social visits, recreation or other activities are not recorded. In addition, the Census only allows respondents to indicate one mode of transportation. As a result, a commuter who bicycles to a subway station and then takes a subway to work, or commuters who bicycle to work only a few days a week are not counted. In New York, the issue of undercounting is particularly true for the "walk to work" category as most New Yorkers walk some distance each day to reach their subway or bus station but do not consider walking as their primary means of commuting.

Journey to Work data only looks at people in the workforce, ages 16 and older. As a result, this dataset automatically excludes children (under 15) who are too young to use bike-share programs. Journey to Work data does not have an upper age limit.

American Community Survey Journey to Work Data (2006):
The American Community Survey (ACS) is an annual population and characteristics survey conducted by the US Census Bureau. Approximately 3 million households nationwide are surveyed. As with the US Census, ACS data on bicycling trends can be misleading because data is only collected on trips made for commuting purposes and because respondents are only able to indicated one primary mode of commuting, thus eliminating multi-modal commuters. However, as it is an annual survey, the ACS provides data that is more current than the US Census.

NYCDOT Screenline/Commuter Cicycling Indicator Counts:
NYCDOT's Screenline counts are a 12- and 18-hour summer bicycle count conducted yearly at intersections along 50th Street in Manhattan and on major bridge crossings. Because it only counts bicycles entering and exiting Manhattan's central business district, and does not count non-Manhattan inter- or intra-borough travel, this study does not use the Screenline Count to estimate the total number of bicyclists in New York. Rather, due to its long duration—counts began in the 1980's and continue today—the Screenline Count provides valuable trend information about the growth of bicycling in New York.

NYCDOHMH Community Health Survey and Youth Risk Behavior Survey (2007):
The NYC Department of Health & Mental Hygiene's Community Health Survey (CHS) is an annual cross-sectional telephone survey that samples approximately 10,000 adults aged 18 and older from NYC neighborhoods. Estimates are weighted to the NYC population per Census 2000 and are age-adjusted to the US 2000 Standard Population.

The New York City Youth Risk Behavior Survey (2007) is a joint effort of the NYC Departments of Health and Mental Hygiene (DOHMH) and Education (DOE). The survey looks at New York City public high school students. The data used in this report was requested from DOHMH Bureau of Epidemiology Services in August 2008. Estimates are weighted to the NYC public high school population.

NYMTC Bicycle Data Collection Program Counts:

The New York Metropolitan Transportation Council (NYMTC) has conducted a bicycle ridership count over three phases, fall 2002 and spring/summer 2003, spring /summer 2004, and spring/summer 2005. The counts were conducted throughout the five boroughs of NYC and the five suburban counties in the NYMTC region. Counts were conducted at both on street locations and off street multi-use lanes. The data is meant to represent a "typical day when the weather was conducive to bicycling and pedestrian activity" The counts were conducted at 226 New York City locations over the course of the three phases. The NYMTC counts are useful in that they include areas outside of Manhattan. However, it is unclear how the counting locations were selected. In addition, not every location was observed every year of the counts, making it difficult to get a true comparison across the different locations. The results do indicate that there is significant bicycle use in geographically different areas of the city, something the other bicycle use counts do not address. The inclusion of on street locations without bike lanes does indicate that bicycle use does not depend on bicycle infrastructure.

Department of City Planning (NYCDCP) Counts:

The Transportation Division of the New York City Department of City Planning has conducted bicycle ridership counts since 1999. Data related to the usage of the city's bicycle lanes and greenway paths are collected each year during the fall season. This data collection effort is intended to assist planners in addressing issues related to cycling in New York City and to support ongoing and future bicycle planning studies. Manhattan has been the only focus of the bicycle counts since 2001, due to limited resources. The NYCDCP counts are useful in that they include the same locations every year, and provide information on bicycle ridership in Manhattan beyond the CBD. However, the Manhattan focus limits their ability to account for bicycle ridership in different areas throughout the City.

Department of City Planning (NYCDCP) Bike and Ride Data (2008):

In 2008, the Department of City Planning Transportation Division began collecting data for a "Bicycle Access and Parking for Subway and Commuter Rail User" study designed to examine current multimodal bicycle-subway/commuter rail patterns and make recommendations to create secure bicycle parking at transit stations. As part of the study, a citywide survey of subway and commuter rail stations was conducted to assess existing bike to transit use and to make site-specific recommendations. Counts were taken on weekdays throughout the summer. Unlike other data collection efforts, this study specifically addressed cyclists using a bicycle for only a portion of their trip. While this study has not examined every transit station in the City, it does account for a large portion of them; in total 239 stations were surveyed. The study revealed very high numbers in areas not typically associated with bicycle ridership (as well as those that are associated with bicycle use).

Department of City Planning (NYCDCP) Bicycle Survey (2007):

The 2007 NYCDCP Bicycle User Survey was a voluntary, online bicyclist needs assessment conducted during New York Bike Month, in May 2006. The survey was made available on the Department of City Planning website and publicized by a variety of bicycle and transportation advocacy groups. Over the course of the month, 1,086 people completed the survey. As with other voluntary surveys, selection bias may be a prominent issue in the Bicycle Survey, as bicyclists or people with strong feelings about bicycling in New York were most likely to respond. In addition, low response rates from places like the Bronx may indicate that outreach was insufficient or that the online format made the survey unavailable to some populations. The data in this report is used to illustrate habits of current New York bicyclists, rather than as an indication of prospective rider populations.

APPENDIX B: COMMUTER DEMAND METHODOLOGY

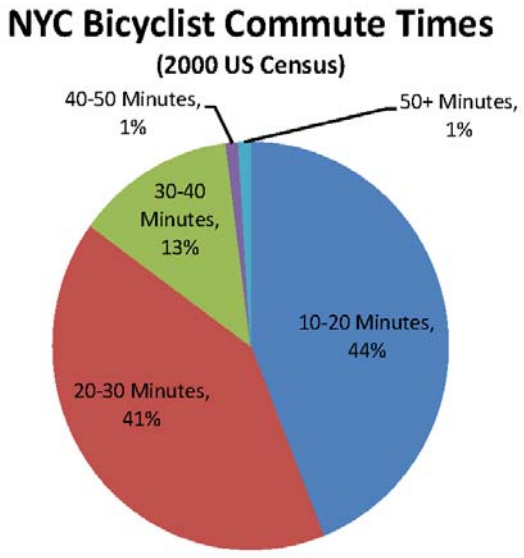
In Europe, commuters make up a substantial portion of the total bike-share users. In Paris, respondents to a JCDecaux survey indicated that 74% of bicycle trips were made for work purposes.[1] ClearChannel Adshel's data from Spain and Scandinavia shows that 60% of bike-share users used the bicycles as part of their commute.[2]

The data set for this analysis was built from 2000 US Census Journey to Work data analyzed at the Public Use Microdata Area (PUMA) level. PUMAs are geographic areas with more than 100,000 residents and less than 400,000 residents. In New York City, PUMAs roughly follow Community Board boundaries and were treated synonymously in this report.

In order to address the limitations of the Census data, explained below, this report provides a low-, mid-, and high-end estimate for the number of potential bicycle commuters. As elsewhere in this report, this is not a prediction of who would or will use a New York City bike-share program; rather it is an estimate of the number of people who live within a "reasonable bicycling distance" of their place of work.

For the purposes of this analysis, a "reasonable bicycling distance" for commuters is defined as less than 5 miles. This distance was determined based off 2000 US Census (Journey to Work) data which indicates that 85% of New York City's bicycle commuters bicycle to work in less than 30 minutes and that only 2% of current bicycle commuters ride for more than 40 minutes. The average bicycle commute time is 27 minutes. This study treats current ridership patterns as an indication of New Yorkers' "willingness to ride" and will assume that the average New Yorker who could commute by bicycle would be willing to ride for up to 30 minutes.

The connection between time and distance is made with the assumption that the average bicycle commuter will ride at a speed of approximately 10-15mph. Given this assumption, we assume that New Yorkers who would bike would be willing to bike between 5 and 7.5 miles for commuting purposes. This study focuses on the conservative 5 mile distance limit for further assumptions.



1 Velib' Website, "Press Release: Appendices Opinion Poll;"
2 Clear Channel Outdoor Website, "SmartBike™;" (http://www.smartbike.com/); Accessed 3/24/08

Low-End Estimate Assumptions:

The "Low End" estimate is comprised of:

- *New Yorkers in the workforce (age 16+) who currently walk to work*
- *New Yorkers in the workforce (age 16+) who currently bicycle to work*
- *New Yorkers in the workforce (age 16+) who currently use "other means" to get to work*

NYC commuters who currently walk to work:

- This study assumes that people who currently walk to work could use a bike-share program as they are traveling short, "bike-able" distances. The 2000 US Census shows that the average New Yorker who currently walks to work has a commute of 16 minutes. New Yorkers who live in PUMA 03802 (Morningside Heights) have the shortest walking commute: 11 minutes. New Yorkers who live in PUMA 03707 (University Heights/Morris Heights) have the longest walking commute: 21 minutes. At an average walking speed of 3mph, this means that the average walking commuter travels 0.8 miles to get to work; residents of PUMA 03707 travel just over 1 mile. These are distances that can easily be undertaken by bicycle. In addition, since walkers are typically the most sensitive to street conditions, this study assumes that environments that are "friendly" to walkers will be hospitable to bicyclists.

New Yorkers in the workforce (age 16+) who currently bicycle to work:

- This study assumes that people who already commute to work by bicycle would also use a bike-share program. While these commuters already own and use personal bicycles we assume that such commuters would augment their current bicycle use with public-use bicycles if such bicycles were spontaneously available since concerns like secure bicycle parking were would be alleviated. The number of New Yorkers in the workforce (age 16+), as counted by the 2000 Census, may be low. NYCDOT's "Screenline Counts" conducted annually since the early 1980's show a 3.43% annual increase in bicycling since then.

Mid- and High-End Assumptions:

This study assumes that people who currently live within a short, "reasonable bicycling distance" from their place of work could use a bike-share program if one were available. Using the US Census designation PUMA as the measurement tool, this study draws radius rings from the midpoint of each PUMA to ascertain the number of people who live in the PUMA and work in census tracts within a certain distance of that midpoint.

The "Mid End" estimate is comprised of:

- New Yorkers in the workforce (age 16+) who live within 2.5 miles (a "bikeable" distance) of their work. The radius ring is 2.5 miles. The maximum possible cycling distance is 5 miles, however, most commuters included in this count would have a much shorter commute.

The "High End" estimate is comprised of:

- New Yorkers in the workforce (age 16+) who live within 5 miles (a "bikeable" distance) of their work. The radius ring is 5 miles. The maximum possible cycling distance is 10 miles, however, most commuters included in this count would have a much shorter commute.

In all cases, census tracts that would require a bicyclist to cross rivers where bicycle-accessible bridges are unavailable were excluded. This exclusion pertained mostly to Staten Island and

western Brooklyn commuters and to northeastern Queens and southeastern Bronx commuters. In the case of the TriBorough Bridge and cyclists commuting between the Bronx, Manhattan and Queens, the distance from the midpoint of each relevant PUMA to the middle of Randall's Island was calculated and then a second ring (with a radius equal to 5 miles less the distance from the PUMA midpoint to the middle of Randall's Island for the "high" estimate or 2.5 miles less the distance from the PUMA midpoint to the middle of Randall's Island for the "middle" estimate) was drawn and other census tracts added or subtracted as necessary. A similar process was used for Cross-Bay Boulevard and Queens cyclists.

Members of the workforce who reported working from home in the 2000 US Census (Journey to Work data) are excluded from the total number of people who could use bike-share programs. It is possible that people working from home might subscribe to a bike-share program for reasons other than commuting, such as errands.

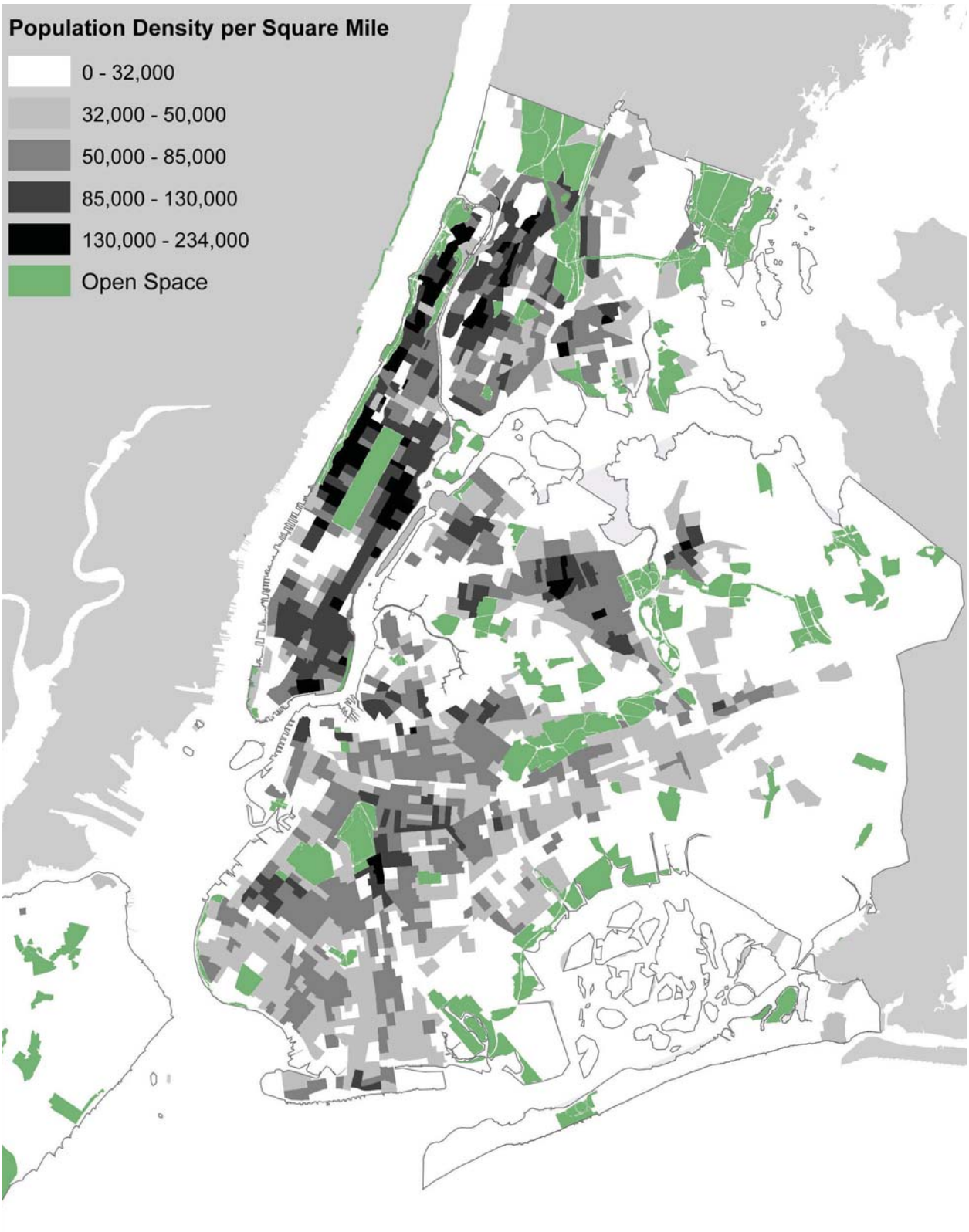
Excluded Populations:
The methodology outlined above excludes two commuter populations who could potentially use a New York City bike-share program. These populations are:

- Commuters who do not live in NYC but commute by train or bus to Grand Central Terminal, 34th Street-Pennsylvania Station, Port Authority Bus Terminal, Atlantic Avenue, Harlem-125th Street or other stations on the MetroNorth, PATH or Long Island Railroads, and work within cycling distance of those stations. Data from Europe predicts that these populations may be substantial. In Paris, people who live in the Parisian suburbs make up 33% of all Velib' users.[3]

    - MetroNorth: 132,300 people daily into Manhattan.[4]
    - LIRR: 100,000 people daily into Manhattan[5]
    - NJ Transit: ~70,000 people daily into Manhattan[6]
    - PATH: 48,000 people daily into Manhattan between 7-10am[7]
    - PA Bus Terminal: 200,000 people daily into Manhattan[8]

- Multi-Modal Commuters who live in NYC and currently take the bus or walk less than 5 miles to connect to a subway, bus or other form of transportation. Data from the Velib' program in Paris indicate that 61% of Velib' annual pass holders use their Velib' bicycles as part of their commute and transfer to other forms of public transportation.[9] DCP's 2006 bicycle survey also indicates a high population of multi-modal bicycle commuters. 29% of respondents said that they transferred from their bicycle to another means of transportation in the course of their commute.

3 Velib' Website, "Now We Know You Better;" (http://www.velib.paris.fr/les_newsletters/10_aujourd_hui_nous_vous_connaissons_mieux); Accessed 8/26/08
4 MTA Website, "About MetroNorth Railroad," (http://www.mta.info/mnr/html/aboutmnr.htm); Accessed 5/15/08
5 MTA Customer Service (5/23/08)
6 New York Metropolitan Transit Council (NYMTC), "2006 Hub-Bound Report," (http://www.nymtc.org/files/hub_bound/2006_Hub_Bound.pdf); Accessed 9/8/08. p.15
7 Ed Sasportis, PATH (email dated 6/5/08)
8 Young, Bill, Tunnels, Bridges & Terminals, Port Authority of New York/New Jersey; Phone Interview: 16 October, 2008
9 Velib' Website, "Now We Know You Better;" (http://www.velib.paris.fr/les_newsletters/10_aujourd_hui_nous_vous_connaissons_mieux); Accessed 8/26/08



New York City has a wide range of population densities, from 85,000/square mile average in Manhattan to 9,000 people/square mile average in Staten Island. Two-thirds of the city's population (5.2 million people) live on a little over one-third of the city's land mass, in neighborhoods with 32,000 people+/square mile. Data from the 2000 US Census.

APPENDIX C: PHASING METHODOLOGY

The selection of areas for inclusion in a New York City bike-share program was based on a variety of considerations including:

- Population Density and High Trip Volume
- Presence of Major Origin/Destination Points
- Significant Bike lane Coverage
- Significant Presence of Bicyclists
- Program Continuity/Contiguous Areas
- Citywide Representation
- Publicity Presence

The number of bike-stations required was determined using the 28 stations/square mile ratio developed in Lyon and Paris. The average bike-station size was determined on a borough level, based primarily on population density (assuming 110 bicycles/resident).[10] Manhattan, with an average of 85,000 people/square mile, will need the largest bike-stations, on average 28 bicycles/station. The number of bicycles/station is not the same as the size of the bike-station. In order to ensure that users can return bicycle easily, most programs assume around 40% more docks than bicycles.

Average Bike-Station Sizes by Borough

	Bronx	Brooklyn	Manhattan	Queens	CityWide
Population/Square Mile	42,000	39,000	85,000	23,000	31,000
Average Bicycles/Station	16	15	28	14	17
Average Station Size (40% Larger)	22	21	39	20	24

Where possible, key indicators, such as population or workforce densities, retail density, or the presence of colleges and universities or cultural attractions, were mapped. Maps were normalized over a 300m grid, which produces the desired 28 stations/square mile density.

Population Density and High Trip Volume:
High population density and high trip volumes are the strongest predictors of the success of a bike-share program. Bike-stations must be located in close proximity to one another in order to ensure program visibility and ease of use. Low density areas which would have many bike-stations for few people and few trips would place unduly high financial and operational stresses on the program. This report focuses on New York's medium and high density areas, defined as having 32,000 people/square mile or more. The average population density of these areas is around 53,000 people/square mile, which is identical to Paris.

Manhattan is the densest borough, with an average population density of 85,000 people/ square mile, excluding open space. It is a uniformly high density borough, which makes it ideal for a bike-share program. Brooklyn has uniformly medium densities between 32,000 and 85,000 people/ square mile. The Bronx and Queens have certain areas with high population densities, notably

10 Paris has approximately 100 bicycles/resident.

the Southwestern Bronx along the 4 and D train corridor and the Queens "Triangle," the area between Northern Blvd, Queens Blvd, and the Flushing Meadows Corona Park. However population density elsewhere in those boroughs drops off precipitously. Staten Island is the lowest density borough, with only 9,000 people/square mile. Only select portions of the St. George area have population densities that could support a bike-share program.

Presence of Major Origin/Destination Points:
Successful bike-share program include major origin (home and hotels) and destination (work, school, commercial centers, cultural or tourist attractions) points within their coverage areas. This allows users to make entire trips via bike-share as well as increasing opportunities for multi-modal commuting. Bike-share programs that only include destination points are of limited use to commuters, although they may be highly used during the day for short trips at lunch hour or by tourists. Bike-share programs that only include origin points would likely see heavy use at the rush hours by users hoping to connect to other modes but daytime use would be limited. In either scenario, bicycles would be underused during a significant portion of the day, limiting program effectiveness and revenues.

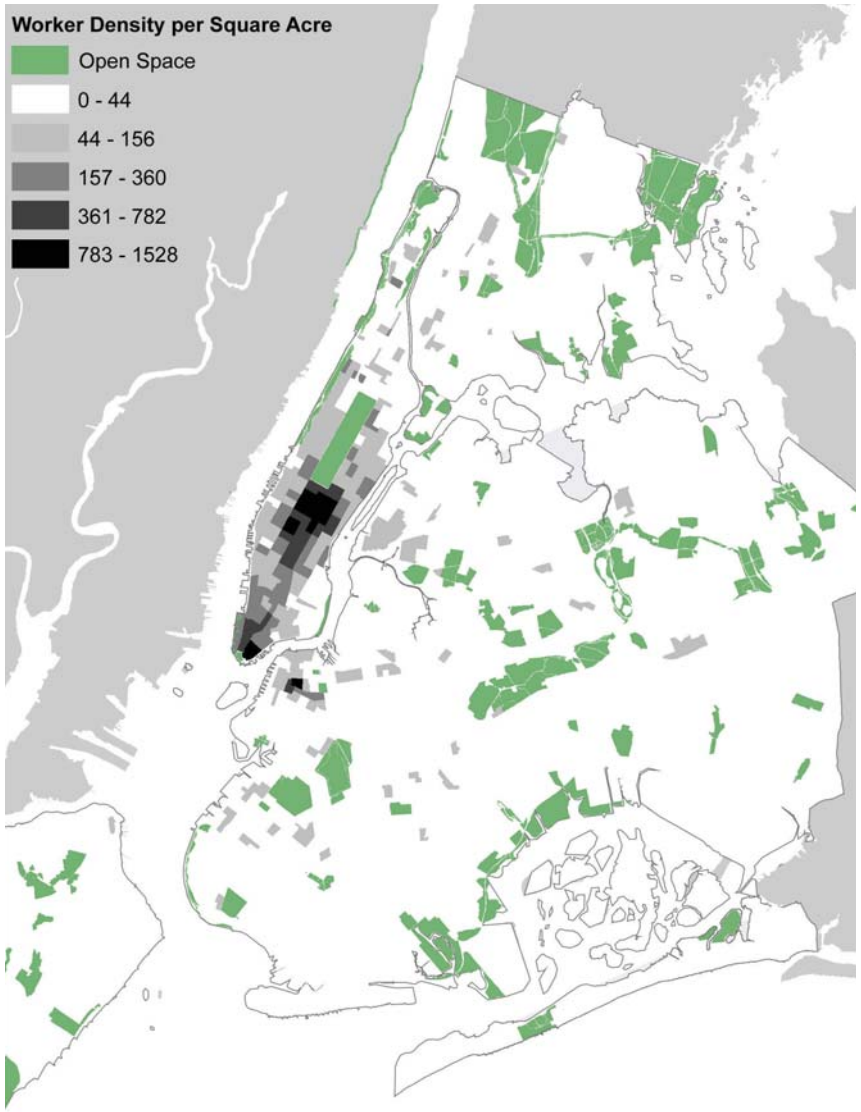
Destinations:
Midtown and Lower Manhattan have the highest workforce densities of anywhere in the city, making these areas prime destination points. In addition, most of the city's major commuter hubs—Grand Central Terminal, Port Authority Bus Terminal, 34th Street-Pennsylvania Station, World Financial Center and South Ferry—are located in Midtown and Lower Manhattan.

Cultural and recreational attractions (such as theaters, movie theaters, concert halls, museums, swimming pools, YMCA/YWCA facilities and libraries) are also important as such facilities are associated with a high volume of trips many of which could be completed by bicycle. While such destinations exist throughout the city, they are found in Midtown and Lower Manhattan at higher densities.

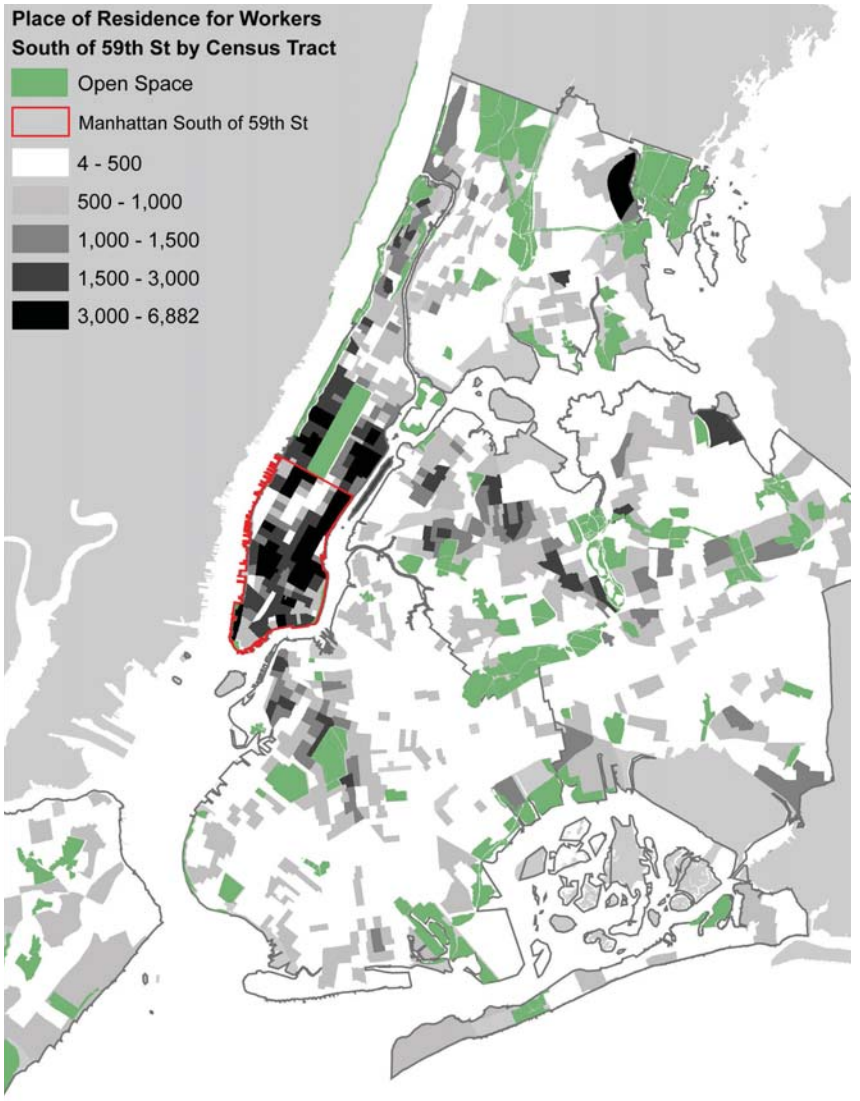
Areas with high retail coverage (measured here as total retail square footage) are also areas where high trip volumes are expected. In particular, Manhattan below 60th Street shows consistent retail coverage, as opposed to other parts of the city where retail coverage is limited to commercial corridors. Hotels and colleges/universities, also overwhelming located in Manhattan, are also high trip volume generators because tourists and students are two strong bike-share demographics.

Origins:
Isolating origin points is more complicated because New York is big and people live almost everywhere. For certain business areas, however, like Midtown, some patterns emerge. For example, a significant number of people who work below 59th Street live on the Upper East and Upper West Sides.

Significant Bike lane Coverage & Presence of Bicyclists:
Bike-share programs bring substantial numbers of new people into bicycling. While many have experience in urban riding, others do not. A high degree of existing bike lane coverage and the presence of other bicyclists are important to increase the safety of these new riders. In addition, the existence of connected networks of bike lanes, which would allow users to make their entire trip on marked routes, may be an incentive for otherwise hesitant new riders.



The highest worker densities are concentrated in Manhattan south of 60th Street. Data from the 2000 US Census.



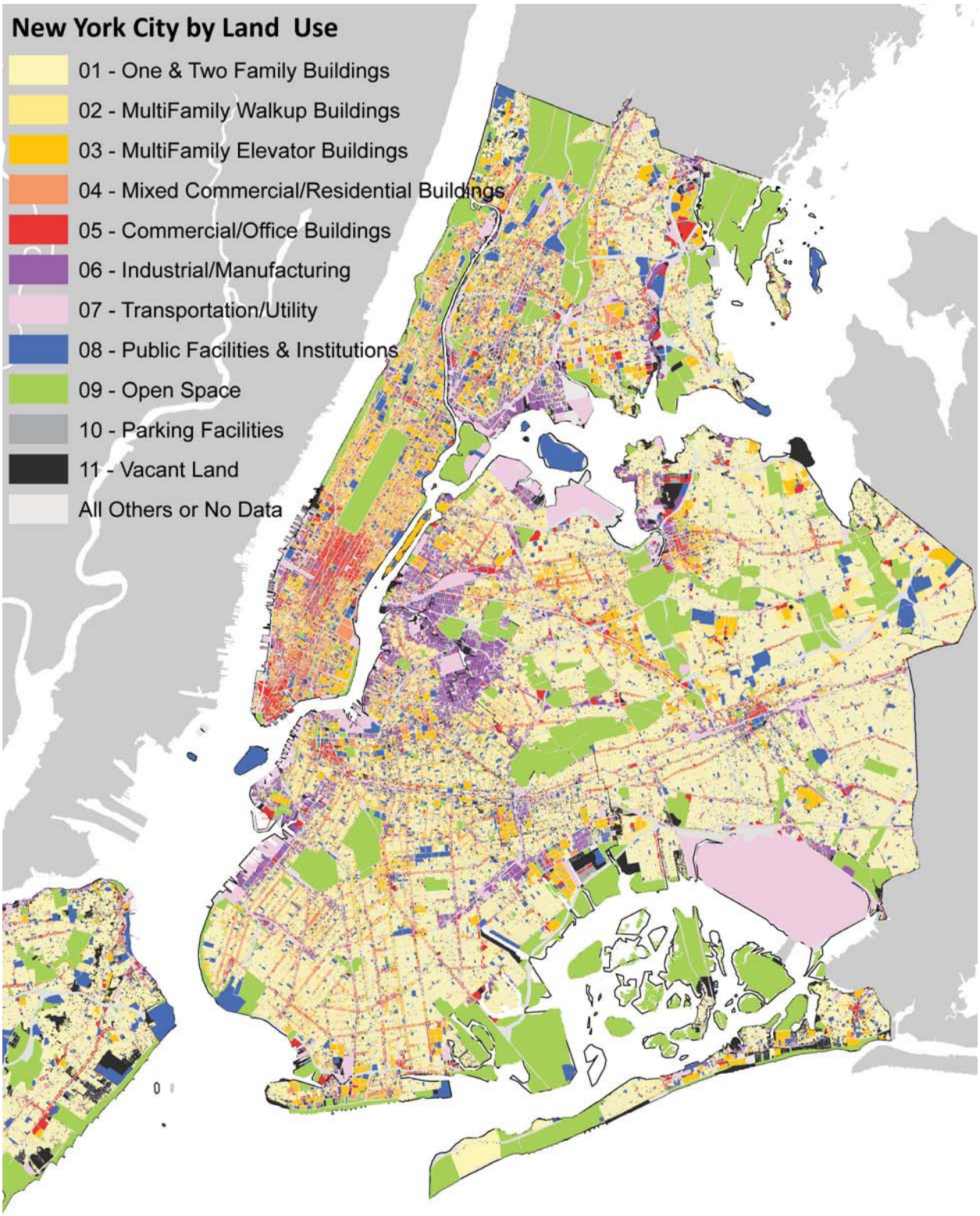
A significant number of these workers live in Manhattan.

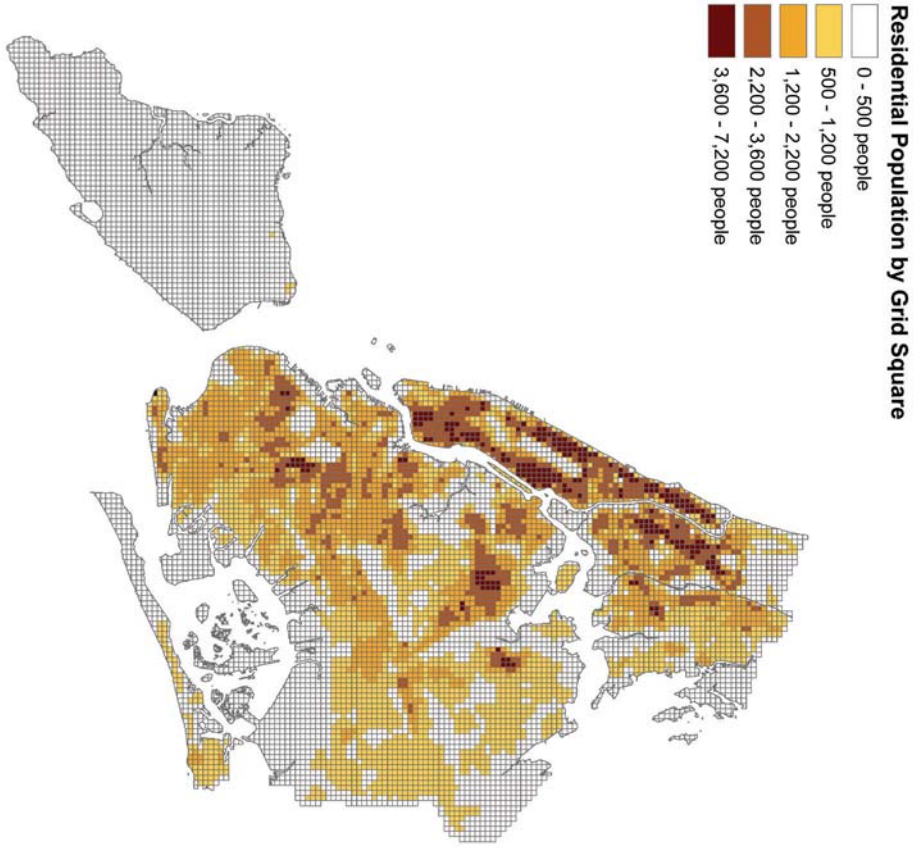
In New York the bike lanes are concentrated in Manhattan and Brooklyn, which are also the areas with the highest numbers of current bicycle riders. These areas are strong candidates for the initial phases of a bike-share program. Other areas of the city, notably in Queens, seem to have large populations of bicyclists and could also support bike-share programs.

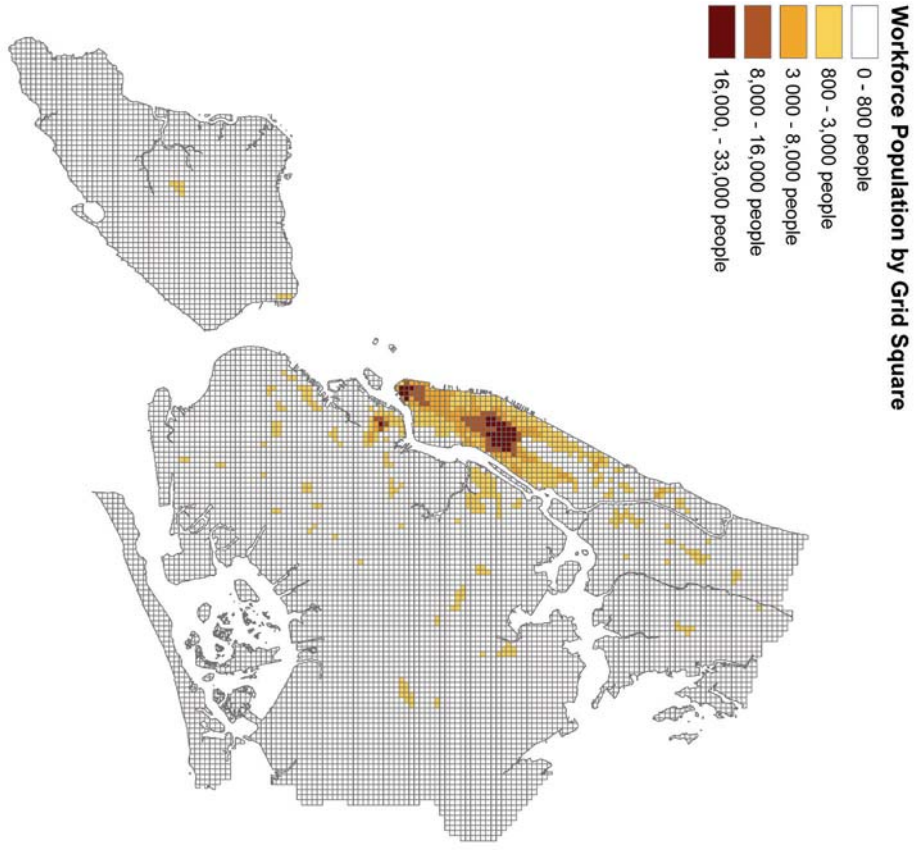
Program Continuity/Contiguous Areas & Citywide Representation:
Bike-share programs require coverage area continuity in order to function efficiently. Placing bike-stations in isolated target areas, for example in Flushing, Williamsburg and Midtown, dramatically decreases the number of potential users, as such a configuration only allows for specific types of trips. In addition, citywide representation is important in order to achieve transportation goals. For Staten Island, whose low population density and small number of bike lanes make bike-share programs less tenable, representation can be achieved by placing bike-stations at the Staten Island Ferry Terminal at South Ferry.

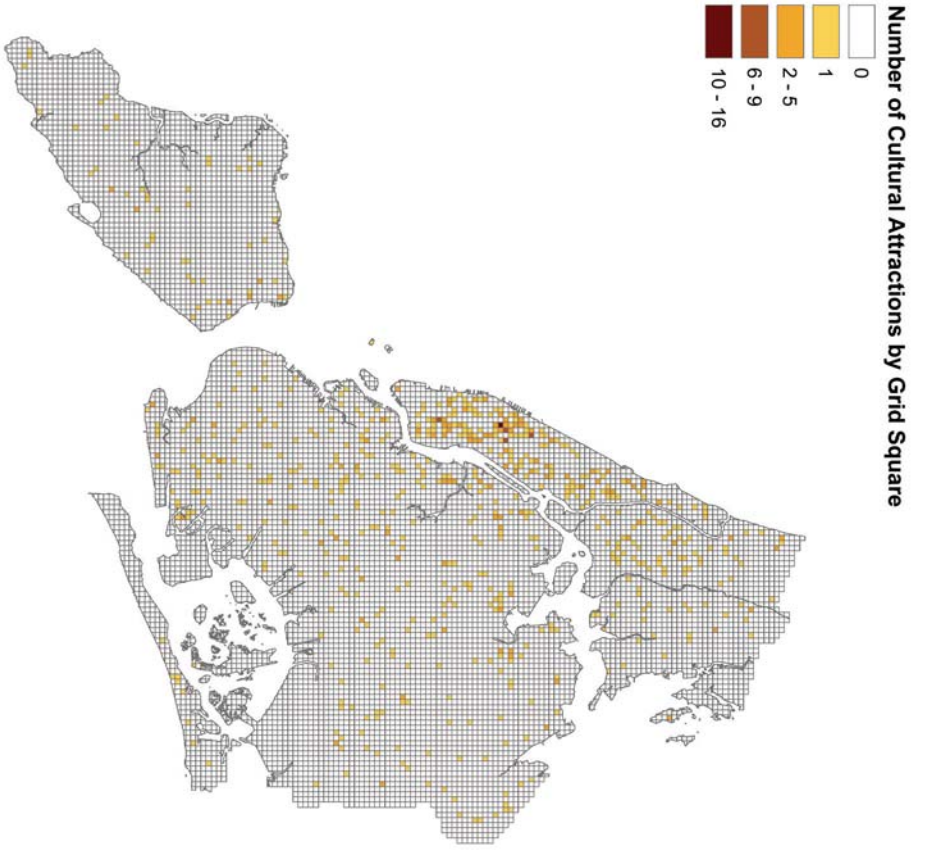
Publicity Presence:
Bike-share programs depend on strong publicity and a "presence" in the streets. These two factors build a "buzz" around the program that can draw in potential users and increase revenues from membership and use fees. While bike-share bicycles would be seen in all parts of New York, programs with high visibility in New York's major commercial, cultural and tourist areas—Midtown and Lower Manhattan, Downtown Brooklyn, etc.—will receive more attention and faster. These areas should be considered for the first phases of the program because they can help to build the momentum needed for program expansion.

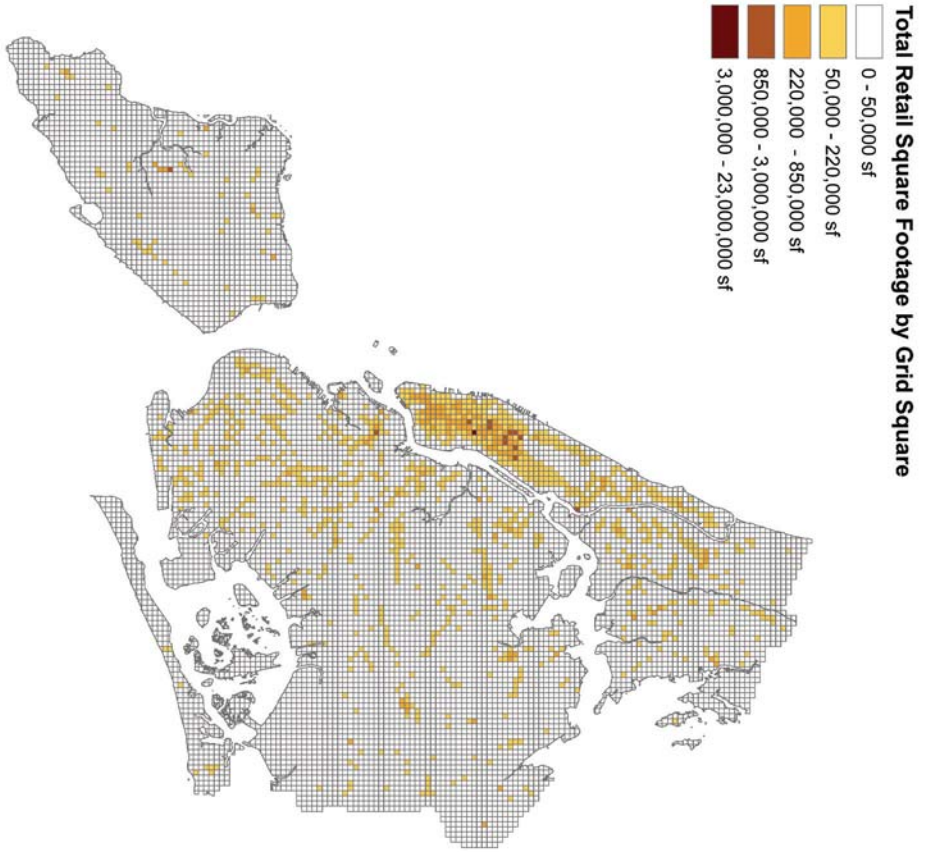
In addition, if a franchise model that relies on on-bicycle advertisements is used, then placing the initial phases of bicycles in areas that tend to generate higher revenues for advertising is desirable. Initial placement in such areas would increase the program's financial viability, but program coverage should not be isolated to these areas.

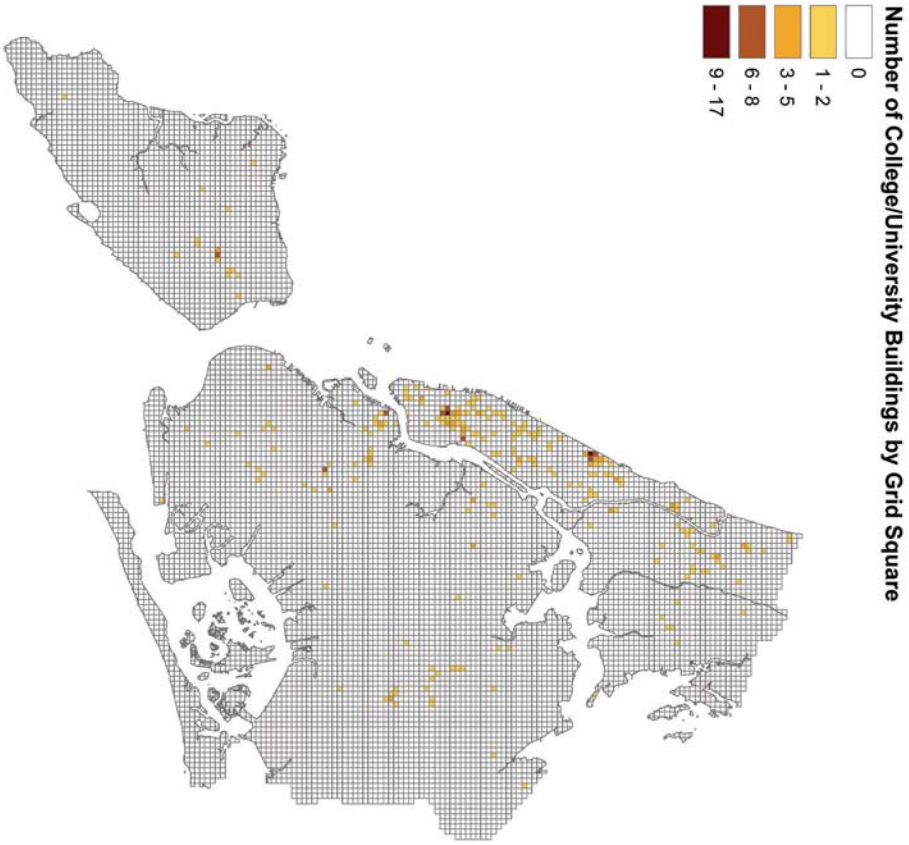

New York City by Land Use
01 - One & Two Family Buildings
02 - MultiFamily Walkup Buildings
03 - MultiFamily Elevator Buildings
04 - Mixed Commercial/Residential Buildings
05 - Commercial/Office Buildings
06 - Industrial/Manufacturing
07 - Transportation/Utility
08 - Public Facilities & Institutions
09 - Open Space
10 - Parking Facilities
11 - Vacant Land
All Others or No Data

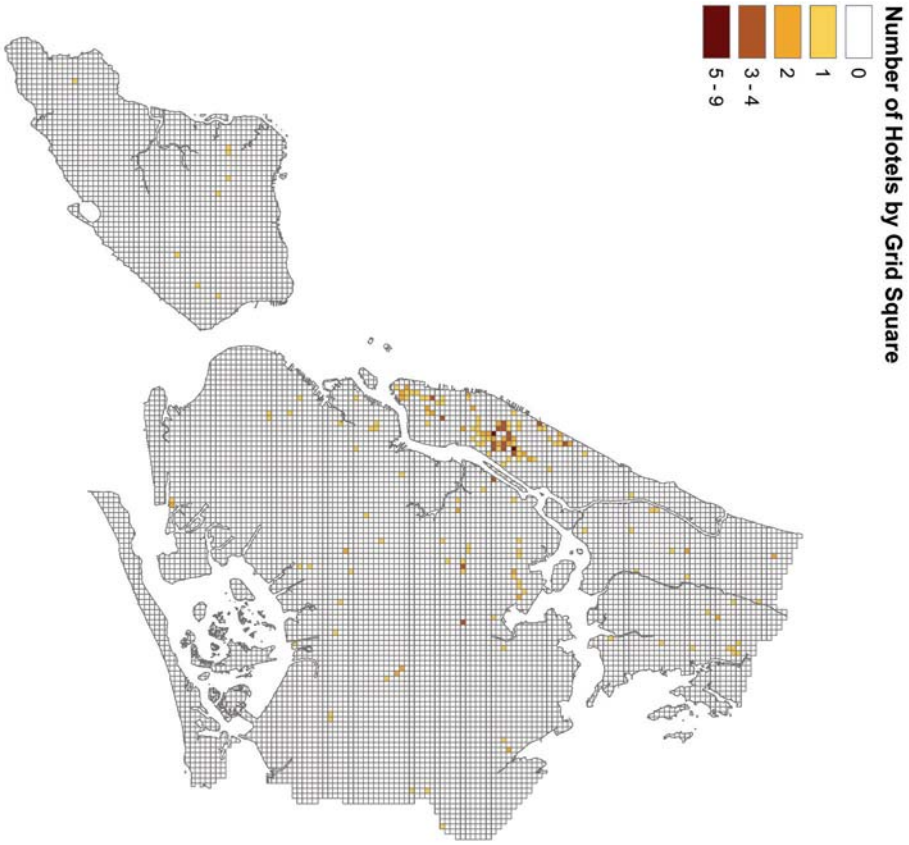

Residential Population by Grid Square
0 - 500 people
500 - 1,200 people
1,200 - 2,200 people
2,200 - 3,600 people
3,600 - 7,200 people


Workforce Population by Grid Square
0 - 800 people
800 - 3,000 people
3 000 - 8,000 people
8,000 - 16,000 people
16,000, - 33,000 people


Number of Cultural Attractions by Grid Square
0
1
2 - 5
6 - 9
10 - 16


Total Retail Square Footage by Grid Square
0 - 50,000 sf
50,000 - 220,000 sf
220,000 - 850,000 sf
850,000 - 3,000,000 sf
3,000,000 - 23,000,000 sf


Number of College/University Buildings by Grid Square
0
1 - 2
3 - 5
6 - 8
9 - 17


Number of Hotels by Grid Square
0
1
2
3 - 4
5 - 9

APPENDIX D: FINANCIAL ASSUMPTIONS

Bike-Share Program Costs:

Bike-Share Capital Costs

City	Montreal	New York	Washington DC	Lyon	Paris
Program	Bixi	2007 Estimate	SmartBike Expansion	Velov'	Velib'
Operator	Stationnement de Montréal	ClearChannel Adshel	ClearChannel Adshel	JCDecaux	JCDecaux
Number of Bicycles	2,400	500	500	1,000	20,600
Capital Cost	No Data	$1,800,000	$1,800,000	No Data	$90,000,000
Capital Cost/Bicycle	$3,000	$3,600	$3,600	$4,500*	$4,400

All data provided by the operators or providers unless otherwise noted.

* This figure is cited to European programs in general in Becker, Bernie, "Bicycle-Sharing Program to Be First of Kind in U.S.," The New York Times, 27 April, 2008

Bike-Share Operations Cost

City	Montreal	Lyon	Barcelona	Washington DC	Paris	New York
Program	Bixi	Velov'	Bicing	SmartBike Expansion	Velib'	2007 Estimate
Operator	Stationnement de Montréal	JCDecaux	ClearChannel Adshel	ClearChannel Adshel	JCDecaux	ClearChannel Adshel
Number of Bicycle	2,400	1,000	3,000	500	20,600	500
Operations Cost	No Data	$1,550,000	$4,500,000	$800,000	$35,000,000	$972,000
Operations Cost/ Bicycle	$1,200	$1,500*	$1,500**	$1,600	$1,700	$1,944

All data provided by the operators/providers or the city unless otherwise noted.

* Buhrmann, Sebastian, Rupprecht Consult Forschung & Beratung GmbH, "New Seamless Mobility Services: Public Bicycles;" Niches Consortium

** Nadal, Luc, "Bike Sharing Sweeps Paris Off Its Feet," Sustainable Transport, Institute for Transportation and Development Policy, Fall 2007, Number 19

Bike-Share Scenario Demand Assumptions:

Phase and Scenario Demand Assumptions

TOTAL SUBSCRIBERS	Assumptions	Projected Uptake	Phase 1	NA (Scenario 2)	Phase 2	Phase 3
Residents in Catchment Area	Variable	6%	947,070	1,434,710	3,627,590	5,255,188
NYC Workers in Catchment Area	Variable	3%	1,067,000	1,023,000	829,000	516,000
Out-of-City Workers in Catchment Area	552,000	3%	552,000	552,000	552,000	552,000
Leisure Tourists staying less than 4 days	85% of Leisure Tourists	9%	29,197,500	29,197,500	29,197,500	29,197,500
Leisure Tourists staying more than 4 days	15% of Leisure Tourists	6%	5,152,500	5,152,500	5,152,500	5,152,500

TOTAL TRIPS	Assumptions	Projected Uptake	Phase 1	NA (Scenario 2)	Phase 2	Phase 3
Residents in Catchment Area	4x/week	6%	11,819,434	17,905,181	45,272,323	65,584,746
NYC Workers in Catchment Area	3/week	3%	4,993,560	4,787,640	3,879,720	2,414,880
Out-of-City Workers in Catchment Area	3/week	3%	2,583,360	2,583,360	2,583,360	2,583,360
Leisure Tourists staying less than 4 days	1x	9%	2,627,775	2,627,775	2,627,775	2,627,775
Leisure Tourists staying more than 4 days	4x	6%	1,236,600	1,236,600	1,236,600	1,236,600
Projected Total Trips			23,260,729	29,140,556	55,599,778	74,447,361

Membership/Use Fee Revenues for Scenario 2 (15,000 Bicycles):

Scenario 2 was not recommended as a phase due to the relatively small Net Operating Income which was deemed to be insufficient if operating costs were higher than expected.

NO PHASE/SCENARIO 2 (15,000 Bicycles)

Demand Assumptions	Total Possible	3%	6%	9%	Projected
Residents in Catchment Area	1,434,710	43,041	86,083	129,124	6%
NYC Workers in Catchment Area	1,023,000	30,690	61,380	92,070	3%
Out-of-City Workers in Catchment Area	552,000	16,560	33,120	49,680	3%
Leisure Tourists staying less than 4 days	29,197,500	875,925	1,751,850	2,627,775	9%
Leisure Tourists staying more than 4 days	5,152,500	154,575	309,150	463,725	6%
Trips/Year		17,199,515	34,399,031	51,598,546	29,140,556
Trips Longer Than 30 Min (5%)		859,976	1,719,952	2,579,927	1,457,028
Cost Assumptions	Rates	3%	6%	9%	Projected
Total Capital Costs	$3,600	$54,000,000	$54,000,000	$54,000,000	$54,000,000
Total Operations Costs	$1,600	$24,000,000	$28,800,000	$34,560,000	$28,800,000
Annual Membership & Use Fee Revenues	Rates	3%	6%	9%	Projected
Annual Pass (residents)	$60	$2,582,478	$5,164,956	$7,747,434	$5,164,956
Annual Pass (non-residents)	$60	$1,841,400	$3,682,800	$5,524,200	$1,841,400
Commuter Annual Pass	$60	$993,600	$1,987,200	$2,980,800	$993,600
Week Pass	$19	$2,936,925	$5,873,850	$8,810,775	$5,873,850
Day Pass	$5	$4,379,625	$8,759,250	$13,138,875	$13,138,875
Use Fees (1/2hr)	$2	$1,719,952	$3,439,903	$5,159,855	$2,914,056
Total Membership & Use Revenue					$29,926,737
Net Operating Revenue					$1,126,737

APPENDIX E: 3RD GENERATION BIKE-SHARE PROGRAMS WORLDWIDE

City	Country	Program Name	Operator	Website
Aix-en-Provence	France	V'Hello	JCDecaux	http://www.vhello.fr/
Barcelona	Spain	Bicing	Clear Channel Adshel	http://www.bicing.com/
Beijing	China	Beijing Bicycle Rental Company	Owner Operated	http://www.bjbr.cn/wd/wd.htm
Berlin and Others	Germany	Call-A-Bike	Deutsche Bahn	http://www.callabike-interaktiv.de
Brussels	Belgium	Cyclocity	JCDecaux	http://www.cyclocity.be/
Burgos	Spain	BiciBur	ITCL	http://www.bicibur.es
Drammen and Others	Norway	Bysykkel	Clear Channel Adshel	http://www.adshel.no/index2.html
Dublin and Others	Ireland	Hourbike	Hourbike	http://www.hourbike.com/hourbike/home.do
Gigón	Spain	Cyclocity	JCDecaux	http://www.gijon.es/Contenido.aspx?id=19315&leng=en&zona=0
Central London	England	TBA	TBA	TBA
Greater London	England	OYbike	OYBike Systems	http://www.oybike.com/
Hangzhou	China	Hangzhou Public Bicycle System	unknown	http://www.hzzxc.com.cn/
Kaohsiung City	Taiwan	C-Bike	unknown	http://www.c-bike.com.tw/eng/map.html
Lyon	France	Vélo'v	JCDecaux	http://www.velov.grandlyon.com/
Marseille	France	Le Vélo	JCDecaux	http://www.levelo-mpm.fr/
Montreal	Canada	Bixi	Montreal Parking Authority	http://bixi.ca/index.php?page_id=1&lang=en
Pamplona	Spain	nbici	CEMUSA	http://www.c-cycles.com/
Paris	France	Vélib'	JCDecaux	http://www.velib.paris.fr/
Parma and Others	Italy	Bicincittà	Communicare	http://bicincitta.com
Rennes	France	Vélo à la Carte	Clear Channel Adshel	http://veloalacarte.free.fr/index2.html
Rome	Italy	Roma'n'Bike	CEMUSA/Bicincittà	http://www.roma-n-bike.it/
Salzburg	Austria	Citybike	Gewista Urban Media	http://www.citybikesalzburg.at/
Sevilla	Spain	sevici	JCDecaux	http://www.sevici.es/
Stockholm	Sweden	City Bikes	Clear Channel Adshel	http://www.stockholmcitybikes.se/en/Home/
Taipei	Taiwan	YouBike	unknown	http://www.youbike.com.tw/upage/
Toulouse	France	Vélô	JCDecaux	http://www.velo.toulouse.fr/
Various	The Netherlands	OV-Fiets		http://www.ov-fiets.nl/
Viennna	Austria	Citybike	Gewista Urban Media	http://www.citybikewien.at/
Washington D.C.	USA	Smark Bike DC	Clear Channel Adshel	https://www.smartbikedc.com/default.asp

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Cover Image: Joseph Simpson / Movement Design Bureau (http://movementbureau.blogs.com)

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Transportation Division
Spring 2009