

NEW YORK METROPOLITAN TRANSPORTATION COUNCIL



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**Hudson River Valley Greenway Link**

**Technical Memorandum #3**

**Task #3**

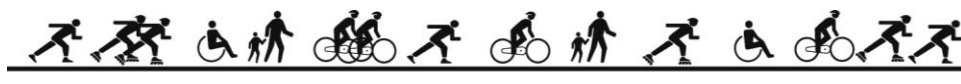
**Goals and Objectives and Gap Analysis**

February 20, 2009

**Submitted By:**



**with:**



### **TASK 3: GOALS AND OBJECTIVES AND GAP ANALYSIS**

The purpose of this document is to outline the goals and objectives of this study and to identify alignments that have not been adequately explored in the previous planning efforts summarized in Task 2. This will allow for a definition of the scope and geographic limit of the research to be performed in Task 4.

#### **GOALS AND OBJECTIVES**

The purpose of this section is to facilitate the determination of the goals of this project and develop a direction and strategy for achieving them. The Steering and Technical Advisory Committees along with NYMTC will make the final determination of the goals and objectives. This document provides a jumping-off point from which further development and refinement will take place.

Following is a preliminary list of goals and objectives for further discussion:

- Provide a continuous route that links communities across the region and provides access to important trip generators and bring trail users closer to nature;
  - Strengthen east-west routes to connect employment centers and neighborhoods with facilities along the greenway.
  - Identify efficient routes to and from major employment centers, commercial districts area schools and recreation facilities.
- Improve mobility and safety for cyclists and pedestrians in the subject corridor such that bicycling and walking become feasible alternatives to motorized travel;
  - Recommend off-road routes (separated from motor vehicle traffic) where possible and appropriate, preferably near the water.
  - Recommend potential on-street bike routes on roadways with excess capacity, both in terms of traffic volumes and lane widths where Class 1, 2 or 3 bicycle routes could be implemented.
  - Ensure safe access for users of all ages and types, including children, seniors and users with limited mobility.
- Where possible identify routes that are both efficient for transportation and pleasant for recreational use;
  - Where possible, develop off-road, multi-use facilities.
  - Provide opportunities for both active and passive (sitting) recreation.
  - Provide access for wheelchairs and baby carriages.

- Provide direct interregional connections for pedestrians and cyclists;
  - Identify and connect to existing and proposed bicycle routes in areas outside the study limits.
  - Provide connections to rail, ferry and bus transit facilities where possible.
  
- Provide improved public access to areas of architectural, historical, natural, cultural, and artistic significance;
  - Identify significant areas of interest including structures or areas in need of repair or preservation.
  - Recommend the provision of educational opportunities to enhance public understanding of the natural landscape and foster stewardship.
  - Recommend the exploration of potential commercial/tourism opportunities along the greenway.
  - Recommend routes that pass through or are adjacent to these areas or provide spurs from the recommended route to connect to these areas.
  - Preserve natural features and wildlife habitats.
  
- Create an implementation strategy;
  - Divide the overall route into distinct sections for phased implementation as funding is secured.
  - Identify interim route segments that may be implemented more quickly.
  - Identify potential sponsors (implementers) for each segment and potential funding sources.
  - Recommend the placement of projects on the five year Transportation Improvement Program (TIP) and in the Regional Transportation Plan (RTP).
  
- Increase public access to and enjoyment of the waterfront;
  - Where feasible, recommend routes adjacent to the waterfront.
  - Where this is not feasible provide spurs to waterfront access points at appropriate locations along the corridor.
  
- Provide unified design guidelines to ensure design consistency across all segments of the route;
  - Consider both paved and unpaved segments.
  - Provide wayfinding signage to locate route access points and develop distinctive trail markers.

## GAP ANALYSIS

The following gap analysis identifies route alignments that have not been adequately explored in previous planning efforts, gaps in the alignment of existing or recommended routes, and areas where the study team needs more information in order to adequately evaluate a given pathway. This analysis also identifies gaps in existing, available data and outlines data that will need to be collected under Task 4. Five criteria, described below, have been identified that are necessary to this evaluation.

- ***Physical conditions:*** An assessment of the existing physical conditions that may affect route implementation, improvements or enhancements. Examples of relevant conditions include roadway capacity, traffic patterns, safety hazards and topography.
- ***Accessibility:*** An evaluation of ease of access to the route or route segment, in terms of the number and convenience of access points.
- ***Connectivity:*** An examination of a route or route segment's relationship to the greenway network and linkages between major trip-generators and destinations.
- ***Environmental regulations and compliance:*** An assessment of the effect of a proposed route on natural resources, wetlands, shorelines or other environmentally sensitive conditions.
- ***Institutional/ownership:*** Identification of institutional and ownership issues in areas that hold promise for new routes.

## HARLEM RIVER CROSSINGS

Identifying an appropriate and viable Harlem River crossing between the Bronx and Manhattan is a critical component of this project. There are three existing potential opportunities to cross from the northern tip of Manhattan to the Bronx:

- The Broadway Bridge
- The Henry Hudson Bridge
- Spuyten Duyvil swing bridge

There are also two new potential opportunities:

- Ferry Service
- Build a New Bridge

### The Broadway Bridge

The Broadway Bridge (figure 1) is owned by NYCDOT, and is currently well used by cyclists and pedestrians traveling from Manhattan to the Bronx. It is a designated bike

route connecting the neighborhoods of Inwood and Marble Hill, and has sidewalks on both sides. Located the farthest away from the Hudson River, and farthest from previously recommended greenway routes, it is physically least like a 'greenway'. However a link to the communities surrounding the bridge could be a valuable non-motorized transportation asset for the many residents that travel on Broadway and the surrounding corridors all the way up to Yonkers.



Figure 1: Broadway Bridge

### ***Broadway Bridge Gap Analysis Summary:***

***Physical Conditions:*** The width of the Broadway Bridge pedestrian and bicycle path is limited. The possibility of capturing the roadway shoulder for bicycle use will be explored.

***Accessibility:*** The east and west sidewalks are accessible from both Manhattan and the Bronx via Broadway.

***Connectivity:*** Of the existing potential crossings, the Broadway Bridge is located farthest away from the Hudson River and farthest from previously recommended multi use path routes. However, links to the multi use path and to key destinations such as St. Joseph's Hospital in Yonkers would be a valuable asset to communities located adjacent to the bridge and should be considered. The Broadway Bridge is on the assigned route of the East Coast Greenway ([www.greenway.org](http://www.greenway.org)).

***Environmental regulations and compliance:*** No issues identified.

***Institutional/ownership:*** NYCDOT owns the bridge and is currently planning a major capital project to replace the lower deck.

### **The Henry Hudson Bridge**

The Henry Hudson Bridge was constructed between 1935-1936, and its lower level walkway was used until recently by cyclists and pedestrians to travel between Inwood Hill Park and the Riverdale section of the Bronx (figure 2). Currently, this walkway is closed while the lower deck for the bridge is replaced, and is scheduled to remain closed until 2010. There is currently no crossing for pedestrians and cyclists over the Henry Hudson Bridge. When the pedestrian path was open it was not ADA compliant

for pedestrians nor compliant with AASHTO guidelines for cyclists. MTA Bridges and Tunnels, the owner of the structure, prohibited cycling on the bridge (cyclists were required to dismount and walk bicycles on the walkway).

The walkway on the east side of the upper level is not open to the public on the Manhattan side. Pedestrians and cyclists are able to access the walkway in the Bronx from Kappock Street. However, once on the Manhattan side, there is a padlocked gate prohibiting further access. There is no ramp leading from the walkway to Inwood Hill Park paths.



Figure 2: Henry Hudson Bridge Lower Walkway

#### ***Henry Hudson Bridge Gap Analysis Summary:***



Figure 3: Henry Hudson Bridge

***Physical Conditions:*** The width of the lower level walkway over the Henry Hudson Bridge is narrow and has obstructions in some areas. The upper level walkway is also narrow, but is free from obstructions until the locked gate on the Manhattan side that prohibits access to Inwood Park.

***Accessibility:*** There is currently no crossing for pedestrians and cyclists over the Henry Hudson Bridge. The lower level walkway is closed until 2010, and

the upper level walkway is not open to the public on the Manhattan (Inwood) side. The lower level walkway is not currently ADA compliant for pedestrians or AASHTO compliant for bicyclists.

***Connectivity:*** When the lower level walkway is reopened in 2010 it will provide a pedestrian-only connection between the woodland pathways of Inwood Hill Park in Manhattan and Riverdale in the Bronx.

***Environmental regulations and compliance:*** No issues identified.

***Institutional/Ownership:*** Creating a connection from the upper level walkway past the Henry Hudson toll plaza to pathways in Inwood Park would require cooperation and approval from the owner of the bridge, MTA Bridges and Tunnels. In addition, the plan would need support from NYCDPR and community, and environmental groups. Landmark status of the bridge must be determined.

## **Railroad Swing Bridge at Spuyten Duyvil**

The railroad swing bridge at Spuyten Duyvil was rehabilitated prior to introduction of Amtrak service on the line in 1985. The bridge has only one track that carries trains in two directions. The bridge pivots open to allow maritime traffic to move between the Harlem and Hudson Rivers and is left open overnight after midnight. Public access to the bridge is forbidden. A multi-use path on the bridge would be the most convenient route for the Greenway, especially considering NYCDPR plans to construct a waterfront path along the Hudson River shoreline adjacent to the tracks from Dyckman Street south to Fort Tryon Park. Access to the bridge for pedestrians and cyclists will require approval by Amtrak. It is not known whether Amtrak or Metro North is planning to use the space for a second track for service to Penn Station. Other concerns include potential security threats, liability concerns, potential effects on maritime operations and engineering concerns regarding the adequacy of the bridge to support the weight of additional structures if required.



*Figure 4: Railroad Swing Bridge at Spuyten Duyvil*

### ***Railroad Swing Bridge Gap Analysis Summary:***

***Physical Conditions:*** Pedestrian and bicycle use of the swing bridge brings up significant concerns about safety and owner liability. In addition, there are engineering issues with constructing a path and concerns about potential effects on train and maritime operations. There will also be disruptions to pedestrian and cyclist access when the bridge is open.

***Accessibility:*** The swing bridge is accessible to the railroad ROW on both the Manhattan and Bronx sides.

**Connectivity:** The railroad swing bridge provides connectivity along the shoreline for a continuous waterfront greenway route.

**Environmental regulations and compliance:** No issues identified.

**Institutional/Ownership:** Bicycle and pedestrian access to the bridge will require Amtrak cooperation and approval.

## UPPER MANHATTAN, INWOOD HILL PARK

### Access to the Broadway Bridge

There is currently no off-road access to the Broadway Bridge from upper Manhattan. Riders are currently directed to Seaman Avenue all the way to 218<sup>th</sup> Street. There is the possibility of placing a new path along the eastern border of Inwood Hill Park running parallel to Payson Avenue and connecting into existing walking paths adjacent to (and above) Payson Avenue. The area inside the park adjacent to Payson Avenue is designated by NYCDPR as a *Forever Wild* location. *Forever Wild* is an initiative of DPR to preserve and protect natural resources such as old growth forest and wetlands.



Figure 5: Sidewalk Fronting Columbia University's Baker Field

There may also be an opportunity to widen the sidewalk along 218<sup>th</sup> Street fronting Columbia University's Baker Field (figure 5), and use it as a shared sidewalk from Inwood Hill Park to the Broadway Bridge. The same could be explored for the sidewalk on the west side of Broadway from 218<sup>th</sup> to Broadway Bridge (figure 6). On the Bronx side of the Broadway Bridge, access is available via Broadway and adjacent streets.

### **Access to Broadway Bridge Gap Analysis Summary:**

**Physical Conditions:** No issues identified.

**Accessibility:** The potential of implementing off-road paths along the eastern border of Inwood Hill Park and widening of sidewalks on the north side of 218<sup>th</sup> Street and the west side of Broadway from 218<sup>th</sup> St to the bridge should be assessed on the Manhattan side (figure 6). On the Bronx side, the five-legged intersection of Broadway, W 230<sup>th</sup> St and Exterior St creates awkward and unsafe alignment.



**Connectivity:** Right-of-way may need to be coordinated with the following institutions at this location: St. Joseph’s Hospital, Columbia University, Shopping Mall, MTA subway stations.

**Environmental regulations and compliance:** An alignment along the eastern edge of Inwood Hill Park may abut *Forever Wild* – designated areas.

**Institutional/ownership:** Ownership of the sidewalk fronting Columbia University’s Baker field needs to be determined. Columbia University and NYCDOT would need to be consulted about the proposal to widen the sidewalks paths leading to the bridge. NYCDPR has a new path along the east side of Inwood Hill Park.



Figure 6: Sidewalk on West Side of Broadway between 218<sup>th</sup> Street and Broadway Bridge

### Access to the Henry Hudson Bridge

Access to the Henry Hudson Bridge lower level pedestrian walkway (currently closed for reconstruction) is via pedestrian paths, in Inwood Hill Park. Reaching the bridge on foot or by bicycle through the park is a challenge due to the high elevation of the bridge and the very steep and heavily wooded terrain. It is possible to ride west on Dyckman Street under the Henry Hudson Parkway and turn north into Inwood Hill Park by the river, climb a flight of stairs to a pedestrian bridge over the railroad tracks and then travel up the recently reconstructed pedestrian paths to the Henry Hudson Bridge. However, no signs currently mark the route to the bridge through the park. Access to Dyckman Street from areas directly south of the study area should also be considered including a NYCDPR proposal to build a connector segment from the current path terminus alongside the northbound Henry Hudson Parkway north to Dyckman Street. (figure 7)

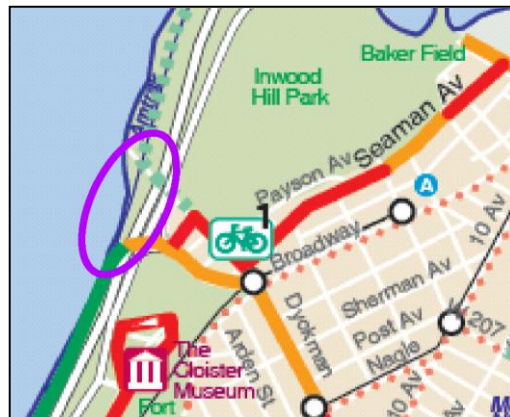


Figure 7: Gap between Manhattan Waterfront Greenway terminus and Dyckman Street

### Access to Henry Hudson Bridge Gap Analysis Summary:

**Physical Conditions:** Reaching the bridge on foot or by bicycle through the park is a challenge due to the high elevation of the bridge and the very steep and heavily wooded

terrain. Any improvements to this access would be need to be made within the public park and would need to be coordinated with NYCDPR.

**Accessibility:** No signage exists to direct path users to the Henry Hudson Bridge walkway. Alternative means to access and direct users to the bridge from Inwood Hill Park should be established. The pedestrian bridge across Amtrak is only accessible by stairs, and is therefore not ADA or AASHTO compliant.

**Connectivity:** No issues identified.

**Environmental regulations and compliance:** No issues identified

**Institutional/ownership:** No issues identified

### **Access to the Spuyten Duyvil Bridge**

North of Dyckman Street there is a paved path on parkland adjacent to the waterfront that extends almost to the Spuyten Duyvil Bridge. Aside from a fence, there are no physical barriers to the bridge from the park path. However, the path ends in a cul-de-sac approximately 100 yards from the bridge (See figure 7). Issues of property ownership and access to Amtrak ROW must be explored between the cul-de-sac and the Spuyten Duyvil Bridge. Another path hugs the waterfront South of Dyckman Street to 187<sup>th</sup> Street, at which point it ends, and provides no connection to other inland or waterfront paths in Manhattan.



*Figure 8: Railroad Swing Bridge at Spuyten Duyvil view from northern end of Inwood Hill Park at the Hudson River*

#### **Access to Spuyten Duyvil Bridge Gap Analysis Summary:**

**Physical conditions:** The possibility of creating the connection between the bridge and the park should be explored.

**Accessibility:** No issues identified.

**Connectivity:** Connects to Dyckman St, Manhattan Waterfront Greenway and points south.

**Environmental regulations and compliance:** Explore possible environmental compliance issues associated with extending a paved path or parkland near the shoreline. Coordinate with NYCDEC.

**Institutional/Ownership:** Determine property ownership south of the bridge and west of the tracks down to Inwood Hill Park.

## RIVERDALE, THE BRONX



Figure 9: Amtrak/Metro North tracks as seen from Riverdale Park at one of many locations where the chain link fence has been cut to allow pedestrian access

## Waterfront Alignment

The Bronx waterfront is poorly connected to the adjacent community to the east. (figure 9) Access currently exists only at the Metro North Riverdale Station at 254<sup>th</sup> Street where pedestrian access to the waterfront continues over the tracks on a bridge (seen in the background in figure 10). In addition, waterfront access and a park were constructed by NYSDEC at the train station (seen in foreground of figure 10)

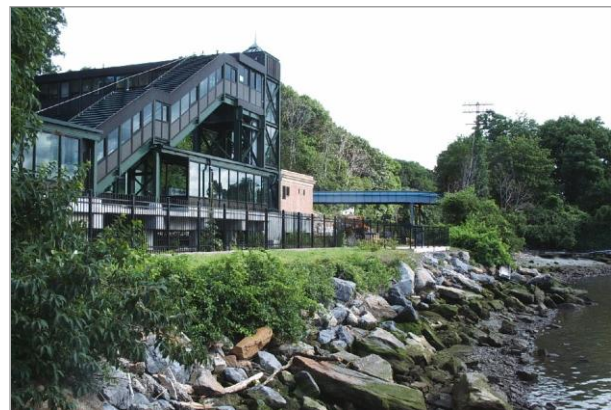


Figure 10: Metro North Riverdale Station

Holes in the chain link fence that border the tracks at other locations suggest that people are finding alternative, and potentially dangerous, routes to the river.

The waterfront is owned by a variety of public and private entities. Some sections are owned by MTA while NYCDPR owns a large portion in the form of Riverdale Park (from approximately 232nd St to 254<sup>th</sup> St). The College of Mount Saint Vincent owns a portion of waterfront property north of 261<sup>st</sup> Street. A number of private residences may still own rights to some portions of the waterfront north of the park. Identifying

ownership of lands will be critical to establishing a waterfront alignment for the greenway.

Identifying viable access points to the waterfront in Riverdale may also require studying the feasibility of new pedestrian/bicycle bridges over the railroad at one or more locations. The rail corridor is 100 feet wide, generally leaving between 3 and 30 feet between the rail corridor and the water. There are four railroad tracks in the corridor carrying Amtrak, Metro-North and CSX freight service.

### ***Waterfront Alignment Gap Analysis Summary:***

***Physical conditions:*** The width of the ROW within which the tracks run needs to be determined. Whether or not there is sufficient ROW to include a path and whether or not a path with the tracks (rail with trail), can be built between the water and the ROW needs to be investigated.

***Accessibility:*** Access to the waterfront from Riverdale currently exists only at the Metro North Riverdale Station at 254<sup>th</sup> Street. Identifying viable access points to the waterfront in Riverdale may require studying the feasibility of new pedestrian/bicycle bridges over the railroad at one or more locations.

***Connectivity:*** Due to the accessibility issues outlined above, a path constructed along the Riverdale waterfront would lack connectivity to other uses/destinations near the corridor.

***Environmental regulations and compliance:*** Environmental issues related to shoreline development and potential wetland encroachment must be explored.

***Institutional/ownership:*** The waterfront is owned by a variety of public and private entities and ownership is unclear in many places. In addition, creating new access points over the railroad tracks would require coordination with Amtrak, Metro North and CSX.

## **Inland Alignments**

In its Draft Greenway Plan released in 2004, NYCDPR describes its long-term vision for the preferred route utilizing the Henry Hudson Bridge from Inwood Hill Park to Riverdale, continuing along the water next to the railroad tracks and around the eastern perimeter of Mount St. Vincent College to the Westchester County line. However a more viable,



Figure 11: Palisade Avenue Trail

short-term alternative is described that utilizes Riverdale Park/Palisade Avenue (where a path in marginal condition already exists), through the Wave Hill property (figure 11), this route is described in Technical Memorandum #2, Literature Review). Federal funding has been secured for the portion of this route through northern Riverdale Park. Other routes to be considered are the designation of the Old Croton Aqueduct Trail and the abandoned Putnam Railroad right-of-way, both of which pass through Van Cortlandt Park in the Bronx.

One of the more important design issues to be addressed in the Bronx is the steep and varied terrain of Riverdale. Bicycling through Riverdale is challenging due to the many steep hills and narrow winding roads. A path along the river would be a flat easy ride by comparison.

Another challenge is the restrictive width of many of the streets and the relatively high traffic volumes on the few streets that go through all or most of the area. This means that on-street route alternatives have to choose between a circuitous route on hilly, narrow and winding local residential streets or, a more direct route utilizing the few large, busy arterials such as the Parkway service roads, Riverdale Avenue or Broadway (figure 12). Either way, cyclists will encounter a challenging route. Generally speaking, however, traveling north-south is much easier than traveling east-west.



Figure 12: shown left to right, Henry Hudson Parkway Service Road, Riverdale Avenue and Broadway

A less tangible yet potentially formidable challenge is the demographic composition of the area. Some sections of Riverdale, and Fieldston in particular (figure 13), are quite exclusive. Attaining public approval for a proposed regional bicycle path connection through local residential streets may prove politically challenging.

***Inland Alignment Gap Analysis Summary:***

***Physical conditions:*** A significant challenge is the restrictive width of many of the streets and the relatively high traffic



Figure 13: Fieldston Roundabout

volumes on the few streets that go through all or most of the area. An important design issue to be addressed is the steep and varied terrain of Riverdale. Traffic volumes along the Henry Hudson Parkway Service Road, Broadway and Riverdale Avenue need to be quantified in order to determine if one of these arterials is a viable route option.

**Accessibility:** The political issues identified above could limit accessibility through residential areas in Riverdale.



Figure 14: Riverdale home

**Connectivity:** In addition to analysis of the Riverdale Park/Palisade Avenue option through the Wave Hill property, other greenway links that should be considered are the Old Croton Aqueduct Trail and the abandoned Putnam Railroad right-of-way, both of which pass through Van Cortlandt Park in the Bronx.

**Environmental Regulations and Compliance:** Proposed pathway constructed in Riverdale Park could affect native plant flora.

**Institutional/Ownership:** Attaining public approval for a proposed regional bicycle path connection passing through residential neighborhoods (figure 14) may prove politically challenging. Some route alternatives may require the cooperation of easements from the Hebrew Home for the Aged and/or the College of Mount Saint Vincent.

## YONKERS

Yonkers is undergoing an impressive resurgence. New parks and a waterfront esplanade (figure 15) are being built. Residential condominiums are going up. (figure 16) Restaurants and bars are opening. The stretch of downtown Main Street to the water has been the focus of successive streetscape improvement projects.

Getting to the Yonkers waterfront from the Bronx, however, is quite challenging. Just south of downtown Yonkers, a



Figure 15: Downtown Yonkers Riverfront Esplanade and Water Taxi Dock

number of active industries back directly onto the Hudson River including a waste management company, American Sugar Refinery, a Westchester County sewage treatment plant and several other facilities. Where these businesses are located on the waters edge, public access is currently restricted. North of downtown Yonkers, the Glenwood Power Station will present another waterfront access challenge.



*Figure 16: New residential waterfront development in downtown Yonkers*

### **Waterfront Alignment/RiverWalk**

The possibility of a continuous pathway to provide additional shoreline access and scenic views along the Yonkers waterfront would be ideal. While the Yonkers waterfront is industrial and/or abandoned in places, a continuous multi-use path could be part of ongoing redevelopment efforts.

The RiverWalk, a plan envisioned by Westchester County, is a waterfront path that follows the Hudson River shoreline from the county border with New York City to Putnam County. The proposed path would use existing pathways, sidewalks, and new pathways where needed. Within Yonkers, a RiverWalk pathway has been designated from the New York City border to the northern boundary of the study area. However the development status of much of this area is not known. Major redevelopment projects on the waterfront that should be considered include the Alexander Street Master Plan and the Struever Fidelco Capelli waterfront development. Both plans propose building a continuous waterfront path and creating new park space for public use.

It is yet to be determined whether all segments of the RiverWalk in Yonkers would be suitable for biking and walking. For example, improvements to Warburton Avenue have been made as part of the Yonkers North Hudson Promenade project north of Trevor Park (figure 17). However, these are pedestrian improvements with no bicycle facilities provided. The greenway could overlap with this portion of the RiverWalk with bicycle improvements.



*Figure 17: RiverWalk on Warburton Avenue*

**Waterfront Alignment/RiverWalk Gap Analysis Summary:**

**Physical Conditions:** The physical conditions of portions of the RiverWalk that are currently under construction have yet to be determined, particularly in regard to their suitability for bicycling.

**Accessibility:** Access to a large portion of the Yonkers waterfront is currently restricted because of existing public and private waterfront industrial uses. Potential access points for greenway users should be identified.

**Connectivity:** As conceived, the RiverWalk will provide excellent connectivity throughout Yonkers to northern portions of Westchester County. However, the connection to New York City is not complete. Two key destinations served by the RiverWalk include the Waterfront Esplanade and JFK Marina/Trevor Park. The possibility of serving the Beczak Environmental Center (figure 18) and other local destinations should be examined.



Figure 18: Beczak Environmental Center

**Environmental regulations and compliance:** The environmental conditions of waterfront land, particularly where light industry exists and/or access is restricted, should be investigated. (figure 19) In particular, contaminated sites and other environmentally sensitive lands (wetlands, wildlife habitats, coastal zones) should be identified.

**Institutional/ownership:** Ownership should be determined where the RiverWalk is not yet constructed. Public access to the waterfront requires coordination with existing property owners and businesses.



Figure 19: Industrial uses along the Yonkers waterfront



## Inland Alignments

### *RIVERDALE AVENUE*

The topography of this part of lower Westchester County, just north of the Bronx line is dramatically different from that of Riverdale. Compared to Riverdale Avenue in the Bronx, Riverdale Avenue in Yonkers is relatively flat. It is also very wide, has a generous raised center island median for much of the way and appears to have excess vehicular capacity. All of these observations should be investigated further and confirmed through a program of traffic data collection. At first glance, Riverdale Avenue appears to be a good candidate for an interior urban greenway route. (figure 20)

#### *Riverdale Avenue Gap Analysis Summary:*

**Physical Condition:** Riverdale Avenue could serve as an on-street bikeway with adjacent sidewalk. The feasibility of creating an on-street path needs to be explored with traffic and accident and roadway capacity data.

**Accessibility:** None identified

**Connectivity:** While this corridor connects to Riverdale Avenue in the Bronx, the Bronx section of Riverdale Avenue may not be the best inland route through the Bronx.

**Environmental regulations and compliance:** No issues identified

**Institutional/ownership:** No issues identified

### *BROADWAY*

Similar to Riverdale Avenue in the Bronx, Broadway, in Yonkers, is characterized by a wide cross section that could provide an opportunity for on street bicycle facilities. (figure 21) These two avenues would either complement a scenic path along the Hudson or work as viable alternatives. Broadway is lined with many small shopping districts and St. Josephs Hospital,



Figure 20: Riverdale Avenue in Yonkers



Figure 21: South Broadway in the vicinity of St. Joseph's Hospital

a major generator of activity. St. Josephs employs many people that use public transportation. A link connecting this facility to the greenway would create a valuable alternative for daily commuters and hospital patrons.

***Broadway Gap Analysis Summary:***

***Physical Conditions:*** South Broadway could serve as on-street bikeway with adjacent sidewalk. However, the safety of creating this on-street path needs to be explored with traffic, accident and roadway capacity data.

***Accessibility:*** No issues identified.

***Connectivity:*** The South Broadway alternative is at the easternmost edge of the study area. East-west connections to other potential greenway alignments as well as to destinations within Yonkers, including the waterfront, would need to be defined. In addition, it is unclear whether the Old Croton Aqueduct State Trailway is continuous or whether a connection is missing on North Broadway between Walsh Road and Lamartine Avenue.

***Environmental regulations and compliance:*** No issues identified.

***Institutional/ownership:*** No issues identified.

**ALTERNATIVE ALIGNMENTS**

Though both Broadway and Riverdale Avenue are the most easily recognizable inland options, the needs of local residents must be closely considered. Alternatives that require further study include Hawthorne and Sunnyside Avenues.

***Sunnyside Drive***

Sunnyside Drive runs north-south in the study area between Valentine Lane and Pier Street. When combined with Bridge Street and Ludlow (which crosses the railroad tracks), Sunnyside offers a connection between Valentine Lane and the waterfront.

***Hawthorne Avenue***

Hawthorne Avenue runs north-south through the study area between Main Street and Depeyster Street. (figure 22) A portion of Hawthorne is already designated as part of the RiverWalk.



Figure 22: Hawthorne Avenue in a residential neighborhood

***Alternative Alignments Gap Analysis Summary:***

***Physical Condition:*** Both alternatives could serve as on-street bikeway with adjacent sidewalk. The safety of creating an on-street path needs to be explored with traffic, accident and roadway capacity data.

***Accessibility:*** No issues identified.

***Connectivity:*** East-west connections to other greenway portions as well as to destinations within Yonkers, including the waterfront, need to be defined.

***Environmental regulations and compliance:*** No issues identified.

***Institutional/ownership:*** No issues identified.

***EAST-WEST CONNECTIONS***

Valentine Lane runs across the entire width of the study area in southern Yonkers and could provide a connection between South Broadway and the RiverWalk or between intermediate portions. While Valentine Lane is the southernmost option, several other continuous east-west roadways exist in the southern portion of Yonkers.



*Figure 23: Old Croton Aqueduct Trail*

In the portion of the study area north of downtown Yonkers, the Old Croton Aqueduct (OCA) Trail (figure 23) travels quite close to the Hudson River but actual linkages to the shoreline are lacking. Connections may be made using existing streets.

***East-West Connections Gap Analysis Summary***

***Physical Condition:*** Valentine Lane could serve as on-street bikeway with adjacent sidewalk. However, the safety of creating an on-street path needs to be explored with traffic data, accident data, and typical section development. A similar assessment would need to be made of various on-street options in the northern study area.

***Accessibility:*** No issues identified.

*Connectivity:* Ensuring connectivity between the OCA Trail and the waterfront is the key issue in the northern portion of the study area.

*Environmental regulations and compliance:* No issues identified.

*Institutional/ownership issues:* May require assessment of land ownership if on-street options are not feasible.

Figures 24 (Bronx and Manhattan) and 25 (Yonkers) graphically depict the gaps identified in the text above.

## COMPILED DATA

### Yonkers

- Traffic counts for various roadway segments in Yonkers: McLean Ave, Lake Ave, Manor House Sq, Radford St, Roberts Ave, Warburton Ave, Glenwood Ave. Data collected from June 12-18 2006 and May 21-27 2007.

Source: Westchester County Department of Public Works. Accessed at <http://www.westchestergov.com/dpw/Traffic%20Counts/yonkerscounts.htm>

### Westchester County/The Bronx

- NYSDOT Continuous Count Location: Broadway @ Westchester County / Bronx County Line. Data collected Jan - Sept 2006.

Source: New York State Department of Transportation (NYSDOT). Accessed at <https://www.nysdot.gov/portal/page/portal/divisions/engineering/applications/traffic-data-viewer>

### Manhattan/The Bronx

- Select bicycle trails evaluated for condition of trail, signage, markings, etc., including Dyckman St / Staff St, Seaman Ave, and Moshulu Pkwy. Data collected from July-Nov 2006.

Source: New York City Department of City Planning (NYCDCP). Accessed at [http://www.nyc.gov/html/dcp/html/transportation/nycbl\\_inventory.shtml](http://www.nyc.gov/html/dcp/html/transportation/nycbl_inventory.shtml)

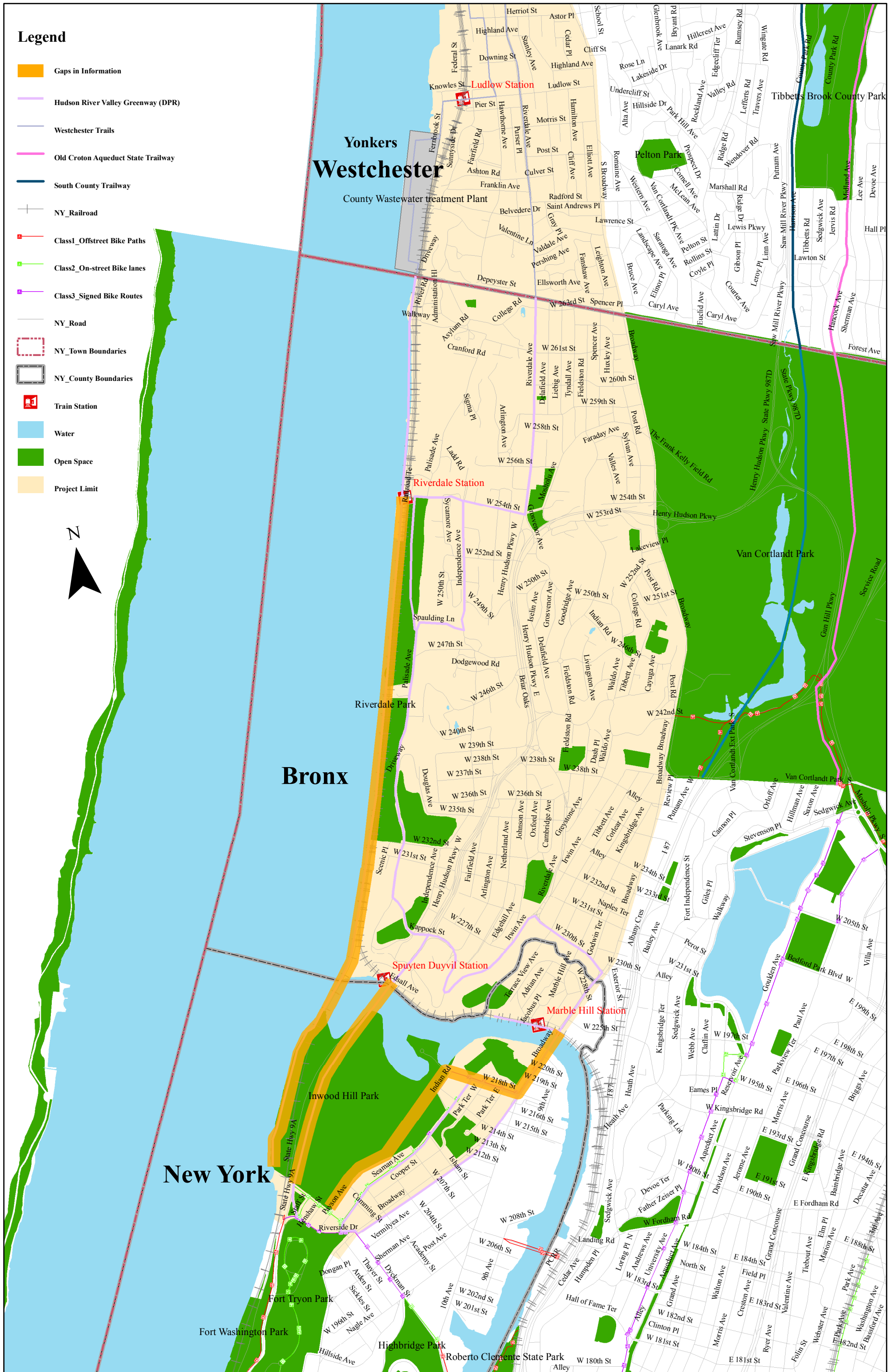
### Manhattan/The Bronx/Yonkers

- Weekday and weekend ped, bike, and auto counts for various multi-use pathways: Staff St / Riverside Dr, Dyckman St / Broadway, Hudson River Path @ Dyckman Fields, Waterfront Path @ Inwood Hill Park, Broadway Bridge, Hudson Bridge Ped Path, W230 / Broadway, W232 / Palisades Ave, Hudson Pkwy NB Serv RD between 250 St & 252 St, Hudson Pkwy SB Serv RD between 250 St & 252 St, 254 / Palisades Ave, Moshulu Ave/ Broadway, Old Putnam RR Trail/Van Cortland Golf House, Warburton Ave/Odell Ave. Data collected from May - Sept 2004 and July - Aug 2005.

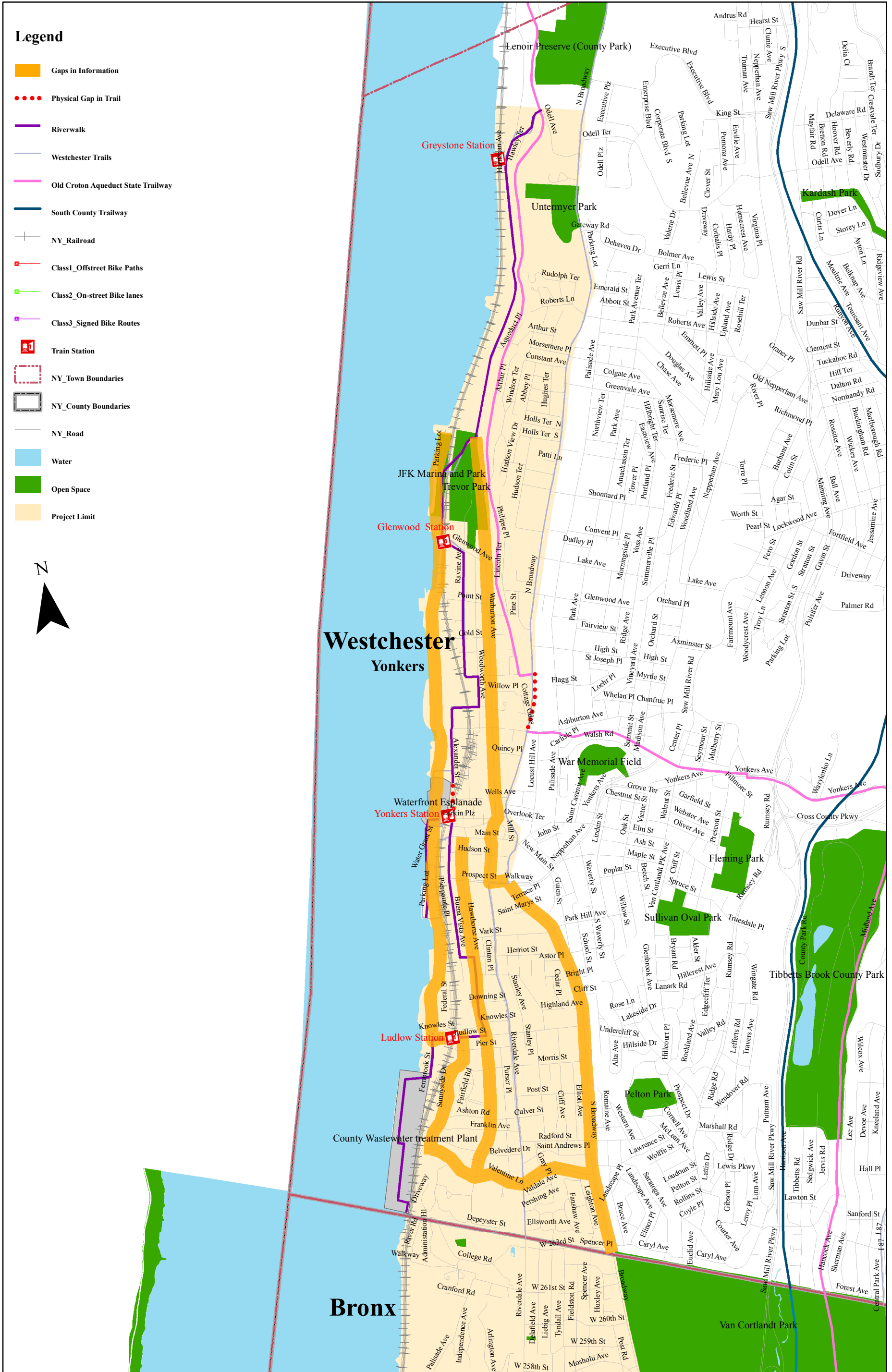
Source: New York Metropolitan Transportation Council. Accessed at [http://www.nymtc.org/project/NYMTC\\_Bicycle\\_Data\\_Collection\\_Program/www\\_html/index.htm](http://www.nymtc.org/project/NYMTC_Bicycle_Data_Collection_Program/www_html/index.htm)

- 2006 ADTs for Broadway, Riverdale Avenue, and Henry Hudson Parkway.

Source: NYSDOT. Accessed at <https://www.nysdot.gov/portal/page/portal/divisions/engineering/applications/traffic-data-viewer>



**Hudson River Valley Greenway Link  
Bronx and Manhattan Gap Analysis  
Figure 24**



**Hudson River Valley Greenway Link**  
**Yonkers Gap Analysis**  
**Figure 25**

1 inch = 1,800 feet