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Image: Muddy LaBou (www.flickr.com)

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Image: Muddy LaBou (www.flickr.com)

BIKE-STATION PLACEMENT AND SIZE

The placement of bike-stations reflects a tension between program visibility and aesthetic clarity of the streetscape and traffic and pedestrian traffic flow. In order for the program to be successful, bike-stations must be easy to find and located in places that users want to go. At the same time, narrow or highly trafficked sidewalks may mean that there is limited room for bike-stations. In New York, the dense array of infrastructure beneath the city's streets can also complicate bike-station installation.

Paris's bike-station placement was guided by a series of rules developed by *Atelier Parisien d'Urbanisme* (APUR) in conjunction with the *Architectes de Batiments de France* (French Architectural Association) and the *Sections Territoriales de Voirie* (Transportation Department); in New York bike-station placement would be decided primarily by NYCDOT. Paris' general implementation rules include: placement of bike-stations near Metro stations and adherence to the average bike-station density guidelines tested in the Lyon bike-share of an about of 28 stations/square mile. This density, also referenced as one bike-station every 300 meters or one bike-station every 4-5 blocks, is the density needed to ensure that users can find a bicycle when they need one and return it easily when they are done.¹

Bike-station sizes in New York would vary depending on the expected volume of traffic and proximity to other bike-stations. Important factors include: population density, worker density, proximity to cultural or recreational attractions such as museums, theatres, and concert halls, and proximity to retail shopping opportunities. Importantly, bike-share programs need have more docking stations than bicycles (typically 40-50% more) to ensure that users can always find a place to leave their bicycle. Assuming 1 bicycle/110 residents, the average New York City bike-station would hold 24 bicycles, although bike-station sizes would differ by borough. Alternatively, smaller bike-stations, placed at a higher frequency (i.e. more stations/square mile) could also be pursued. In general, 10 bicycles, parked at a bike-station, can fit into one car parking space.

Proposed general guidelines for the placement of New York bike-stations are as follows. Bike-stations should be placed:

- On wide sidewalks or in the roadbed. Bike-stations should not impede pedestrian or vehicular traffic.
- With enough frequency to ensure program visibility and use (approx. 28-30 stations/square mile)
- Along existing or proposed bike lanes whenever possible
- Near subway stations, major bus stops, the Staten Island Ferry Terminal and other ferry landings
- Near major cultural and tourist attractions
- Adjacent to major public spaces and parks

Sidewalk Bike-stations:

Bike-stations placed on the sidewalk should be placed in line with other forms of street furniture and trees. Where possible, curb bulb-outs should be used to limit the intrusion of the bike-stations into pedestrian pathways. Wide sidewalks (Lenox Ave. for example), and wide roadway me-

¹ Atelier Parisien d'Urbanisme (APUR), "Etude de Localisation des Stations de Velos en Libre Service," December 2006; p.48

dians in particular, provide options for smaller bike-stations. Bike-stations could also be placed along the frontage of open air municipal parking lots and city property, and on private property (for example on university campuses) in partnership with landowners. As with Paris, underutilized space under viaducts and elevated railroads and highways (for example under the FDR in the Financial District, under the MetroNorth tracks at 125th Street, or under the Park Ave. Viaduct at Grand Central) could be used for larger bike-stations.



As in Paris, sidewalk bike-stations in New York City should be placed inline with other streetscape elements. Image (L): Luc Nadal (www.flickr.com)

Roadbed Bike-stations:

Roadbed bike-stations should be placed primarily just off major avenues to provide additional protection for riders and the bicycles themselves. In some places, advertising panels on the bike-stations could serve a double purpose, protecting on street bike-stations from damage from cars while simultaneously drawing attention to the bike-share program. On street bike-stations in particular should be placed near to bike lanes. On street bike-stations could potentially be placed in parking spaces adjacent to fire hydrants and serve a dual purpose of deterring parking in front of the hydrant.

Roadbed bike-stations are beneficial because they do not impact pedestrian or vehicular traffic flows, and do not require costly modifications to existing storm drains and sewers. Roadbed



In Paris, on-street bike-stations are buffered by parked cars. Parked cars could serve a similar role in New York.

bike-stations would take the place of parking spaces, although the reduction in parking would be minimal as it would be spread over a large area.

Bike-stations in Existing Public Spaces:

Bike-stations should be placed directly adjacent to major public spaces, such as Grand Army Plaza, Bryant Park or Columbus Circle. To ensure 24 hour access, bike-stations should not be placed inside the city's major recreational parks (e.g. Central Park, Prospect Park, Van Cortland Park, Flushing Meadow Park) but rather along the periphery where late night foot traffic is higher. Bike-stations should be a priority in or alongside parks and plazas near transit (e.g. Union Square, Herald Square or Foley Square). Smaller "plaza" parks (e.g. the plaza at the intersection of Madison and St. James in Manhattan, or Winfield Plaza in Woodside, Queens) may benefit from increased use stemming from bike-stations along their edges.



Spaces under viaducts are reclaimed by Velib' bike-stations (L). In New York, space is available under infrastructure like the FDR or the MetroNorth tracks pictured above (RT). Image (L): Image: TCY (<http://commons.wikimedia.org/>)



The peripheries of parks also offer options for bike-station placement. In New York, underutilized urban plazas could benefit from the traffic and activity that a bike-station could bring. Image (L): Image: austinevan (www.flickr.com)

BIKE-STATION DESIGN AND INSTALLATION

Effective bike-station design must consider a wide variety of issues including the physical space used by the bike-station and interactions with pedestrians, drivers and other bicyclists, docking mechanisms and installation and power sources.

Overall Design:

Bike-station designs that use individual docking stations are preferable in New York City where sidewalk space is scarce and pedestrian mobility is of the utmost importance. JCDecaux and the Montreal Parking Authority both use this mode, locking their bicycles to discrete docking stations connected, in JCDecaux's case, by underground wiring, and in Montreal's case, by a metal plate affixed to the street. The small low scale of JCDecaux's or the Montreal Parking Authority's docking stations makes them unobtrusive and discreet; important benefits in a busy, crowded city like New York. In contrast, the long docking bar, used in Barcelona and Washington DC, could be disruptive to pedestrian flow.

Locking Mechanism:

This report recommends an intuitive locking system that clearly tells users when the bicycle has been fully and properly locked. The locking mechanism should be fully incorporated into the bicycle design; it should be impossible to remove the lock without breaking the bicycle. Since bike-share bicycles are heavy, "roll in" systems may be superior to "lift in" systems, in terms of ease of use. However, the overall durability of the locking mechanism should be the deciding factor.

Installation and Power Sources:

Bike-stations that require excavation or rely on the city's power grid are infeasible in New York. Excavation and trenching to power sources would be costly and time consuming. In addition,



Bixi stations are lifted into place with a boom truck and are bolted to the ground. No excavation is required. Image: Yvonne Bambrick/ysuchislife (www.flickr.com)



Excavation and trenching is required for JCDecaux (above) and ClearChannel Adshel bike-share kiosks. Image: Ladybadtiming (www.flickr.com)

New York's subterranean infrastructure would significantly limit the placement of such bike-stations. The constant roadwork as utility companies and city agencies rip up the street to access and repair infrastructure below and even routine road resurfacing would also be an issue, possibly requiring periodic shutdowns and potentially costly relocations.

This report recommends pre-fabricated and/or modular bike-station designs that can be bolted into a variety of roadway surfaces (e.g. concrete or asphalt). Quick installation and de-installation times (minutes or hours as opposed to days) are necessary. Solar power, which is currently used to power the city's MuniMeters, is suggested.

PILOT PROGRAMS

This report finds that a small “pilot” bike-share program would be unsuccessful in New York. Evidence from bike-share programs around the world suggests that small programs do not provide meaningful transportation, health or economic development gains nor do they provide a significant basis from which the city could evaluate the effectiveness of the program. In a city as densely populated as New York, small pilots in particular pose problems because the program coverage area would be insufficient to warrant bicycle use.

SmartBike in Washington DC provides valuable lessons about the difficulties posed by small pilots. With 120 bicycles spread out over 10 bike-stations, the bike-stations are hard to find unless one knows where to look. Washington has not seen transportation benefits from the program. In contrast, Velib’ opened its doors with 10,000 bicycles and then six months later doubled the number of bicycles to cover the whole city, allowing the program to see immediate transportation gains (5% reduction in automobile traffic in the first year).² Six months after Velib’ opened it was credited with helping Paris weather the multi-day transit strike in the winter of 2007.³

Because SmartBike is too small to generate large revenues from membership or use fees, expansion options for the program are also limited. Velib’ opened with 13,000 annual subscribers, €377,000 in starting revenue.⁴ In contrast, SmartBike opened with 250 annual subscriptions for initial revenue of \$10,000.⁵ The small number of bicycles makes one day passes infeasible and has led program operators to consider limiting the number of annual passes. Thus tourists or potential riders who are unwilling to commit immediately to an annual pass cannot use SmartBike. In contrast, Paris sold 2.5 million one day passes in the first 6 months alone, dramatically changing how many tourists explore Paris and generating significant revenues. In New York, the city’s ability to develop a bike-share program is dependent on starting at the right scale. With much of the city’s street furniture already under contract, other funding mechanisms, such as membership and user fees, which depend on volume, will be needed to pick up the slack.

Changing perceptions about bicycles, driven to some extent by increasing energy costs and growing awareness of climate change issues, may also point cities in the direction of larger initial programs. As Kelly says of Washington DC’s SmartBike program:

“Knowing what we know now, of course, we would have launched it bigger. But when we were initially thinking about this we really weren’t sure how popular it would be. The rising cost of gas and the ever-increasing green attitude of everybody is now showing us that yes, the city will support a broader program.”⁶

2 Bremner, Charles & Marie Tourres, “A year on, the cycle experiment has hit some bumps,” *The London Times*, 8 July, 2008 & Dell, Kristina, “Bike-Sharing Gets Smart,” *Time Magazine*, 12 June 2008 (<http://www.time.com/time/magazine/article/0,9171,1813972,00.html>); Accessed 9/02/08

3 Mulholland, Tara, “Paris’s bicycle rental system gets a baptism by fire,” *International Herald Tribune*, (<http://www.ihf.com/articles/2007/11/22/europe/velib.php>); Accessed 08/13/08

4 Bennhold, Katrin. “A New French Revolution’s Creed: Let Them Ride Bikes,” *The New York Times*, 16 July 07.

5 Alice Kelly, Program Manager, District DOT; Phone interview: 14 August 2008

6 Aaron, Brad, “Streetfilms: DC Bike-Share Hits the Ground Rolling,” (<http://www.streetsblog.org/2008/08/22/streetfilms-dc-bike-share-hits-the-ground-rolling/>); Accessed 09/08/08

Small Pilot Examples

100 Bicycles
0.1 Square Miles



500 Bicycles
0.6 Square Miles



1,000 Bicycles
1.25 Square Miles



2,000 Bicycles
2.6 Square Miles



Small bike-share programs or pilots are insufficient for New York's size and density.

A large bike-share program may also be important to New York City for the publicity it could bring. However, with a number of other American cities, such as Minneapolis, Boston, and Philadelphia, looking to introduce bike-share programs, a small program is unlikely to generate significant attention.

PROGRAM SIZE AND EXTENT

Bike-share programs that are financially self-sufficient tend to be larger programs that can take advantage of volume-based funding mechanisms such as advertising or membership fees, and focused around densely populated or highly trafficked area where bicycles and bike-stations can be used by the maximum number of people. In many cases, this combination of attributes also creates programs which see significant transportation and health benefits. In contrast, small programs, and programs that are placed in low density/less trafficked areas, do not typically produce the revenues required to be financially self-sustaining. These programs provide few, if any, transportation or health benefits. Purely recreational programs, similar to bike rentals currently offered by private companies such as Bike-And-Roll, likewise fail to provide needed positive transportation or health impacts.

This report recommends that a New York City bike-share focus on the medium and high density areas of the city, defined as areas with 32,000 people/square mile or more. About two-thirds of the city's population (5.2 million people) live in these areas (about 81 square miles). These areas, which encompass portions of four of the five boroughs, can be served by a bike-share program of approximately 49,000 bicycles, spread over 2,600 bike-stations at an average density of 28-30 stations/square mile. New York's bike-share program should start in Manhattan south of 60th Street and in portions of Brooklyn and Downtown Brooklyn where there are bridge connections to Manhattan. These areas are the most highly trafficked portions of the city by residents, commuters and tourists, making the program self-sufficient from the start with membership and use fees alone. Program expansion, to include the rest of the city's medium and high density areas could be achieved with the addition of advertising revenues as the large number of bicycles could generate sufficient revenues.

New York City's size—304 square miles spread over four distinct land masses—and range of population densities—85,000 people/square mile in Manhattan vs. 9,000 people/square mile in Staten Island—means that the city will have to think strategically about program expansion. A high bike-station density (28-30 stations/square mile) is necessary for bike-share programs because it allows users to find and return bicycles easily. In lower density areas this bike-station density may be financially infeasible. Staten Island, for example, is excluded from the citywide bike-share program recommended in this report because of its small potential user base. In some lower density areas, it may be more cost effective to encourage bicycling by increasing the quantity and quality of personal bicycle parking facilities rather than by introducing a bike-share program.

PHASING AND FUNDING

This report recommends introducing bike-share to New York City in a series of large, swift phases, culminating in a total of 49,000 bicycles. Paris provides a valuable model for effective program phasing. Velib's phasing allowed the program to build on its own momentum and reach subscribers from outside the coverage area in anticipation of future coverage. In addition, the large starting size allowed the program to open its doors to tourists and one day users, which generated substantial revenues from the outset.

Membership/use fees and advertising are the two largest sources of revenue for a New York City bike-share program and both should be used. While a Manhattan/Downtown Brooklyn focused program could be funded with membership and use fees alone, this report recommends that the city pursue a bike-share franchise, using on-bicycle advertisements, to further expand bike-share coverage to the rest of the city.

The following phasing is recommended:

- Phase 1: The initial phase (10,500 bicycles), should be located in the highest density, highest trafficked areas, and funded through membership and use fees generated by the program itself.
- Phases 2 & 3: Subsequent phases (10,500-49,000 bicycles) should be funded partially through membership and use fees and partially through a bike-share franchise using on-bicycle advertisements. Authorizing legislation, CEQR/ULURP and FCRC approvals for the bike-share franchise should be pursued concurrent to the introduction of the first phase. The franchise "expansion" phases would extend bike-share coverage into areas that are densely populated (32,000+ people/square mile) but do not have sufficient commuter or tourist traffic to support a program on their own. These phases should be introduced as soon as possible, within the confines of the franchise authorization.

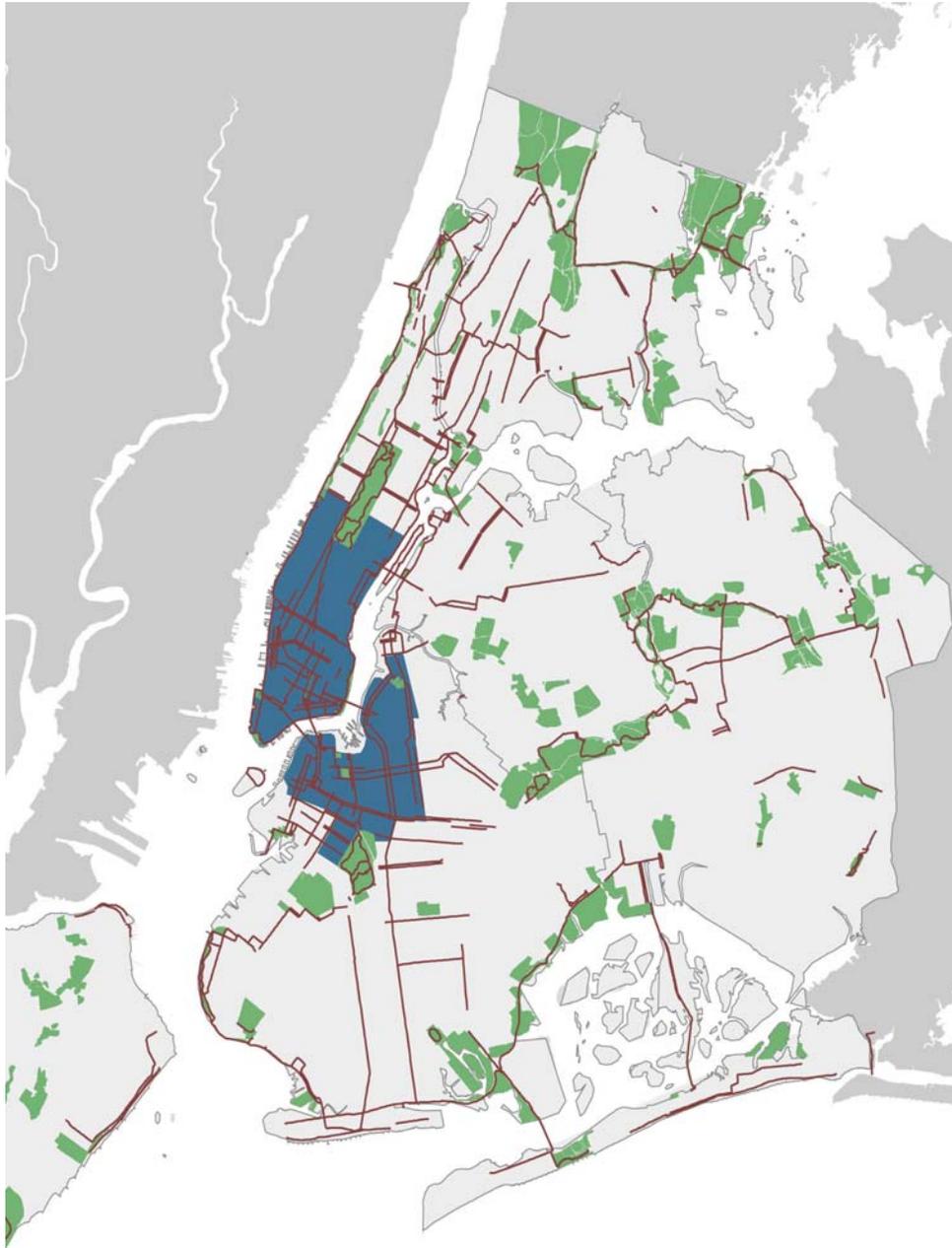
For Phase 1 in particular, this report looked to ensure that initial program coverage included highly trafficked areas, major origin and destination points for commuters, and covered neighborhoods in multiple boroughs that are currently characterized by large numbers of existing bicyclists and a high degree of bike lane coverage. Phases 2 & 3 followed the same guidelines with additional focus on increasing program continuity and citywide representation. Further discussion of the phasing analysis is included in Appendix C: Phasing Methodology.

The following financial models estimate potential costs and revenues for each phase.⁷ 3% annual inflation was assumed for all costs and a 20% increase in operating costs was assumed for each 3% increase in uptake. Advertising revenue is assumed for Phases 2 & 3. Further assumptions about costs, revenues, ridership numbers and uptake can be found in Appendix D: Financial Assumptions.

⁷ The financial estimate for 15,000 bicycles/Scenario 2 (which is not recommended as a phase) is included in Appendix D: Financial Assumptions

PHASE 1: 10,500 Bicycles

- Phase 1 is built by the city and operated under a service contract.
- Operations costs are covered by membership/use fees
- This phase covers Manhattan south of 60th Street and substantial portions of Northwestern Brooklyn, including Greenpoint-Williamsburg, Fort Greene, Prospect Heights and Park Slope.



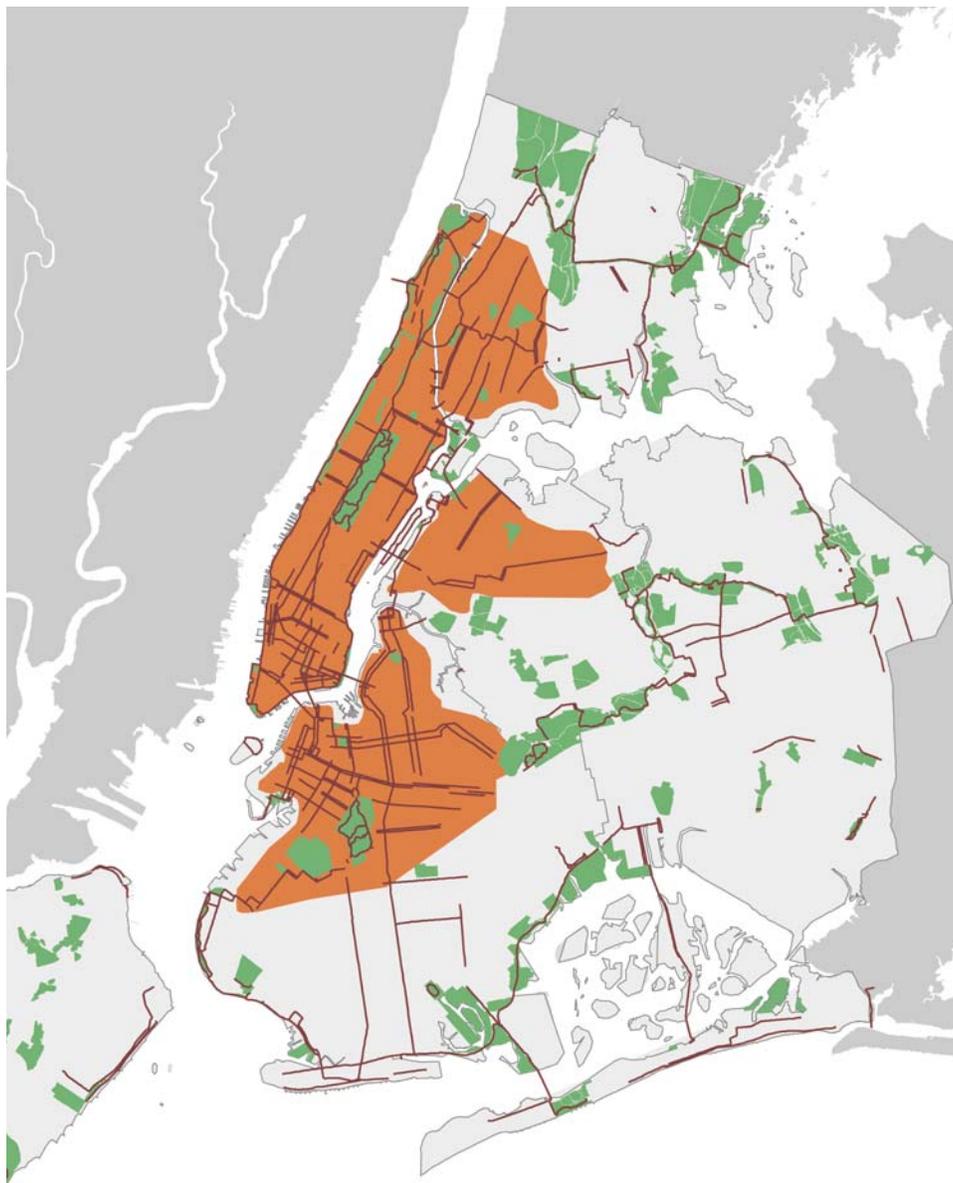
Proposed Phase 1
10,500 Bicycles
City-Built/Service Contract

PHASE 1/SCENARIO 1 (10,500 Bicycles)

Demand Assumptions	Total Possible	3%	6%	9%	Projected
Residents in Catchment Area	947,070	28,412	56,824	85,236	6%
NYC Workers in Catchment Area	1,067,000	32,010	64,020	96,030	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		14,362,562	28,725,124	43,087,685	23,260,729
Trips Longer Than 30 Min (5%)		718,128	1,436,256	2,154,384	1,163,036
Cost Assumptions	Rates	3%	6%	9%	Projected
Total Capital Costs	\$3,600	\$37,800,000	\$37,800,000	\$37,800,000	\$37,800,000
Total Operations Costs	\$1,600	\$16,800,000	\$20,160,000	\$24,192,000	\$20,160,000
Annual Membership & Use Fee Revenues	Rates	3%	6%	9%	Projected
Annual Pass (residents)	\$60	\$1,704,726	\$3,409,452	\$5,114,178	\$3,409,452
Annual Pass (non-residents)	\$60	\$1,920,600	\$3,841,200	\$5,761,800	\$1,920,600
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	\$1,436,256	\$2,872,512	\$4,308,769	\$2,326,073
Total Membership & Use Revenue					\$27,662,450
Net Operating Revenue					\$7,502,450

PHASE 2: 30,000 Bicycles (+29,500)

- Phase 2 is the first expansion of the New York City bike-share under a franchise agreement.
- Operations costs are covered by a combination of membership/use fees and on-bicycle advertisements.
- This phase continues coverage into upper Manhattan and Northwestern Brooklyn, including Bedford-Stuyversant, Crown Heights, Ditmas Park and Sunset Park. Bike-share coverage is introduced in Queens (Astoria, Jackson Heights, LIC) and the Bronx (Melrose, Grand Concourse, Fordham, East Tremont).



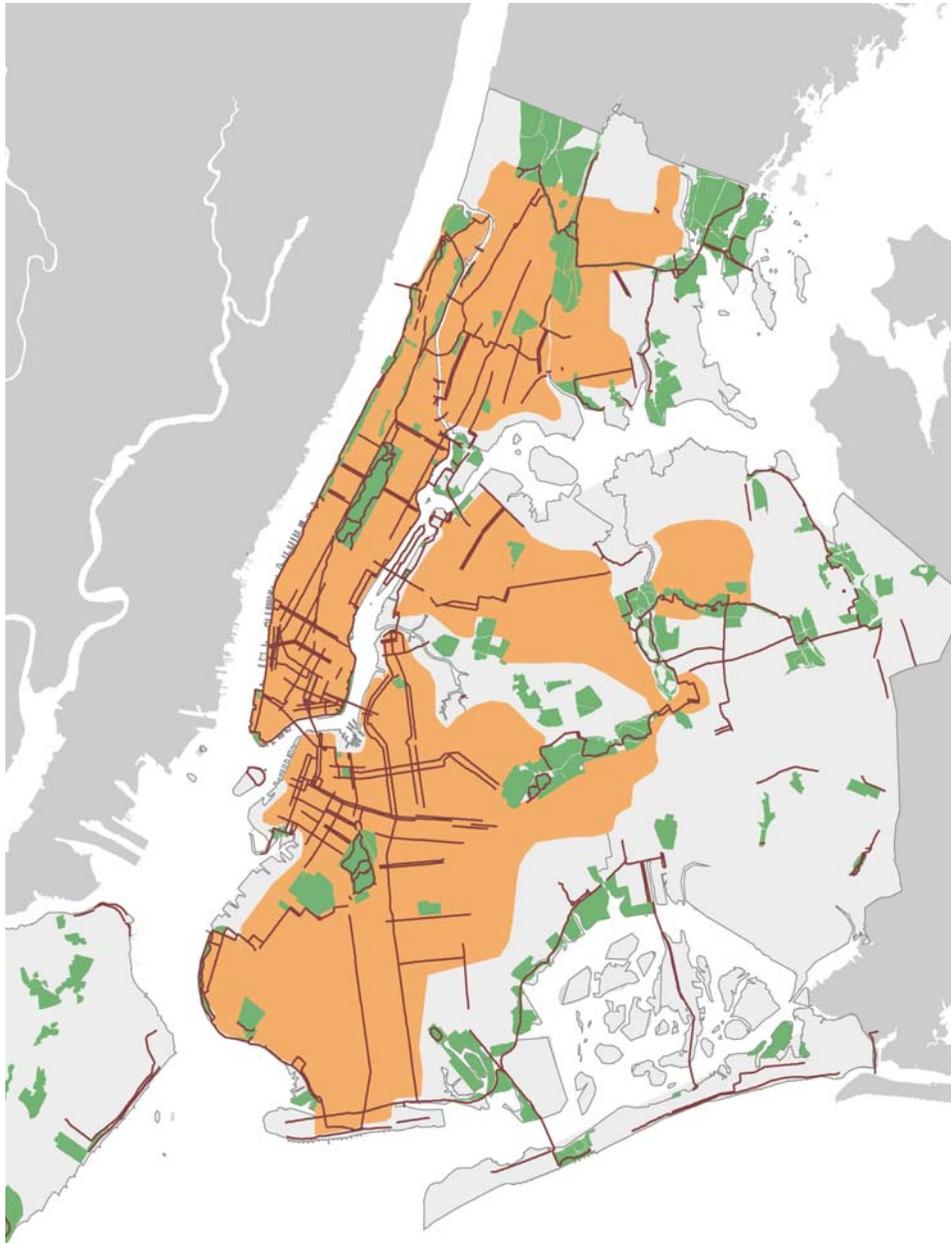
Proposed Phase 2
30,000 Bicycles
1st Franchise Expansion

PHASE 2/SCENARIO 3 (30,000 Bicycles)

Demand Assumptions	Total Possible	3%	6%	9%	Projected
Residents in Catchment Area	3,627,590	108,828	217,655	326,483	6%
NYC Workers in Catchment Area	829,000	24,870	49,740	74,610	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/Near		29,975,167	59,950,333	89,925,500	55,599,778
Trips Longer Than 30 Min (5%)		1,498,758	2,997,517	4,496,275	2,779,989
Cost Assumptions	Rates	3%	6%	9%	Projected
Total Capital Costs	\$3,600	\$108,000,000	\$108,000,000	\$108,000,000	\$108,000,000
Total Operations Costs	\$1,600	\$48,000,000	\$57,600,000	\$69,120,000	\$57,600,000
Annual Membership & Use Fee Revenues	Rates	3%	6%	9%	Projected
Annual Pass (residents)	\$60	\$6,529,662	\$13,059,324	\$19,588,986	\$13,059,324
Annual Pass (non-residents)	\$60	\$1,492,200	\$2,984,400	\$4,476,600	\$1,492,200
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	\$2,997,517	\$5,995,033	\$8,992,550	\$5,559,978
Total Membership & Use Revenue					\$40,117,827
Net Operating Revenue (Membership Only)					-\$17,482,173
Advertising Revenue					\$43,140,000
Net Operating Revenue (With Advertising)					\$25,657,827

PHASE 3: 49,000 Bicycles (+15,000)

- Phase 3 is the second expansion of the New York City bike-share under a franchise agreement.
- Operations costs are covered by a combination of membership/use fees and on-bicycle advertisements.
- This phase further extends coverage in Brooklyn, Queens and the Bronx, including Bay Ridge, Flatbush, Coney Island, Elmhurst, Flushing, Pelham Parkway, Woodlawn and Kingsbridge.



Proposed Phase 3
49,000 Bicycles
2nd Franchise Expansion

PHASE 3/SCENARIO 4 (49,000 Bicycles)

Demand Assumptions	Total Possible	3%	6%	9%	Projected
Residents in Catchment Area	5,255,188	157,656	315,311	472,967	6%
NYC Workers in Catchment Area	516,000	15,480	30,960	46,440	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		38,666,538	77,333,076	115,999,614	74,447,361
Trips Longer Than 30 Min (5%)		1,933,327	3,866,654	5,799,981	3,722,368
Cost Assumptions	Rates	3%	6%	9%	Projected
Total Capital Costs	\$3,600	\$176,400,000	\$176,400,000	\$176,400,000	\$176,400,000
Total Operations Costs	\$1,600	\$78,400,000	\$94,080,000	\$112,896,000	\$94,080,000
Annual Membership & Use Fee Revenues	Rates	3%	6%	9%	Projected
Annual Pass (residents)	\$60	\$9,459,338	\$18,918,677	\$28,378,015	\$18,918,677
Annual Pass (non-residents)	\$60	\$928,800	\$1,857,600	\$2,786,400	\$928,800
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	\$3,866,654	\$7,733,308	\$11,599,961	\$7,444,736
Total Membership & Use Revenue					\$47,298,538
Net Operating Revenue (Membership Only)					-\$46,781,462
Advertising Revenue					\$67,140,000
Net Operating Revenue (With Advertising)					\$20,358,538

FEES

As bicycles are not the default mode choice for most New Yorkers, bike-share membership and user fees must stay low in order to attract users. Offering the first ½ hour for free, and providing a 15 minute grace period to riders who arrive at their destinations only to find the bike-station full, are necessary elements of a successful bike-share program and should be included in New York. In addition, the policy of charging small (\$1-2) escalating fees for additional ½ hours should also be retained in order to keep bicycles in circulation.

Price elasticity is an unknown in bike-share programs. New York should continue to monitor uptake rates of other programs such to see if there is a discernable impact on uptake. Bixi, in particular, which will charge \$78/year, as opposed to \$40/year charged by Velib' should be watched closely. Cost of living factors should also be considered.

The financial estimates in this report are based on the assumption that a New York City bike-share program could charge more than is currently charged in Paris for Velib' use, without negatively impacting use. This report recommends that the membership and user fees charged by the Velib' program in Paris serve as minimums for a New York program. The price of a MetroCard should be used as a comparison point by which to judge bike-share fees. Bike-share prices should remain well below MTA prices.

- **Annual Membership:**

The financial analysis for this report assumed an annual membership fee of \$60. The introduction of advertising to the revenue streams available to a bike-share program may help to make this possible at larger scales.

- **Monthly Membership:**

A monthly membership option is not recommended because it could result in ridership decreases in the winter months.

- **Daily and Weekly Membership:**

As daily passes are likely to be used most by visitors or for recreation uses, this report recommends daily membership rates that are comparable to the 24 hour "Fun Pass" offered by the MTA. The financial analysis used for this report assumed a daily membership rate of \$5.

This report assumed that weekly passes would be purchased by people staying in New York City for longer than 4 days. As such, the financial analysis used for this report assumed a weekly membership rate of \$19 (4 days x \$5 =\$20).

Credit Card Alternatives:

The credit card requirement, inherent in Third Generation bike-share programs could pose some problems for lower income New Yorkers who might otherwise use the program. In consultation with the NYCDHMH, this study suggests that prepaid cards used exclusively for the bike-share system could be an alternative option for those who do not have a credit card. While these are often associated with transaction or maintenance fees, the city or operator may be able to negotiate with the card provider to keep the fees low.

SAFETY OPTIONS

Ensuring safety, for bike-share users and others, is a crucial part of any bike-share program. Especially in New York where many negative perceptions surround bicyclist safety, introducing measures to encourage bike helmet use, promoting good bicyclist and driver behavior and increasing the city's protected bicycle facilities is doubly important. As discussed in Chapter 5, bicycling in New York is safer than it used to be. The increased use of bicycle helmets and increased bicyclist presence and awareness may play a role here.

Helmets:

The self-serve nature of bike-share programs limits their ability to provide helmets. JCDecaux's investigation of imbedding membership cards into personal bike helmets is the closest that any program to date has come to providing helmets, and should be explored for New York. Short of legislation mandating helmet use, there is no way to make bike-share use contingent on wearing a helmet. In addition to being difficult legislation to pass, such legislation could also reduce the number of bike-share riders by eliminating the spontaneity of bike-share use. In the absence of program-provided helmets, the city could encourage helmet use by:

- Giving Out Free Helmets with Annual Bike-Share Membership

Through NYCDOT's "GET FIT-TED" helmet distribution and safety awareness campaign, the city already distributes free bicycle helmets. Free helmet distribution could be extended to include people who purchase annual bike-share memberships. Official New York City bicycle helmets, which are specially designed by NYC and Co., the city's official marketing and tourism, and sponsored by Target, could be sent to subscribers. Alternatively, helmet vouchers, redeemable at New York City bicycle shops could be distributed. While such a system could not enforce the wearing of helmets, it could eliminate price as an obstacle to use.



NYCDOT's GET FIT-ED program teaches helmet safety and gives away free Official NYC bicycle helmets.

- Exploring "Chip in Helmet" Programs like that Developed by JCDecaux
JCDecaux's proposed "Chip in Helmet" Program will allow annual subscribers to imbed their membership card in a personal bike helmet. Further discussion of this option should occur as program details emerge. However, as with all other helmet options this program cannot make people wear helmets.
- Continuing Public Service Campaigns Encouraging Helmet Use
Helmet use can also be encouraged through public service campaigns. The LOOK campaign's "Helmet Hair is Beautiful" postcard series is one such effort which attempts to erase the stigma around helmet use. Such campaigns should be continued. Private sector efforts, such as the "Safety is Sexy" campaign (<http://safetyissexy.blogspot.com/>) which

highlights fashionable bicycle helmets, helmets that look like hats, and other safety accessories, should also be explored further.

Promoting Good Bicyclist and Driver Behavior:

As discussed in Chapter 3, the combined efforts of the NYCDOT, NYCDHMH, the NYPD and public advocacy organizations like Transportation Alternatives have produced valuable public service campaigns (e.g. the LOOK Campaign) aimed at increasing bicycle awareness. The city can further encourage safety by further increasing the presence and scope of these programs. In addition, the city can encourage better bicyclist and driver behavior by:

- Clarifying and Publicizing Bicycle Rules of the Road

Many bicyclists are unsure of the rules of the road which increases the dangers they face and the dangers they pose to other bicyclists, pedestrians and drivers. While bicycle rules are mentioned in the New York State Drivers Manual, the mention is cursory and easy to miss in a document otherwise entirely devoted to cars. In the absence of clear, widely publicized official bicycling rules that deal with bicycle-specific situations (like yield responsibilities between bicycles and buses for example), bicyclists make up their own rules or follow the (sometimes poor) examples of other riders. Well publicized, bicycle specific road rules could help to increase bicyclist safety and overall predictability in bicyclist behavior.



Bicycling road rules are posted on each Velib' bicycle. "I don't ride on the sidewalk. I respect traffic lights and stop signs. I don't carry passengers. I don't ride against traffic (except on counterflow bikelanes)." Image: orici (www.flickr.com)

- Using Bike-Stations and Bicycles to Publicize Bicycle Safety Information

Bike-station and bicycles present a perfect opportunity to distribute bicycle safety information to bicyclists. Space should be provided to provide information such as basic traffic laws, the importance of helmet use, and the location of bike lanes.

- Publicizing Existing Bicycling Safety Courses

Private and non-profit organizations such as Bike New York offer free and/or low cost bicycling safety courses. Such classes could be publicized in bike-share or other bicycling materials.

Increasing New York City's Bicycle Infrastructure:

NYCDOT should continue striping and building new bike lanes and protected greenways throughout the city. Special attention should be paid to increasing network connectivity (more east/west lanes in Manhattan and the South Bronx for example). In addition, protected lanes should be built wherever possible.

THEFT REDUCTION

The bike-station structure, subscription service and credit card deposit/penalty features, unique to 3rd generation bike-share programs have dramatically reduced theft and have made bike-share programs viable in a way that their predecessors were not. However, some problems still remain. While New York City's theft rate is significantly lower than that of Paris, Barcelona or Washington DC, a number of design and behavioral incentives should be considered to further limit theft.

- Complicated or unintuitive bike-station locking mechanisms make it difficult for users, especially short term users, to know when their bicycle is properly returned. Bicycle thieves use such opportunities to take bike-share bicycles without providing traceable credit card information. Simple, intuitive systems that clearly indicate when bicycles are locked, such as flashing green/red lights, are recommended.
- Most bicycle thieves want working bicycles (the creation of a resale market for parts is avoided by using specialized parts that do not fit other bicycles). Bike-station designs in which it is possible to break the lock without rendering bicycle inoperable should be avoided in New York.
- Credit card fraud and identity theft could be an issue. Payment systems that require the purchaser to physically have their card with them at the time of purchase, or employ other anti-fraud measures, should be used.
- Low penalty fees can make it cheaper to steal a bike-share bicycle than to buy a new one. The going price of a basic new bicycle can range as high as \$500 in New York City, the deposit fee for the New York bike-share should be assessed accordingly. Bike-share administrators should watch results from SmartBike in Washington DC which charges \$250 for bicycles that are not returned, to determine an appropriate fee for New York.
- A New York City bike-share program would likely, like Paris, generate significant publicity. To reduce incentives for theft, New York could also consider making replica bike-share bicycles available for purchase.