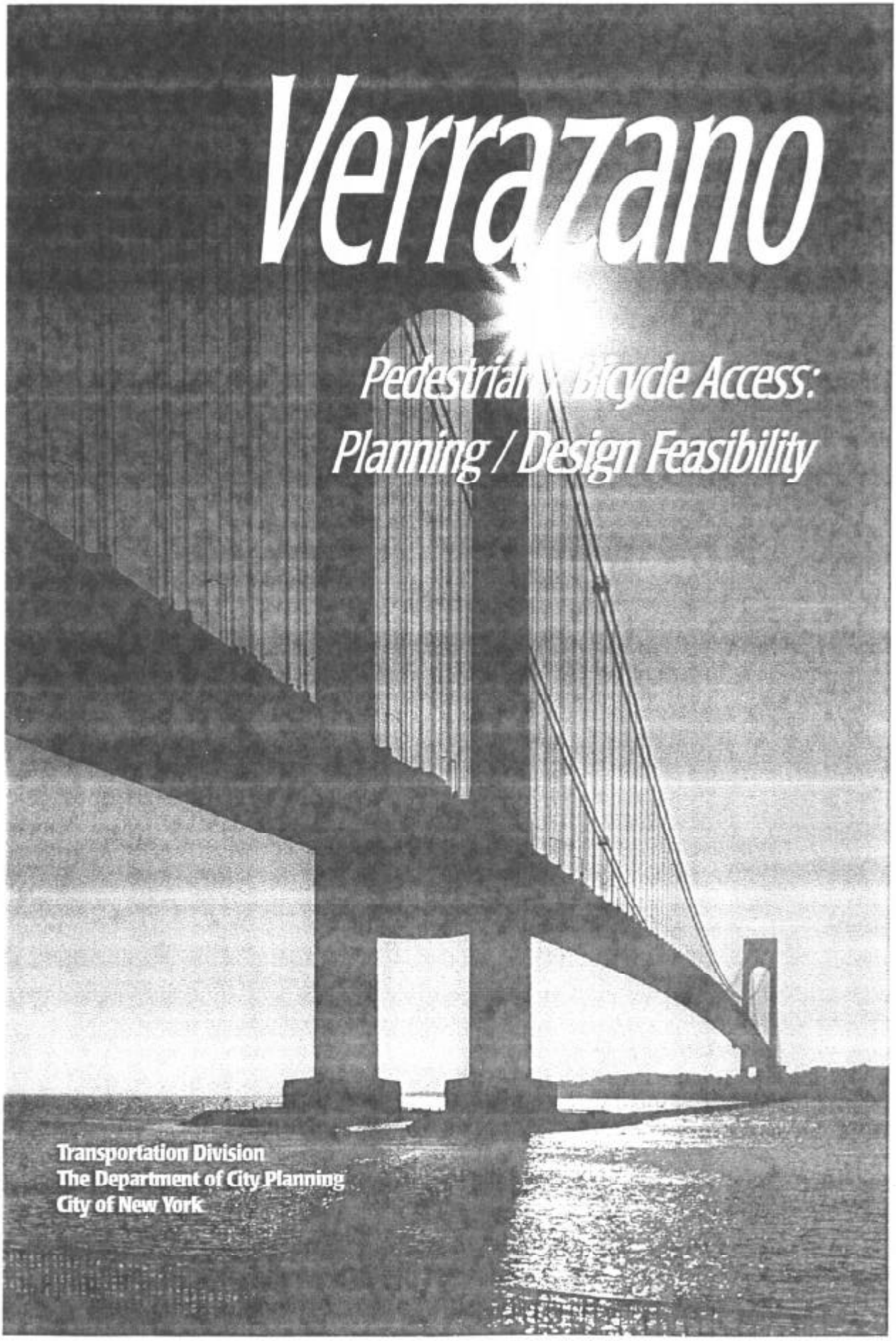

Verrazano
Pedestrian / Bicycle Access:
Planning / Design Feasibility
Transportation Division
The Department of City Planning
City of New York

# Verrazano

## *Pedestrian / Bicycle Access: Planning / Design Feasibility*

**Rudolph W. Giuliani, Mayor**
City of New York

**Joseph B. Rose, Director**
Department of City Planning

Transportation Division
The Department of City Planning
City of New York

December, 1997


# Schematic Greenway Plan

priority greenway route

other potential greenway routes

borough boundary

27 water crossing

# Introduction

The Department of City Planning has undertaken a study to determine the feasibility of pedestrian and bicycle access between Brooklyn and Staten Island. Today, cyclists and pedestrians detour to Manhattan via the Staten Island Ferry for Staten Island-Brooklyn trips. When the Verrazano-Narrows Bridge was opened in 1964, pedestrians and cyclists lost the ability to cross between Brooklyn and Staten Island, which was previously possible by ferry at 69th Street in Brooklyn.

This lost linkage was identified as a priority route in the Department of City Planning's 1993 *Greenway Plan for New York City*, which outlined the city's vision for a citywide 350-mile network of landscaped bicycle and pedestrian paths. The 1997 *New York City Bicycle Master Plan* also recommends access across bridges.

This study was initiated as part of a larger effort to reduce congestion and pollution in New York City to help meet federal mandates of the 1990 Clean Air Act. Walking, cycling and in-line skating, in contrast to the automobile, are non-polluting, take less space and are far more quiet than other modes of transportation.

## Four Alternatives

Four alternatives were assessed for the feasibility of reestablishing bicycle and pedestrian access between Brooklyn and Staten Island:

1. Bike-on-Bus or Van across the Bridge
2. Ferry across the Narrows
3. On-Lane Path across the Bridge
4. New, Separate Path across the Bridge

The purpose of the study is to assess the feasibility of a Brooklyn-Staten Island link to encourage a pollution-free commuting option and improve recreational opportunities.

Photo: MTA Bridges and Tunnels

*The 2-mile harbor Narrows can be crossed by vehicles on the Verrazano-Narrows Bridge. Pedestrians, bikers, and skaters are prohibited on the bridge.*

The study objectives include ensuring safety for pedestrians, in-line skaters and cyclists; ensuring that vehicular traffic is not impacted; linking access to existing and proposed pedestrian paths and bike routes; and investigating the most cost-effective alternatives.

## The study found that:

- All four alternatives are found to be physically feasible, but range widely in costs and benefits. All alternatives could be safe, secure, linked to other Greenways and would not impact vehicular traffic.

- Any proposed access alternative has the potential for significant demand, given the growing commuter market between Staten Island and Brooklyn, major employers, the need for access between the Brooklyn and Staten Island Gateway National Recreation Area, and other significant visitor attractions.

- Greenway access across the harbor between Brooklyn and Staten Island is important both locally and to the national greenway efforts, such as the East Coast Greenway, as the link between Long Island, New York, New Jersey, and New England.

## The Preferred Alternative

The short-term preferred alternative for pedestrian/bicycle access between Brooklyn and Staten Island is a bike-on-bus system for existing New York City Transit Buses S53 and S79, which currently cross the Verrazano Bridge. This alternative is the safest, most cost-effective alternative, and provides both a positive first step in the provision of access between the two boroughs and a means to assess the user demand for the inter-borough access. The cost is $22,275 plus an advertising campaign. Alternatively, a shuttle van—if demand is warranted—could provide point to point service.

The long-term goal of a path dedicated to pedestrians, cyclists and skaters should be considered as major bridge repairs are undertaken or funding becomes available.

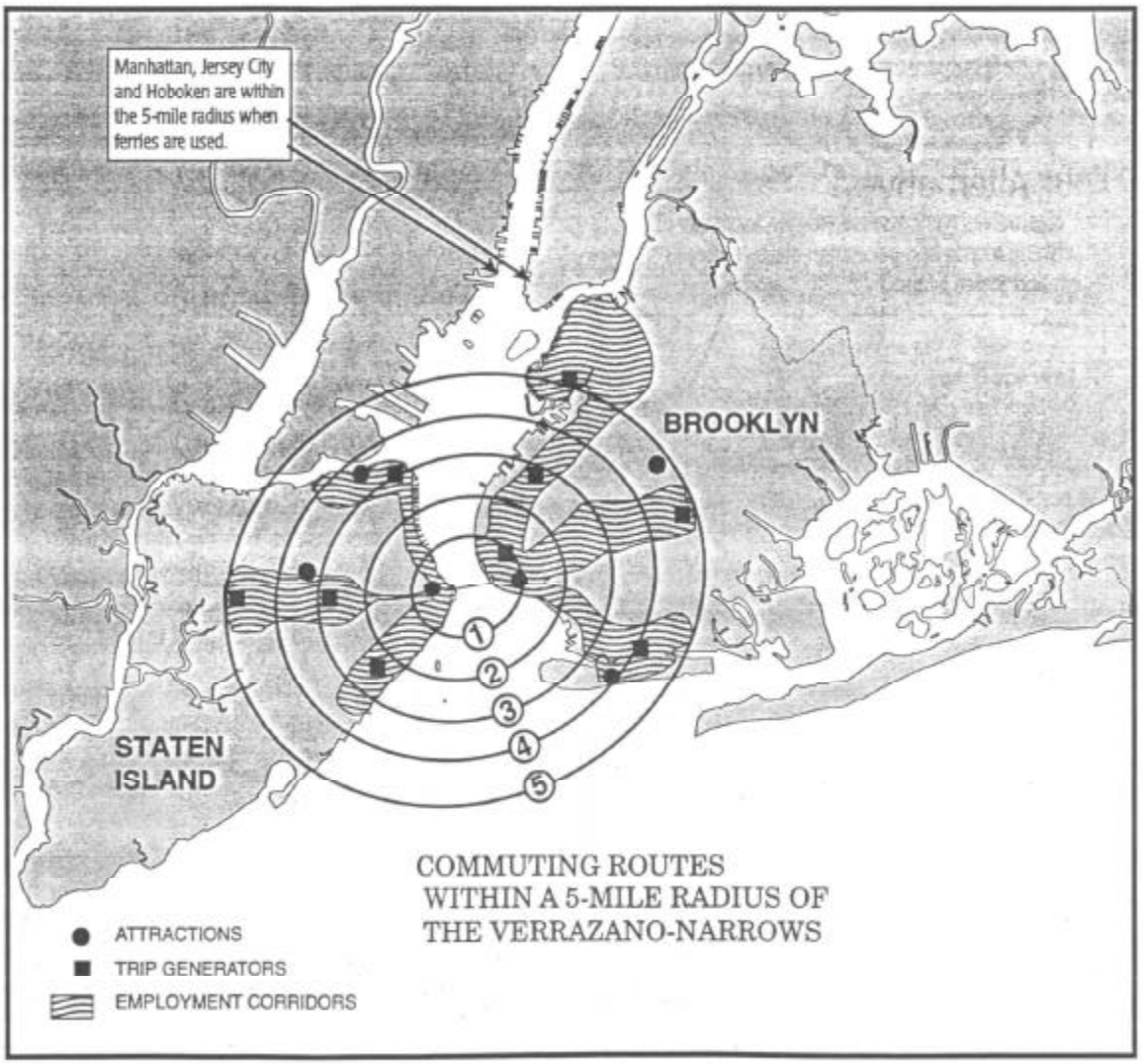
Both bicycle and in-line skating use in New York City has increased substantially. According to the Department of Transportation, daily bicycle use increased by 124% from 1980 to 1995. Transportation Alternatives estimates that on a given day 80,000 New Yorkers use bicycles. Skaters have increased across the country from 20,000 in 1984 to over 10 million in recent estimates. In 1995 counts on two Manhattan off-street paths, in-line skaters outnumbered cyclists by a ratio of 2 to 1.

> Transportation Alternatives estimates that on a given day 80,000 New Yorkers use bicycles.

In Staten Island and Brooklyn the popularity of walking, cycling and skating is also growing as a mode of commutation and recreation. The users of a proposed bicycle/pedestrian path between Brooklyn and Staten Island were assessed by researching origin-destination sample data from the 1990 U. S. Census, which identifies the commuter trips between Brooklyn and Staten Island. A distance limit of 10 miles (the national standard distance that a bicyclist will feasiblely ride in a given direction) was applied to the typical trips between Brooklyn and Staten Island by using a five mile radius from the base of the Verrazano-Narrows Bridge.

According to the census data, 19,000 Staten Island residents work in Brooklyn and 4,954 Brooklyn residents work in Staten Island. Academic institutions also provide significant origin/destination venues. For example, Staten Island College has a student body of 11,822, of these 2,569 commute from Brooklyn.

*Destination patterns overlaid with mileage show the potential trips that could be made by cyclists if the Verrazano Bridge were opened to bikes.*



*Miles of bike paths exist along the Brooklyn and Staten Island waterfronts that could be linked by a cross-Narrows connections. Here, bikers ride under the bridge in Staten Island.*

The employment pattern that emerged generally follows the manufacturing and commercial land use patterns and the major travel corridors. The shaded area on the map identifies concentrated employment destinations of residents from the other borough.

*The Shore Parkway Esplanade leads to the Verrazano Bridge.*

In Brooklyn such corridors include the commercial strip of 4th Avenue leading north and Shore Parkway going south east along an industrial and commercial belt, as well as a less defined pattern leading east to Brooklyn College. In Staten Island, the corridors extend northward on Bay Street to St. George, southward along Father Capodanno Boulevard to South Beach Psychiatric Center, and westward along the Staten Island Expressway to Staten Island College. Along these corridors, trip generators and employment centers are identified by squares on the map which include the civic center and various academic and health institutions.

Tourists and recreational users were also assessed. Gateway National Park has 1.6 million visitors a year at their Staten Island facilities. The origin of these visitors has not been surveyed, but it is commonly known that the various Staten Island cycling, hiking, fishing, and bird watching facilities attract significant numbers of Brooklynites. Similarly, Floyd Bennett Field, Jacob Riis Park, and the Jamaica Bay Wildlife Refuge draw Staten Islanders to the Brooklyn side of the harbor. In addition, the Staten Island Chamber of Commerce has estimated that 300,000 tourists take the ferry annually to Staten Island. Earlier records from the 1970's indicate more than 60,000 cyclists per year on the ferry. Charity rides, the Marathon, and the 5-Boro Bike Tour also attract visitors.

Of the four alternatives selected for assessment in this study of a Brooklyn-Staten Island pedestrian/bicycle link, three alternatives propose using the Verrazano Bridge. Two of the alternatives, the on-lane path and the new separate path, pose a demanding challenge for pedestrians, cyclists, and skaters. The bridge is both long, nearly 2 miles including the approaches, and high, thus requiring steep climbs and a significant trip by foot or bike. The width of the six lanes of traffic on each of the bridge's two levels does not allow for a new path on the roadway without eliminating one lane of traffic. High speed truck traffic discourages biking and walking along or beside the traffic lanes without a significant barrier. Suspension bridges are symmetrically balanced, making it probable that any new path on one side of the bridge would have to be equally loaded on the other side of the bridge. Below the bridge are two decrepit piers that could be improved to provide for landings in the ferry alternative.

# Bus Alternative

Accommodating bikes on new or existing buses and bus routes has proven to be an effective and inexpensive way to bridge gaps in Seattle and Phoenix and other municipal bikeway systems, providing cyclists with new opportunities in commutation and recreation. Several bus options are possible, including bike-on-bus, shuttle buses or vans, and franchise buses.

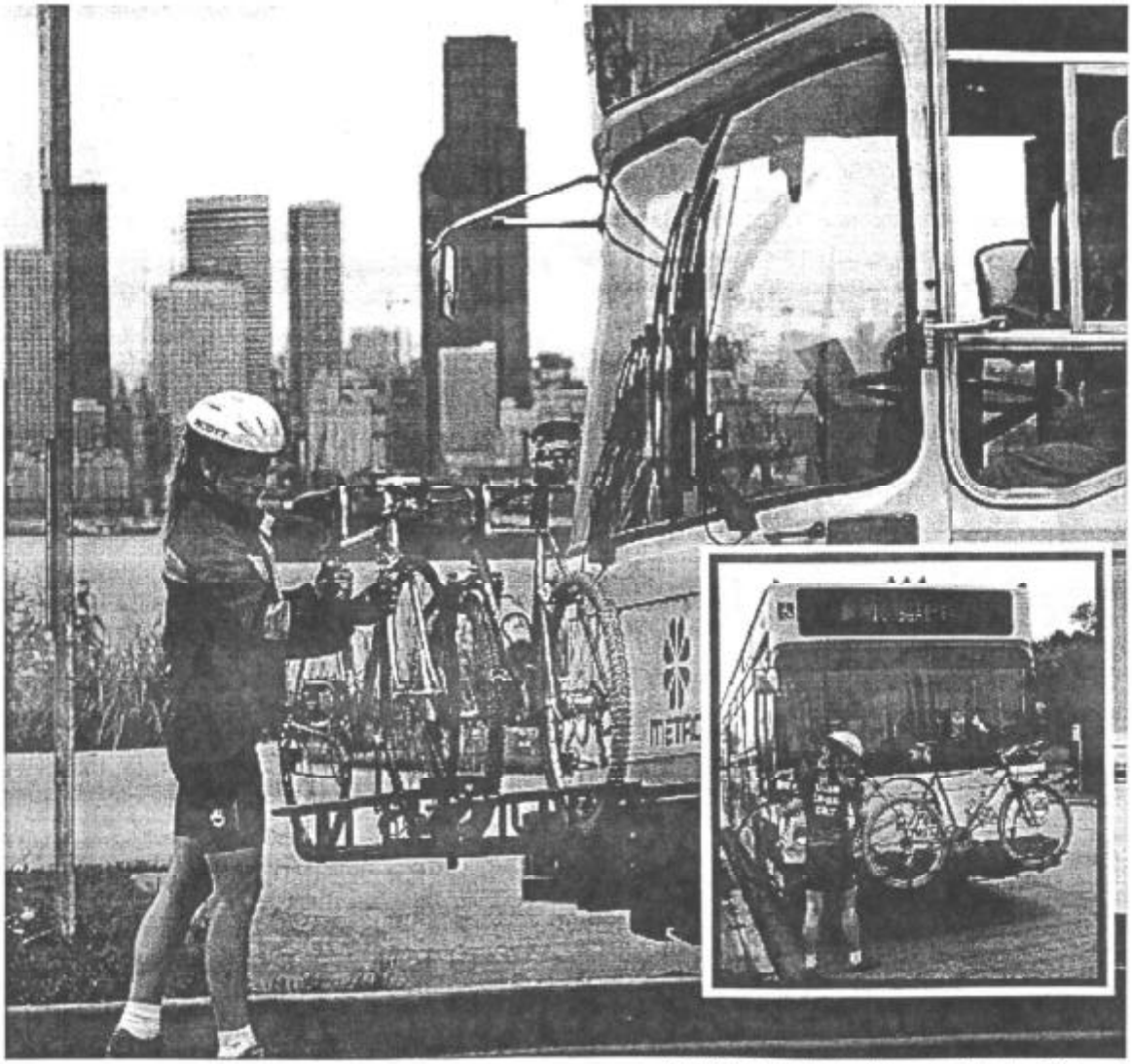
The bike-on-bus system involves installing an external bike rack to the front of the 21 buses used for existing New York City Transit Buses S53 and S79 that currently cross the Verrazano Bridge. The "Line-Haul" option permits cyclists to board anywhere along the bus route, giving cyclists more flexibility making bike trips or commutes and attracting more users to the service. Installation and maintenance costs are modest and no passenger space is lost inside the bus. Front mount racks offer the cyclist the greatest amount of safety since the racks are in full view of the bus driver.

Racks are relatively easy to use. Cyclists can load or unload a bike in less than 30 seconds, without the help of the driver, ensuring that buses will not be delayed in their routes. Once loaded, the bike is secure. The risk of damage

## 12–20 bikers could cross the bridge per hour in each direction

to the bike or the bus is minimal, during loading or while in transit. It is recommended that ten extra racks be purchased for demonstrations and back-up buses in case of breakdowns.

Other bus options include a point-to-point system on the S53 and S79, a dedicated bike shuttle route with a bus or van, or the use of racks on franchise buses. The point-to-point system would allow bicycle loading from a designated



*Cyclists place their bikes in the bus racks in less than 30 seconds.*

point on either side of the bridge, moving cyclists between the two boroughs. A dedicated bike shuttle—a van often with a trailer for the bikes—that runs a continuous loop route service can accommodate more bikers. This service requires a known demand to attract a private operator. Lastly, franchise buses could be equipped with bike racks and serve the commuting bikers, increasing the availability of buses crossing the bridge and lessening the cyclists waiting time.


*The S53 and S79 buses stop at 92nd Street in Brooklyn before entering the on-ramp to the Verrazano Bridge.*

The MTA New York City Transit (NYCT) has concluded that a traditional bike-on-bus is not operationally practical. The NYCT suggests that operation may be appropriate for a private operator under contract to the City or to an agency with recreational facilities accessible via the bridge such as the National Parks Service in Fort Wadsworth in Staten Island and the New York City Department of Parks and Recreation's John Jay Park in Brooklyn.

With organizational changes and operator training, however, the MTA concerns could be addressed. Depot bus distribution, rack-equipped buses on non-bike approved routes, and the ability of drivers on the route and in the depot to adjust to the additional length of the rack-equipped buses are concerns that are surmountable. For example, drivers may need little training to move buses in the depot when the racks are in the upright folded position. And, racks could be locked in the upright position or easily removed when driven on other than approved bike-on-bus routes. Turning movements on Staten Island pose few problems of tight narrow urban streets that might make maneuvering rack-equipped buses more difficult. Testing one or two racks on Staten Island buses could verify the feasibility, and identify any unanswered questions.

MTA concerns should be carefully assessed, particularly since, upon investigation, a private shuttle bus is unlikely to be feasible due to the unknown demand and need for reasonable head ways. The National Parks Service has proposed to run a shuttle service within Fort Wadsworth for its visitors. The shuttle is not, at this time, proposed for bike-on-bus or for Verrazano access.

The preferred alternative for pedestrian/bicycle access between Brooklyn and Staten Island is a line haul bike-on-bus system for existing New York City Transit Buses S53 and S79 which currently cross the Verrazano Bridge.

## Advantages

- Cost of outfitting buses is minimal.
- 24-hour access across harbor.
- Simple to implement and operate; low maintenance costs.
- If demand is low, loss is minimal.
- Good intermediate step; if market demand increases, then next steps can be assessed.
- All-weather access across harbor.
- First test of a line-haul service with bike racks.
- Allows for access across bridge for those who may find the 2 mile path, with relatively steep grades, too rigorous for walking or biking.
- Safe to use; tested and successfully proven in other cities.
- Excellent connections to public transportation (S53 to 95th St./4th Ave Subway Station, S79 to 86th St/4thAve Subway Station).

## Disadvantages

- Only two bicycles at a time. Therefore a family or group of three or more would split up, some waiting to catch the next bus.
- May underserve the market (6-10 buses/hour equals 12 to 20 riders per direction).
- Buses may be delayed by a cyclist unfamiliar with putting bikes on the racks (less than 30 seconds is required for most users).
- Bus turning radius may increase with a rack-equipped bus, making some narrow urban streets more difficult to maneuver.
- Buses are not dedicated to a specific line. Buses can be distributed to various lines; thereby putting buses with bike racks over routes that are not approved for that purpose.
- Typically, cyclists would be required to wait for the bus.
- Cost of bus ride vs. free path
- Loss of experience of walking, biking, or skating over the bridge.

The costs, maintenance, access hours and ease of implementation rate well, but there may be some increased operational concerns for the Metropolitan Transportation Authority (MTA), New York City Transit (NYCT).

# Ferry Alternative

A ferry has the potential to provide transportation between Brooklyn and Staten Island for both pedestrians and cyclists who do not have access to a car. This would "link" portions of the Greenway in both boroughs, Shore Parkway in Brooklyn and Father Capodanno Boulevard in Staten Island and would eliminate the detour to Lower Manhattan via the Staten Island ferry to connect between the two boroughs. Signage along the Greenway could provide information about the available ferry service on both sides of the Narrows.

Fort Wadsworth's Battery Weed is the preferred ferry docking site in Staten Island. Fort Wadsworth came under the jurisdiction of the National Park Service in September 1995. At this time, the National Park Service is proposing passenger ferry service between Battery Weed and other Gateway National Recreation Area units, and possibly Harbor Park. Cost for reconstruction of Battery Weed is estimated at $2 million.

Denyse Wharf is located in the Fort Hamilton section of Brooklyn, adjacent to the southeast foot of the Verrazano-Narrows Bridge. It is currently under the jurisdiction of the Department of the Army and is in a general state of disrepair. The fenced-off wharf is not accessible to the public. It was estimated in 1991 that renovating the wharf for use as a fishing pier would cost approximately $125,000.A fingerpier would need to be constructed to accommodate a ferry dock. Today's costs are preliminarily estimated at $1 million.


*Above: Brooklyn's 69th Street Pier can accommodate additional ferry service.*

*Left: Bikers arrive in Atlantic Highlands from Manhattan's Pier 11.*

*Below: Brooklyn's Denyse Wharf is a potential ferry stop that can be accessed from the Shore Parkway Esplanade.*

*Ferry use in the harbor has increased.*

## Advantages

- Ferries are an appealing mode of transport.
- Easy boarding and unloading.
- Easy access to Brooklyn's Shore Parkway Esplanade and Staten Island's bike routes on the Bay Street and Father Capodanno Greenways.
- Recreational users will be well-served.
- All-weather alternative.
- Safe.
- Secure.

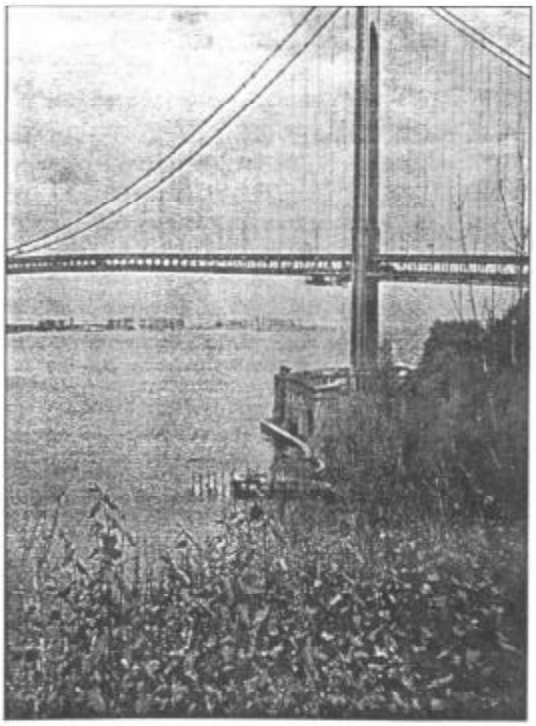
## Disadvantages

- Unknown market demand.
- To make this alternative economically feasible the cost to the user may be high.
- Waiting time may discourage users.
- Limited hours due to ferry operation costs.
- Steep climb from Battery Weed to New York Avenue.

Although this alternative rates well on user quality and safety, it is difficult to assess its market feasibility. As waterborne transportation grows, some commuter ferry operation may find it profitable to serve recreational users in this location during off-peak periods.

New York City's policy of no subsidies for new ferry services would require that all ferry capital and operating costs be paid by the private operator.

The 69th Street Pier is located in the Bay Ridge section of Brooklyn. It is under the jurisdiction of the New York City Department of Transportation. A commuter ferry operated by Express Navigation runs between Pier 11 in Manhattan and Atlantic Highlands in New Jersey with, until recently, a stop at the 69th Street Pier in both directions. Bicycles are permitted on board for an extra three dollars. The 69th Street Pier was recently damaged, causing its temporary closure.



*Battery Weed at Fort Wadsworth is a potential ferry stop.*

# On-Lane

Creating the opportunity for cyclists and pedestrians to travel directly between Staten Island and Brooklyn could be achieved by establishing an on-lane path replacing one of the twelve vehicular lanes on the bridge. This alternative has the advantage of supporting two-way traffic for pedestrians and cyclists in one 12-foot wide path, thereby reducing costs. All other bridge alternatives require two paths because of the symmetrical loading needs of a suspension bridge.

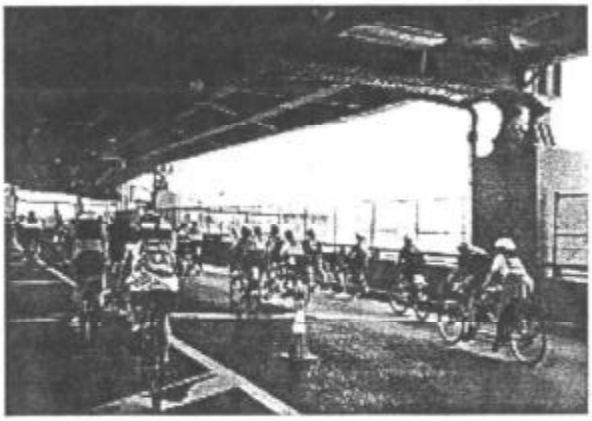
There are two on-lane options, one on the northern-most lane of the lower level and another alternative on the southern-most lane of the upper level. On the lower level, the northern-most lane is the least costly of the two on-lane options and requires no significant structures to be built.

**The on-lane alternatives are less costly, more secure and easier to maintain.**

This option uses existing approach ramps – the westbound 92nd Street on-ramp on the Brooklyn side, and the westbound off-ramp to School Street on the Staten Island side. The second option, on the south side of the upper level, uses the existing eastbound 92nd Street exit to Dalgren and proposes a ramp structure on the Staten Island side leading to New York Avenue or Major Avenue. This upper level option has the advantage of being open to the sky with better views and is without the noise and shading factors of the lower level option.

The use of a traffic lane may be viewed as a reduction in capacity and service to a community and customer base that pays a significant toll to cross the facility. Reducing the number of lanes from 12 to 11, however, would still allow for appropriate levels of service to be maintained during the morning and evening peak hours. Also, the change in level of service is not significantly different between east- and westbound traffic. Therefore, the focus of analyzing which lane could be closed with the least impact to vehicular traffic shifts to other determinants, such as access and egress from the bridge. The length, grade and transition from the bridge into the local street system have been assessed as important factors. The approach ramps are over 1 mile in length. Grades vary, but do not exceed 4 percent. Connections can be made to public parks, or preferably, to public streets with 24-hour access. Another factor in assessing the feasibility of the use of a traffic lane is the west-bound traffic stopping to pay the toll. Estimated queuing at the toll plaza was approximately 30 seconds per vehicle, still a level of delay that is considered well within the range of driver acceptance. Recent installation of an electronic "E-Z Pass" fare card system should further expedite vehicular traffic.

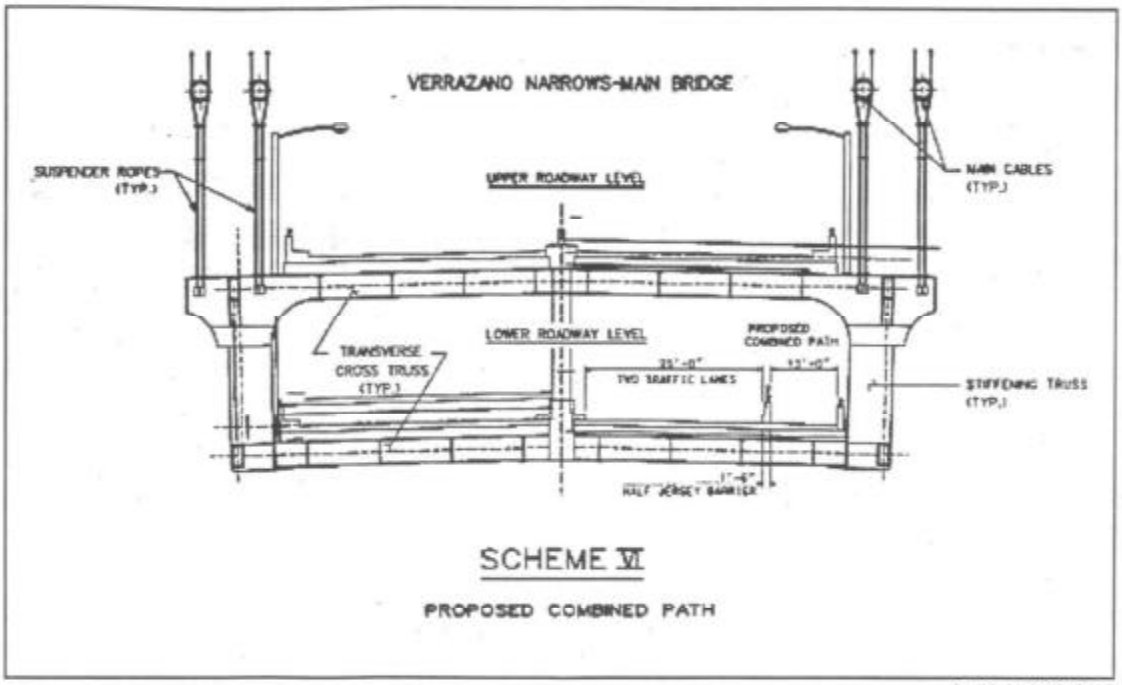
Moving from the bridge to the local streets should be a safe, efficient transition for cyclists and pedestrians, without any vehicular traffic conflict. On Staten Island the lower level alternative has a pedestrian/cyclist route which avoids vehicular lane crossings. There is a maintenance road used only by the Metropolitan Transportation Authority (MTA) Bridges & Tunnels vehicles. Entry to this road is made east of the toll plaza by a switch-back turn that follows back along the bridge anchorage and leads to Fort Wadsworth or Major Avenue. This road and the adjacent shoulder widths are sufficient to support a separate path.



*Over 30,000 cyclists participate in the 5-Boro Bike Tour which crosses the Verrazano-Narrows Bridge.*

To separate vehicular traffic from cyclists and pedestrians, jersey barriers would be placed between the traffic lane and the bicycle/pedestrian lane. The cost would be $2.2 million for the lower level option and $3 million for the upper level option.

*Left: A traffic lane–either the upper level southern most lane or the lower level northern most lane–could be retrofitted as a pedestrian/bike lane.*




*This cross section drawing shows the location of a lower level path, which would replace a vehicular lane.*

Drawing: Ammann & Whitney

## Advantages

- A path would have 24-hour access.
- Minimum maintenance would be required.
- Access on and off the path would be easy for cyclists.
- Good connections to the Greenway Network.
- One path across the bridge rather than two, which is necessary for a new and separate path.
- Less costly alternative and low long term costs.
- Good connections to public transportation (S53 to 95th St/ 4th Ave Subway Station, S79 to 86th St/ 4th Ave Subway Station).
- Good security and access for emergency vehicles.

## Disadvantages

- Loss of one lane of traffic is an opportunity cost for future use of the bridge.
- Pathway is adjacent to traffic and subject to roadway noise and fumes.
- Fewer traffic lanes may inconvenience motorists.
- Modification of sidewalk requires closure of one traffic lane during construction and bridge maintenance.
- Two-way bike/pedestrian path could cause user conflict.

This alternative rates well on maintenance, user and emergency access, cost and security, but the opportunity cost of the loss of a vehicular lane is also important and the perceived loss of service is significant.

*The 92nd Street on-ramp and adjacent sidewalks could be retrofitted to include bikers and pedestrians for the lower level alternative.*

# A New, Separate Path

A new, separate path for pedestrians/cyclists can be constructed on the Verrazano-Narrows Bridge. The Department of City Planning selected a consultant, Ammann and Whitney, to assess the feasibility of constructing a path on the bridge structure.

Five alternative routes across the main span were developed and assessed. Connections require new ramps and/or modification of the existing structure to accommodate the bicycle/pedestrian pathways. Other alternative connections such as stair towers were not evaluated due to the 90 to 140-foot bridge height. Also, elevators were not considered to be a viable option due to the costs of operation, security, and the need for a back-up means of egress.

The preferred alternative for a pedestrian/bicycle pathway across the Verrazano-Narrows Bridge combines a path between the suspender ropes on the main bridge with a pathway on the Brooklyn Approach existing sidewalks and new pathway structures on the Staten Island Approach. A path on either side of the bridge is recommended to provide for the balanced loading of the bridge structural members. The path on the north side of the bridge would be for pedestrians, and the one on the south side would be for bicyclists. The paths are proposed to be 10 feet wide with a horizontal clearance of 7'-11" at suspender rope locations, occurring approximately every 50 feet. The location of the paths on the upper level of the main bridge between the suspender ropes provides advantages in structural considerations, ease of construction, and costs. The whole life cost (over 50 years) is estimated at $26.5 million.

The MTA recommends another scheme located outboard of the bridge's lower level. The MTA prefers this scheme costing $40 million, maintaining that a continuous 10-foot path is safer, easier to maintain, and a reduced security risk to the facility. MTA is concerned about the safety and liability inherent in any strategy that introduces pedestrian and bicycle access to the Verrazano-Narrows Bridge.

*The rendering below provides a vision of the proposed bike path on the upper deck of the Verrazano-Narrows Bridge.*

Rendering: Paul Rourke

## Advantages

- A new, separate path would have 24-hour access.
- This path separates pedestrians/cyclists from automobile traffic.
- Separate bike and pedestrian paths improve safety.
- Path location offers unrestricted views, no shadowing from the upper deck, and reduced noise and fumes that are experienced on the lower level.
- Suspender ropes provide a feeling of containment without blocking vistas, thereby providing a sense of security for path users.
- Good connections to public transportation (S53 to 95th St/4th Ave Subway Station, S79 to 86th St/4th Ave Subway Station).
- Pathway visible from roadway, providing a degree of security.
- Provides high capacity for pedestrians and cyclists.
- Separate paths provide alternatives during bridge maintenance.
- Minimum structural reinforcement required.

## Disadvantages

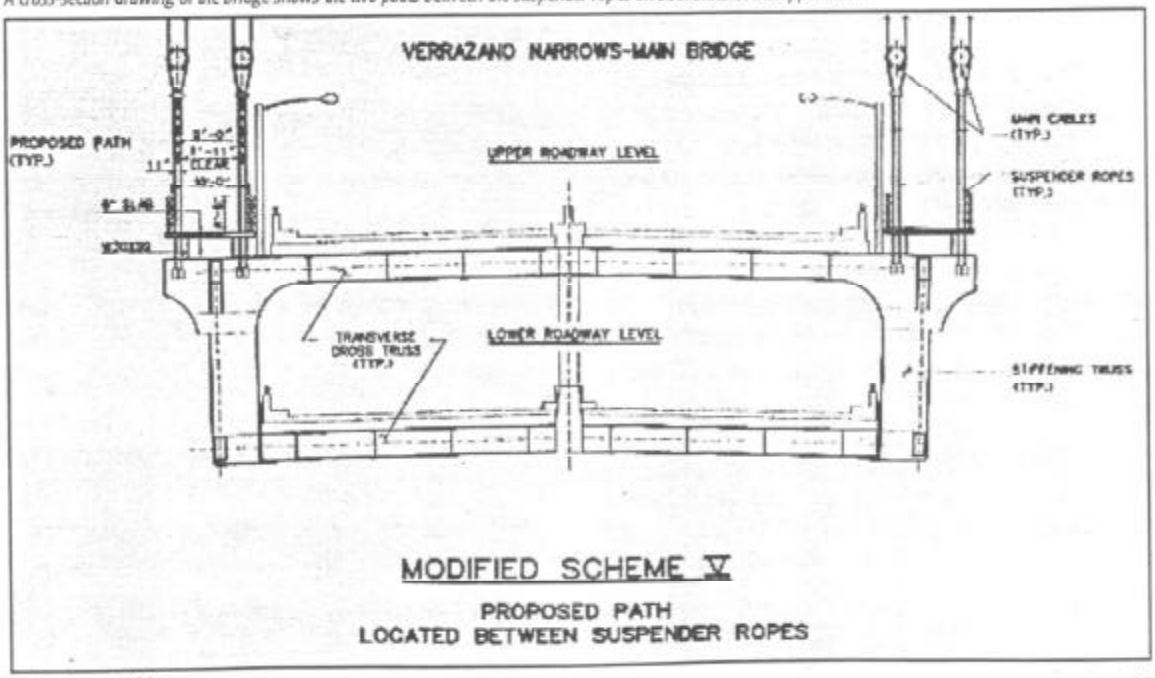
- Two paths are required to provide for balanced loading of bridge structural elements.
- Minimum width of 8-feet for two-way bikeway cannot be met where suspender ropes interrupt 10-foot width of path.
- Highest cost option due to expensive construction.
- Public accessibility to the bridge's structural members, such as the suspender ropes, poses potential concerns to the operator.

With no allocated funds and unknown user demand for a new, separate path, this highest cost alternative rates poorly in the calculated cost-benefit terms, despite the long term benefits of the permanent, 24-hour accessible path this alternative provides for potential path users.

*The rendering shows the proposed upper level pedestrian path on the bridge.*

Rendering: Paul Bouche

*A cross-section drawing of the bridge shows the two paths between the suspender ropes on both sides of the upper level.*




Drawing: Ammann & Whitney

# Conclusion

The short term preferred alternative of establishing a line haul bike-on-bus system for existing New York City Transit Buses S53 and S79 has advantages in light of the unknown demand. The costs are minimal and the system provides a method to assess the user demand for the inter-borough access. Improving the Preferred Alternative is also possible if the market is underserved by this alternative. It may be possible to expand the bus program, starting on a limited basis, and building it with bus resources if the market demand grows. An incremental, more expansive proposed bus program could include:

**Phase 1**:
Bike racks tested on weekends on the S79 and the S53

**Phase 2**:
Bike racks tested 7-days a week on the S79 and S53

**Phase 3**:
Private or subsidized shuttle bus, van or ferry service provided during peak recreational hours on weekends. Bike racks encouraged/required on express buses for peak commuter hours

**Phase 4**:
7-day-a-week shuttle bus, van or ferry service

**Phase 5**:
If constituency is still growing, reassess other alternatives.

This study of the feasibility of a pedestrian and bicycle link between Brooklyn and Staten Island has engendered a high degree of interest in both bike-on-bus and dedicated bridge pedestrian/bicycle paths. Some have thought that the more capital intensive building of a new, separate path was the best solution and that a bike-on-bus system was not necessary. Others have encouraged the bike-on-bus alternative because of its practical, incremental approach.

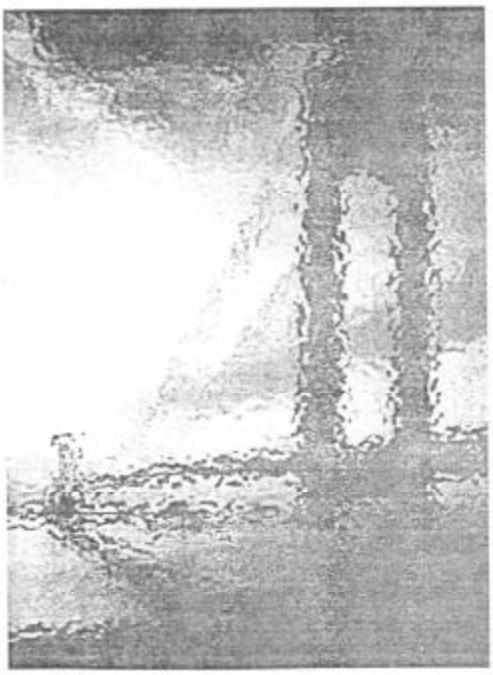
In addition, significant concerns were raised over the lack of better provision for the needs of pedestrians, skaters, strollers, and other Greenway users besides bikers. For example, some reaction was only focused on a dedicated path for pedestrians. A bridge path has been looked upon by all as a way of providing people with the opportunity to experience the lower Bay and New York Harbor from the bridge, as is the case with the George Washington Bridge and other facilities.

This study has become a spring board for a larger discussion of bicycle and pedestrian facilities on bridges in the city. As a result, intensive discussions with the MTA, the New York City Department of Transportation, and Transportation Alternatives have led to the development of two goals:

1. Conduct a pilot test of a bike-on-bus line-haul service before the 1998 spring biking season, and

2. Improve pedestrian and bicycle access, starting with bridges that have existing paths. As a second priority, provide access to bridges that now have no paths.

Cycling, walking, and in-line skating are economically efficient modes of transportation that also have tremendous health benefits. These alternatives to the automobile are also environmentally efficient and non-polluting in a city where we struggle to reduce noise and congestion. Urban areas are excellent areas to encourage alternative commutation, since most trips are within 2 to 10 miles—a distance conducive to bikes, skates and walking. Developing our linkages to connect the extensive Greenway system via the Verrazano-Narrows Bridge will not only provide for Brooklyn and Staten Island residents, but will put New York City on the East Coast Greenway, the more urban alternative to the Appalachian Trail. Building this access between Brooklyn and Staten Island, across one of the nation's most important and beautiful harbors, is a priority for New York City's 350-mile Greenway, and will help to encourage a healthy, efficient alternative to automobile use.



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