River Road/Hudson Waterfront Corridor Strategy: A Phase Two Study

FINAL REPORT

June 2013

Prepared for:

NJTPA
NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

Prepared by:

THE Louis Berger Group, INC.

in association with:

RBA

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and

Amercom Corporation

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June, 2013

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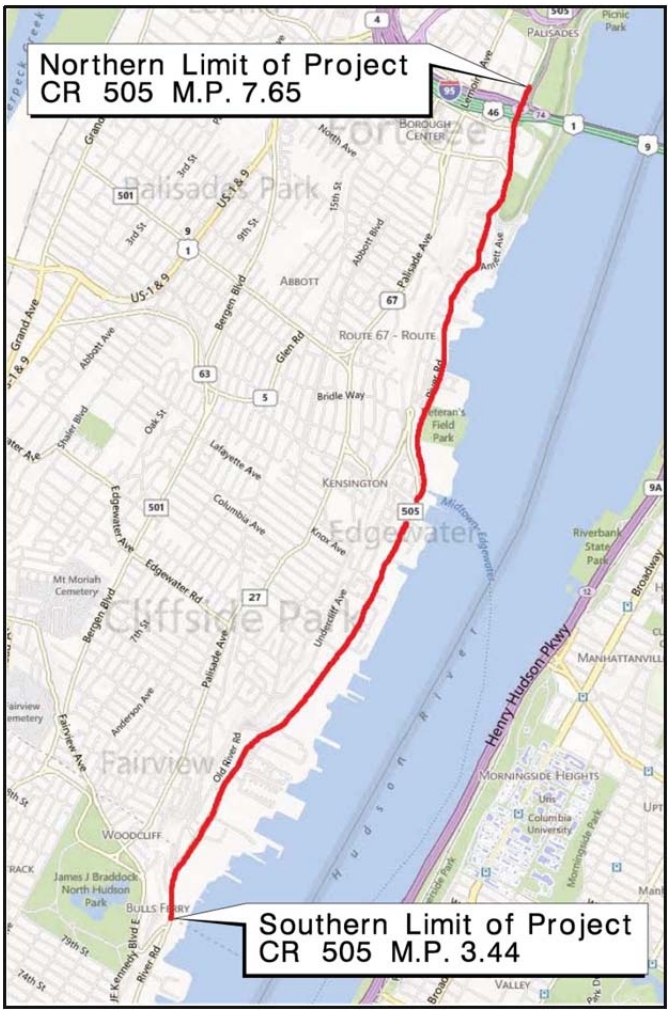
1. Executive Summary

The Hudson River waterfront in Bergen County is among the most densely populated landscapes in the entire state of New Jersey. This unique landscape is a narrow strip sandwiched between the Hudson River to the east and the Palisades to the west. The corridor represents a critical link for Bergen County and other North Jersey residents accessing job centers in New York City, Jersey City, and the region at large. Therefore, this study is to promote regional and multi-jurisdictional strategies to better accommodate pedestrians, bicyclists and transit riders in the River Road corridor. While improvements to River Road have been made incrementally by Bergen County over the years, this study is to provide the opportunity to view the corridor as a whole, addressing issues and recommending improvements necessary to sustain current and future development. This study has examined access and safety with respect to transit services, as well as continuity and connectivity for pedestrians and bicyclists.



Project Area

This Study is Federally-funded through the North Jersey Transportation Planning Authority (NJTPA), the Metropolitan Planning Organization (MPO) for the 13-county northern and central New Jersey region, of which Bergen County is a part. The study project area is located along an approximately 4-mile stretch of County Route 505 (River Road) from Edgewater's boundary with Hudson County in the south (Milepost 3.44) to Sylvan Street in the Borough of Fort Lee (Milepost 7.65). This technical study planned and developed improvements to mobility, accessibility, safety, and quality-of-life along the River Road Corridor in the Boroughs of Edgewater and Fort Lee, Bergen County, New Jersey. This effort built upon the recommendations and established momentum put forth in the previous technical study effort, entitled *The River Road/Hudson Waterfront Circulation Study*, which took a broader-brush approach in looking at overall corridor operations, issues, and opportunities in both Hudson and Bergen Counties. This second phase of the study focused on the River Road corridor within Bergen County and concentrated on developing a series of improvements and complimentary mobility strategies for pedestrians, bicyclists, and transit riders within the corridor.

1.1 Public Outreach and Interagency Coordination

The intent of this early public involvement and coordination was to commit to a continuous and comprehensive Community Involvement process to inform and involve stakeholders in the process and provide the opportunity for frequent and meaningful public feedback, and to coordinate the public activities through the early planning process. A series of project team meetings and conference calls were held to discuss logistics and details in preparation for, and facilitation of, upcoming Technical Advisory Committee, Public Information Center, and NJ TRANSIT meetings to assist in the development of a shared vision for the future of the River Road Corridor, in general.

The project team developed a user-friendly website that is hosted on Bergen County's Department of Planning & Economic Development website (http://www.co.bergen.nj.us/index.aspx?nid=752). The website was designed to have a similar look as the website developed for the first phase of the study and features simple-to-use navigation to share information about the project with the County staff, project stakeholders, and the general public.

During the project development process, a series of Technical Advisory Committee (TAC) meetings were held at critical milestones throughout the project's development.

During the project development process, a series of Technical Advisory Committee (TAC) meetings were held at critical milestones throughout the project's development. The responsibilities of the TAC included: providing feedback to the project team; identifying stakeholders, community groups and partners associated with community outreach to participate in various public outreach activities; develop, guide and participate in community involvement activities; and guide the development and direction of the project.

Technical Advisory Committee (TAC) members included the following:

- Bergen County
  - Department of Planning and Economic Development
  - Engineering Department
- North Jersey Transportation Planning Authority
- Edgewater Borough
  - Public Officials
  - Department of Public Works
  - Engineers
  - Police Department
  - Shade Tree Board
- Fort Lee Borough
  - Public Officials
  - Engineers
  - Police Department
  - Regional Chamber
- NJ TRANSIT
- New York Waterway
- Port Authority of New York and New Jersey
- Meadowlink
- Hudson River Waterfront Conservancy
- Rutgers Voorhees Transportation Center
- East Coast Greenway Alliance
- New Jersey Sierra Club
- New Jersey Bike & Walk Coalition
- Bicycle Touring Group of North Jersey

The members of the TAC provided historic and local knowledge and the vision necessary to comprehensively address the needs of the study areas. The Technical Advisory Committee convened two (2) times during the project in the Meeting Room of the Edgewater Community Center. These meetings occurred prior to the public meetings to ensure local officials were briefed on the project prior to the public having access to the information. Appendix A provides minutes of the Technical Advisory Committee meetings.

As noted above, the Technical Advisory Committee included members from the Borough of Edgewater. The project team made a separate presentation of the study and proposed improvements to the Borough of Edgewater's Mayor and Council on Monday, April 1, 2013. The Borough of Edgewater expressed concerns with some of the recommendations in the proposed plan. Their concerns are articulated in Resolution 2013-11, which was adopted by the Mayor and Council on April 15, 2013 and is included in Appendix A.

The goal of all project-related public outreach was to engage a broad representation of the public in the project process, and provide opportunities to ensure a diversity of ideas and viewpoints are incorporated into discussions of mobility and safety issues. The public outreach communications utilized print and electronic media, including a project website, municipal websites, flyers, press releases, and a project email list in order to build awareness about the project, solicit feedback about community preferences and generate public attendance at public meetings. The purpose of the public information meetings was to seek input, present concept improvements and recommendations and address concerns of the local residents in a public forum. These meetings provided an opportunity for stakeholders and residents to provide input and share comments regarding the existing problems and issues within the corridor and the various conceptual

improvements that were considered during the project. Two (2) Public Information Centers were held in the Meeting Room of the Edgewater Community Center.

In addition to NJ TRANSIT employees participating in the Technical Advisory Committee Meetings, two (2) meetings were held at the NJ TRANSIT offices in Newark, New Jersey. The first meeting was held on Friday, July 13, 2012. The purpose of this meeting was to discuss the NJ TRANSIT issues and needs throughout the study corridor. Minutes of the meeting are included in Appendix A.

As a part of the public outreach efforts for this study, an online survey was developed to solicit public input about the existing issues and concerns throughout the River Road corridor and to gather information about the current use of the corridor. Survey questions included topics regarding general travel, walking, transit, and bicycling. A link to the survey was added to the project website, as well as the websites of Edgewater Borough, Fort Lee Borough, Bergen County, and the NJTPA. Notification of the survey was sent to a project email list, and the newspaper The Record published an article about the project on their website, www.northjersey.com, including a link to the project website and the online survey. Participants were encouraged to include contact information with the purpose of being informed on future public meetings.

1.2 Existing Conditions

Within the study area, River Road is classified as Bergen County Route 505, and its functional class is an Urban Minor Arterial south of State Route 5 and Urban Principal Arterial north of State Route 5. Principal Arterials are, by definition, classified as serving primarily mobility needs, regional travel, and providing a moderate degree of land access, with a minor arterial characterized as carrying more of a mix of local and regional volumes than a principal arterial and providing a higher degree of local access. Within the study area, River Road is primarily a two, four or five lane cross-section with several variations of lane configurations to accommodate various turning movements at intersections and driveways. Shoulder widths vary from zero to fourteen feet. A portion of the study area includes a painted median, and a short section in the vicinity of Gorge Road has a raised median curb. The speed limit within the study area is 35 miles per hour throughout. As reported in the Phase 1 study, the average daily traffic on River Road ranges from approximately 37,000 vehicles north of Old River Road, to 34,000 vehicles south of Bulls Ferry Road, and 25,000 vehicles north of North Street.

As part of the project, the project team completed field survey and mapping efforts. As part of this work, mapping was completed with the use of high level fixed wing mapping at a scale of 1”=20’ completed in AutoCAD across a bandwidth of 300 feet. A digital terrain model was developed allowing cross sections and profiles of the existing alignments to be taken at proposed locations allowing accurate assessments of all alternatives developed. Utilizing GPS, a control monument network tied to the NAD 83 and NAVD 88 coordinate systems was established through the project corridor. These control monuments were used for tying the mapping with all its features into the project coordinate system as well as being used to tie down the existing roadway baseline.

1.3 Environmental Screening

The environmental screening was based upon a review of GIS-based environmental mapping and database information available from the New Jersey Department of Environmental Protection. GIS environmental constraints maps were prepared and relevant constraints and environmentally sensitive areas are outlined in section 4.2. The GIS Environmental Constraints Maps are included in Appendix D. It should be noted that the screening is preliminary in nature. As more detailed plans/layouts are developed in a further phase, more in-depth and detailed environmental investigations will be necessary to more definitively determine the need for environmental permits and whether or not conceptual designs that are advanced meet permitting criteria. Said future investigations may require more detailed, field based investigations in the vicinity of proposed improvements.

1.4 Pedestrian Facilities

The condition of pedestrian facilities varies throughout the study area. While existing sidewalk conditions are generally good, a number of gaps in the network were identified. Primarily in the southern section several worn paths indicating unmet pedestrian demand were observed, while in the northern section it was not uncommon to spot a pedestrian walking along the side of the road. There are significant portions of sidewalk within the corridor that do not meet the guidelines set forth by the Americans with Disabilities Act (ADA) and the Public Right-of-Way Accessibility Guidelines (PROWAG). These cases range from overgrown shrubbery to crumbled sidewalk and missing handicap curb ramps.

River Road is a heavily travelled corridor with many attractions on both the northbound and southbound sides of the roadway; however, crossing River Road on foot is difficult throughout the study area due to missing sidewalks, the width of the road, substandard curb ramps and sidewalks, short crossing signals (which can be seen in section 1.8) and a lack of safe crossings.

There is a total of 13,100 linear feet of sidewalk that is either missing or in poor condition. Sidewalk was deemed substandard if it did not meet ADA and PROWAG design guidelines. These requirements state that a path of travel includes an unobstructed way of pedestrian passage. These pathways are required to have a minimum width of 60 inches to allow for two streams of traffic; however, sidewalk with a width of less than 60 inches is acceptable as long as there is a passing space greater than 60 inches at an interval of no more than 200 feet. The sidewalks are also required to have a minimum of 36 inches to travel around obstructions such as utility poles or fire hydrants. The Project team declared sidewalk to be in poor condition if it was excessively cracked, crumbled or displayed areas of ponding.

Throughout the study area there is a total of 8,000 feet of gaps in the existing sidewalk on both the east (northbound) and west (southbound) sides of River Road as shown on the Existing Conditions Pedestrian Facilities Maps, found in Appendix H. In the southern section of the study area there is the largest running gap in the sidewalk, 2,000 feet, between Thompson Lane and Old River Road (at the Edgewater Commons). Pedestrians were observed traversing through knee-high grass and walking through nearby parking lots in order to safely travel to a point where they could cross River Road. This segment of missing sidewalk has become a worn path utilized by pedestrians to access transit stops and shops along River Road.

1.5 Transit Facilities

Numerous transit routes are available within the River Road study area. Available transit includes bus and ferry, providing access to and from local destinations within New Jersey and regional destinations in Manhattan. Operators within the study area include NJ TRANSIT, New York Waterway (NY Waterway), and private shuttle buses. NJ TRANSIT has six (6) Bus Routes, 156, 158, 159, 188, 751, and 755, that service the corridor as well as its surrounding areas. The corridor has high ridership. NJ TRANSIT provided ridership numbers which can be seen in Section 4.7 of this report and Appendix J. Further, several shuttle routes are available to individual residential and commercial developments. Transit access, including transit routes, ferry terminal locations, bus stops, and shuttle connections are detailed in Appendix I.

One ferry terminal is located within the study area. The Edgewater Ferry Landing terminal, owned and operated by NY Waterway, provides service to the Midtown/West 39th Street terminal in Manhattan. An additional ferry terminal, Port Imperial/Weehawken, is located south of the study area in the Township of Weehawken, Hudson County. This ferry terminal is also owned and operated by NY Waterway and provides service to the Midtown/West 39th Street terminal in Manhattan, as well as two other terminals in Manhattan, the Pier 11/Wall Street terminal and the World Financial Center terminal.

1.6 Bicycle Facilities

There are numerous constraints to bicycling along the River Road corridor that are evident throughout the corridor or unique to specific target areas. There are intersection crossing issues, land development constraints, steep slopes, and bicycle disconnects. Constraints are usually conditions that pose a hurdle to attaining a desired goal – but often they provide opportunities for overall improvement. Some of the major bicycle travel constraints include:

- Lack of consistent shoulder or lane widths reduces predictability
- Lack of designated on-road bicycle facilities forces many to ride on the sidewalk
- Lack of bicycle loop detectors in the pavement inhibit bicycle traffic from following traffic signals
- Numerous right and left turn lanes conflicts

1.7 Conceptual Improvements

The purpose of this study is to improve overall corridor safety and mobility for non-motorized modes of travel, and enhance the livability and economic vitality of the corridor. Corridor-wide improvement concepts were developed to address the safety and mobility issues identified based on information gathered from the first phase of this study, field

investigations conducted by the project team, crash data, and public concerns and suggestions received through the project's community outreach.

The proposed corridor-wide improvement concepts have been organized in to long-term, mid-term, and short-term recommendations. The long-term recommendations were designed to best encompass the vision of the corridor that would accommodate pedestrians, bicyclists, and transit users. The recommendations in the long-term concept are anticipated to take more than 5 years to construct, and the pedestrian, transit, and bicycle improvements may include some roadway widening, right-of-way acquisitions, and drainage and utility impacts, but they do not include any impacts to existing buildings. The recommendations in the mid-term concept have a construction time frame of 3 to 5 years. These improvements could be made as part of future repaving along the corridor, and may require some right-of-way acquisitions. The recommendations in the short-term concept have a construction time frame of less than 3 years. These improvements would provide some "quick fixes" to some of the identified problems within the corridor.

Long-term Concept

The long-term concept for the River Road corridor includes improvements to bicycle, pedestrian, and transit facilities that best encompass the long-term vision of the corridor. These improvements are shown on the Long-Term Improvement Concept Plans, located in Appendix L. Below is a summary of these improvements:

- Reduce the travel lanes to 11-foot lanes, which will be striped with high visibility reflective markings, to accommodate both on-road and off-road bicycle facilities.
- Build an off-road shared use path along the east side (northbound) side of River Road. The 10-foot path should be continuous and separated by a 6-foot vegetative buffer or a 2-foot barrier. Install yield priority signs along the shared use path to reinforce that bicycle traffic must yield to pedestrians.
- On the west side (southbound) of River Road create a connected system of pedestrian facilities throughout the corridor by installing a 5-foot sidewalk where it is missing or is physically deficient.
- Install a 5-foot bike lane along both sides of River Road. The bike lane will be continuous and paired with a designated painted buffer space separating the bicycle lane from the adjacent motor vehicle travel lane. For most of the corridor the buffer is 2-foot wide with limited exceptions. Buffers appeal to a wider cross-section of bicycle users because they provide greater shy distance between motor vehicles and bicyclists. In addition, buffers provide space for bicyclists to pass another bicyclist without encroaching into the adjacent vehicle travel lane.
- Install ADA compliant curb ramps and detectable warning surfaces at locations where they are missing or substandard. This improvement is also part of the mid-term and short-term concepts.
- Install pedestrian hybrid beacons at five (5) locations within the corridor to provide safe crossings for pedestrians, which is also part of the mid-term concept.
- Adjust pedestrian crossing times at signalized intersections in order to provide adequate time for pedestrians to cross the roadway, which is also part of the mid-term and short-term concepts.
- Where necessary, replace pedestrian signal heads with a countdown display pedestrian signal head to help pedestrians assess how much time they have to finish crossing the street, which is also part of the mid-term and short-term concepts
- Consolidate and/or eliminate bus stops to provide shorter bus trips due to less stops; and therefore less dwell time, higher speeds, and decreased travel time.
- Install a series of bus stop alternatives that provide bus bays at bus stops throughout the corridor; and therefore, a protected area for both the transit users and the stopped bus away from the travel lane, providing safe access for the transit users and reduce delay to vehicles traveling on River Road. These alternatives are also part of the mid-term concept.
- Install ADA compliant bus shelters at existing bus stops, which is also part of the mid-term and short-term concepts.

- Install intersection crossing markings to guide bicyclists on a safe and direct path through intersections, including driveways, which is also part of the mid-term concept.
- Install "through bike lanes" where there are bike lanes and right-turn only lanes at intersections to assist bicyclists to correctly position themselves to avoid conflicts with turning vehicles.
- Install colorized advance bicycle boxes at high conflict locations especially where there are frequent bicycle left-turns and/or motorist right-turns. This is also part of the mid-term concept.
- Install shared lane markings along the corridor. Frequent, visible placement of markings is essential. Along River Road they should be placed every 50-100 feet. While generally not a preferred treatment on higher volume streets, shared lane markings help to reinforce the legitimacy of bicycle traffic on the street and recommend proper bicyclist positioning. Because shared lane markings do not designate a particular part of the roadways for the exclusive use of bicycles they are not considered a facility type. Rather, a shared lane marking is a pavement marking that is used to support a complete bikeway network.

Mid-term Concept

The mid-term concept for the River Road corridor includes the following improvements. These improvements listed below are in addition to the improvements noted above in the long-term concept section that are also part of the mid-term concept.

- On both sides of River Road create a connected system of pedestrian facilities throughout the corridor by installing a 5' sidewalk where it is missing or is physically deficient. This is also included as part of the short-term concept.
- Install 5-foot bike lanes where there is sufficient right-of-way; sharrows should be utilized where there is insufficient space for bike lanes.
- Install "through bicycle lanes" where there are bike lanes and right-turn only lanes at intersections in order to assist bicyclists to correctly position themselves to avoid conflicts with turning vehicles. Where there isn't room for a through bicycle lane, a combined bicycle lane/turn lane should be considered, especially along the southern four-lane portion of the corridor.
- Provide bicycle detection at all signalized intersections.
- Install wayfinding signs to key destinations with the direction, distance, destination and riding time for bicyclists from current location including connections to the Hudson River Waterfront Walkway.
- Enhance gateway treatments such as welcome signs and landscaping at the northern entrance of the corridor near Bruce Reynolds Boulevard, at State Route 5 and the southern border of the county near Churchill Road.

Short-term Concept

The short-term concept for the River Road corridor includes the following improvements. These improvements listed below are in addition to the improvements noted above in the long-term concept and mid-term concept sections that are also part of short-term concept.

- Install shared lane markings along the corridor. Frequent, visible placement of markings is essential. Along River Road they should be placed every 50-100 feet. While generally not a preferred treatment on higher volume streets, shared lane markings help to reinforce the legitimacy of bicycle traffic on the street and recommend proper bicyclist positioning. The shared lane marking is not a facility type, it is a pavement marking.
- Install "MAY USE FULL LANE" signs (R4-11) along the northern 4-lane segment of the corridor where no bicycle lanes or adjacent shoulders usable by bicyclists are present and lane widths are <14'.
- Install bicycle "WRONG WAY" signs and "RIDE WITH TRAFFIC" plaques (R5-1b, R9-3CP) back-to-back with other signs to minimize visibility to other traffic where wrong-way riding by bicyclists is frequently observed.
- Create secure and safe bicycle parking at key bicycling destinations (or starting points) including schools, shopping centers, recreational facilities, public buildings, and parks throughout the corridor.

- Provide and promote bicycle parking, showering and clothes changing facilities at worksites, transportation terminals, and other destinations.
- Conduct a feasibility study to determine a suitable location to install a bicycle repair station for commuters and residents to ride their bikes to the ferry terminal with secure, sheltered parking.
- An unsignalized mid-block crosswalk will be striped at Maple Street and pedestrians will be directed with signage to cross at this location and at Central Avenue, north of Henry Hudson Drive.

1.8 Concept Improvement Components

Following is a description of specific components that are part of the long-term improvements concept, as shown in the Long-Term Improvement Concept Plans, located in the Appendix L. The description below highlights where these improvement concepts can be "scaled back" to facilitate installation and minimize impacts.

1.8.1 Pedestrian Hybrid Beacons

There are several areas where it is difficult for pedestrians to cross River Road due to the absence of a safe crossing, either a traffic signal with crosswalks or a mid-block crosswalk. In order to provide safe crossings for pedestrians throughout the corridor, the project team reviewed the location of existing NJ TRANSIT bus and NY Waterway ferry shuttle stops and ridership data, the distances between existing signalized intersections with safe crossings, the pedestrian crash data from the corridor, and land uses in the area. This information led to the recommendation of installing five (5) pedestrian hybrid beacons within the corridor to provide safe crossings for pedestrians. More specifically, these locations were selected for a combination of reasons including proximity to an existing bus stop, distance from a signalized intersection, high bus and shuttle ridership, and nearby land uses.

The locations of the proposed pedestrian hybrid beacons are listed below and are shown on the Long-Term Improvement Concept Plans. These locations will include the installation of signage and marked crosswalks with the pedestrian hybrid beacon.

- Milepost 5.25 at Garden Place
- Milepost 5.82 at the Admiral's Walk Driveway
- Milepost 6.28 at North Street
- Milepost 6.84 at Maple Street
- Milepost 7.15, 325 feet north of Henry Hudson Drive

The installation of the pedestrian hybrid beacons is part of both of the long-term and mid-term improvements. The hybrid beacons are not included as part of the short-term improvements, but due to the existing wide pavement at Maple Street (Milepost 6.84), it is proposed to have an unsignalized mid-block crosswalk as part of the short-term improvement concept.

1.8.2 Traffic Signal Timing Revisions

Pedestrian crossing times at the 13 signalized intersections within the study area were reviewed. Based on this review, it was found that pedestrian crossing times at only two of the signalized intersections meet the current standards of the 2009 Manual on Uniform Traffic Control (MUTCD) for all pedestrian crossings at the intersection. The following intersections require adjusted pedestrian timings in order to comply with the MUTCD, 2009 Edition and provide adequate time for pedestrians to cross the roadway safely. Unless otherwise noted below, Bergen County maintains jurisdiction of these traffic signals.

- River Road & Old River Road / Unilever Driveway
- River Road & Gorge Road / City Place
- River Road & Thompson Lane
- River Road & Edgewater Commons / Old River Road
- River Road & Archer Street
- River Road & Hilliard Avenue

- River Road & Dempsey Avenue
- River Road & NJ Route 5 (NJDOT jurisdiction)
- River Road & Glenwood Avenue
- River Road & Orchard Street (Borough of Edgewater jurisdiction)
- Hudson Terrace & Bruce Reynolds Boulevard (Port Authority jurisdiction)

These signal timing improvements are part of the short-term improvements and will be carried through to the mid-term and long-term improvements.

1.8.3 Replacement of Pedestrian Signal Heads

Of the 13 traffic signals within the corridor 11 were noted to have pedestrian signal heads that do not have a countdown display. Based on this review, it is recommended that the pedestrian signal heads at the following intersections be replaced with pedestrian signal heads with a countdown display, as recommended by New Jersey Department of Transportation and in compliance with the 2009 MUTCD standards. Unless otherwise noted below, Bergen County maintains jurisdiction of these traffic signals.

- River Road & Old River Road / Unilever Driveway
- River Road & Gorge Road / City Place
- River Road & Thompson Lane
- River Road & Edgewater Commons / Old River Road
- River Road & Archer Street
- River Road & Hilliard Avenue
- River Road & Dempsey Avenue
- River Road & NJ Route 5 (NJDOT jurisdiction)
- River Road & Glenwood Avenue
- River Road & Orchard Street (Borough of Edgewater jurisdiction)

The countdown display helps pedestrians assess how much time they have to finish crossing the street. These improvements are part of the short-term improvements and will be carried through to the mid-term and long-term improvements. These improvements can also be made at the same time as the traffic signal timing revisions.

Additionally, it was noted during the field survey that the intersection of River Road and Central Avenue is currently operating in flashing mode. The pedestrian signal heads at the intersection have a countdown display, but were dark and not operational. It is recommended that the pedestrian signal heads, push buttons, and associated signs should be covered while this traffic signal is operating in flashing mode. It is assumed that the pedestrian signal heads will be operational when the traffic signal is in full operation.

1.8.4 Consolidation and Elimination of Bus Stops

The Project team reviewed the location of the existing bus stops within the corridor and compared the locations with the NJ TRANSIT bus ridership data and the existing condition information gathered during the field inventory. Each bus stop location was reviewed for three criteria: the absence of a safe crossing, low ridership, or proximity to another existing bus stop. According to the Transit Cooperative Research Program (TCRP) Report 19, “Guidelines for the Location and Design of Bus Stops,” the bus stop spacing for urban areas range from 500 to 1200 feet, and the typical spacing is 750 feet. Based on this review, there are some bus stop locations within the corridor that are proposed to be either eliminated or consolidated as part of the mid-term and long-term improvements. The disadvantage to the elimination or relocation of these stops would be that the stops are farther apart requiring longer walking distances, but the advantage would be shorter bus trips due to less stops; and therefore less dwell time and higher speeds. In addition to shorter bus rides, traffic flow throughout the corridor would improve with the elimination or consolidation of stops and consolidated stops would enable the provisions of more amenities and safety features.

1.8.5 Bus Bays

In addition to the long-term corridor-wide concepts that have been developed, a series of bus stop alternatives have been developed with the help of NJ Transit that provide bus bays at bus stops throughout the corridor. The locations of these stops are detailed below in Table 1-1. These locations were selected because of ridership of they were locations that had few physical constraints. As shown in the Bus Stop Alternative Plans included in Appendix M, the specifics of each bus stop alternative vary, but they each provide a bus bay and waiting area. The layout as shown on the plans has been developed with the New Jersey Department of Transportation (NJDOT) bus turnout design criteria.

Table 1-1
Bus Stop Alternatives

Existing Bus Stop Location	Direction of Travel	Bus Stop Alternative
Old River Road (Edgewater Borough Hall)	NB	A
Thompson Lane	NB	B
Edgewater Commons (Old River Road)	SB	C
Archer Street (1325' S) (Old River Road)	NB	D
North Street	NB	E
	SB	
Orchard Street	SB	F
Burdette Court relocated to Henry Hudson Drive	NB	G

*See Appendix M for Bus Stop Alternative Plans

The transit aspects of the recommendations were worked together with NJ TRANSIT. The bus bays have been recommended because they will provide a protected area for both the transit users and the stopped bus away from the travel lane. This will provide safe access for the transit users and reduce delay to vehicles traveling on River Road. The transit alternatives are part of the mid-term and long-term improvement concepts. They were designed to be stand-alone, so they can be constructed independently from one another.

1.8.6 Bus Shelters

As explained in the Existing Conditions section, there are 20 existing bus stops that do not have a bus shelter. According to the TCRP Report 19, "Guidelines for the Location and Design of Bus Stops," it is suggested to install a shelter in an urban location where there are at a minimum 50 to 100 boardings per day. Based on this guideline, the following bus stops meet the criteria for the installation of a shelter:

- Old River Road (Edgewater Borough Hall), Southbound
- City Place (Gorge Road), Northbound
- Thompson Lane (352'S) (Waterford Towers), Southbound
- Thompson Lane (1360'N) (Edgewater Commons South), Northbound
- Russel Avenue, Northbound
- Dempsey Avenue, Southbound
- NJ Route 5 (444'N) (Admiral's Walk Condominiums), Northbound
- Glenwood Avenue (845'S) (Veterans Park), Southbound
- North Street, Southbound

Some of these bus stop locations are recommended to be consolidated or eliminated. These potential improvements should be considered before shelters are installed at these locations.

1.8.7 Bicycle Facilities

In addition to traditional solutions to bicycle travel within the corridor such as bike lanes, shared lane markings, share the road signs, innovative approaches and state-of-the-practice designs were examined. Most of the design treatments are in accordance with the Manual on Uniform Traffic Control Devices (MUTCD), the American Association of State Highway

and Transportation Officials (AASHTO), and New Jersey Department of Transportation's *Bicycle Compatible Roadways and Bikeways and Pedestrian Compatible Planning and Design Guidelines*.

1.8.8 Additional Improvement Concepts

In addition to providing improved bicycle, pedestrian, and transit accommodations along River Road and including intersection treatments it would be desirable to explore opportunities to provide access to River Road from neighborhoods to the west of River Road including those on the "bluff" above River Road. This effort could be initiated by completing a feasibility study of improvements to the roadways intersecting River Road with a special consideration of constructing a "funicular" or inclined plane that could be used to portage bicycles and pedestrians from elevated neighborhoods to lower elevated locations that could accommodate travel by bicycle, including accessing River Road. This recommendation was made in the Phase I Study Report and should be explored as a long term solution for making these important neighborhood connections to the River Road Corridor.

Another option for encouraging bicyclists who access and travel along River Road's steep inclines could be the installation of a bicycle lift or CYCLOCABLE®. This type of lift is a fully automatic, electrically powered facility, installed just below the ground that allows cyclists to be towed up the incline. Such a facility can play an important role in providing mobility options for senior cyclists, or those that find themselves challenged by River Road's steep incline.

1.9 Bicycle Access to/from the George Washington Bridge (GWB) – Conceptual Design Recommendations

Concept level plans were developed for three target area locations near the George Washington Bridge. The locations were chosen based on public and stakeholder input. The concept plans illustrate the existing deficiencies and highlight the proposed conceptual solutions and ideas that would improve bicycle safety and accessibility. The concept plans are located in Appendix N and are described below:

1.9.1 Concept 1: Crossing Hudson Terrace to access GWB Walkways

- **Short-Term Recommendation**

Stripe a high visibility crosswalk and bicycle specific crossing treatments ("crossbike") across Hudson Terrace at the GWB south walkway and a high visibility crosswalk across Hudson Terrace at the existing traffic signal adjacent to the north walkway access. Stripe crosswalks across the maintenance access roads on/off the GWB.

- **Mid-Term Recommendation**

Install a hybrid beacon, also known as a High-intensity Activated CrossWalK (HAWK) signal, at the Hudson Terrace intersection with the GWB south walkway. This will work in conjunction with the existing traffic light at the ramp from the GWB westbound at Hudson Terrace. The signal will provide gaps in the Hudson Terrace motor vehicle traffic when actuated, allowing the pedestrian and bicycle traffic to cross to roadway safely.

1.9.2 Concept 2: Shared Use Path along the Eastern Side of Hudson Terrace between Fort Lee Historic Park and GWB North Walkway

- **Concept 2a: Shared Use Path along Hudson Terrace between Fort Lee Historic Park and GWB South Walkway**

Construct a shared use path along the eastern side of Hudson Terrace between the entrance of Fort Lee Historic Park and the GWB south walkway. This will require earthwork under the Palisades Interstate Parkway entrance ramp to the GWB. Constructing this path will provide a continuous off-road connection between the GWB south walkway and the existing path along Hudson Terrace that extends south to Henry Hudson Drive.

- **Concept 2b: Shared Use Path along Hudson Terrace between GWB South Walkway and GWB North Walkway**

Construct a shared use path along the eastern side of Hudson Terrace between the GWB south walkway and the GWB north walkway by installing a physical barrier and adding additional curb width.

1.9.3 Concept 3: Bike Lanes along Hudson Terrace between GWB and Sylvan Street

Stripe and sign bicycle lanes along both sides of Hudson Terrace between the GWB and Sylvan Street, preserving the on street parking where possible. This will target the high crash intersections of Hudson Terrace at both Merkle Street and Sylvan Street, increasing visibility and expectation of potential conflict.

Note: The conceptual recommendations described above and located in Appendix N are based on limited qualitative assessments. Prior to advancing the Concept Plan recommendations, further data collection, analysis and survey should be completed to fully assess the impacts of the proposed recommendations. Additionally, early coordination and continued communication with agencies having jurisdiction over the roadway or facilities in question should be initiated to confirm the feasibility of the recommended improvements.

1.10 Transit Oriented Development (TOD)

A transit-friendly River Road is more accommodating of pedestrians, bicycles, and bus riders and creates an opportunity for development and land uses that improve mobility and quality of life corridor-wide. Appling the concepts of TOD to the River Road corridor can help by reducing conflicting traffic movements into/out of driveways and may help to reduce congestion of River Road. For the purpose of this investigation, TOD (transit-oriented development) refers to land use and site design practices designed to encourage investment in making more walkable, transit accessible, connected, mixed-use places along the River Road Corridor. Current development patterns along the corridor require people to get into their car for every trip, but by encouraging people to drive less, TOD could result in reducing congestion along River Road through lower travel demand and a reduction in conflicting traffic patterns. The goal is to develop new connections and retrofit existing land uses. A proposed technique would be to build residential housing above commercial retail spaces. This would benefit both commercial and residential land uses.

TOD typically integrates a mix of uses and civic spaces with an efficient and heavily utilized transportation system. The type of uses found in TOD are retail, which is often located on the ground floor and set right up against the street to enhance the pedestrian experience, and residential or office above in mid to high rise buildings. TOD encourages walking and transit use. Accommodation of the car is considered but not a primary factor. Because TOD's are mixed use, parking ratios can be lowered by allowing the different types of uses to share parking. The high density development often makes parking garages feasible.

To understand whether a parcel could be redeveloped requires more than evaluating it to see if it fits the typical TOD characteristics. It requires looking at other information about the existing site. Particular attention needs to be paid to whether an existing parcel is in an economic position to be redeveloped, and whether it is sized and located in such a way that it can achieve the above principles when developed. The first step in finding the locations most suited for TOD is to create a list of criteria by which to evaluate the parcels in the study area. Below are the criteria based upon the TOD elements described above. These were generated specifically for this project and the conditions found along the corridor. Each is ranked on a four-point scale (0-3), and each explicitly states what is required to earn the associated score. The study area is then divided into sub-areas for evaluation. These sub-areas were derived primarily by studying individual parcels. However, where parcel size is very small, such as in single family detached housing, sub-areas where consolidated into a whole of similar type. Totaling the score for each area will reveal which locations are best suited for TOD development.

The result of this evaluation shows that three of the areas with the most potential to be redeveloped as TODs are the proposed development areas of Hudson Lights, The Center at Fort Lee and Edgewater Harbor. Thus, it is no wonder that these parcels already have substantial development proposed. Other parcels within the study area also have potential for redevelopment, including the movie theater near the south end of the study area, Edgewater Commons, Market Place and the Ferry Terminal and surrounding parcels.

Although the ranking criteria were not expanded to look at *existing* sites for their potential to be retrofitted, it should be noted that elements of TOD can be incorporated into these types of sites without being triggered by wholesale redevelopment. For instance, new walkways, trails and streets that connect development sites, parking lots and transit stops increase the opportunity for travel that is not by car and that is accomplished without utilizing River Road. It may also be possible to build within existing developments; locating new buildings, parking structures, pedestrian and bicycle connections and open spaces that incorporate the existing buildings into a holistic TOD approach. Integrating TOD practices into transit operations and land use regulation will enable developers, designers, and property managers to create places that are more walkable/bikeable and transit accessible.

1.11 Implementation Matrix

Utilizing information obtained during the evaluation of existing infrastructure, discussions with the Technical Advisory Committee and feedback from community outreach, an Action Implementation Menu was developed of recommended solutions to consider for the corridor. This menu of "actions" is intended to guide Edgewater, Fort Lee and Bergen County in developing a prioritized implementation strategy for improving the pedestrian, transit, and bicycle conditions along the corridor. The matrix is categorized into 5 categories: Engineering, Education and Enforcement, Regulatory and Maintenance, Evaluation, Maintenance and Regulatory. All of the "actions" are corridor wide except for some of the Engineering recommendations. All actions are further supplemented by three factors: **Responsibility**, **Timeframe**, and **Cost**.

Responsibility identifies the agency charged with the responsibility for leading implementation of the proposed action item.

Timeframe identifies the required amount of time to capture the full benefit of the recommendation, including development and implementation.

- Short-Term (1-3 years)
  - Improvements can be made with minor improvements to the corridor. Would include signing and striping changes. These changes could be made with minimal design effort and would provide "quick-fixes" to identified problems.
- Mid-Term (3-5 years)
  - Improvements can be made as part of future repaving. Would include signing and striping changes. All striping to be high visibility reflective markings
- Long-Term (5+ years)
  - Changes may include roadway widening, easements, right of way acquisitions, drainage and utility impacts, etc.

The **Cost** estimate includes the relative cost of implementing the strategy (low, medium, high). Any cost noted is an estimate and will vary depending on the type of materials, phasing, etc.

- Low (under $2,000)
- Medium ($2,000 - $10,000)
- High (over $10,000)

The matrix also includes recommendations from the three bicycle concepts addressing access to the George Washington Bridge. The action items included in the concepts will have the most impact if done together. However, implementation can be done in phases.

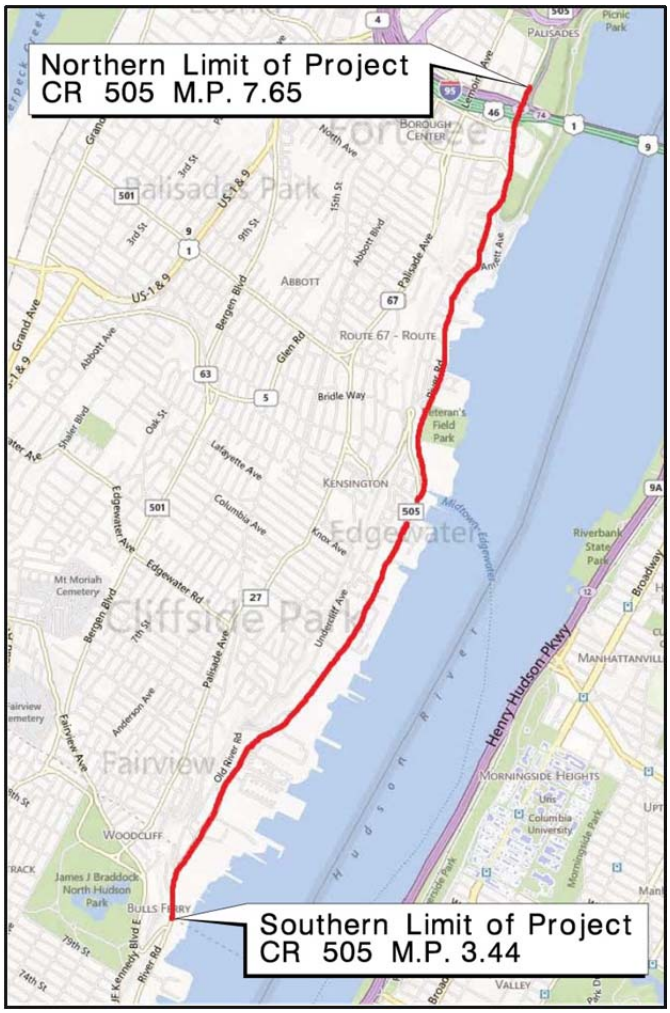
1.12 Summary

The recommendations outline physical and programmatic actions that will help the corridor become more pedestrian and bicycle-friendly including education, enforcement, evaluation, maintenance and regulatory actions the County and Boroughs can implement to improve conditions. Recommendations also include broader regional connectivity of the nearby Hudson River Waterfront Walkway, access to the George Washington Bridge, and Palisades Interstate Park as

well as links to Hudson County, ferry service to New York City and transit to other parts of the area. As presented in this report, existing connections are missing or deficient in a number of locations within the study corridor. This report has provided the groundwork for making such improvements as well as provided an overall time frame of when the improvements can and should be made. With the construction of the noted improvements, the River Road corridor will provide a continuous pedestrian and bicycle connection from the Hudson County boundary line to the George Washington Bridge, providing users a safe and accessible passage for the length of the corridor.

2. Introduction

The Hudson River waterfront in Bergen County is among the most densely populated landscapes in the entire state. This "Gold Coast" has experienced tremendous development and redevelopment pressures, as former industrial and brownfield properties have been converted into commercial centers and residential enclaves. This unique landscape, a narrow strip sandwiched between the Hudson River to the east and the Palisades to the west, remains considerably isolated from the remainder of Bergen County – with only a small number of access points from the riverfront communities to the rest of the region. Such rapid growth in this narrow strip requires cooperative efforts from the County, NJ TRANSIT, private developers, and the local municipalities of Edgewater and Fort Lee to ensure that these communities remain viable and that all transportation options are considered, including pedestrian-friendly and transit oriented development. In addition, the corridor represents a critical link for Bergen County and other North Jersey residents accessing job centers in New York City, Jersey City, and the region at large. Therefore, this study is to promote regional and multi-jurisdictional strategies to better accommodate pedestrians, bicyclists and transit riders in the River Road corridor. While improvements to River Road have been made incrementally by Bergen County over the years, this study is to provide the opportunity to view the corridor as a whole, addressing issues and recommending improvements necessary to sustain current and future development. This study has examined access and safety with respect to transit services, as well as continuity and connectivity for pedestrians and bicyclists.



Project Area

This Study is Federally-funded through the North Jersey Transportation Planning Authority (NJTPA), the Metropolitan Planning Organization (MPO) for the 13-county northern and central New Jersey region, of which Bergen County is a part. The study project area is located along an approximately 4-mile stretch of County Route 505 (River Road) from Edgewater's boundary with Hudson County in the south (Milepost 3.44) to Sylvan Street in the Borough of Fort Lee (Milepost 7.65). This technical study planned and developed improvements to mobility, accessibility, safety, and quality-of-life along the River Road Corridor in the Boroughs of Edgewater and Fort Lee, Bergen County, New Jersey. This effort built upon the recommendations and established momentum put forth in the previous technical study effort, entitled *The River Road/Hudson Waterfront Circulation Study*, which took a broader-brush approach in looking at overall corridor operations, issues, and opportunities. This second phase of the study focused on the River Road corridor within Bergen County and concentrated on developing a series of improvements and complimentary mobility strategies for pedestrians, bicyclists, and transit riders within the corridor.

3. Public Outreach and Interagency Coordination

Informing, involving, and engaging the public is essential in transportation and land use planning that is responsive to community values, builds an understanding of the purpose and benefits to the area of proposed plans and initiatives, and that enlists their participation in the process. Understanding the need for support from the local community, a Public Involvement Action Plan (PIAP) was developed to guide Bergen County in implementing a comprehensive and transparent community outreach process for the study, which included various stakeholder meetings, public meetings, developing a project website and data sharing site, and an online survey.

The intent of this early public involvement and coordination was to commit to a continuous and comprehensive Community Involvement process to inform and involve stakeholders in the process and provide the opportunity for frequent and meaningful public feedback, and to coordinate the public activities through the early planning process.

A project website, flyers, press releases and email were used to provide updates on the project as developed and to announce meetings as warranted.

3.1 Project Team Coordination

A series of project team meetings and conference calls were held to discuss logistics and details in preparation for, and facilitation of, upcoming Technical Advisory Committee, Public Information Center, and NJ TRANSIT meetings to assist in the development of a shared vision for the future of the River Road Corridor, in general. The meetings held included:

- **Project Kick-off Meeting - Thursday, January 12, 2012:** A meeting was held between the County and the project consulting team to discuss various project protocols, potential schedule of community outreach efforts and data collection efforts.
- **Meeting with Bergen County - Wednesday, August 1, 2012:** A meeting was held between the project team and a planner from the County's Division of Land Use and Development Review responsible for the development review for the Boroughs of Edgewater and Fort Lee. The purpose of the meetings was to discuss existing and future development in the project area.
- **Project Team Meeting - Tuesday, November 20, 2012:** The purpose of the meeting was to review and discuss the concepts developed for the River Road corridor with the County.
- **Project Team Meeting with County Engineers - Monday, April 1, 2013:** A meeting was held between the County Engineer's Office, Department of Planning and Economic Development, and the project consulting team to review and discuss the concepts developed for the corridor with the County Engineers.

Minutes of these meetings are included in Appendix A.

3.2 Project Website

The project team developed a user-friendly website that is hosted on Bergen County's Department of Planning & Economic Development website (http://www.co.bergen.nj.us/index.aspx?nid=752). The website was designed to have a similar look as the website developed for the first phase of the study and features simple-to-use navigation to share information about the project with the County staff, project stakeholders, and the general public.

The website was used to disseminate project information, announce meetings, answer frequently asked questions (FAQ's), post documents, such as meeting agendas and presentation materials, and collect comments from the public. The project website was updated regularly over the course of the study, with information regarding past and upcoming meetings, and some of the materials on the website were provided in English, Korean, and Spanish, as determined by County. A screenshot of the project website can found in Appendix A.

3.3 Technical Advisory Committee (TAC)

During the project development process, a series of Technical Advisory Committee (TAC) meetings were held at critical milestones throughout the project's development. The responsibilities of the TAC included: providing feedback to the project team; identifying stakeholders, community groups and partners associated with community outreach to participate in various public outreach activities; develop, guide and participate in community involvement activities; and guide the development and direction of the project. The Project team coordinated with the County to develop a Technical Advisory Committee comprised of key stakeholders of the Road/Hudson Waterfront Corridor Strategy study area.

Technical Advisory Committee (TAC) members included the following:

- Bergen County
  - Department of Planning and Economic Development
  - Engineering Department
- North Jersey Transportation Planning Authority
- Edgewater Borough
  - Public Officials
  - Department of Public Works
  - Engineers
  - Police Department
  - Shade Tree Board
- Fort Lee Borough
  - Public Officials
  - Engineers
  - Police Department
  - Regional Chamber
- NJ TRANSIT
- New York Waterway
- Port Authority of New York and New Jersey
- Meadowlink
- Hudson River Waterfront Conservancy
- Rutgers Voorhees Transportation Center
- East Coast Greenway Alliance
- New Jersey Sierra Club
- New Jersey Bike & Walk Coalition
- Bicycle Touring Group of North Jersey

The members of the TAC provided historic and local knowledge and the vision necessary to comprehensively address the needs of the study areas. The Technical Advisory Committee convened two (2) times during the project. These meetings occurred prior to the public meetings to ensure local officials were briefed on the project prior to the public having access to the information. Technical Advisory Committee meetings were held in the Meeting Room of the Edgewater Community Center on the following dates:

- Tuesday, June 19th, 2012
- Tuesday, December 18. 2012

Appendix A provides minutes of the Technical Advisory Committee meetings.

As noted above, the Technical Advisory Committee included members from the Borough of Edgewater. The project team made a separate presentation of the study and proposed improvements to the Borough of Edgewater's Mayor and Council on Monday, April 1, 2013. The Borough of Edgewater expressed concerns with some of the recommendations in the proposed plan. Their concerns are articulated in Resolution 2013-11, which was adopted by the Mayor and Council on April 15, 2013 and is included in Appendix A.

3.4 Public Information Centers

The goal of all project-related public outreach is to engage a broad representation of the public in the project process, and provide opportunities to ensure a diversity of ideas and viewpoints are incorporated into discussions of mobility and safety issues. The public outreach communications utilized print and electronic media, including a project website, municipal websites, flyers, press releases, and a project email list in order to build awareness about the project, solicit feedback about community preferences and generate public attendance at public meetings. The purpose of the public information meetings was to seek input, present concept improvements and recommendations and address concerns of the local residents in a public forum. These meetings provided an opportunity for stakeholders and residents to provide input and share comments regarding the existing problems and issues within the corridor and the various conceptual improvements that were considered during the project. Two (2) Public Information Centers were held in the Meeting Room of the Edgewater Community Center on the following dates:

- Public Information Center #1 - June 28, 2012
- Public Information Center #2 - January 17. 2013

The first public information center took place in the Meeting Room of the Edgewater Community Center on a Thursday evening. The meeting introduced the project to the general public, solicited input on the current issues and concerns throughout the corridor, and identified potential ideas and strategies that should be considered in the development of the various improvement alternatives. The meeting was arranged as an open information session with a formal presentation at 4:30 and 6:30 P.M. The time between the presentations was informal in nature and allowed participants to direct questions to individual members of the project team. Detailed maps of the area were on display and comment cards were provided to encourage participants to share their questions and comments. Flyers and minutes from this meeting are included in Appendix A.

The second public information center took place in the Meeting Room of the Edgewater Community Center on a Thursday evening. This meeting had a workshop format. Presentations were made at 4:00 P.M. and 6:30 P.M. that gave an overview of the project and work completed-to-date, including the online survey results, and then presented the preliminary conceptual improvements for the corridor to the group. Following the presentations, attendees grouped themselves into small working groups according to interests to ask questions and provide feedback on the preliminary concepts. The groups included 1) Pedestrian/Transit, 2) Bicycle, and 3) Other/Land Use. Following the brainstorming sessions each group presented their discussion and ideas. Flyers and minutes from this meeting are included in Appendix A.

3.5 NJ TRANSIT Coordination

In addition to NJ TRANSIT employees participating in the Technical Advisory Committee Meetings, two (2) meetings were held at the NJ TRANSIT offices in Newark, New Jersey. The first meeting was held on Friday, July 13, 2012. The purpose of this meeting was to discuss the NJ TRANSIT issues and needs throughout the study corridor. Minutes of the meeting are included in Appendix A. Some concerns and ideas that were taken away from this meeting include the following:

- One of the main concerns for bus riders is having to cross River Road.
- The busiest segment of the corridor is between the former Edgewater Borough Hall by Hilliard Avenue and Gorge Road.
- Bus usage in the corridor has grown from 6% to double digits
- There are plans to equip buses with GPS tracking systems.
- Suggested consolidating bus stops
- Bus bump outs and mid-block crossing were suggested for the corridor
- Recommended that the project team ride the bus in the morning peak and video tape it.

The second meeting was held on Wednesday, December 5, 2013. The purpose of this meeting was to present the preliminary transit improvements for the corridor to NJ TRANSIT and obtain their feedback and approval for these

concepts. Minutes of the meeting are included in Appendix A. Some comments and feedback received at this meeting include the following:

- Local municipalities create bus stop locations, not NJ TRANSIT.
- Advertising in the bus shelters is contracted with the local municipality (i.e. Edgewater). The advertisers provide and maintain the shelters.
- A NJDOT permit is needed for any new shelter, regardless of the jurisdiction of the roadway.
- NJ TRANSIT's order of priorities for transit accommodation is as follows: 1) proximity, 2) security, 3) safety, 4) convenience, and 5) views.
- For operational reasons, NJ TRANSIT prefers far-side bus stops, but customers may prefer near-side bus stops because they are closer to the crosswalks.
- NJ TRANSIT agrees that stop consolidation is preferable.
- NJ TRANSIT prefers 12-foot lanes for bus travel.
- Overall, the NJ TRANSIT team liked the bus stop alternatives that were presented.

3.6 Online Survey

As a part of the public outreach efforts for this study, an online survey was developed to solicit public input about the existing issues and concerns throughout the River Road corridor and to gather information about the current use of the corridor. Survey questions included topics regarding general travel, walking, transit, and bicycling. A link to the survey was added to the project website, as well as the websites of Edgewater Borough, Fort Lee Borough, Bergen County, and the NJTPA. Notification of the survey was sent to the project email list, and the newspaper The Record published an article about the project on their website, www.northjersey.com, including a link to the project website and the online survey. Participants were encouraged to include contact information with the purpose of being informed on future public meetings.

The survey resulted in 179 respondents. A summary of the survey results can be found in Appendix A. Below is some general information about the corridor based on the survey results.

The commuting travel patterns of the survey population are as follows:

- 59% Drive
- 19% Use Transit
- 9% Bike
- 9% Walk
- 3% Carpool

The corridor usage of the survey population is as follows:

- 25% of respondents walk nearly every day along the corridor
- 14% of respondents ride their bikes nearly every day along the corridor
- Of the transit users, 43% use it for shopping and running errands and 40% use it to get to school and work

The most common reasons for not riding a bike are as follows:

- 19% No bike paths or lanes
- 18% Too many cars
- 13% Drivers don't share the road

The overall impression was that participants are not using non-motorized modes of transportation because they are inconvenient and dangerous. Generally, most find the corridor to be inadequate in its current state.

4. Existing Conditions

Within the study area, River Road is classified as Bergen County Route 505, and its functional class is an Urban Minor Arterial south of State Route 5 and Urban Principal Arterial north of State Route 5. Principal Arterials are, by definition, classified as serving primarily mobility needs, regional travel, and providing a moderate degree of land access, with a minor arterial characterized as carrying more of a mix of local and regional volumes than a principal arterial and providing a higher degree of local access. Within the study area, River Road is primarily a two, four or five lane cross-section with several variations of lane configurations to accommodate various turning movements at intersections and driveways. Shoulder widths vary from zero to fourteen feet. A portion of the study area includes a painted median, and a short section in the vicinity of Gorge Road has a raised median curb. The speed limit within the study area is 35 miles per hour throughout. As reported in the Phase 1 study, the average daily traffic on River Road ranges from approximately 37,000 vehicles north of Old River Road, to 34,000 vehicles south of Bulls Ferry Road, and 25,000 vehicles north of North Street. The New Jersey Department of Transportation (NJDOT) Straight Line Diagrams for this section of County Route 505 are included in Appendix B.

As part of the project, the project team has completed field survey and mapping efforts. As part of this work, mapping was completed with the use of high level fixed wing mapping at a scale of 1”=20’ completed in AutoCAD across a bandwidth of 300 feet. A digital terrain model was developed allowing cross sections and profiles of the existing alignments to be taken at proposed locations allowing accurate assessments of all alternatives developed. Utilizing GPS, a control monument network tied to the NAD 83 and NAVD 88 coordinate systems was established through the project corridor. These control monuments were used for tying the mapping with all its features into the project coordinate system as well as being used to tie down the existing roadway baseline.

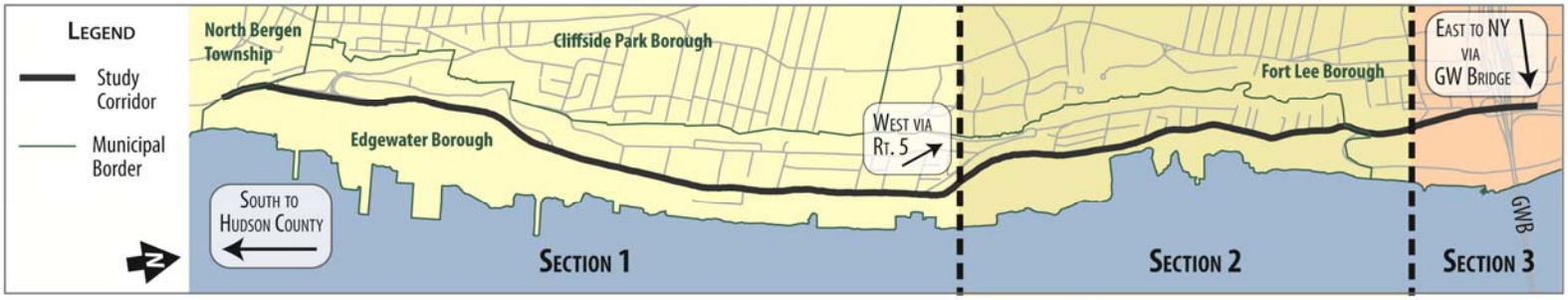
Additionally, the project team has researched all existing tax maps and property ownership data through the approximately 4-mile stretch of River Road (County Route 505). All property lines, right of way lines, lots, blocks, tax parcels and owners have been plotted as an overlay file to the 1:20 scale AutoCAD base maps developed. This will allow the project team to identify right-of-way (ROW) impacts for various alternatives to be analyzed. A copy of the developed base mapping is included in Appendix C.

4.1 General Roadway Characteristics

The River Road study corridor is located west of the Hudson River between the Hudson County line and the George Washington Bridge. The roadway (County Route 505) is called River Road in Edgewater Borough and Hudson Terrace north of its intersection with Bruce Reynolds Boulevard (milepost 7.46) in Fort Lee Borough. Bergen County has jurisdiction of the roadway. The speed limit throughout the corridor is 35 miles per hour. The corridor has three distinct segments (going south to north), illustrated in the following figure, with very different traveling experiences for all mode of travel:

- **Section 1 - Four lane segment** - starting from the southernmost segment at the Bergen/Hudson County line, heading north until State Route 5.
- **Section 2 - Two lane segment -** between State Route 5 and Main Street.
- **Section 3 - Bicyclist access to the George Washington Bridge** – from Main Street north to Sylvan Street.

Note: Section 3 goes slightly beyond the original geographic area defined by the study’s scope, but was included to accommodate mobility concerns in this area as pointed out by the Technical Advisory Committee (TAC) and the general public during the study’s public outreach process.

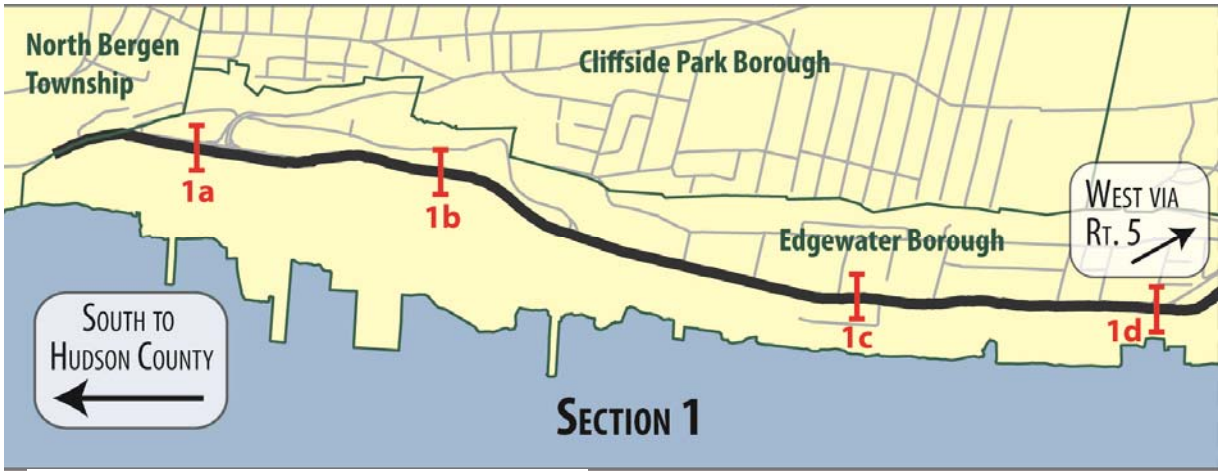


While the River Road corridor has three general sections along the project length, there are variations in the roadway characteristics that affect travel. The following text details the existing roadway conditions along River Road and Hudson Terrace. Within each of the three sections, distinct segments were identified, with varying accommodations as follows:

4.1.1 Section 1: Four lane segment

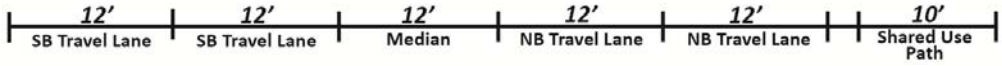
This segment of roadway stretches between the Hudson County border (milepost 3.44) and just north of State Route 5 (milepost 5.70). This is a highly urbanized segment of River Road. Although there are isolated segments of either striped or curbed median along the center of the roadway, there are typically four travel lanes, (two in each direction) and no striped shoulder. This leaves bicyclists sharing the outside travel lane with motor vehicle traffic.

The topography along this southernmost segment is typically level. The roadway parallels the Hudson River, and has no major elevation changes or steep grades in this area. This changes significantly to the north. There are four distinct typical cross-sections along Section 1, as shown in the following figure:



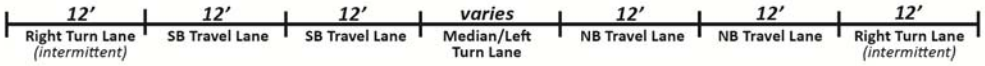
➢ Section 1a. Four travel lanes and a shared use path (Hudson County Line to Gorge Road / MP 3.40 – 3.84)

Along the southernmost portion of the River Road corridor, there are four 12-foot wide travel lanes (two in each direction) and a separate 10-foot wide shared use path. While mature shade trees provide a nice buffer from the roadway, the trees create vertical clearance issues. In addition, there are no intersection treatments.



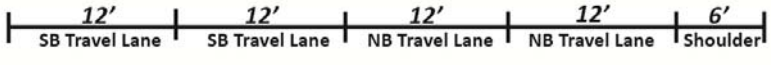
➢ Section 1b. Four travel lanes and dedicated right turn lanes (Gorge Road to the entrance of Edgewater Commons / MP 3.84 – 4.55)

There are four 12-foot wide travel lanes and turn lanes along this segment. The northbound right turn lanes run almost continually along this segment of the corridor. This is a major conflict to through bicycle travel. There are no shoulders. Bicyclists share the 12-foot travel lane with vehicles.



➢ Section 1c. Four travel lanes and a northbound shoulder and no sidewalk (Russel Avenue to Binghamton Way / MP 5.07 – 5.15)

There is a short segment of River Road where there is a wide striped shoulder along the northbound side, but no sidewalk. This is located between Russel Avenue and Binghamton Way. There is a large tennis complex immediately east of the roadway, that is located several feet lower than the roadway grade. Jersey barrier exists along the northbound roadway edge. The 12-foot wide travel lanes are similar to the surrounding segments. The 6-foot wide gore striped northbound shoulder accommodates northbound cyclists.



- **Section 1d. Four travel lanes and no shoulders (Entrance to Edgewater Commons Shopping Center to north of State Route 5 / MP 4.55 – 5.80)**

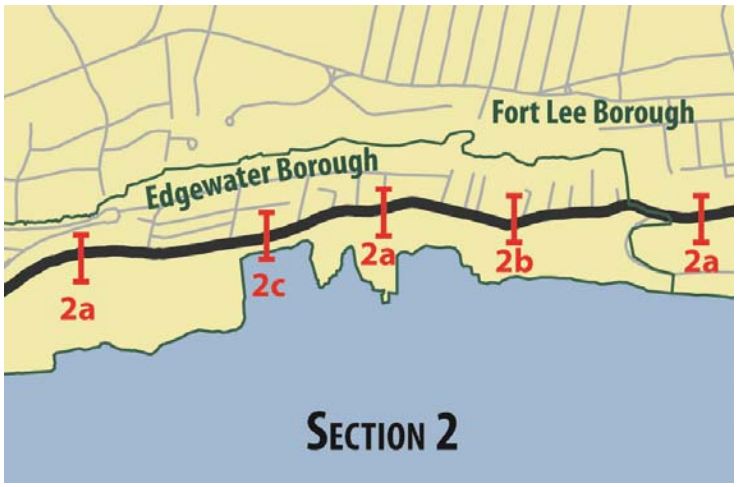
A majority of the four lane segment has no shoulder and four 12-foot wide travel lanes. Bicyclists share the outside travel lane, unless they are maneuvering to make a left turn.

4.1.2 Section 2:Two lane segment

This second major segment is in the central portion of the River Road corridor. This portion stretches from just north of State Route 5 (milepost 5.70) and the intersection with Main Street, Fort Lee (milepost 7.27). This segment has two travel lanes (one in each direction) and a variable width striped shoulder. The land use is predominantly residential through this segment.

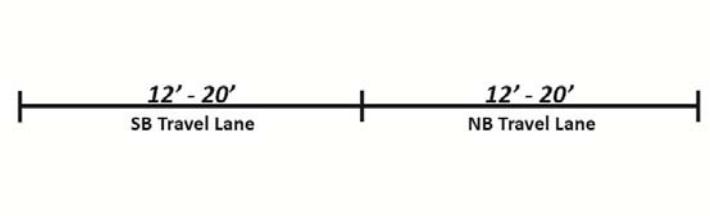
There are widely varying roadway widths, ranging from 28 feet to 83 feet wide, all of which is striped as one travel lane in each direction. This variability leaves the bicyclists having to constantly adjust where they position themselves relative to other through traffic on the roadway.

The elevation changes dramatically along this segment, varying from approximately 10 feet at the southern limit to approximately 240 feet at the northern limit. The steepest portion has a sustained grade of 11% for almost a half a mile. There are three distinct typical cross-sections along Section 2, as shown in the following figure:



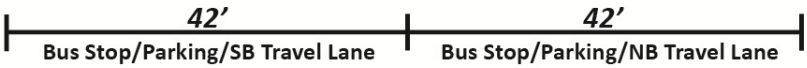
➢ 2a. Two travel lanes and shoulders (Entire length of Section 2 except for two spot locations / MP 5.80 - 7.09)

North of the intersection with Route 5, River Road transitions to a two lane (one lane in each direction) roadway. The roadway has a variable width. Many portions are 40 feet wide, providing travel lanes that are wide enough for bicyclists and motorists to operate side-by-side. However, this is not consistent.



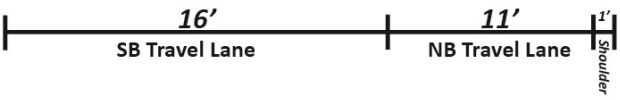
➢ 2b. Two very wide travel lanes (Maple St. / MP 6.78 – 6.86)

Around the Maple Street intersection and bus stop area, River Road widens to a total of 83-feet wide. This includes a total of two travel lanes (one in each direction) and no striped shoulders or bus stop designation. Each travel lane is over 42-feet wide. Buses and cars have been observed stopping side by side next to through motor vehicle traffic. This widened cross section is isolated to the Maple Street intersection area. There is no edgeline striping through this segment.



➢ 2c. Two travel lanes and no shoulders (Point just north of North Street / MP 6.30 – 6.32)

There is an isolated narrow point just north of the North Street intersection with River Road. The total paved width is 28 feet. Northbound there is an 11-foot wide travel lane and a one foot wide striped shoulder. The southbound lane is 16 feet wide and has no striped shoulder. This narrow point is isolated around an active restaurant (Le Jardin) that provides valet parking via a circular driveway abutting the roadway.



4.1.3 Section 3: Two lane segment with access to the George Washington Bridge

The third and northernmost segment is the shortest, but has direct connections to the George Washington Bridge (GWB). This portion stretches between the intersection with Main Street, Fort Lee (milepost 7.27) and Sylvan Street (milepost 7.65)

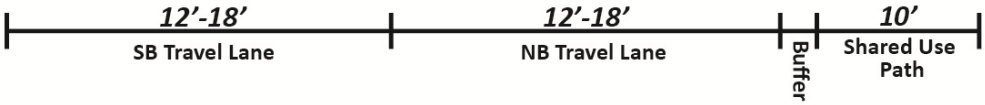
Between the intersection with Main Street (milepost 7.27) and Milepost 7.57 there are four marked travel lanes (two in each direction) along this segment. The road name also changes from River Road to Hudson Terrace at its intersection with Bruce Reynolds Drive (milepost 7.46). Upon passing the bridge underpass and approaching the northern walkway of the GWB (milepost 7.57), the lanes are no longer marked and there is parking on both sides of the street.

There is a paved shared use path along the east (northbound) side of the road between Henry Hudson Drive and Bruce Reynolds Boulevard. This accommodates much of the bicycle traffic between Henry Hudson Drive and the GWB.

Figure 4-4

- **3a. Two Travel lanes and a two-way paved shared use path (Henry Hudson Dr. to Bruce Reynolds Blvd. / MP 7.09 – 7.46)**

Between Henry Hudson Drive and Bruce Reynolds Boulevard there are two travel lanes (one in each direction) and a parallel paved shared use path along the east (northbound) side of the road. The path is 10 feet wide. The total roadway width varies along this segment, averaging approximately 36 feet wide. Each of the travel lanes and the shoulder striped along the northbound lane are approximately 12 feet wide.



4.2 Environmental Screening

The environmental screening was based upon a review of GIS-based environmental mapping and database information available from the New Jersey Department of Environmental Protection. GIS environmental constraints maps were prepared and relevant constraints and environmentally sensitive areas are outlined below. The GIS Environmental Constraints Maps are included in Appendix D. It should be noted that the screening is preliminary in nature. As more

detailed plans/layouts are developed in a further phase, more in-depth and detailed environmental investigations will be necessary to more definitively determine the need for environmental permits and whether or not conceptual designs that are advanced meet permitting criteria. Said future investigations may require more detailed, field based investigations in the vicinity of proposed improvements.

4.2.1 Regional setting

The project area is located in the Boroughs of Edgewater and Fort Lee, which are located in Bergen County, New Jersey.

4.2.2 Geology and Soils

The project area lies in New Jersey's Piedmont Physiographic Province, in an area underlain by the "Stockton" and "Lockatong" geological formations. These formations, which were formed during the Upper Triassic period, primarily consist of arkosic sandstone, along with siltstone and shale. The area along both the Hackensack River and Newark Bay are located within an area that long ago was characterized by salt marsh and estuarine deposits.

4.2.3 Vegetation

The project area, which extends from just west of Undercliff Avenue to the Hudson River, includes both highly developed sections of Edgewater as well forested and scrub shrub cliffside areas and modified herbaceous communities (i.e. lawn areas) at Veterans Field Park. Given the relatively small size of these areas, however, vegetative community impacts are not anticipated to be a significant adverse impact.

4.2.4 Freshwater Wetlands

Based upon a review of NJDEP GIS based environmental mapping and aerial photography, the project study area encompasses a small amount of freshwater wetlands located along the Hudson River along the northeastern portion of the project area. All of the wetlands mapped by NJDEP within the project limits are anticipated to be either ordinary resource or intermediate value wetlands due to the absence of trout production waters or threatened/endangered species or their habitats. Wetlands and/or Waters that may potentially be impacted by proposed project improvements will require wetlands permits and/or transition area waivers from NJDEP in accordance with the New Jersey Freshwater Wetlands Protection Act.

4.2.5 Wetland transition areas

Wetland transition areas, which extend perpendicularly from the actual wetland boundaries to a width depending on the wetlands resource classification, are associated with both of the identified project area wetlands. As mentioned above, the majority of the on-site wetlands will be classified as either ordinary or intermediate resource value wetlands. These wetlands have a 0 foot or 50 foot wide wetland transition, respectively, surrounding them. Should wetland transition areas be impacted by proposed project improvements, said impacts will require transition area waivers from NJDEP as outlined above.

4.2.6 Watercourses

With the exception of Hudson River, which bounds the east side of the project study area, there are no other regulated watercourses within the project study limits per NJDEP GIS-based mapping. The Hudson River is tidally flowed where it borders the project study area and has a Surface Water Classification of SE, State Estuarine. Due to the tidal nature of the Hudson River where is borders the project study area, any project related impacts that are proposed within 500 feet of the high tide line of the Hudson River may potentially require NJDEP Waterfront Development Permits and NJDEP Bureau of Tidelands issued Tideland Conveyances.

4.2.7 Floodplains (Regulated)

Based upon NJDEP GIS mapping, there are no mapped or regulated non-tidal floodplains within the project area. There is a tidal floodplain associated with both the Hackensack River and the Hudson River/Upper New York Bay.

4.3 Commuting Patterns

The project team acquired census data from the U.S. Census Bureau. The principal idea to acquire such data was to observe the general population and its means of transportation throughout the corridor. The numbers generated on Tables 4-1 and 4-2 are estimates produced by the U.S. Census Bureau based on samples of the population. There can be a large margin of error, especially for the smaller cities. Because the U.S. Census Bureau has been consistent in their asking of the same question about means of travel to work over time, it is one of the best sources for tracking trends in bicycling to work levels. However, commute trips make up only about 25% of all trips a person makes each day. Additionally, the Census required respondents to choose only one mode of transportation. As a result, multi-modal trips, such as biking to transit are not necessarily counted as a biking trip.

The data shown in Table 4-1 was generated from the American Community Survey 5-Year Estimates for the Means of Transportation to Work by Selected Characteristics. The survey data is inclusive of the years 2007 through 2011. The data assessed was for workers 16 years and older in the population centers of the Borough of Edgewater, Borough of Fort Lee, and County of Bergen. The percentages for the use of public transportation were computed. As shown in this table, it is estimated that 37% of all workers in Edgewater, 20% of all workers in Fort Lee, and 13% of all workers in Bergen County commute to work using public transportation.

Table 4-1
2007 Through 2011 American Community Survey 5-Year Estimates
Means of Transportation to Work

Population Center	Workers 16 years and older				
	Total		Use Public Transportation		
	Estimate	Margin of Error	Estimate	Margin of Error	Percent
Edgewater Borough	6,471	±476	2,392	±383	37
Fort Lee Borough	17,570	±635	3,554	±390	20
Bergen County	439,561	±2,192	58,827	±2,057	13

Data suggests that bicycling for commuting purposes in Edgewater and Fort Lee is very low. The 2006-2010 American Community Survey (ACS), as indicated in Table 4-2, estimated that of the workers 16 years old and older (total worker population of 6,504 in Edgewater and 16,878 in Fort Lee), zero (with a margin of error of 123) traveled to work by bicycle.

Table 4-2
2006-2010 American Community Survey 5-year Estimate Table S0801

Location	Commute to Work by Bicycle	Margin of Error
Edgewater Borough	0.0%	+/- 0.5
Fort Lee Borough	0.0%	+/- 0.2
Cliffside Park Borough	0.1%	+/- 0.1
North Bergen Township	0.5%	+/- 0.4
Weehawken Township	0.1%	+/- 0.1
City of Hoboken	0.5%	+/- 0.4
New York City	1.0%	+/- 0.1

Table 4-2 2006-2010 American Community Survey 5-year Estimate Table S0801		
Location	Commute to Work by Bicycle	Margin of Error
Bergen County	0.2%	+/- 0.1
Hudson County	0.3%	+/- 0.1
State of New Jersey	0.3%	+/- 0.1
State of New York	0.5%	+/- 0.1
United States	0.5%	+/- 0.1

Although specific data on mode share for non-commute trips does not exist, anecdotal evidence and field observations indicate that people are bicycling in the corridor, especially for recreation. Traffic screenline counts done by the New Jersey Department of Transportation during 12-hour periods (6:00am-6:00pm) over three days in October 2011 reveal that almost 6,000 cyclists, accounting for 17% of total traffic, use the nearby Route 9W corridor through Tenafly on the weekends. Table 4-3 shows the results of this data.

Table 4-3 Traffic Volume by Day: Route 9W north of Orbach Way in Alpine and Sylvan Avenue and E. Clinton Avenue in Tenafly								
Mode of Transportation	Friday		Saturday		Sunday		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Bicycle	360	3%	3,024	24%	2,901	25%	6,285	17%
Car	11,812	87%	9,074	73%	8,688	74%	29,574	78%
Truck	1,363	10%	408	3%	170	1%	1,941	5%
Total	13,535	100%	12,506	100%	11,759	100%	37,800	100%

4.4 Related Plans, Projects, Policies, and Ordinances

Existing conditions includes more than infrastructure. As part of the evaluation process, the project team gathered, reviewed and evaluated information on any relevant plans, policies and programs. The full summary of the analysis can be found in Appendix E.

4.4.1 Parking Regulations

The Borough of Edgewater ordinance prohibits parking along River Road throughout the study area. Table 4-4 below summarizes the locations where parking is permitted based on the Borough of Edgewater Administrative Code §432-2.

Table 4-4
Permitted Parking Areas on River Road, Edgewater Borough

Mileposts	Side	Location
3.93 - 4.09	SB	From 472 feet north of Gorge Road to 118 feet north of Thompson Lane
5.75 - 6.07	NB	From 280 feet north of Route 5 to 25 feet south of southerly entrance to Veterans Field
5.78-6.07	SB	From 405 feet north of Route 5 to northerly entrance of Veterans Field
6.69 - 6.73	SB	From Palisade Terrace to Arlington Terrace
6.82 - 6.87	NB	From 198 feet north of Annett Avenue to 495 feet north of Annett Avenue
6.83 - 6.86	SB	From 67 feet south of Maple Street to 97 feet north of Maple Street

4.4.2 Bicycling Regulations

The municipal codes of Fort Lee and Edgewater were reviewed to ascertain if there are any requirements related to bicycling accommodations. Edgewater Borough has several relevant requirements including the prohibition of bicycle riding on the sidewalk.

4.4.3 Hudson River Waterfront Walkway Access

The municipal codes of Fort Lee and Edgewater were reviewed to ascertain if there are any requirements related to access to the Hudson River Waterfront Walkway (HRWW). Edgewater places requirements for access to the HRWW which state that any proposal for development fronting on the Hudson River must provide a public access easement along the Hudson River with suitable access to the walkway. Specifically one perpendicular access shall be provided between River Road and the HRWW every 300 feet, though any development shall not be required to provide more than two access points. Applicants are required to identify all access points within 1000 feet of the subject property. Neither municipality has bicycle parking requirements for development.

4.5 Crash Data

The project team reviewed vehicle crash records obtained from the Rutgers University Plan4Safety database for the five-year period between January 2007 and December 2011 within the study area. The limits of the data reviewed extended from the intersection of River Road at Old River Road (County Route 505 Milepost 3.67) to the intersection of Hudson Terrace at Bruce Reynolds Boulevard (County Route 505 Milepost 7.46). Specific focus was directed at crashes involving pedestrians.

During the five-year period reviewed there were 16 crashes that involved pedestrians. A summary of the data reveals:

- The crashes resulted in 17 injuries, including 14 injured pedestrians
- There were no fatalities
- Alcohol was not involved with any of the crashes
- 7 of the 16 crashes occurred during dark lighting conditions
- 7 of the 16 crashes occurred during rainy conditions

A table summarizing these 16 specific crashes can be found in Appendix F. The location of these pedestrians crashes are noted on the Existing Conditions Maps found in Appendix F.

The project team also reviewed vehicle crash records to identify crashes involving a bicyclist along the River Road corridor (CR505) between mileposts 3.44 and 7.74. The review of the study corridor was extended to Sylvan Street to incorporate feedback from the public regarding conflicts between bicyclists and motorists near the George Washington Bridge.

During the five-year period reviewed, there were a total of fourteen (14) crashes that occurred within this study corridor. A summary of the data reveals the following:

- There were no fatalities, but all involved moderate injury.
- The majority of these crashes (11) occurred during daylight conditions
- The most predominant pre-crash vehicle action prior to the bicyclist being hit was the motorist making a left turn (6) or going straight ahead (5).
- Merkle Street (milepost 7.61) is a crash cluster with the highest number of crashes (4) throughout the corridor
- Crashes are evenly split between those that occurred at the intersection and not at the intersection.

A table summarizing the crash details is included in Appendix F. The “Bicyclist Crashes” map also included in Appendix F illustrates the locations of these bicyclist crashes along the corridor.

4.6 Pedestrian Facilities

Several field visits were conducted to obtain information about the existing pedestrian conditions of the corridor. The project team walked the study corridor taking and documenting detailed measurements of the pedestrian facilities and noting areas of deficiency. The areas of focus were sidewalks, curb ramps, and roadway crossings.

The condition of pedestrian facilities varies throughout the study area. While existing sidewalk conditions are generally good, a number of gaps in the network were identified. Primarily in the southern section several worn paths indicating unmet pedestrian demand were observed, while in the northern section it was not uncommon to spot a pedestrian walking along the side of the road. There are significant portions of sidewalk within the corridor that do not meet the guidelines set forth by the Americans with Disabilities Act (ADA) and the Public Right-of-Way Accessibility Guidelines (PROWAG). These cases range from overgrown shrubbery to crumbled sidewalk and missing handicap curb ramps.

River Road is a heavily travelled corridor with many attractions on both the northbound and southbound sides of the roadway; however, crossing River Road on foot is difficult throughout the study area due to unsafe crossings, missing sidewalks, substandard curb ramps and sidewalks, and the width of the road.

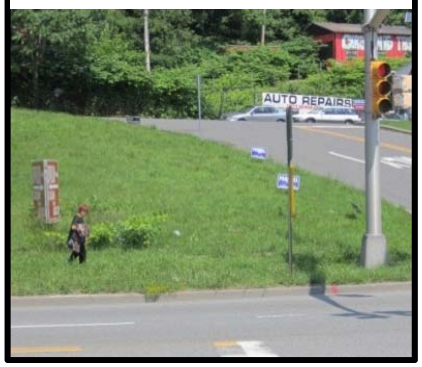
4.6.1 Sidewalks

Table 4-6 summarizes the existing deficient sidewalk conditions along the River Road corridor. There is a total of 13,100 linear feet of sidewalk that is either missing or in poor condition. This table indicates the location of the deficient sidewalk; the length of the area of concern; whether it is a gap, poor condition, substandard, obstructed or has a vertical discontinuity; and potential physical constraints.

Crumbled sidewalk along the southbound side of River Road

Sidewalk was deemed substandard if it did not meet ADA and PROWAG design guidelines. These requirements state that a path of travel includes an unobstructed way of pedestrian passage. These pathways are required to have a minimum width of 60 inches to allow for two streams of traffic; however, sidewalk with a width of less than 60 inches is acceptable as long as there is a passing space greater than 60 inches at an interval of no more than 200 feet. The sidewalks are also required to have a minimum of 36 inches to travel around obstructions such as utility poles or fire hydrants. The Project team declared sidewalk to be in poor condition if it was excessively cracked, crumbled or displayed areas of ponding.

A pedestrian walking through grass where sidewalk is missing



Throughout the study area there is a total of 8,000 feet of gaps in the existing sidewalk on both the east (northbound) and west (southbound) sides of River Road as shown on the Existing Conditions Pedestrian Facilities Maps, found in Appendix H. In the southern section of the study area there is the largest running gap in the sidewalk, 2,000 feet, between Thompson Lane and Old River Road (at the Edgewater Commons). Pedestrians were observed traversing through knee-high grass and walking through nearby parking lots in order to safely travel to a point where they could cross River Road. This segment of missing sidewalk has become a worn path utilized by pedestrians to access transit stops and shops along River Road.

In the northern portion of the corridor, sidewalk does not exist for 1,500 feet along the east (northbound) side of River Road, between Hilltop Lane and Henry Hudson Drive, one of the major gaps in the northern segment. Pedestrians trying to access the Palisades Interstate Park and transit stops were witnessed walking along the shoulder of the roadway.

The corridor is riddled with portions of substandard sidewalk. In the southern section of River Road, across from Old River Road (approximate Milepost 3.67), there exists a wide, brick shared use path that has several dips and areas where water appeared to pond. Further north along the corridor, along the southbound side of River Road at North Street, crumbled concrete is all that remains. This portion of sidewalk is difficult for pedestrians to navigate. Segments along the northern stretch of the corridor were observed to be extremely narrow with obstructions such as utility poles creating difficulty for pedestrians to effortlessly pass through. These areas have been noted in Table 4-6.

4.6.2 Curb Ramps

Substandard curb ramp with overgrowth

With the exception of recently modernized intersections, a large number of the existing curb ramps throughout the study area were measured to be substandard in accordance with the ADA and PROWAG regulations. Curb ramps are required to have a maximum cross slope of 2% and running grade of 1:12. The ramp width and length is to be a minimum of 36 inches in each direction, have a level landing area of a minimum of 36 inches by 36 inches. The front of the ramp shall be flush with the pavement and have a maximum gutter slope of 5%. Each curb ramp must be equipped with a 24 inch by 48 inch detectable warning surface located within the crosswalk. The ADA requires that any curb ramp approach servicing two crosswalks have a 2-foot, 6-inch by 4-foot space within the crosswalk striping and outside of the direct line of passing vehicular traffic. Any curb ramp that did not meet these requirements is considered to be deficient. Curb ramps were noted to be in poor condition when the concrete was falling apart or the detectable warning surface showed extensive wear. Table 4-7 indicates the specific deficiencies with the substandard curb ramps within the study corridor. As noted, five (5) curb ramps were found to be missing and an additional 28 curb ramps were deficient.

Table 4-6
Deficient Sidewalk

Section of Corridor (Mileposts)	Location	Side	Length (feet)	Deficiency	Available Right-of-Way (feet)*	Physical Constraints		
						Obstruction	Grading	Remarks
3.6 - 3.9	Old River Road to 600 feet north of Gorge Road	SB	1600	Missing Sidewalk	14	X		Controller Cabinet
3.7 - 3.8	Old River Road and 300 feet north of Old River Road	NB	305	Poor Condition	24			
3.9 - 4.1	600 feet north of Gorge Road to Thompson Lane	SB	470	Substandard Width	7			
4.1 - 4.6	Thompson Lane to Old River Road	SB	2000	Missing Sidewalk	14			
4.2 - 4.3	315 feet north of Independence Way to Shopping Center Entrance	NB	340	Substandard Width	6			
4.3 - 4.4	8000 feet north of Independence Way to 985 feet south of Old River Road	NB	150	Obstructed & Vertical Discontinuity	9			
4.4 - 4.5	Shopping Center Entrance to Signalized Shopping Center Entrance	NB	490	Substandard Width	9			
4.5 - 4.6	Shopping Center entrance to Old River Road	NB	265	Substandard Width	12			
4.6 - 4.8	200 feet north of Old River Road to Archer Street	NB	765	Substandard Width	28			
4.9 - 5.2	200 feet north of Vreeland Terrace to Binghamton Way	NB	1060	Missing Sidewalk	10		X	Elevated roadway
5.2 - 5.3	Binghamton way to 240 feet north of Binghamton Way	NB	240	Substandard Width	3			
5.6 - 5.7	375 feet north of Tower Drive to 140 feet south of the Ferry Entrance	NB	150	Missing Sidewalk	16			
5.8 - 6.0	Route 5 to Glenwood Avenue	SB	300	Poor Condition	4	X		Wall
5.8 - 5.9	460 feet north of Route 5 to 1150 feet south of Glenwood Avenue	NB	215	Substandard Width	9			
6.0 - 6.1	0.4 miles north of Route 5 to Glenwood Avenue	NB	250	Missing Sidewalk	5		X	Along the front of the Edgewater Community Center
6.0 - 6.1	630 feet south of Glenwood Avenue and 390 feet south of Glenwood Avenue	SB	235	Substandard Width	6	X		Wall
6.1 - 6.2	280 feet north of Glenwood Avenue and 80 feet south of Hudson Cove	SB	55	Poor Condition	7			
6.3 - 6.4	North Street to Sterling Place	NB	670	Missing Sidewalk	25			Structures exist within right-of-way
6.3 - 6.4	North Street to 290 feet south of Sterling Place	SB	300	Poor Condition	9	X		Wall
6.5 - 6.53	140 feet south of Vela Way to Vela Way	NB	140	Missing Sidewalk	18	X	X	Fencing along steep grade
6.6 - 6.7	Orchard Street to Palisade Plaza	NB	475	Missing Sidewalk	5	X	X	Drainage Structure
6.7 - 6.8	Palisade Plaza to Yorkview Drive	NB	485	Substandard Width & Overgrowth	7	X	X	Drainage Structure
6.8 - 7.1	Hilltop Lane and Henry Hudson Drive	NB	1500	Missing Sidewalk	5	X	X	House across from Hooks Lane
7.1 - 7.2	From Massa Lane to 170 feet south of Old Palisade Road	SB	415	Substandard Width	18	X	X	Wall
7.2 - 7.23	130 feet north of Old Palisade Road to 175 feet south of Main Street	SB	230	Substandard Width, Overgrowth & Obstruction	5			
7.3 - 7.4	Central Ave to Main Street	SB	N/A	Obstructed	6	X		Utility Poles

*Available right-of-way is measured from the face of the existing curb to the existing right-of-way line, and is the average of the segment

Table 4-7
Deficient Curb Ramps

Location along River Road	Corner	Deficiency							
		Missing	Length	Running Slope	Landing Area	Detectable Warning Surface	Cross Slope	Gutter Slope	Clear Space
Intersection at Old River Road	NW			X		X			X
	NE			X	X	X			X
	SE	X							
	SE			X		X			
	SW*					X			
	SW*					X			
	SW	X							
	SW*								
	SW*			X			X	X	
Office Driveway (Milepost 3.77)	NE			X	X				
	SE	X							
Exxon Driveway (Milepost 4.51)	NW		X					X	
	SW				X		X		
Intersection at Russel Avenue	NW			X			X		
	SE			X	X		X		
	SW			X					X
	NE	X							
Mariner's Bank Driveway (Milepost 5.52)	NE			X	X		X		
	SE			X			X		
Intersection at Dempsey Avenue	NW			X					
	NE			X	X				
	SE			X	X				
	SW			X	X		X		
Mid-block crossing (Milepost 5.82)	NE			X			X		
Intersection at Glenwood Avenue	NW				X		X		X
	SW			X			X		X
	NE			X			X	X	X
	SE	X							
Intersection at Arlington Terrace	SW					X			
Intersection at Bruce Reynolds Boulevard	NW				X				X
	NE				X				
	NE				X				
	SW			X	X				

* Curb ramp part of a curbed, concrete island.

4.6.3 Constraints

There are many constraints present to bring the River Road corridor up to ADA and PROWAG standards. As noted in Table 4-6, right-of-way constraints are the most common throughout the study area. Right-of-way availability varies greatly from the southern section up through the northern section. In some locations there exists an extensive amount of space for improvements, while in others the right-of-way line is abutting the existing curb, allowing minimal to zero room for updates.

A steep grade and structural constraints at Hooks Road and River Road

Other locations along the corridor possess more difficult constraints to overcome. At River Road and Hooks Lane a house is built directly adjacent to the roadway. This is through an existing narrow stretch of River Road and has minimal right-of-way. Existing topography is another contributor to the physical constraints. The northern section of River Road/Main Street is parallel to exceedingly steep terrain along the northbound side.

4.7 Transit Facilities

4.7.1 Existing Transit Routes

Numerous transit routes are available within the River Road study area. Available transit includes bus and ferry, providing access to and from local destinations within New Jersey and regional destinations in Manhattan. Further, several shuttle routes are available to individual residential and commercial developments. Operators within the study area include NJ TRANSIT, New York Waterway (NY Waterway), and private shuttle buses. Transit access, including transit routes, ferry terminal locations, bus stops, and shuttle connections are detailed in Appendix I.

- **NJ TRANSIT**

The study area includes bus service operated by NJ TRANSIT, including six bus routes which traverse a portion of the study area. These routes include local bus service within the study area and regional service to points in Manhattan. A summary of each of the routes is below.

- **Route 156** – Provides service between Englewood Cliffs and the Port Authority Bus Terminal in New York via the Lincoln Tunnel. Within the study area, it makes stops along River Road south of Gorge Road to Weehawken north of Lincoln Harbor. It provides a connection between the uplands and gold coast via Gorge Road. This service operates only in the peak direction and hours (to New York during the morning peak and from New York during the evening peak), with headways as short as 10-12 minutes toward New York in the morning peak and outbound in the evening peak.
- **Route 158** – Operates between the George Washington Bridge Plaza in Fort Lee and the Port Authority Bus Terminal in New York via the Lincoln Tunnel. It makes numerous stops within the entire study area between Fort Lee and Lincoln Harbor. This is an all-day service throughout the corridor on weekdays, Saturdays and Sundays. Frequencies are as high as 4-6 minutes in the peak periods, with off-peak frequencies of approximately 30 minutes.
- **Route 159** – Provides service between Fort Lee and the Port Authority Bus Terminal in New York via the Lincoln Tunnel. Within the study area it makes stops along River Road in Edgewater south of Gorge Road. It provides a connection between the uplands and gold coast via Gorge Road. The 159 service operates in the peak periods and peak directions as an express service along River Road, with express and local service in the uplands as well.
- **Route 188** – Operates between West New York and the George Washington Bridge bus station in New York via the George Washington Bridge. It makes stops along River Road between Guttenberg and Fort Lee, most of which are located in the study corridor. Service operates every 30 minutes on weekdays and every 90 minutes on Saturdays and Sundays.

- **Route 751** – Provides service between Bergen Community College in Paramus and Edgewater Commons. It provides a connection between the uplands and gold coast via Gorge Road and operates north to Edgewater Commons along River Road.
- **Route 755** – Operates between Bergen Community College in Paramus and Edgewater Commons. It provides service along River Road into the study area south of Fort Lee to Edgewater Commons. The 751 and 755 each operate on 90 minute headways, which provide a combined 45 minute headway for passengers traveling from Edgewater to Paramus. Only the Edgewater endpoint falls within the study area.

New York Waterway Ferry

One ferry terminal is located within the study area. The Edgewater Ferry Landing terminal, owned and operated by NY Waterway, provides service to the Midtown/West 39th Street terminal in Manhattan. The Edgewater Ferry Landing terminal services the Port Imperial Ferry Service which is also owned and operated by NY Waterway Located along River Road at the intersection with NJ Route 5, the NY Waterway terminal does not have public parking, but is serviced by NJ TRANSIT Bus Routes 158 and 188 and a NY Waterway shuttle. Service to and from the Edgewater Ferry Landing terminal is limited to weekdays in the morning and evening peak periods. A new proposed ferry location in Edgewater is being discussed and anticipated to be located by Borough Hall in Edgewater.

An additional ferry terminal, Port Imperial/Weehawken, is located south of the study area in the Township of Weehawken, Hudson County. This ferry terminal is also owned and operated by NY Waterway and provides service to the Midtown/West 39th Street terminal in Manhattan, as well as two other terminals in Manhattan, the Pier 11/Wall Street terminal and the World Financial Center terminal. This terminal is a transit hub with available public parking, NY Waterway shuttle service, and connections to both the NJ TRANSIT Hudson-Bergen Light Rail and NJ TRANSIT Bus Routes 23, 158, and 158. Service to and from the Port Imperial/Weehawken terminal runs daily from 6:00 A.M. to midnight on weekdays and 8:00 A.M. to 1:00 A.M. on weekends.

4.7.2 NJ TRANSIT Ridership

Bus Ridership data, separated by bus stop, was obtained from NJ TRANSIT. The data is inclusive of Bus Routes 156, 158, and 159, and does not include data for Bus Route 188, 751, and 755. The bus routes service the corridor as well as its surrounding areas, ranging from Englewood Cliffs to the Port Authority Bus Terminal in New York City. The data represents the average daily ridership from November 12-16, 2012 and includes boarding and alighting data for each bus stop in the corridor. A summary of the ridership data can be found in Table 4-8 below. This data was used to evaluate impacts to transit riders if stops are eliminated or consolidated as part of the conceptual improvements. The bus stop locations within the corridor can be seen in the Existing Conditions Transit Services in Appendix I. The raw ridership data can be found in Appendix J.

Table 4-8
NJ TRANSIT Bus Route 156, 158 & 159
Average Daily Ridership, November 12 – 16, 2012

Bus Stop	Direction	Board	Alight	Total
CHURCH HILL ROAD	SB	6	0	6
OLD RIVER RD (EDGEWATER BOROUGH HALL)	SB	252	32	284
	NB	0	34	34
CITY PLACE (GORGE ROAD)	NB	4	174	178
THOMPSON LANE	SB	810	12	822
THOMPSON LANE (352 feet south) (WATERFORD TOWERS)	SB	104	6	110
THOMPSON LANE(1360 feet north) (EDGEWATER COMMONS SOUTH)	NB	14	98	112
THOMPSON LANE	NB	4	28	32

Table 4-8
NJ TRANSIT Bus Route 156, 158 & 159
Average Daily Ridership, November 12 – 16, 2012

Bus Stop	Direction	Board	Alight	Total
EDGEWATER COMMONS (OLD RIVER ROAD)	SB	118	30	148
ARCHER STREET	SB	98	12	110
ARCHER STREET (1325 feet south) (OLD RIVER ROAD)	NB	30	16	46
ARCHER STREET	NB	2	42	44
VREELAND TERRACE	SB	44	2	46
	NB	0	18	18
RUSSEL AVENUE	SB	360	22	382
	NB	4	108	112
GARDEN PLACE	SB	452	22	474
	NB	2	68	70
HILLIARD AVENUE	SB	310	20	330
	NB	0	72	72
DEMPSEY AVENUE	SB	66	0	66
	NB	0	2	2
NJ ROUTE 5 (EDGEWATER MARINA FERRY TERMINAL)	SB	294	26	320
	NB	10	42	52
NJ ROUTE 5 (444 feet north)	NB	0	40	40
GLENWOOD AVENUE	SB	0	0	0
GLENWOOD AVENUE (845 feet south) (VETERANS PARK)	SB	78	2	80
	NB	0	4	4
GLENWOOD AVENUE	NB	0	18	18
NORTH STREET	SB	106	4	110
	NB	2	34	36
STERLING PLACE	SB	22	2	24
	NB	0	4	4
ORCHARD STREET	SB	34	2	36
	NB	0	12	12
PALISADES TERRACE	SB	22	14	36
	NB	2	2	4
ANNETTE AVENUE	NB	2	18	20
MAPLE STREET	SB	104	6	110
BURDETTE COURT	NB	0	44	44

4.7.3 Bus Stop Conditions

As a part of the field inventory, each bus stop in the corridor was examined to assess if its features met standards set forth in the ADA, PROWAG, and Manual on Uniform Traffic Control Devices (MUTCD). These field examinations included details on bus shelters, signage, amenities, lighting, safe pedestrian crossings, and accessible routes. A summary of the field results can be found in Table 4-9 and are described below.

All bus stops must meet the ADA standards. Compliance requires a boarding and alighting area at each bus stop. At bus stops where a shelter is provided, the bus stop pad can be located either within or outside of the shelter. This is considered the boarding and alighting area that passengers use to mount and dismount the bus.

- **Shelters**

Bus shelters fall under the purview of the municipality or jurisdiction and are maintained as such. The study corridor has 39 bus stops. Nineteen of these bus stops have shelters. Bus shelters should provide a minimum clear floor or ground space entirely within the shelter, complying with the ADA. As noted in Table 4-9, of the 19 existing shelters, seven (7) were found to be not in compliance with ADA standards. In review of the bus shelters, it was found that clear floor space was reduced due to advertisement panels contained within the shelters.

Based on ADA guidelines, boarding and alighting areas shall provide a clear length of 96 inches minimum, measured perpendicular to the curb, and a clear width of 60 inches minimum, measured parallel to the vehicle roadway. Field investigations included measurements of the boarding and alighting area of each transit stop. As shown in Table 4-9, if a bus stop is compliant, this signifies it has met all the criteria set forth in the ADA standards

- **Signage, Amenities, and Lighting**

Bus route signs were noted in Table 4-9 if present at each stop. Signage included the bus route servicing the bus stop, as well as route information and times. Ferry shuttle signs are also posted at the corresponding stops. Field investigations also noted whether or not there are amenities at the bus stops available for transit riders. The transit stops were evaluated for amenities such as trash containers and benches. Of the bus shelters evaluated, 19 were equipped with benches and 15 with trash cans.

As part of the field inventory, each transit stop was surveyed for lighting conditions, specifically street lighting. It was noted if the bus stop had street lighting in the vicinity. Of the 39 bus stops evaluated, nine (9) had street lighting. As a part of the transit section of the corridor, ferry shuttle service is provided along with other bus routes. It was noted if there was a ferry stop at corresponding bus stops, as well as if it was signed accordingly. The ferry shuttle schedule is administered by the NY Waterway. If NY Waterway has a shuttle stop at a specific bus stop, but does not have corresponding signage, it was noted in Table 4-9.

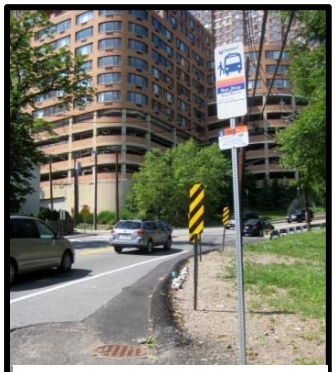
Table 4-9
Bus Stop Conditions

Bus Stop	Direction	Shelter Present	Transit Info Signage		Amenities		Street Lighting	Ferry Shuttle Stop	Bus Shelter ADA Compliant	Boarding and Alighting Area ADA Compliant	Safe Pedestrian Crossing Within 300 feet	300 Feet of Accessible Route	
			Bus	Ferry	Bench	Trash Can						To North	To South
Old River Road (Edgewater Borough Hall)	SB	No	Yes	No	No	Yes	None	No	Not Applicable	Yes	Signalized Intersection	Yes	Yes
	NB	No	Yes	No	No	No	None	No	Not Applicable	No	Signalized Intersection	Yes	Yes
City Place (Gorge Road)	NB	No	Yes	Yes	No	No	None	Yes	Not Applicable	Yes	Signalized Intersection	Yes	Yes
Thompson Lane	SB	Yes	Yes	No	Yes	Yes	None	No	Yes	Yes	Signalized Intersection	No	Yes
Thompson Lane (352'S) (Waterford Towers)	SB	No	Yes	No	No	No	None	No	Not Applicable	Yes	None	Yes	Yes
Thompson Lane (1360'N) (Edgewater Commons South)	NB	No	Yes	Yes	No	No	None	Yes	Not Applicable	No	None	Yes	Yes
Thompson Lane	NB	Yes	Yes	Yes	Yes	Yes	None	Yes	Yes	Yes	Signalized Intersection	Yes	Yes
Edgewater Commons (Old River Road)	SB	Yes	Yes	No	Yes	Yes	None	No	No	Yes	Signalized Intersection	Yes	No
Archer Street	SB	Yes	Yes	No	Yes	Yes	None	No	No	Yes	Signalized Intersection	Yes	Yes
Archer Street (1325'S) (Old River Road)	NB	Yes	Yes	No	Yes	Yes	None	No	No	Yes	Signalized Intersection	Yes	Yes
Archer Street	NB	Yes	Yes	No	Yes	No	None	No	No	Yes	Signalized Intersection	Yes	Yes
Vreeland Terrace	SB	No	Yes	No	No	No	None	No	Not Applicable	Yes	Signalized intersection ~750' south or ~850' north. Both locations have bus stops.	Yes	Yes
	NB	No	Yes	Yes	No	No	None	Yes	Not Applicable	No		Yes	Yes
Russel Avenue	SB	Yes	Yes	No	Yes	Yes	None	No	Yes	Yes	Signalized Intersection	Yes	Yes
	NB	No	Yes	No	No	No	None	Yes	Not Applicable	No	Signalized Intersection	No	No
Garden Place	SB	Yes	Yes	No	Yes	Yes	None	No	Yes	Yes	Signalized intersection with crosswalk is ~1250' south or ~850' north	Yes	Yes
	NB	Yes	Yes	No	Yes	Yes	None	Yes	Yes	Yes		Yes	Yes
Hilliard Avenue	SB	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes	Signalized Intersection	Yes	Yes
	NB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Signalized Intersection	Yes	Yes
Dempsey Avenue	SB	No	Yes	No	No	No	Yes	No	Not Applicable	No	Signalized Intersection	Yes	Yes
	NB	No	Yes	No	No	No	Yes	No	Not Applicable	No	Signalized Intersection	Yes	Yes
NJ Route 5 (Edgewater Marina Ferry Terminal)	SB	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Signalized Intersection	Yes	Yes
	NB	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes	Signalized Intersection	Yes	Yes
NJ Route 5 (444'N) (Admiral's Walk Condominiums)	NB	No	Yes	No	No	No	None	No	Not Applicable	No	Mid-Block Crossing	Yes	Yes
Glenwood Avenue*	SB	No	No	No	N/A	N/A	N/A	No	Not Applicable	N/A	N/A	N/A	N/A
Glenwood Avenue (845'S) (Veterans Park)	SB	No	Yes	Yes	No	No	None	Yes	Not Applicable	No	Nearest crosswalk is ~800' south with a bus stop	Yes	Yes
	NB	Yes	Yes	No	Yes	No	None	No	Yes	Yes		Yes	Yes
Glenwood Avenue	NB	Yes	Yes	No	Yes	No	None	No	Yes	Yes	Signalized Intersection	Yes	No
North Street	SB	No	Yes	Yes	No	No	None	Yes	Not Applicable	No	None	Yes	Yes
	NB	No	Yes	No	No	No	Yes	No	Not Applicable	Yes	None	No	Yes
Sterling Place	SB	No	Yes	Yes	No	No	None	Yes	Not Applicable	No	Signalized intersection with crosswalk are ~1000' south or ~850' north	Yes	Yes
	NB	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes		Yes	No
Orchard Street	SB	No	Yes	Yes	Yes	No	None	Yes	Not Applicable	No	Signalized Intersection	Yes	Yes
	NB	Yes	Yes	No	Yes	No	None	No	Yes	Yes	Signalized Intersection	No	No
Palisade Terrace	SB	No	Yes	Yes	No	No	None	Yes	Not Applicable	No	Signalized intersection with crosswalk is ~550' south or 3000' north	Yes	Yes
	NB	Yes	Yes	No	Yes	Yes	None	No	Yes	Yes		Yes	Yes
Annette Avenue	NB	No	Yes	No	No	No	None	No	Not Applicable	No	None	Yes	Yes
Maple Street	SB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	None	Yes	Yes
Burdette Court	NB	No	Yes	No	No	No	None	No	Not Applicable	Yes	None	No	No

* Bus Stop part of NJ TRANSIT Ridership Data, but was not seen during field survey.

➢ Missing Connections

One of the main comments that the project team has received regarding the corridor is that bus shelters should be connected by an accessible route. Throughout the corridor there is a general lack of connections for pedestrians to access transit facilities.



River Road at Burdette Court
Looking northbound

As noted in Table 4-9, there are five (5) bus stops that do not have a safe, accessible crossing of River Road within 300 feet to either the north or the south. There are three (3) bus stops that do not have an accessible route, at least 300 feet in length, extending away from the bus stop on either side.

➢ Unsignalized Pedestrian Crossings

There is only one mid-block crossing in the corridor. It is located about 450 feet north of State Route 5. The MUTCD presents the guideline under Signal Warrant #4 stating that signal control is not warranted for locations where the demand for a pedestrian crossing is less than 300 feet from an existing signal controlled crossing. For the purpose of this study, this 300 foot threshold was utilized in establishing safe crossings of River Road, as noted in Table 4-9. There are many instances where bus stops have a signalized intersection with crosswalks within 300 feet, creating a safe crossing. If bus stops did not have a safe crossing, it was noted how far the next signalized intersection was located.

4.8 Traffic Signals

Within the study corridor there are 13 semi-actuated signalized intersections. All of the pedestrian crossings at marked crosswalks are controlled by pedestrian signal heads with push buttons.

4.8.1 Pedestrian Crossing Times

The project team reviewed signal timing directives obtained from Bergen County for the 13 signalized intersections found within the study area. The review of the signal timings focused on pedestrian crossing time requirements set forth by the Manual on Uniform Traffic Control Devices (MUTCD), 2009 Edition.

For the reviewed intersections, all of the pedestrian phases meet the required minimum 7 second Walk and 3 second Don't Walk buffer interval.

Table 4-10 summarizes the required pedestrian clearance time (indicated by the flashing Don't Walk). There was a significant change in the calculation of the pedestrian clearance interval from the previous 2003 Edition of the MUTCD and the 2009 Edition. This change was caused by the adjusted pedestrian walking speed, lowered from 4.0 feet per second (2003 Edition) to 3.5 feet per second (2009 Edition). The review of the signal timing directives found that several of the signalized intersections meet the outdated 2003 MUTCD requirements, but have not been updated to meet the 2009 MUTCD requirements.

Table 4-10 indicates which pedestrian crossings at the signalized intersections within the project area meet the 2009 MUTCD requirements for the pedestrian clearance interval. Of the 13 signalized intersections within the corridor, there are 48 marked pedestrian crossings, of which only 16 meet the MUTCD calculated pedestrian clearance interval standards.

Table 4-10
Pedestrian Change Interval Compliance

Intersection	Pedestrian Crossing Across Vehicle Approach	Flashing Don't Walk Time Meets MUTCD 2009[1]
River Road & Old River Road / Unilever Driveway	Northbound	N
	Southbound	N
	Eastbound	Y
	Westbound	N
River Road & Gorge Road / City Place	Northbound	N
	Southbound	N
	Eastbound	N
	Westbound	N
River Road & Thompson Lane	Northbound	N
	Southbound	N
	Eastbound	N
	Westbound	N
River Road & Edgewater Commons	Southbound	N
	Eastbound	Y
	Westbound	N
River Road & Archer Street	Northbound	Y
	Southbound	N
	Eastbound	Y
	Westbound	N
River Rd & Russel Avenue	Northbound	Y
	Eastbound	Y
River Road & Hilliard Avenue	Northbound	N
	Southbound	N
	Eastbound	Y
	Westbound	Y
River Road & Dempsey Avenue	Northbound	N
	Southbound	N
	Eastbound	N
	Westbound	N
River Road & NJ Route 5	Northbound	N
	Southbound	N
	Eastbound	Y
	Westbound	Y
River Road & Glenwood Avenue	Northbound	Y
	Southbound	Y
	Eastbound	Y
	Westbound	N
River Road & Orchard Street	Northbound	N
	Southbound	N
	Eastbound	N
	Westbound	N
River Road & Central Avenue	Northbound	Y
	Southbound	Y
	Eastbound	Y
Hudson Terrace & Bruce Reynolds Boulevard	Northbound	N
	Southbound	N
	Eastbound	N
	Westbound	Y

1. Pedestrian walking speed of 3.5 feet per second

4.8.2 Pedestrian Signal Heads

Within the study corridor, all of the signalized intersections have crosswalks controlled by pedestrian signal heads. Of the 13 signalized intersection within the corridor, only two (2) of the intersections, Hudson Terrace & Bruce Reynolds Boulevard and River Road & Central Avenue, have countdown pedestrian signal heads. The other intersections have non-countdown type pedestrian signal heads. Table 4-11 lists each intersection and the pedestrian signal head type present. The table also indicates if the pedestrian signal head at each intersection pedestrian crossing is operational and if a countdown type pedestrian signal head is present.

Table 4-11
Pedestrian Signal Heads

Intersection	Across Vehicle Approach	Operational	Countdown
River Road & Old River Road / Unilever Driveway	Northbound	Y	N
	Southbound	Y	N
	Eastbound	Y	N
	Westbound	Y	N
River Road & Gorge Road / City Place	Northbound	Y	N
	Southbound	Y	N
	Eastbound	Y	N
	Westbound	Y	N
River Road & Thompson Lane	Northbound	Y	N
	Southbound	Y	N
	Eastbound	Y	N
	Westbound	Y	N
River Road & Edgewater Commons	Southbound	Y	N
	Eastbound	Y	N
	Westbound	Y	N
River Road & Archer Street	Northbound	Y	N
	Southbound	Y	N
	Eastbound	Y	N
	Westbound	Y	N
River Rd & Russel Avenue	Northbound	Y	N
	Eastbound	Y	N
River Road & Hilliard Avenue	Northbound	Y	N
	Southbound	Y	N
	Eastbound	Y	N
	Westbound	Y	N
River Road & Dempsey Avenue	Northbound	Y	N
	Southbound	Y	N
	Eastbound	Y	N
	Westbound	Y	N
River Road & NJ Route 5	Northbound	Y	N
	Southbound	Y	N
	Eastbound	Y	N
	Westbound	Y	N
River Road & Glenwood Avenue	Northbound	Y	N
	Southbound	Y	N
	Eastbound	Y	N
	Westbound	Y	N
River Road & Orchard Street	Northbound	Y	N
	Southbound	N	N
	Eastbound	Y	N

Table 4-11
Pedestrian Signal Heads

Intersection	Across Vehicle Approach	Operational	Countdown
	Westbound	Y	N
River Road & Central Avenue	Northbound	N	Y
	Southbound	N	Y
	Eastbound	N	Y
Hudson Terrace & Bruce Reynolds Boulevard	Northbound	Y	Y
	Southbound	Y	Y
	Eastbound	Y	Y
	Westbound	Y	Y

4.9 Hudson River Waterfront Walkway

The Hudson River Waterfront Walkway (HRWW) is a work-in-progress urban pathway connecting the municipalities from the Bayonne Bridge to the George Washington Bridge. Parts of the Walkway run concurrent with the East Coast Greenway, a similar minded project to create an urban parkway running along the Atlantic coast. The construction and maintenance of the Walkway is monitored by the non-profit Hudson River Waterfront Conservancy.

Signed connections to the HRWW can be found throughout the study corridor. Locations of these signed connections can be found on the Existing Conditions Pedestrian Facilities Maps included in Appendix H and are as follows:

- Entrances and exits of Edgewater Commons
- Edgewater Towne Center/Whole Foods
- Intersection of River Road and Dempsey Avenue
- By the northbound bus stop at North Street
- Stairway at Vela Way
- Annette Avenue

4.10 Bicycle Facilities

This section identifies the existing conditions for bicyclists within the corridor and provides a summary of this evaluation including data inventory, field investigation, and Bicycle Demand & Suitability Analysis. An Opportunities and Constraints Analysis was conducted to identify bicycle trip attractors and generators, gaps in connectivity, and barriers to riding.

4.10.1 Key Bicycle Destinations/Attractors

- **East Coast Greenway**

The alternate routing for the East Coast Greenway (ECG) to cross the Hudson River is along the George Washington Bridge (GWB). Between Jersey City and Fort Lee, the ECG uses the Hudson River Waterfront Walkway (HRWW) wherever it has been constructed. Where the HRWW is not present, the ECG uses the sidewalk and/or roadway network.

- **Bike Route 9/Route 9W**

Route 9W is a popular destination for all types of cyclists – ranging from those in training, those commuting to work and those just looking for a casual ride. The corridor runs parallel to the Palisades Interstate Parkway and stretches from Fort Lee, New Jersey into New York State. In its 350-mile entirety, Bike Route 9 connects Manhattan and Montreal.

➢ George Washington Bridge

The George Washington Bridge (GWB) is used by many types of bicycle (and pedestrian) travelers. These types of travelers include commuters, tourists, recreational travelers and those using it for general utilitarian outings. Bicycle riders often use the GWB for accessing the more scenic roadways of New Jersey such as Henry Hudson Drive located within Palisades Interstate Park parallel to the River Road corridor. Frequently bicyclists do the 75-mile loop ride over the GWB to the Bear Mountain Bridge located to the north in Rockland County, New York via Bike Route 9.

➢ Bike Shops

Just outside of the corridor, on Hudson Terrace, there is a bicycle shop named Strictly Bicycles that is a regional destination for bicyclists. The shop is popular because it is the only shop along the Route 9W bike loop. The shop is convenient for bicyclists in preparation for their ride. It also features a café sponsored by the Benzel-Busch Motor Car Corp.[1] that is utilized as a gathering place for bicyclists to socialize before or after their rides. Although the shop is located in Fort Lee, a Fort Lee Patch article on the shop "Strictly Bicycles Assures Smooth Riding For Cyclists"[2] suggests that most of its customer base consists of those traveling from New York City via the GWB.

4.10.2 Bicycles and Public Transportation

➢ NJ TRANSIT Buses

Bicycles are permitted at all times with bike racks on the front of buses or those equipped with underfloor luggage compartments on a first-come, first-served basis. NJ TRANSIT is phasing in bike racks on all of its local buses.

➢ NY Waterway Ferry

The NY Waterway Ferry offers ferry service to and from Edgewater Ferry Terminal and nearby Port Imperial/Weehawken Ferry Terminal. There is a $1.25 surcharge to riders who bring their bikes on ferries between New Jersey and New York.

[1] http://www.strictlybicycles.com/about/
[2] http://fortlee.patch.com/articles/strictly-bicycles-assures-smooth-riding-for-all-cyclists

Needs Assessment

➢ Field Investigation Summary

A field inventory and assessment was completed of the project corridor on May 17, 2012. This included an initial windshield survey to identify major segments based on variations to the overall cross section and typical bicycle accommodation. Once these segments were identified, lane widths, shoulders, parallel shared use paths and any separating buffer areas were confirmed using a measuring wheel and/or a box measuring tape. General observations of bicycle related issues included:

Minimal existing facilities

Conflicts with turn lanes

Bicycle compatible shoulder

Wide road widths

Narrow road widths

Steep grades

Connections to the Hudson River Waterfront Walkway

Linkages to retail & other destinations

Lack of bicycle amenities

➢ Bicycle Parking

Bicycle parking is a key component of a functional bicycle network. A person is much less likely to cycle if there is no place to safely park a bike. Although a comprehensive bicycle parking inventory was not conducted as part of this study, during fieldwork it was observed that bicycle parking within the corridor is limited. While there may be bicycling parking in other locations along the corridor, only the Edgewater Ferry was noted to have available bicycle parking.

Share the Road signs along River Road

Signs

Throughout the River Road corridor there are "Share the Road" signs to remind motorists and cyclists to share the road. They are often accompanied by "Ride in Single File" placards to inform bicyclists to ride in single file.

➢ 2004 New Jersey Statewide Bicycle and Pedestrian Master Plan, Phase 2 Demand and Suitability Model Summary

Utilizing the methods and data for modeling bicycle demand and suitability from the NJ Statewide Bicycle and Pedestrian Master Plan, Phase 2, published in 2004, an analysis of bicycle demand in the 2-mile radius surrounding the corridor and the suitability for biking on River Road and the connecting roadway network was conducted. According to the model, bicycle demand is medium (201-1,000 daily bicycle trips) for the majority of the River Road Corridor and the River Road corridor as it currently exists is "less suitable" for bicycle travel; however link segments that are upland, such as Route 5 (except for the link between milepost 1.8 and 2.16) and Palisade Avenue, are "more suitable" for bicycle travel.

It should be noted that the bicycle demand model used provides a conservative estimate of demand that accounts for utilitarian trips only and does not consider recreational trips. The bicycle suitability model evaluates links (segments) of a corridor, not full corridors. The analysis should be used as a guide to illustrate areas where demand generally exists and suitability could potentially be enhanced with the implementation of new or improved facilities for bicycling. See Appendix K: Bicycle Demand and Suitability Analysis for the full results of the analysis.

➢ 2012 NJDOT Statewide Bicycle Map Bicycle Suitability Rating Summary

The Statewide Bike Map provides bicycle suitability ratings for state and county roadway at the link level and not for intersections. The criteria used to develop the ratings included traffic volumes, traffic speeds, outside travel lane width, the availability of a paved shoulder, presence of parking and land use. According to the statewide bicycle map, the following roadways in the study corridor are rated as follows:

- **River Road** is rated least suitable
- **Route 5** is rated least suitable
- **Bruce Reynolds Boulevard** is rated least suitable
- **Palisade Avenue** varies between moderately and least suitable
- **Anderson Avenue** is moderately suitable
- **Center Avenue** is most suitable

The ratings system used to identify roadways suitability for the Statewide Bicycle Map is very sensitive to both traffic volumes and posted speed limits. The traffic volumes on Center Avenue and parts of Anderson Avenue are significantly lower than the volumes on River Road. Some sections of Anderson have volumes roughly equivalent to those on River Road. With respect to posted speed limits, River Road is posted at 35 miles per hour while Center Avenue and Anderson Avenue are posted at 25 miles per hour. For this reason, River Road is shown as "least suitable" while Center and Anderson Avenues are shown as "most suitable" and "moderately suitable", respectively.

The ratings, however, should not be considered a measure of safety. The level of comfort or challenge, or even the safety associated with riding on a given section of roadway is in large part dependent on the competence, confidence and judgment of the bicyclist. The suitability of a roadway for bicycling can also be related to the purpose of the trip (touring, commuting, etc.).

4.10.3 Bicycle Opportunities and Constraints

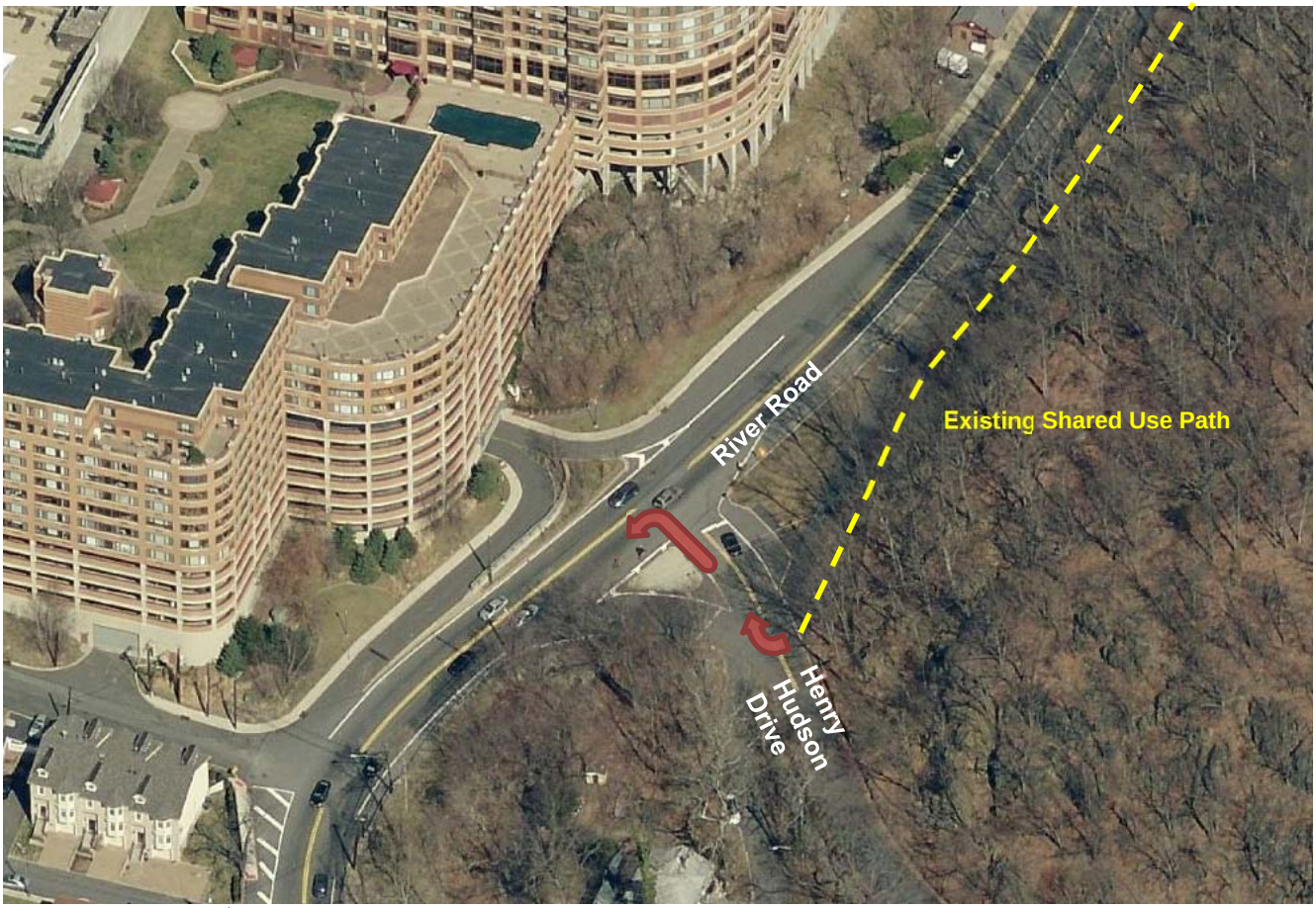
There are many opportunities to enhance bicycling throughout the corridor – and just as many constraints that make the creation of a cycling network difficult. Based on data, field investigations, and community outreach, an analysis of constraints and opportunities was conducted which resulted in the following lists of constraints and opportunities. The lists are not exhaustive, but provide a base from which a prioritized bicycle improvement strategy could be developed.

➢ Constraints

There are numerous constraints to bicycling along the River Road corridor that are evident throughout the corridor or unique to specific target areas. There are intersection crossing conditions, land development constraints, steep slopes, and bicycle disconnects. Constraints are usually conditions that pose a hurdle to attaining a desired goal – but often they provide opportunities for overall improvement. Some of the major bicycle travel constraints include:

Access to/from the GWB

- Southbound, the shared use path encourages riding at high speed and then ends with an abrupt steep downward grade. Cyclists wishing to continue south must cross River Road to share the southbound travel lanes. This requires crossing Henry Hudson Drive and River Road to successfully make this connection.



Indicates cyclists' movement

- Northbound, there is a major gap in the bicycle accommodation between the GWB and Bruce Reynolds Boulevard. The shared use path does not connect to the GWB, leaving a gap of approximately 170 feet, where bicyclists need to share the road along Hudson Terrace. While there is an 8-foot wide sidewalk for the northern portion of this link, this diminishes to approximately 5-foot wide under a major ramp abutment just north of Bruce Reynolds Boulevard. This is not wide enough to accommodate bicycle and pedestrian traffic. By the standards of the American Association of State Highway and Transportation Officials (AASHTO) 2012 *Guide for the Development of Bicycle Facilities*, the minimum width of a shared use path is 10 feet. The guidelines allow for a minimum width of 8 feet in certain circumstances which are not applicable here.

- The GWB and its accompanying ramps and support structures present visual barriers for bicyclists turning left across Hudson Terrace to and from the GWB walkways.

- Cyclists accessing the GWB from the north along Hudson Terrace are faced with multiple conflicts before they can safely access the bridge ranging from crossing multiple travel lanes to the limited sight distance due to centerline column obstructions.

On-Road Bicycle Facilities

- Lack of consistent shoulder or lane widths reduces predictability
- Lack of designated on-road bicycle facilities forces many to ride on the sidewalk
- No bicycle loop detectors in the pavement inhibit bicycle traffic from following traffic signals
- Numerous right and left turn lanes conflicts

Off-Road Bicycle Facilities

- River Road is often used as the on-road alternate for the Hudson River Waterfront Walkway. Although the Hudson River Waterfront Walkway provides a separation from roadway traffic, it is not an ideal facility for cyclists for these reasons: 1) most cyclists are looking to travel at speeds beyond the walking pace of the pedestrians using the facility 2) the Walkway was constructed with bricks and stones, which is not an ideal surface for bicycle use 3) the Walkway's circuitous routing adds significant travel time for through trips. To avoid these uncomfortable and potentially dangerous conflicts with other users along the Walkway, many cyclists chose not use the Walkway and use River Road as their through route. The long-term gaps in the Walkway presented by current industrial waterfront uses will also continue to be a deterrent for cyclists looking for a through connection to points north or south. Signed connections to the Walkway from River Road are limited (See graphic below).

Topography

- Horizontal and vertical curves limit sight distance

- There are long segments of the corridor that have very steep slopes, and many novice or casual bicycle riders are not comfortable riding this steep grade for such a long distance. Field observations have included several northbound riders walking their bicycles up the hill. This is also an issue southbound as the steep hill allows bicyclists to very easily attain speeds in excess of the 35 mile per hour posted speed limit. Again, this condition is not comfortable for many novice or casual bicycle riders, and they have to use caution and heavy braking to keep their bicycle under a comfortable speed.

- Connection to the Uplands is made difficult by changes in elevation and slope

Roadway Design

- Limited bicycle compatible roadway configurations
- Extremely narrow segments
- Extremely wide travel lane segments
- Dedicated left and right turn lanes
- Left turn conflicts to major destinations
- Left turn conflicts to/from shared use paths
- There are numerous large residential and commercial land uses that have constructed major driveway access points or parking lots along River Road. Several of these utilize right or left turn only lanes, creating frequent conflicts for through bicycle travel.
- There are segments along the River Road corridor where bicycle traffic traveling northbound or southbound has the choice to travel along a parallel paved shared use path, or share the travel lanes with motor vehicle traffic. Transition to and from these paths presents a significant constraint for southbound bicyclists, as the shared use path are located along the eastern (northbound) side of River Road. Southbound cyclists must cross all the travel lanes two times in order to legally continue along the corridor.

Opportunities

Bicycle Access to Key Destinations

There are many opportunities within the River Road corridor to provide residents and commuters with bicycle access to key destinations. The following outlines some of the major bicycle travel opportunities for implementing bicycling improvements based on information collected through the field investigations and input from community outreach:

- **George Washington Bridge connection** – This is the only bicycle accessible connection across the Hudson River between New Jersey and New York, south of the Bear Mountain Bridge. There is also no toll charged for walking or bicycling across the bridge, whereas motor vehicle tolls are currently range between $7.50 and $12 dollars depending on time of day and if the travelers are using E-Z Pass.
- **Edgewater Ferry Terminal connection** – The NY-NJ Waterways ferries in the area are easily accessible by bicycle, and bicycle parking is free of charge. In a July 15th, 2012 article, “Bike lanes to offer ferry-goers alternative,” posted on NorthJersey.com, NY Waterway spokesman said that “there are no more than 20 [passengers] who actually park them [bicycles] at Weehawken [Ferry Terminal].” However, he added that “If we have to install more bike racks for more customers we'd certainly welcome it." This leaves the conversation on the table for additional bike parking in the future driven by customer demand.
- **Striped shoulders along River Road and Hudson Terrace** – There are segments of striped shoulders located along the roadway. These are generally short and of varying width.
- **Wide travel lanes** – There are segments of wide travel lanes along River Road, both at the transition between the four lane section and the two lane section just north of the intersection with Route 5.

- **East Coast Greenway (ECG)** - The vision for the ECG is a "green travel corridor will provide cyclists, walkers, and other muscle-powered modes of transportation with a low-impact way to explore the eastern seaboard."
- **Hudson County bike lane connection** - Providing a connection to bike lanes along River Road in Hudson County would provide continuity for a through route for cyclists traveling the corridor.
- **Shared Use Paths** - Shared use paths are available along the east (northbound) side of the road between the Hudson County border and Gorge Road (0.25 miles long), and between Henry Hudson Drive and Bruce Reynolds Boulevard (0.4 miles long). This creates the opportunity for bicyclists to travel along a separate facility, shared with pedestrians, but isolated from motor vehicle traffic.
- **Designated Bike Routes** - Hudson Terrace from the GWB north to Palisades Avenue and Palisades Avenue between Hudson Terrace and Route 9 are both designated as American Association of Highway and Transportation Officials (AASHTO) numbered Bike Route 9, part of the official U.S. Bicycle Route System (USBRS).

Education, Encouragement and Enforcement

Increasing the rate of cycling for transportation within the corridor can come as a result of physical improvements but it can also be a byproduct of simply seeing others engaging in more of this type of activity.

One of the keys to encouraging people to bike more is to provide educational opportunities for bicyclists and motorists to learn how to share the road with each other. There are several resources within the state, such as the New Jersey Bike and Walk Coalition, that can provide information on "rules of the road" and provide clear expectations of how all modes of transportation should behave while using the street.

Within this corridor, there are a number of existing opportunities that can be leveraged for support to get bicyclists riding more. Here are a few:

Education & Encouragement

The Bicycle Touring Club of North Jersey (BTCNJ) is the largest touring club in New Jersey with more than 1,300 members in approximately 1,000 households. They have an active club rides schedule which offers approximately 1,000 rides each year. One of their weekly club rides, Russian Teardrop Monument Ride, starts at Edgewater Commons Mall and goes down River Road into Hoboken/Jersey City and to Liberty State Park, and then to the Tear Drop Memorial, a gift from the Russian government to the United States as a memorial to the victims of September 11th located in the Bayonne terminal area. The Club also sponsors educational courses, such as bicycle riding safety clinics, in partnership with the New Jersey Bike & Walk Coalition (NJBWC).

Enforcement

Edgewater and Fort Lee Police Department utilize bicycle patrol as part of their policing programs. Enforcement should foster mutual respect between roadway users and improve safety for all. Cyclists and law enforcement should host educational events together to build this mutual respect around safe cycling along the corridor. If cyclists feel they are supported by the law, they are more likely to feel comfortable riding. This will also give police officers the opportunity to get a better understanding of cyclists' needs and experiences.

Economic Vitality

1) Bike Events

In 2008, the advocacy organization Bikes Belong did a survey of U.S. recreational events promoters to assess the economics of impact road riding events. They found that riders participating in these events "spent nearly **$140 million** on

food, lodging, and other purchases"[3] which directly benefits the host community. Often these events can be a community's introduction to riding and are seen as "gateway" events into the activity of bicycling. Within the River Road corridor, there are a number of events that take place and could foster this type of activity and play a role as an economic driver such as:

Tour de Fort Lee

Each year the Fort Lee Education Foundation sponsors the Tour de Fort Lee. This fun and family-friendly event includes a 12-mile bicycle ride or 2-mile walk. This event takes place annually in the fall.

Gran Fondo New York

The Gran Fondo New York bike race is the largest bike event in New Jersey. The race begins in Fort Lee and ends at the Port Imperial Ferry Terminal in Weehawken. With its two courses, the Gran (103 miles) and Medio (65 miles) Fondos, this Italian-styled cycling event is a large attractor for serious cyclists with "about 5,000 racers from 70 countries, including Argentina, Italy, Chile, China and Colombia."[4]

2) Bike Tourism

According to Adventure Cycling[5], bicycle tourists have a typical demographic profile:

- Highly educated
- Higher discretionary income
- Bike travelers spend more than average tourist (e.g. $100 daily versus $60+ in 2005)
- Typically stay longer in an area
- Less direct impact on local government
- Green travel potential and linkage with trains/buses
- Becoming sweet spot for 50-64 demo, which in 2010 accounts for 43% of increase in consumer spending

Bicycle Opportunities and Constraints Map

Knowing the destinations that attract bicycling trips helps form the baseline for future land use changes and access improvements. There are certain destinations that are known to attract bicycling trips. These include:

- *Schools*
- *Parks/Open Space*
- *Religious Buildings*
- *Commercial Activities/Services*
- *Post Offices and Libraries*
- *Transit Stops and Stations*

The "Bicycle Opportunities and Constraints" map on the following pages illustrates key bicycling destinations, difficult crossings and more.

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[3] **Bikes Belong Survey: The Size & Impact of Road Riding Events** http://www.bikesbelong.org/assets/documents/uploads/fullrecridereport.pdf

[4] http://www.northjersey.com/fortlee/Gran_Fondo_bike_race_winds_through_North_Jersey_and_New_York.html

[5] http://www.bikeleague.org/summit12/Presentations/Calculating%20the%20Value%20of%20Bicycle%20Travel/JimSayer.Calculating%20the%20Value%20of%20bicycle%20travel.pdf

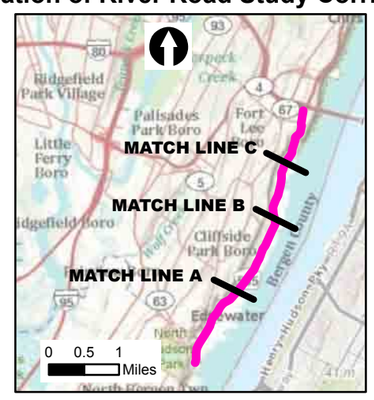
Legend

- River Road
- HRWW Signed Connection
- Curb Cut
- Right Turns Conflict
- Left Turn Conflict
- River Road Multi-use Path
- Municipal Building
- Police
- Ferry Shuttle Bus Stop
- Bus Stop
- Traffic Signal
- Wetland
- Shopping Center
- Park
- Municipal Facility
- County Boundary
- Municipal Border

0 200 400 800 Feet

Sources: Base Mapping - Microsoft Corp. 2008, ESRI web server. Wetland - NJDEP 2007; Parks - LBG 2012; Hospital and Bergen County Parcels - NJ Office of Information Technology (NJOIT), 2008, 2011; Bus/Ferry Stops - LBG and Bergen County, 2012.

Location of River Road Study Corridor



River Road/Hudson Waterfront Corridor Strategy: A Phase Two Study

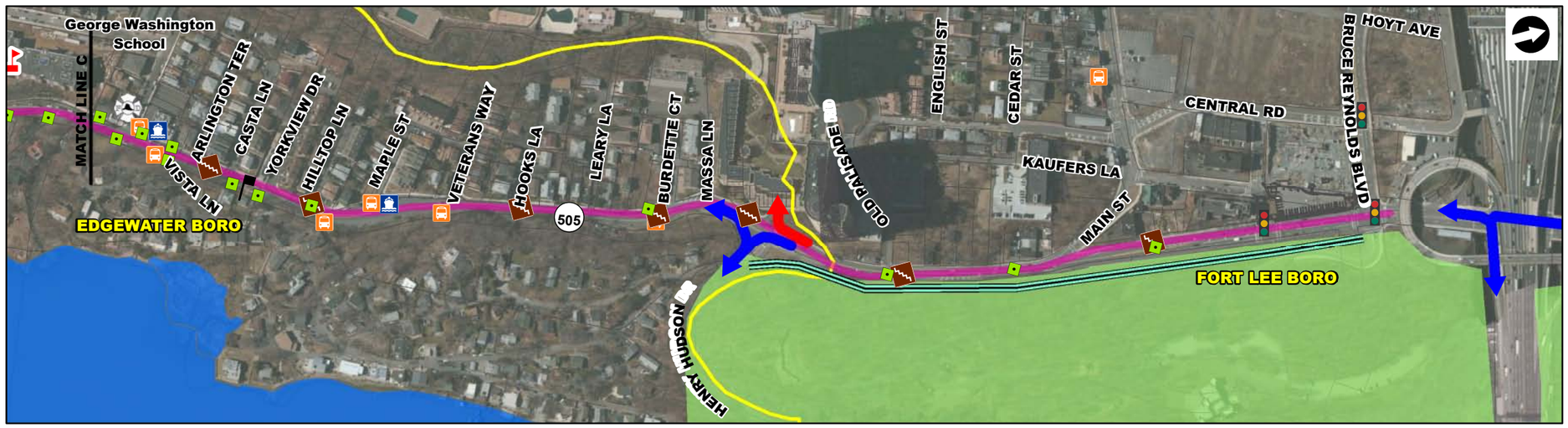
Bicycle Opportunities and Constraints

Sheet 1

RBA

NJTPA NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

April 2013



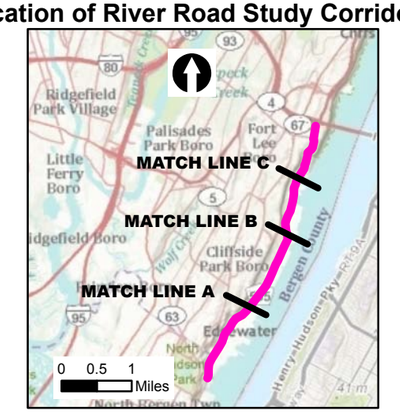
Legend

- River Road
- HRWW Signed Connection
- Curb Cut
- Steep Grade
- Right Turns Conflict
- Left Turn Conflict
- River Road Multi-use Path
- Municipal Building
- Police
- Ferry Shuttle Bus Stop
- Bus Stop
- Traffic Signal
- Wetland
- Shopping Center
- Park
- Municipal Facility
- County Boundary
- Municipal Border

0 200 400 800 Feet

Sources: Base Mapping - Microsoft Corp. 2008, ESRI web server. Wetland - NJDEP 2007; Parks - LBG 2012; Hospital and Bergen County Parcels - NJ Office of Information Technology (NJOIT), 2008, 2011; Bus/Ferry Stops - LBG and Bergen County, 2012.

Location of River Road Study Corridor



River Road/Hudson Waterfront Corridor Strategy: A Phase Two Study

Bicycle Opportunities and Constraints

Sheet 2

RBA

NJTPA NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY

April 2013

5. Conceptual Improvements

The purpose of this study is to improve overall corridor safety and mobility for non-motorized modes of travel, and enhance the livability and economic vitality of the corridor. Corridor-wide improvement concepts were developed to address the safety and mobility issues identified based on information gathered from the first phase of this study, field investigations conducted by the project team, crash data, and public concerns and suggestions received through the project's community outreach.

The proposed corridor-wide improvement concepts have been organized in to long-term, mid-term, and short-term recommendations. The long-term recommendations were designed to best encompass the vision of the corridor that would accommodate pedestrians, bicyclists, and transit users. The recommendations in the long-term concept are anticipated to take more than 5 years to construct, and the pedestrian, transit, and bicycle improvements may include some roadway widening, right-of-way acquisitions, and drainage and utility impacts, but they do not include any impacts to existing buildings. The recommendations in the mid-term concept have a construction time frame of 3 to 5 years. These improvements could be made as part of future repaving along the corridor, and may require some right-of-way acquisitions. The recommendations in the short-term concept have a construction time frame of less than 3 years. These improvements would provide some "quick fixes" to some of the identified problems within the corridor.

5.1.1 Long-term Concept

The long-term concept for the River Road corridor includes improvements to bicycle, pedestrian, and transit facilities that best encompass the long-term vision of the corridor. These improvements are shown on the Long-Term Improvement Concept Plans, located in Appendix L. Below is a summary of these improvements:

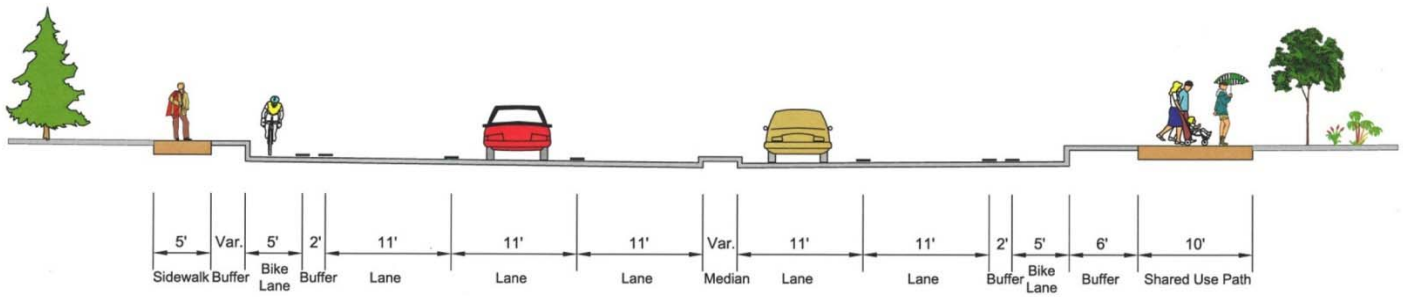
- Reduce the travel lanes to 11-foot lanes, which will be striped with high visibility reflective markings, to accommodate both on-road and off-road bicycle facilities.
- Build an off-road shared use path along the east side (northbound) side of River Road. The 10-foot path should be continuous and separated by a 6-foot vegetative buffer or a 2-foot barrier. Install yield priority signs along the shared use path to reinforce that bicycle traffic must yield to pedestrians.
- On the west side (southbound) of River Road create a connected system of pedestrian facilities throughout the corridor by installing a 5-foot sidewalk where it is missing or is physically deficient.
- Install a 5-foot bike lane along both sides of River Road. The bike lane will be continuous and paired with a designated painted buffer space separating the bicycle lane from the adjacent motor vehicle travel lane. For most of the corridor the buffer is 2-foot wide with limited exceptions. Buffers appeal to a wider cross-section of bicycle users because they provide greater shy distance between motor vehicles and bicyclists. In addition, buffers provide space for bicyclists to pass another bicyclist without encroaching into the adjacent vehicle travel lane.
- Install ADA compliant curb ramps and detectable warning surfaces at locations where they are missing or substandard. This improvement is also part of the mid-term and short-term concepts.
- Install pedestrian hybrid beacons at five (5) locations within the corridor to provide safe crossings for pedestrians, which is also part of the mid-term concept.
- Adjust pedestrian crossing times at signalized intersections in order to provide adequate time for pedestrians to cross the roadway, which is also part of the mid-term and short-term concepts.
- Where necessary, replace pedestrian signal heads with a countdown display pedestrian signal head to help pedestrians assess how much time they have to finish crossing the street, which is also part of the mid-term and short-term concepts
- Consolidate and/or eliminate bus stops to provide shorter bus trips due to less stops; and therefore less dwell time, higher speeds, and decreased travel time.
- Install a series of bus stop alternatives that provide bus bays at bus stops throughout the corridor; and therefore, a protected area for both the transit users and the stopped bus away from the travel lane, providing safe access

for the transit users and reduce delay to vehicles traveling on River Road. These alternatives are also part of the mid-term concept.

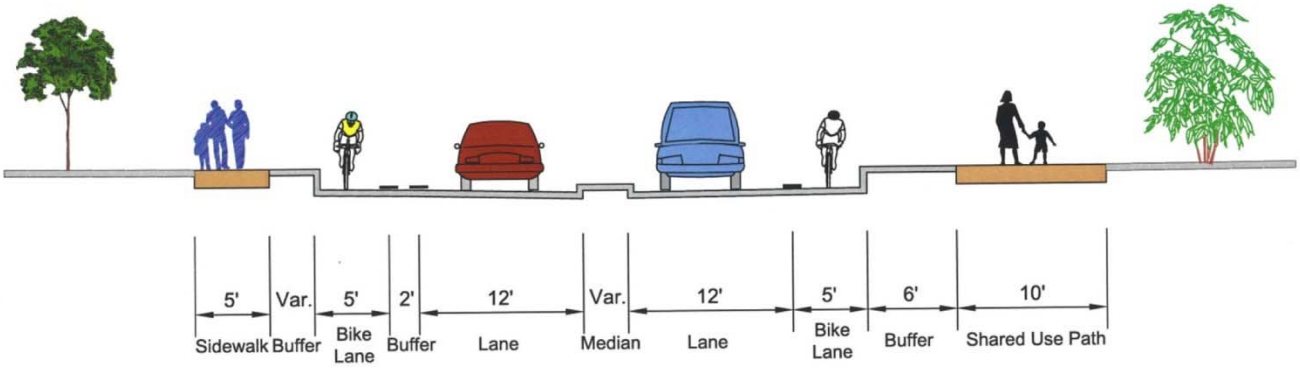
- Install ADA compliant bus shelters at existing bus stops, which is also part of the mid-term and short-term concepts.

- Install intersection crossing markings to guide bicyclists on a safe and direct path through intersections, including driveways, which is also part of the mid-term concept.
- Install "through bike lanes" where there are bike lanes and right-turn only lanes at intersections to assist bicyclists to correctly position themselves to avoid conflicts with turning vehicles.
- Install colorized advance bicycle boxes at high conflict locations especially where there are frequent bicycle left-turns and/or motorist right-turns. This is also part of the mid-term concept.
- Install shared lane markings along the corridor. Frequent, visible placement of markings is essential. Along River Road they should be placed every 50-100 feet. While generally not a preferred treatment on higher volume streets, shared lane markings help to reinforce the legitimacy of bicycle traffic on the street and recommend proper bicyclist positioning. Because shared lane markings do not designate a particular part of the roadways for the exclusive use of bicycles they are not considered a facility type. Rather, a shared lane marking is a pavement marking that is used to support a complete bikeway network.

Long-Term Concept Typical Cross Section (south of Garden Place)



Long-Term Concept Typical Cross Section (north of Garden Place)



5.1.2 Mid-term Concept

The mid-term concept for the River Road corridor includes the following improvements. These improvements listed below are in addition to the improvements noted above in the long-term concept section that are also part of the mid-term concept.

- On both sides of River Road create a connected system of pedestrian facilities throughout the corridor by installing a 5' sidewalk where it is missing or is physically deficient. This is also included as part of the short-term concept.
- Install 5-foot bike lanes where there is sufficient right-of-way; sharrows should be utilized where there is insufficient space for bike lanes.
- Install "through bicycle lanes" where there are bike lanes and right-turn only lanes at intersections in order to assist bicyclists to correctly position themselves to avoid conflicts with turning vehicles. Where there isn't room for a through bicycle lane, a combined bicycle lane/turn lane should be considered, especially along the southern four-lane portion of the corridor.
- Provide bicycle detection at all signalized intersections.
- Install wayfinding signs to key destinations with the direction, distance, destination and riding time for bicyclists from current location including connections to the Hudson River Waterfront Walkway.
- Enhance gateway treatments such as welcome signs and landscaping at the northern entrance of the corridor near Bruce Reynolds Boulevard, at State Route 5 and the southern border of the county near Churchill Road.

5.1.3 Short-term Concept

The short-term concept for the River Road corridor includes the following improvements. These improvements listed below are in addition to the improvements noted above in the long-term concept and mid-term concept sections that are also part of short-term concept.

- Install shared lane markings along the corridor. Frequent, visible placement of markings is essential. Along River Road they should be placed every 50-100 feet. While generally not a preferred treatment on higher volume streets, shared lane markings help to reinforce the legitimacy of bicycle traffic on the street and recommend proper bicyclist positioning. The shared lane marking is not a facility type, it is a pavement marking.
- Install "MAY USE FULL LANE" signs (R4-11) along the northern 4-lane segment of the corridor where no bicycle lanes or adjacent shoulders usable by bicyclists are present and lane widths are <14'.
- Install bicycle "WRONG WAY" signs and "RIDE WITH TRAFFIC" plaques (R5-1b, R9-3CP) back-to-back with other signs to minimize visibility to other traffic where wrong-way riding by bicyclists is frequently observed.
- Create secure and safe bicycle parking at key bicycling destinations (or starting points) including schools, shopping centers, recreational facilities, public buildings, and parks throughout the corridor.
- Provide and promote bicycle parking, showering and clothes changing facilities at worksites, transportation terminals, and other destinations.
- Conduct a feasibility study to determine a suitable location to install a bicycle repair station for commuters and residents to ride their bikes to the ferry terminal with secure, sheltered parking.
- An unsignalized mid-block crosswalk will be striped at Maple Street and pedestrians will be directed with signage to cross at this location and at Central Avenue, north of Henry Hudson Drive.

5.2 Concept Improvement Components

Following is a description of specific components that are part of the long-term improvements concept, as shown in the Long-Term Improvement Concept Plans, located in Appendix L. The description below highlights where these improvement concepts can be "scaled back" to facilitate installation and minimize impacts.

5.2.1 Continuous Shared Use Path & Sidewalks

As noted in the Existing Conditions section, there are several locations where the existing sidewalk is in poor condition, does not meet current ADA standards, or is missing throughout the corridor. The following improvements will provide a connected system of pedestrian facilities throughout the entire corridor.

A five foot sidewalk is proposed along the west (southbound) side of River Road where there is currently missing or substandard sidewalk. This includes a total of 5605 feet of sidewalk and will provide a continuous sidewalk connection along the west (southbound) side of the entire corridor. This improvement is recommended as part of the short-term improvement concept, and is carried through to the long-term improvement concept. The short-term improvement concept can be completed within three years, with little to no required easements.

Example of a shared use path

Source: www.bikepedimages.org / Jim Hash

A 10-foot off-road shared use path is proposed along the east (northbound) side of River Road as part of the long-term concept. Throughout the corridor, the shared use path is separated from motorized vehicular traffic by either a 6 foot grass buffer or a 2 foot barrier, with the exception of the section between the Trader Joe's driveway (Milepost 4.95) and Binghamton Way (Milepost 5.15). In this area, the roadway is elevated, and the shared use path is proposed below the roadway at grade with the existing buildings. Throughout the corridor, the proposed shared use path can be used by all non-motorized users, including pedestrians, bicyclists, inline skaters, and wheelchair users. Due to the right-of-way that would be needed to accommodate the widening for this improvement, in addition to the other bicycle and transit improvements, the shared use path is only included in the long-term improvement concept.

As part of the short-term and mid-term improvement, a 5-foot sidewalk is proposed along the east (northbound) side of River Road, in place of the 10-foot shared use path, where there is currently missing or substandard sidewalk. This will provide a total of a continuous sidewalk connection along the east (northbound) side of the entire corridor in the mid-term timeframe. There is one location within the corridor where there are both right-of-way and physical constraints, and the sidewalk cannot be constructed in the short-term timeframe. This area is located from Maple Street north to Henry Hudson Drive (Milepost 6.84 to 7.09) on the east (northbound side). In the short-term time frame there will be no sidewalk connection in this section. An unsignalized mid-block crosswalk will be striped at Maple Street and pedestrians will be directed with signage to cross at this location and at Central Avenue, north of Henry Hudson Drive. The installation of a hybrid beacon will also be proposed at this location.

5.2.2 Curb Ramps and Detectable Warning Surfaces

Based on the field investigations conducted by the project team, it was determined that there are 28 curb ramps throughout the corridor that do not meet current ADA guidelines. There were also 5 locations where a curb ramp was not present. As part of the short-term improvements, it is recommended to install ADA compliant curb ramps at the locations noted in Table 4-7 and detectable warning surfaces at each of these locations where curb ramps are not present:

- River Road & Old River Road: Southeast Corner
- River Road & Old River Road: Southwest Corner
- River Road & Office Driveway (Milepost 3.77): Southeast Corner
- River Road & Russel Avenue: Northeast Corner
- River Road & Glenwood Avenue: Southeast Corner

5.2.3 Pedestrian Hybrid Beacons

As previously discussed, there are several areas where it is difficult for pedestrians to cross River Road due to the absence of a safe crossing, either a traffic signal with crosswalks or a mid-block crosswalk. In order to provide safe crossings for pedestrians throughout the corridor, the project team reviewed the location of existing NJ TRANSIT bus and NY Waterway ferry shuttle stops and ridership data, the distances between existing signalized intersections with safe crossings, the pedestrian crash data from the corridor, and land uses in the area. This information led to the recommendation of installing five (5) pedestrian hybrid beacons within the corridor to provide safe crossings for pedestrians. More specifically, these locations were selected for a combination of reasons including proximity to an existing bus stop, distance from a signalized intersection, high bus and shuttle ridership, and nearby land uses.

The Manual on Uniform Traffic Control Devices (MUTCD), 2009 Edition defines a pedestrian hybrid beacon as "a special type of hybrid beacon used to warn and control traffic at an unsignalized location to assist pedestrians in crossing a street or highway at a marked crosswalk." The hybrid beacon is unlike a traditional traffic signal because the signal heads on the mast arm remain dark until it is activated by a pedestrian on the side of the road. Once the beacon is activated, the signal heads facing the motorists display a flashing yellow light, a steady yellow light, and then a steady red light. At this point, it is safe for the pedestrian to cross. When the calculated pedestrian crossing time has ended, the signal heads display an alternating red light, and then the signal head goes dark again. The signal head will remain dark until the next time the beacon is activated by a pedestrian. A sample of the beacon sequence is shown in Figure 5-1.

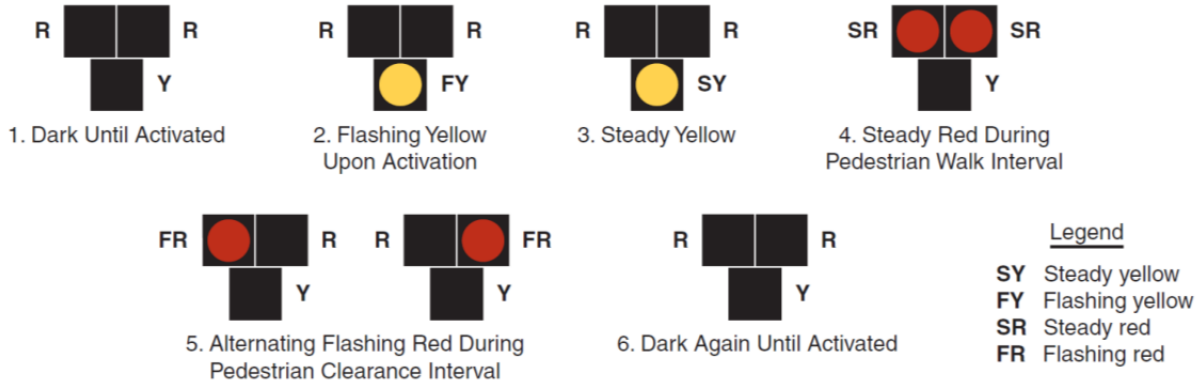
Example of a pedestrian hybrid beacon
Source: Kevin Posey

The locations of the proposed pedestrian hybrid beacons are listed below and are shown on the Long-Term Improvement Concept Plans, located in Appendix L. These locations will include the installation of signage and marked crosswalks with the pedestrian hybrid beacon.

- Milepost 5.25 at Garden Place
- Milepost 5.82 at the Admiral's Walk Driveway
- Milepost 6.28 at North Street
- Milepost 6.84 at Maple Street
- Milepost 7.15, 325 feet north of Henry Hudson Drive

The installation of the pedestrian hybrid beacons is part of both of the long-term and mid-term improvements. The hybrid beacons are not included as part of the short-term improvements, but due to the existing wide pavement at Maple Street (Milepost 6.84), it is proposed to have an unsignalized mid-block crosswalk as part of the short-term improvement concept.

Figure 5-1
MUTCD Figure 4F–3
Signal Sequence for a Pedestrian Hybrid Beacon



5.2.4 Traffic Signal Timing Revisions

As discussed in the Existing Conditions section, the pedestrian crossing times at the 13 signalized intersections within the study area were reviewed. Based on this review, it was found that pedestrian crossing times at only two of the signalized intersections meet the current standards of the 2009 Manual on Uniform Traffic Control (MUTCD) for all pedestrian crossings at the intersection. Based on this review, the following intersections require adjusted pedestrian timings in order to comply with the MUTCD, 2009 Edition and provide adequate time for pedestrians to cross the roadway safely. Unless otherwise noted below, Bergen County maintains jurisdiction of these traffic signals.

- River Road & Old River Road / Unilever Driveway
- River Road & Gorge Road / City Place
- River Road & Thompson Lane
- River Road & Edgewater Commons / Old River Road
- River Road & Archer Street
- River Road & Hilliard Avenue
- River Road & Dempsey Avenue
- River Road & NJ Route 5 (NJDOT jurisdiction)
- River Road & Glenwood Avenue
- River Road & Orchard Street (Borough of Edgewater jurisdiction)
- Hudson Terrace & Bruce Reynolds Boulevard (Port Authority jurisdiction)

These signal timing improvements are part of the short-term improvements and will be carried through to the mid-term and long-term improvements.

5.2.5 Replacement of Pedestrian Signal Heads

As previously noted, 11 of the 13 traffic signals within the corridor have pedestrian signal heads that do not have a countdown display. Based on this review, it is recommended that the pedestrian signal heads at the following intersections be replaced with pedestrian signal heads with a countdown display, as recommended by New Jersey Department of Transportation and in compliance with the 2009 MUTCD standards. Unless otherwise noted below, Bergen County maintains jurisdiction of these traffic signals.

- River Road & Old River Road / Unilever Driveway
- River Road & Gorge Road / City Place
- River Road & Thompson Lane
- River Road & Edgewater Commons / Old River Road
- River Road & Archer Street
- River Road & Hilliard Avenue
- River Road & Dempsey Avenue
- River Road & NJ Route 5 (NJDOT jurisdiction)
- River Road & Glenwood Avenue
- River Road & Orchard Street

Figure 5-2
MUTCD Figure 4E–1
Typical Pedestrian Signal Heads with Countdown Display

Typical pedestrian signal heads with the countdown display are shown in Figure 5-2. The countdown display helps pedestrians assess how much time they have to finish crossing the street. These improvements are part of the short-term improvements and will be carried through to the mid-term and long-term improvements. These improvements can also be made at the same time as the traffic signal timing revisions.

Additionally, it was noted during the field survey that the intersection of River Road and Central Avenue is currently operating in flashing mode. The pedestrian signal heads at the intersection have a countdown display, but were dark and

not operational. It is recommended that the pedestrian signal heads, push buttons, and associated signs should be covered while this traffic signal is operating in flashing mode. It is assumed that the pedestrian signal heads will be operational when the traffic signal is in full operation.

5.2.6 Consolidation and Elimination of Bus Stops

The Project team reviewed the location of the existing bus stops within the corridor and compared the locations with the NJ TRANSIT bus ridership data and the existing condition information gathered during the field inventory. Each bus stop location was reviewed for three criteria: the absence of a safe crossing, low ridership, or proximity to another existing bus stop. According to the Transit Cooperative Research Program (TCRP) Report 19, "Guidelines for the Location and Design of Bus Stops," the bus stop spacing for urban areas range from 500 to 1200 feet, and the typical spacing is 750 feet. Based on this review, there are some bus stop locations within the corridor that are proposed to be either eliminated or consolidated as part of the mid-term and long-term improvements. The disadvantage to the elimination or relocation of these stops would be that the stops are farther apart requiring longer walking distances, but the advantage would be shorter bus trips due to less stops; and therefore less dwell time and higher speeds. In addition to shorter bus rides, traffic flow throughout the corridor would improve with the elimination or consolidation of stops and consolidated stops would enable the provisions of more amenities and safety features. The locations of the eliminated or consolidate bus stops are detailed in Table 5-2 and are shown on the Long Term Concept Plans in Appendix L.

5.2.7 Bus Bays

In addition to the long-term corridor-wide concepts that have been developed, a series of bus stop alternatives have been developed that provide bus bays at bus stops throughout the corridor. The locations of these stops are detailed below in Table 5-1. These locations were selected due to ridership and had few physical constraints. As shown in the Bus Stop Alternative Plans included in Appendix M, the specifics of each bus stop alternative vary, but they each provide a bus bay and waiting area. The layout as shown on the plans has been developed with the New Jersey Department of Transportation (NJDOT) bus turnout design criteria.

Table 5-1
Bus Stop Alternatives

Existing Bus Stop Location	Direction of Travel	Bus Stop Alternative
Old River Road (Edgewater Borough Hall)	NB	A
Thompson Lane	NB	B
Edgewater Commons (Old River Road)	SB	C
Archer Street (1325' S) (Old River Road)	NB	D
North Street	NB	E
	SB	
Orchard Street	SB	F
Burdette Court relocated to Henry Hudson Drive	NB	G

*See Appendix M for Bus Stop Alternative Plans

The bus bays have been recommended because they will provide a protected area for both the transit users and the stopped bus away from the travel lane. This will provide safe access for the transit users and reduce delay to vehicles traveling on River Road. The bus stop alternatives are part of the mid-term and long-term improvement concepts. They were designed to be stand-alone, so they can be constructed independently from one another.

Table 5-2
Bus Stop Improvements

Existing Bus Stop Location	Direction of Travel	Improvement	Transit Alternative	Description
Churchill Road	SB	To Be Eliminated		This bus stop is located ~500 feet from the next bus stop that is located at a signalized intersection with crosswalks. Ridership data shows low usage.
Old River Road (Edgewater Borough Hall)	NB	To Remain	A	This bus stop provides access to the Borough Hall and new developments. There is also potential for additional transit modes (e.g., ferry).
	SB	To Remain		
City Place (Gorge Road)	NB	To Remain		
Thompson Lane (352'S) (Waterford Towers)	SB	To Be Consolidated / Relocated		These two stops are less than 500 feet apart. They have been consolidated and relocated to the southeast corner of the intersection of River Road & Thompson Lane.
Thompson Lane	SB			
	NB	To Remain	B	Flat open land with room for bus bay.
Thompson Lane (1360'N) (Edgewater Commons South)	NB	Possible Elimination		This stop does not have a pair on the southbound side and is located ~1000 feet south of an existing bus stop.
Edgewater Commons (Old River Road)	SB	To Be Relocated	C	By relocating this stop to the southwest corner, there is more room for amenities and to create a bus bay.
Archer Street (1325'S) (Old River Road)	NB	To Remain	D	By the northbound stop there is an open area with possible modification to the acceleration lane that would provide room for a bus bay. There is also a possible jughandle reconfiguration at this intersection.
Archer Street	NB	To Remain		
	SB	To Remain		
Vreeland Terrace	NB	Possible Elimination		These bus stops do not have a safe crossing alternative. The nearest signalized intersection with crosswalks are ~750 feet south or ~850 feet north. Both locations have bus stops.
	SB	Possible Elimination		
Russell Avenue	NB	To Remain		
	SB	To Remain		
Garden Place	SB	To Remain		These bus stops do not have a safe crossing alternative. The nearest signalized interaction with crosswalks are ~1250 feet south or ~850 feet north. A pedestrian hybrid beacon is proposed at the intersection of River Road & Garden Place to provide a safe crossing.
	NB	To Remain		
Hilliard Avenue	NB	To Remain		
	SB	To Remain		
Dempsey Avenue	SB	Possible Elimination		These two stops are located ~500 feet from other bus stops that are at a signalized intersection with crosswalks. Bus ridership is low compared to these nearby stops.
	NB	Possible Elimination		
NJ Route 5 (Edgewater Marina Ferry Terminal)	SB	To Remain		
	NB	To Remain		
NJ Route 5 (444'N) (Admirals Walk Condominiums)	NB	To Remain		A pedestrian hybrid beacon is proposed at the existing crosswalk location.
Glenwood Avenue (845'S) (Veterans Park)	NB	Possible Elimination		These bus stops do not have a safe crossing alternative. The nearest crosswalk is ~800 feet south, with a bus stop on the northbound side and no bus stop on the southbound side. The existing stop will be relocated south to where a pedestrian hybrid beacon is proposed.
	SB	To Be Relocated		
Glenwood Avenue	NB	Possible Elimination		The road is narrow in this location. This bus stop is located ~650 feet south of another bus stop where a pedestrian hybrid beacon is proposed.
North Street	NB	To Remain	E	These bus stops do not have a safe crossing alternative. A pedestrian hybrid beacon is proposed at the intersection of River Road & North Street to provide a safe crossing.
	SB	To Remain		
Sterling Place	SB	Possible Elimination		These bus stops do not have a safe crossing alternative. The nearest signalized intersections with crosswalks are ~1000 feet south (700 feet south to proposed pedestrian hybrid beacon at North Street) or ~850 feet north.
	NB	Possible Elimination		
Orchard Street	SB	To Remain	F	There is room at the southbound location for a bus bay. The northbound bus stop could be moved south of the intersection of River Road and Orchard Street where there is more room for a bus bay.
	NB	To Remain		
Palisade Terrace	NB	Possible Elimination		These bus stops do not have a safe crossing alternative. The nearest signalized intersection with crosswalks are ~550 feet south or >3000 feet north (650 feet north to proposed pedestrian hybrid beacon at Maple Street).
	SB	Possible Elimination		
Maple Street	SB	To Be Relocated		These bus stops do not have a safe crossing alternative. A pedestrian hybrid beacon is proposed at the intersection of River Road & Maple Street to provide a safe crossing. Bus bays will be provided on the northbound and southbound sides.
Annette Avenue	NB	To Be Relocated		
Henry Hudson Drive	SB	New Bus Stop	G	The northbound bus stop does not have a safe crossing alternative. It is being relocated north of Henry Hudson Drive where a pedestrian hybrid beacon is proposed. A southbound bus stop does not exist at this location, but a new southbound stop will be added.
Burdette Court	NB	To Be Relocated		

*See Appendix G for the Transit Alternative Plans.

5.2.8 Bus Shelters

As explained in the Existing Conditions section, there are 20 existing bus stops that do not have a bus shelter. According to the TCRP Report 19, "Guidelines for the Location and Design of Bus Stops," it is suggested to install a shelter in an urban location where there are at a minimum 50 to 100 boardings per day. Based on this guideline, the following bus stops meet the criteria for the installation of a shelter:

- Old River Road (Edgewater Borough Hall), Southbound
- City Place (Gorge Road), Northbound
- Thompson Lane (352'S) (Waterford Towers), Southbound
- Thompson Lane (1360'N) (Edgewater Commons South), Northbound
- Russel Avenue, Northbound
- Dempsey Avenue, Southbound
- NJ Route 5 (444'N) (Admiral's Walk Condominiums), Northbound
- Glenwood Avenue (845'S) (Veterans Park), Southbound
- North Street, Southbound

Some of these bus stop locations are recommended to be consolidated or eliminated. These potential improvements should be considered before shelters are installed at these locations.

5.2.9 Bicycle Facilities

In addition to traditional solutions to bicycle travel within the corridor such as bike lanes, shared lane markings, share the road signs, innovative approaches and state-of-the-practice designs were examined. Most of the design treatments are in accordance with the Manual on Uniform Traffic Control Devices (MUTCD), the American Association of State Highway and Transportation Officials (AASHTO), and New Jersey Department of Transportation's *Bicycle Compatible Roadways and Bikeways and Pedestrian Compatible Planning and Design Guidelines*. More treatments, additional information on bicycle best practices, and the Bicycle Facilities Toolkit can be found in Appendix O.

5.2.10 Additional Improvement Concepts

In addition to providing improved bicycle, pedestrian, and transit accommodations along River Road and including intersection treatments it would be desirable to explore opportunities to provide access to River Road from neighborhoods to the east of River Road including those on the "bluff" above River Road. This effort could be initiated by completing a feasibility study of improvements to the roadways intersecting River Road with a special consideration of constructing a "funicular" or inclined plane that could be used to portage bicycles and pedestrians from elevated neighborhoods to lower elevated locations that could accommodate travel by bicycle, including accessing River Road. This recommendation was made in the Phase I Study Report and should be explored as a long term solution for making these important neighborhood connections to the River Road Corridor.

Another option for encouraging bicyclists who access and travel along River Road's steep inclines could be the installation of a bicycle lift or CYCLOCABLE® (See Appendix O). This type of lift is a fully automatic, electrically powered facility, installed just below the ground that allows cyclists to be towed up the incline. Such a facility can play an important role in providing mobility options for senior cyclists, or those that find themselves challenged by River Road's steep incline.

5.3 Multimodal Level of Service Summary

The Multimodal Level of Service analysis was developed for the National Cooperative Highway Research Program (NCHRP) and is documented in NCHRP Report 616 (and Project 3—70), entitled Multimodal Level of Service Analysis for Urban Streets. This calculation technique includes an assessment of auto drivers, transit passengers, bicycle riders and pedestrians. Existing Levels of Service along River Road were calculated using volumes from the most current NJDOT Straight Line Diagrams and are summarized in Table 5-3.

The Multimodal Level of Service Analysis for Urban Streets is the most current state of the practice transportation modeling technique available for use in this project. The model incorporates both physical elements of the roadway right of way and traffic dynamic characteristics. These include:

- Traffic volume (Average Daily Traffic)
- Percentage of heavy vehicles
- Average number of buses per hour
- Average number of pedestrians per hour

Additional parameters that are incorporated into the calculations include:

- Signal Spacing
- Signal Progression Quality
- Speed Limit
- Bus Stops with Shelter
- Pavement Quality

The analysis is sensitive to traffic volume. This contributes to low results along the River Road corridor in both the existing and proposed long term. While the enhancements to the walking, transit access and bicycling environment may encourage significant mode shift along the corridor, no reduction in motor vehicle traffic was assumed in this analysis.

The analysis shows significant enhancement to the bicycling accommodation, and minor improvement in the modeling results for all travel modes. The greatly improved accommodation for casual and family bicycle riding along the proposed shared use path is likely underrepresented in this analysis, as the software can not differentiate the path from a wide sidewalk. The benefits gained from completing a continuous sidewalk network and the associated transit access improvements are also not represented in the model results.

The summary table below details the existing and proposed long-term conditions. The detailed results of this analysis and documentation on the analysis technique are included in the Appendix G: Multimodal Level of Service Analysis.

Table 5-3
Long-Term Alternative Multimodal Level of Service Summary (MMLOS)

Corridor Section*	Travel Mode	Existing LOS	LOS #	Proposed LOS	LOS #	Change
1a	Bicycle	F	4.44	E	3.61	0.83
	Pedestrian	D	3.82	D	3.79	0.03
	Transit	E	4.54	E	4.53	0.01
	Auto	F	5.83	F	5.83	0.00
1b & 1d	Bicycle	F	4.44	E	3.61	0.83
	Pedestrian	D	4.20	D	3.90	0.3
	Transit	E	4.60	E	4.55	0.05
	Auto	F	5.83	F	5.83	0
1c	Bicycle	E	3.65	E	3.65	0
	Pedestrian	E	4.44	D	3.98	0.46
	Transit	C	3.19	C	3.12	0.07
	Auto	F	3.02	F	3.02	0
2a	Bicycle	F	4.97	E	3.99	0.98
	Pedestrian	E	4.89	E	4.48	0.41
	Transit	E	4.76	E	4.70	0.06
	Auto	F	5.98	F	5.98	0
2b	Bicycle	C	2.57	C	2.10	0.47
	Pedestrian	E	4.61	E	4.62	-0.01
	Transit	E	4.71	E	4.72	-0.01
	Auto	F	5.98	F	5.98	0
2c	Bicycle	F	5.68	F	4.41	1.27
	Pedestrian	E	4.92	E	4.74	0.18
	Transit	E	4.76	E	4.73	0.03
	Auto	F	5.98	F	5.98	0
3a	Bicycle	E	4.06	E	4.06	0
	Pedestrian	D	3.65	D	3.65	0
	Transit	C	3.07	C	3.07	0
	Auto	F	3.02	F	3.02	0

*The corridor sections correspond to the sections in Section 4.1 General Roadway Characteristics

5.4 Bicycle Access to/from the GWB – Conceptual Design Recommendations

Concept level plans were developed for three target area locations near the George Washington Bridge. The locations were chosen based on public and stakeholder input. The concept plans illustrate the existing deficiencies and highlight the proposed conceptual solutions and ideas that would improve bicycle safety and accessibility. The concept plans are located in Appendix N and are described below:

5.4.1 Concept 1: Crossing Hudson Terrace to access GWB Walkways

- **Short-Term Recommendation**

Stripe a high visibility crosswalk and bicycle specific crossing treatments ("crossbike") across Hudson Terrace at the GWB south walkway and a high visibility crosswalk across Hudson Terrace at the existing traffic signal adjacent to the north walkway access. Stripe crosswalks across the maintenance access roads on/off the GWB.

- **Mid-Term Recommendation**

Install a hybrid beacon, also known as a High-intensity Activated CrossWalK (HAWK) signal, at the Hudson Terrace intersection with the GWB south walkway. This will work in conjunction with the existing traffic light at the ramp from the GWB westbound at Hudson Terrace. The signal will provide gaps in the Hudson Terrace motor vehicle traffic when actuated, allowing the pedestrian and bicycle traffic to cross to roadway safely.

5.4.2 Concept 2: Shared Use Path along the Eastern Side of Hudson Terrace Between Fort Lee Historic Park and GWB North Walkway

- **Concept 2a: Shared Use Path along Hudson Terrace between Fort Lee Historic Park and GWB South Walkway**

Construct a shared use path along the eastern side of Hudson Terrace between the entrance of Fort Lee Historic Park and the GWB south walkway. This will require earthwork under the Palisades Interstate Parkway entrance ramp to the GWB. Constructing this path will provide a continuous off-road connection between the GWB south walkway and the existing path along Hudson Terrace that extends south to Henry Hudson Drive.

- **Concept 2b: Shared Use Path along Hudson Terrace between GWB South Walkway and GWB North Walkway**

Construct a shared use path along the eastern side of Hudson Terrace between the GWB south walkway and the GWB north walkway by installing a physical barrier and adding additional curb width.

5.4.3 Concept 3: Bike Lanes along Hudson Terrace between GWB and Sylvan Street

Stripe and sign bicycle lanes along both sides of Hudson Terrace between the GWB and Sylvan Street, preserving the on street parking where possible. This will target the high crash intersections of Hudson Terrace at both Merkle Street and Sylvan Street, increasing visibility and expectation of potential conflict.

The Note: The conceptual recommendations described above and located in Appendix N are based on limited qualitative assessments. Prior to advancing the Concept Plan recommendations, further data collection, analysis and survey should be completed to fully assess the impacts of the proposed recommendations. Additionally, early coordination and continued communication with agencies having jurisdiction over the roadway or facilities in question should be initiated to confirm the feasibility of the recommended improvements.

6. Transit Oriented Development

A more transit-friendly River Road would be more accommodating of pedestrians, bicycles, and bus riders; creating a new opportunities for development and mix of land uses that enhance mobility and quality of life corridor-wide. For the purpose of this investigation, TOD (transit-oriented development) refers to land use and site design practices that encourage investment in walkable, transit accessible, connected, mixed-use places along the River Road Corridor. Existing development patterns along the corridor require people to get into their car for every trip, but by encouraging people to drive less, TOD should result in reduced congestion along River Road through lower travel demand and a reduction in conflicting traffic patterns.

TOD typically integrates a mix of uses and civic spaces with an efficient and heavily utilized transportation system. The type of uses found in TOD are retail, which is often located on the ground floor and set right up against the street to enhance the pedestrian experience, and residential or office above in mid to high rise buildings. TOD encourages walking and transit use. Accommodation of the car is considered but not a primary factor. Because TOD's are mixed use, parking ratios can be lowered by allowing the different types of uses to share parking. The high density development often makes parking garages feasible.

Typically, application of TOD principles would result in:

- Close integration with public transit
- Transit use by the residents of the development
- A mix of uses
- High or medium density development to support the transit and mixes of uses
- Active, pedestrian-scaled streets
- Bicycle-Friendly streets and trails connections
- Increased Connectivity (providing alternate routes of travel other than River Road)
- Reduced Congestion and reduced traffic conflicts

Integrating TOD practices into transit operations and land use regulation will enable developers, designers, and property managers to create places that are more walkable/bikeable and transit accessible. Even though there are limited opportunity sites for wholesale redevelopment within the study area, existing development can be retrofitted. It may even be structurally possible and financially feasible to add floors on top of some existing buildings. Adjusting parking requirements where more short trips will be made by bike or walking can free up land around existing buildings. That could allow for new infill buildings, parking structures, pedestrian and bicycle connections and open space that incorporate existing buildings into new development around new streets and open spaces; emulating TOD more than the historical pattern.

Transit options and operations could be enhanced. Future projects and existing developments with adequate frontage may elect to collaborate with NJ TRANSIT (NJT) to offer a more integrated experience by consolidating bus stops to fewer, more efficient, high-amenity "super" station stops. A “super stop” is a bus station designed to provide a comfortable, efficient, waiting and boarding experience. The boarding area is sheltered, out of the travel-way and may be elevated for quick boarding. Tickets or passes may be required to ride, eliminating delay caused by on-board ticketing. Longer 'articulated" buses may have several boarding points. Enhanced bus operation could be more easily implemented than a complete transportation overhaul and it is an approach that may be attractive to existing developments rather than just the places on the corridor that could support substantial new development in the future. Creating super stops would result in shorter travel times because there would be fewer stops and the stops that would exist would have expedited boarding.

This report will detail a tool kit that can be used to achieve the above TOD and super stop principles. While more will be presented throughout this report, example tools are:

- New development should create stub end connections to adjacent parcels so that future development will be able to build off the stub end and make a pedestrian and automobile connection other than River Road.

- The zoning code can be amended to allow for a mix of uses in any location likely to be re-developed or renovated along the transit corridor.
- Various investments into the bus system such as the installation of branded bus shelters that create a new and improved image for the bus lines and demonstrate that government agencies have made a long term commitment to the transit corridor, giving the residents the confidence that a good transit system will be here to stay.

While this report goes into detail on these and other tools, the tool kit can be expanded with analysis and approaches that go beyond this report. For example, design standards for a Bus Rapid Transit (BRT) and/or super stops can be finalized and a strategy prepared for implementing the reduction in bus stops and the implementation of enhanced bus operations. A walking audit of the River Road corridor can be conducted to find locations that already have commercial activity and a pedestrian environment which a super stop may be able to enhance. This walking audit will provide further information on ideal super stop locations. The corridor can also be studied to find locations where it may be possible to build commercial services that synergize with the transit. Examples of this type of commercial use include but are not limited to a café, dry cleaning or day care. Developments that can be retrofitted to integrate these uses along the River Road corridor may also become places to install a super stop.

Timing is important here. The population of Edgewater Borough has more than doubled in the last 20 years, from 5,000 in 1990 to about 11,500 at the last census in 2010. Virtually all of this growth has occurred along the River Road corridor. Based on press releases of the anticipated new projects, 2,000 residential units and 270,000 square feet of additional retail could be added to the River Road corridor, equivalent to a small town. Many options are available to improve both new and existing development by applying TOD principles. This report will detail these options – first by analyzing the physical nature of the corridor in order to determine ideal location for TOD and super stops; and then outlining strategies for moving forward with these concepts.

6.1 Understanding TOD

In developing criteria to evaluate potential TOD areas, it is important to understand what Transit Oriented Development means. Typically, a TOD will have the following characteristics:

- Integration of a public transit system with development
- Heavy transit use by the residents of the development
- A mix of uses in the development
- High or medium density development to support the transit and mixes of uses
- Pedestrian friendly; to encourage walking when not using public transit

While not strictly necessary for a TOD, the following development criteria are also beneficial to consider in creating new TOD's, especially in the River Road Corridor where any new development will stress the existing transportation infrastructure:

- Bicycle-Friendly Roads
- Increased Connectivity (providing alternate routes of travel other than River Road)

Section 6.4 (Identifying TOD Opportunity Areas) summarizes a simple parcel-based assessment of River Road locations that are or more or less susceptible to the application of TOD principles.

6.2 Existing Regulatory Framework

6.2.1 Planning and Zoning (2.1)

At present, there are 19 different zoning districts fronting the five mile corridor from the George Washington Bridge in Fort Lee Borough to the Hudson County line just below the intersection with Gorge Road.

Land use for this stretch of River Road is regulated by municipal zoning ordinances of the Bergen County boroughs of Fort Lee and Edgewater. Most of the corridor, 4 ½ of the 5 miles between the George Washington Bridge and the Hudson County line, lies within Edgewater Borough. The northernmost half-mile is in Fort Lee and offers direct access onto the George Washington Bridge and, once on the New York side of the bridge, easy boarding onto transit at the GWB Bus Station, a major hub for NYC Transit bus lines, and the 175th Street subway station serving the Eighth Avenue Express A line and the Broadway/Seventh Avenue Local 1 line.

➢ Fort Lee

Fort Lee's land use policies provide support and guidance for the redevelopment of the blocks at the foot of the George Washington Bridge. The Borough has focused on bringing a dynamic mix of uses so that new projects add up to more than a bedroom community or back-office operations, creating an interesting, lively Main Street district. With a sufficient transportation infrastructure, the existing policies could foster TOD development. The policies that stand out are:

- Residential zoning districts R-6A, R-7A, R-9, and R-12 permit a range of densities and building heights appropriate to a town center, but they do not permit ground floor commerce.
- District C-3, "Limited Business," encourages/permits the continued use of several parcels at the base of the bridge as multi-story office development. Hotels and other hospitality-related activities are permitted as well.
- District C1-B, the zoning designation for both sides of the intersection at Main Street, permits a mix of uses – offices, restaurants, and residential uses are all allowed by right. Active retail is required along Main Street ground floor frontage.
- "Area 5": Guided by the Council's 2004 Redevelopment Plan for Redevelopment Area 5, the Borough has attracted two major projects, referred to as "The Center at Fort Lee" and "Hudson Lights", that are working their way toward realization. The development program for each project is outlined in section 7.C of this report.

➢ Edgewater

Edgewater's land use policies have tracked redevelopment opportunities and challenges as they have emerged over the past 20 years. Most of the thirteen zoning districts provide regulatory support for existing underlying uses or specific proposals for large former industrial sites as they have become available. The below regulations show that there are very few mixed use development opportunities by right in Edgewater, which will make TOD difficult to achieve unless the regulations are changed.

- Residential zoning districts R-1 and R-2 provide for small-lot, single-family homes on 1/5th or 1/8th-acre lots.
- R-3, R-4, and R-5 are residential districts that accommodate a range of dwelling types, from (R-3) small-lot singles and twins, to town houses, apartments to (R-5) 16-story residential high-rise buildings. Districts R-4 & R-5 permit limited retail intended to serve project residents only.
- District SRH accommodates age-restricted multifamily housing and community residences
- The Mixed Use Commercial Residential District (MCRD) and CBD provide land use regulation for complicated larger projects along River Road.
- Business districts B-1, B-2, B2A, B-3, and B-4 provide for a range of commercial activities. District B-1 permits the basic family of retail-based commerce. B-2 and 2A introduce flexibility in lot size and some careful architectural guidance, acknowledging the traditional scale and character of the Shadyside area. B-4 permits a broader range of uses, including on-site fabrication of products for sale such as crafts, furniture and signs.
- The OR-1, Office Research zone accommodates buildings for business offices as well as laboratories, research operations and product testing facilities.

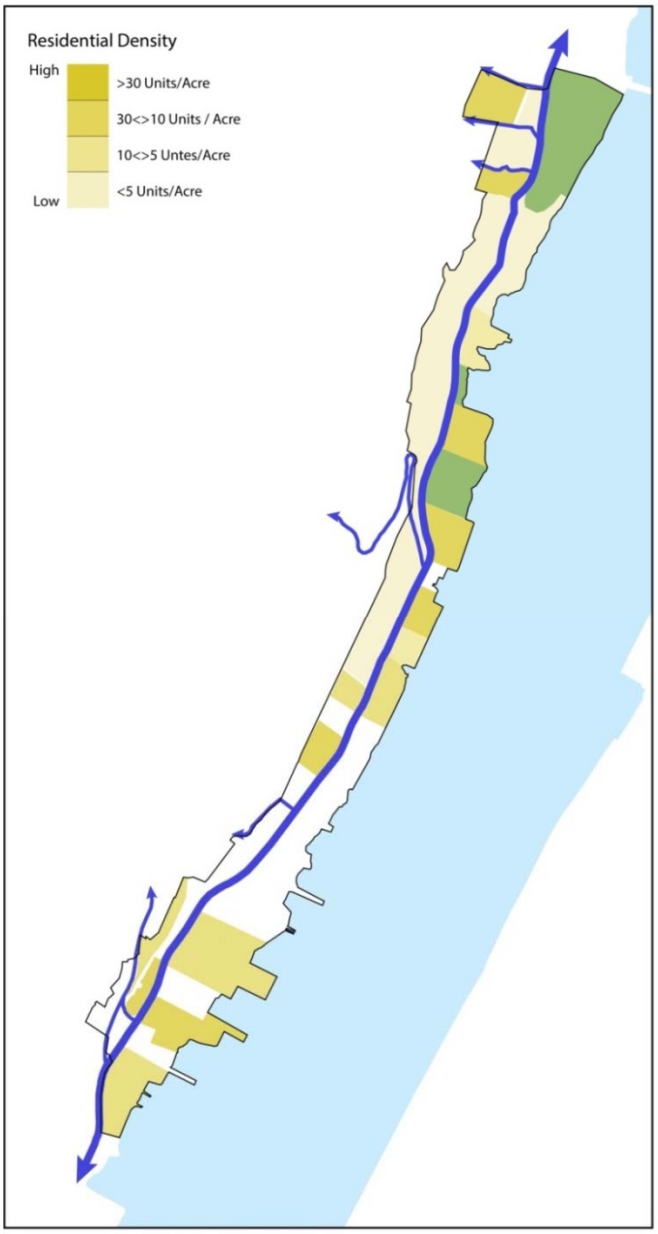
6.3 Mapping for TOD Analysis

As part of the development of this report, mapping was developed for TOD analysis. Much of the mapping was generated from GIS shape files and a survey of the River Road corridor. This information included the alignment and width of River Road itself, parcel delineation and bus stop locations. However, this information did not include building footprints or land use, both of which are critical in evaluating TOD opportunities. The team had to gather this information from aerial imagery and site visits. Below is a summary of the land use patterns and demographic study created for this effort. The team also gathered information about proposed development that is likely to impact the study area in the near future.

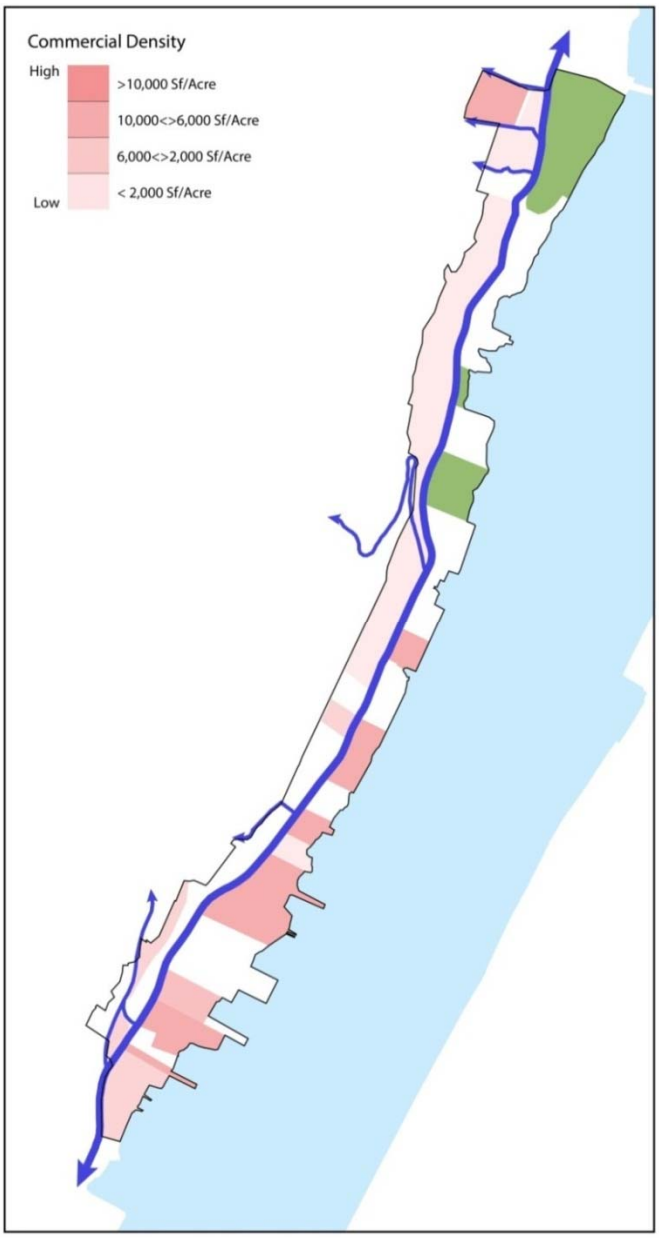
Regional Network (Source: The RBA Group)

6.3.1 Land Use Pattern

Just a few decades ago, River Road was a utilitarian access way to bustling waterside industries and a few crossroads shops. Today, franchise retail establishments, condominiums, entertainment, and institutional uses have displaced nearly all of those industries. The emerging landscape is occupied by a mix of higher density condominiums (tapping into the Manhattan job market) and the sort of contemporary buildings, signs, parking lots, and commercial business types found along successful commercial corridors everywhere. An incremental, opportunistic, evolution has transformed parcels over time. As industrial giants like Unilever, Ford, Jack Frost, and Alcoa have contemplated closure or relocated their operations, opportunities have been created for new ventures. The attractiveness of Hudson River frontage, the generous size of development parcels, and access to the Manhattan job market enables a variety of business models to prosper creating a land use pattern characterized by self-contained commercial and residential projects that front on the corridor but that have little to do with each other. There is a mixture of uses but very little mixing of activities, customers, or culture. This is an outcome of market forces and the geography of the place, a constrained sliver of real estate bound by the Hudson River on one side and the rise of the Palisades Cliff on the other.



Residential Density (Source: The RBA Group)



Commercial Density (Source: The RBA Group)

6.3.2 Employment Commute Study

➢ Fort Lee

- More than 50% of the employed Fort Lee residents head south to work.
- Almost 70% have a commute of less than 10 miles.
- More than 35% of the employed Fort Lee residents work in New York City and 10% work in Fort Lee.
- 12% of people who work in Fort Lee live in New York City.

(Source: http://onthemap.ces.census.gov)

➢ Edgewater

The Employment Commute Analysis shows that most River Road commuters head to Manhattan for work. There are sharp peaks in ridership in the southbound AM buses and in the evening's northbound numbers. That will mean:

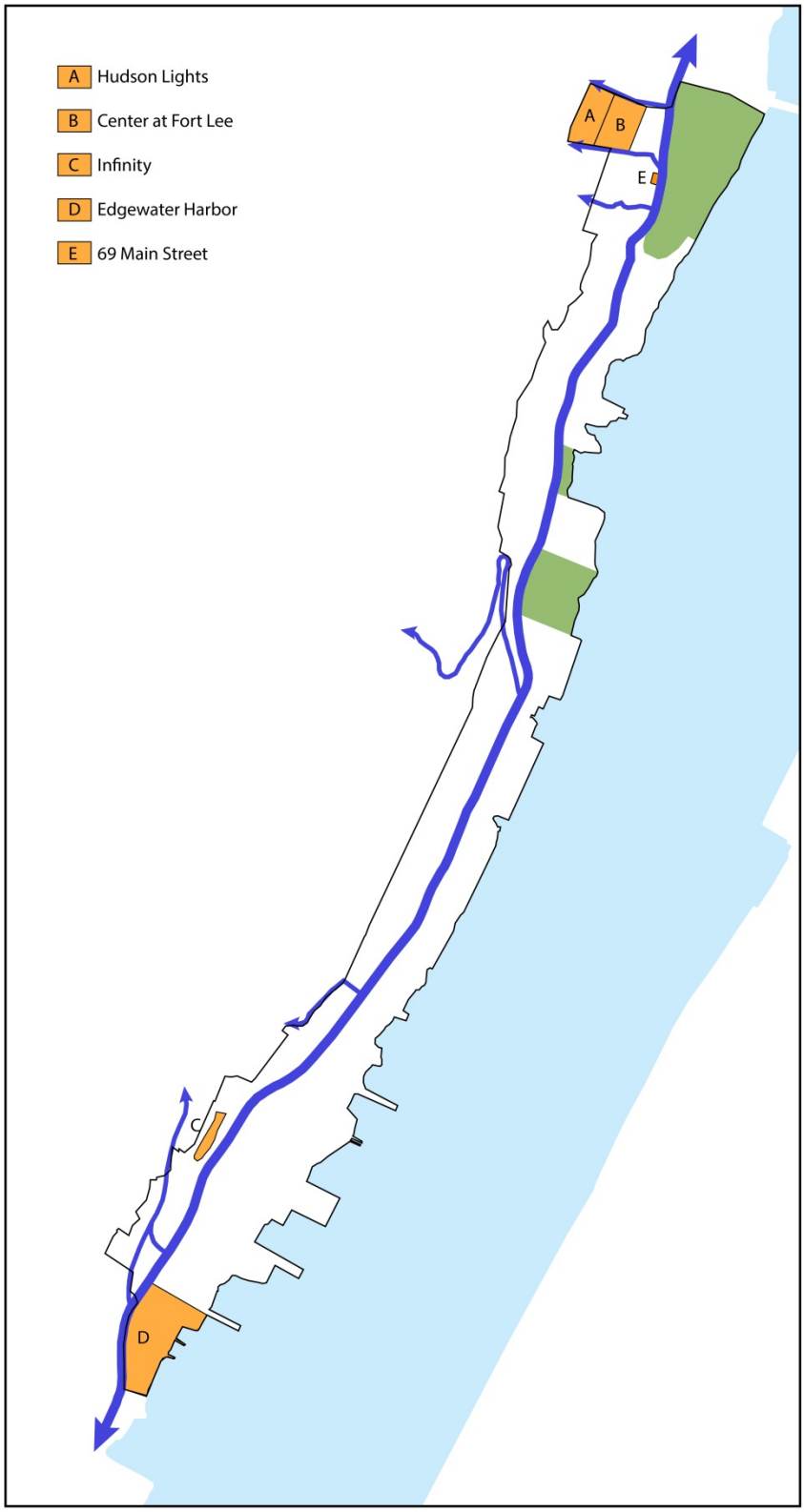
- Comfortable station stops for larger numbers will be more appreciated on the west side of River Road than on the east side.
- Boarding and ticketing efficiencies will "pay off" with reduced dwell time on west side stations. Example efficiencies would be implementing the My Tix program that uses smart phone apps and at home ticket printing to speed boarding.
- Since condo development is concentrated on the east side, crossing accommodations and signal timing should anticipate most activity at morning commuters crossing from east to west at key intersections in the vicinity of bus stops.
- The kind of amenity most likely to be appreciated by transit-riders at northbound stations is a quick, safe, comfortable walk home and opportunity to make convenience purchases - such as the dry cleaning, dinner, or household sundries.

These observations would seem to indicate that the private market partners likely to see benefit to their customer base will be different for different stations. Southbound stations could be of great interest to entities that manage residential properties and the design and location of northbound stations may be of interest to retail operators.

- More than 50% of the employed Edgewater residents head south to work. More than 77% have a commute of less than 10 miles.
- Approximately 50% of the employed Edgewater residents work in New York City and 7% work in Edgewater.
- Approximately 10% of people who work in Edgewater commute from New York City. A combined 10 % of people who work in Edgewater Park come from Jersey City, Union City, or West New York.

(Source: http://onthemap.ces.census.gov)

6.3.3 Planned Development



Map of Planned Development (Source: The RBA Group)

Over the past couple of decades development along River Road has taken off. River Road has been attractive to developers because of its accessibility to New York City through several modes of transportation including automobile, bus and ferry, and because River Road is fronted by large parcels of available land which was once industrial but has become available for new uses. While the development along River Road has slowed since the recession, it does continue. Over the course of the research for the existing conditions of River Road, five development sites have been identified; Hudson Lights, The Center at Fort Lee, Edgewater Harbor, Infinity and 69 Main Street. Below is a description of each. These five projects will total over 270,000 square feet of retail space and over 2,000 new residential units. This level of development is certain to put a greater demand on the transportation infrastructure of River Road.

Fort Lee

The three projects being developed in Fort Lee are Hudson Lights, The Center at Fort Lee and 69 Main Street--all near the foot of the George Washington Bridge. All projects have been approved and will add a significant amount of development to Fort Lee and the upper extent of the River Road corridor. Hudson Lights and the Center at Fort Lee are across the street from each other. Both have access to several bus routes and are within walking distance of other densely developed areas of Fort Lee. These two projects will create a new mixed-use hub for the Borough. The third, 69 Main Street, will add residential development on the River Road corridor, a portion of which will be affordable housing. Below are the development details for Hudson Lights, the Center at Fort Lee, and 69 Main Street.

Illustration of Hudson Lights & The Center at Fort Lee (Source: http://therealdeal.com)

Hudson Lights

Location:
Bounded by Martha Washington Highway, Main Street, Lemoine Avenue and Bruce Reynolds Boulevard

Acreage: 7.5 acres

Program:
175,000 square feet retail
477 + apartments
1,235 parking spaces (mainly in garage)
175 room hotel
2,000 square feet for potential museum

Developer:
Tucker Development Corporation

The Center at Fort Lee

Location:
Bounded by Central Road, Main Street, Martha Washington Highway and Bruce Reynolds Boulevard

Acreage: 7.7 acres

Program:
900 units of residential
1.75 acre public park
7,000 square feet retail
11,000 square feet movie theater
2,000 square feet for potential museum

Developer:
Fort Lee Redevelopment Associates; SJP Residential Properties, James Demetrakis & Palisades Financial

69 Main Street

Address:
69 Main Street, Fort Lee, New Jersey

Acreage: .4 acres

Program:
83 market rate residential units
57 affordable units

Height:
15 Stories

Edgewater

There is less development proposed for Edgewater than there is for Fort Lee. Infinity is a small project located in Edgewater. This project is already under construction and consists of retail on the ground floor with residential above. This project does not front River Road directly, but its proximity would still impact the corridor.

Edgewater Harbor is a development site proposed at the southern border of Bergen County. This mixed-use development is being built on the former Unilever site. Construction is complete on a new municipal building and has begun on other retail development on out-parcels. However, due to the slowing economy, other parts of the development have been delayed.

According to Edgewater's 2008 master plan, the Borough is also required to build 279 affordable residential units by 2018. When built, these units will have a significant impact on the corridor because of the limited circulation patterns of Edgewater. Below are the development details for Edgewater Harbor and the Infinity development.

Edgewater Harbor

Address:
45 River Road

Acreage:
23.7

Program:
75,000 square feet retail
392 rental residential units
80 condo units
Municipal building / police station

Developer:
National RE/Sources

Illustration of The View at Edgewater Harbor (Source: http://edgewaterharborblog.com)

Infinity

Address/location:
West side of Old River Road, across from Independence Way

Acreage:
1.7

Program:
4 residential stories – 100 units
5,600 square feet retail
13,000 square feet 2-story underground parking garage
2 pocket parks--one at the north and one at the south end

Developer:
Arilex-Infinity LLC; James Demetrakis, Rahamin Evar, Mesha Evar & Yeheskel Evar

6.4 Identifying TOD Opportunity Areas

6.4.1 TOD Analysis

To understand whether a parcel could be redeveloped requires more than evaluating it to see if it fits the typical TOD characteristics. It requires looking at other information about the existing site. Particular attention needs to be paid to whether an existing parcel is in an economic position to be redeveloped, and whether it is sized and located in such a way that it can achieve the above principles when developed. *The following section summarizes a simple parcel-based assessment of River Road locations that are or more or less susceptible to the application of TOD principles. Tables that show how criteria were scored and how the rankings we calculated are found in Appendix P.*

TOD Criteria

The first step in finding the locations most suited for TOD is to create a list of criteria by which to evaluate the parcels in the study area. Below are the criteria based upon the TOD elements described above. These were generated specifically for this project and the conditions found along the corridor. Each is ranked on a four-point scale (0-3), and each explicitly states what is required to earn the associated score. The study area is then divided into sub-areas for evaluation. These sub-areas were derived primarily by studying individual parcels. However, where parcel size is very small, such as in single family detached housing, sub-areas where consolidated into a whole of similar type. Totaling the score for each area will reveal which locations are best suited for TOD development.

1) Is the existing zoning amenable to medium density mixed use development?

0- Existing zoning is single use and low density residential or it is a park or public open space
1- Existing zoning is single use and low density commercial
2- Existing zoning is single use medium density
3- Existing zoning is multi use and medium density

2) Is the parcel(s) large enough to support medium density mixed-use development? (If there are multiple parcels, the total study zone may be larger than what is described below, but evaluation should be made on individual parcel size within a zone, or the likelihood of the parcels easily being combined.)

0- The parcel(s) is < 2 acres (87,120 square feet)
1- The parcel(s) is 2-5 acres (87,120 – 217,800 square feet)
2- The parcel(s) is 5-10 acres (217,800 – 435,600 square feet)
3- The parcel(s) is > 10 acres (435,600 square feet)

3) Is the parcel(s) on the waterfront?

0- The parcel(s) is > ½ mile from the waterfront
1- The parcels(s) is ½ - ¼ mile from the waterfront
2- The parcel(s) is < ¼ mile from the waterfront
3- The parcel(s) is on the waterfront

4) Is the parcel(s) in a flood plain?

0- > 75% of the parcel(s) is in a flood plain.
1- 50%-75% of the parcel(s) is in a flood plain.
2- 25%-50% of the parcel(s) is in a flood plain.
3- < 25% of the parcel(s) is in a flood plain.

5) Is the parcel(s) ground contaminated?

0- Most of the parcel(s) is on an unremediated/contained brownfield
1- Most of the parcel(s) is on a remediated/contained brownfield
2- Part of the parcel(s) is on a remediated/contained brownfield
3- The parcel(s) is not on a brownfield

6) What is the quality of (public) transit options?

0- There are no transit options within ¼ mile of the parcel(s)
1- There are transit options within ¼ mile, but they are not directly adjacent to the parcel(s)
2- There is one transit option directly adjacent to the parcel(s)
3- There is more than one transit option within ¼ mile of the parcel(s)

7) Is there opportunity to connect circulation elements to adjacent parcel(s)?

0- The parcel(s) cannot increase connectivity to other parcels beyond River Road
1- Connecting to adjacent parcels is not currently possible, but adjacent parcels are underutilized (potential for change) and connections could be developed in the near future on at least one side.
2- One side of the adjacent developments could be connected to redevelopment on this parcel(s)
3- The parcel(s) and/or the adjacent parcel(s) already have a block structure, or it would be possible to connect to existing development on both sides of the parcel(s) if redeveloped.

8) How under-developed are the current parcel(s)?

0- The FAR(Floor Area Ratio) is >75% of the parcel(s), or it is a park or public open space
1- The FAR is 50%-75% of the parcel(s)
2- The FAR is 25-50% of the parcel(s)
3- The FAR is > 25% of the parcel(s)

9) Is the current development medium density mixed use?

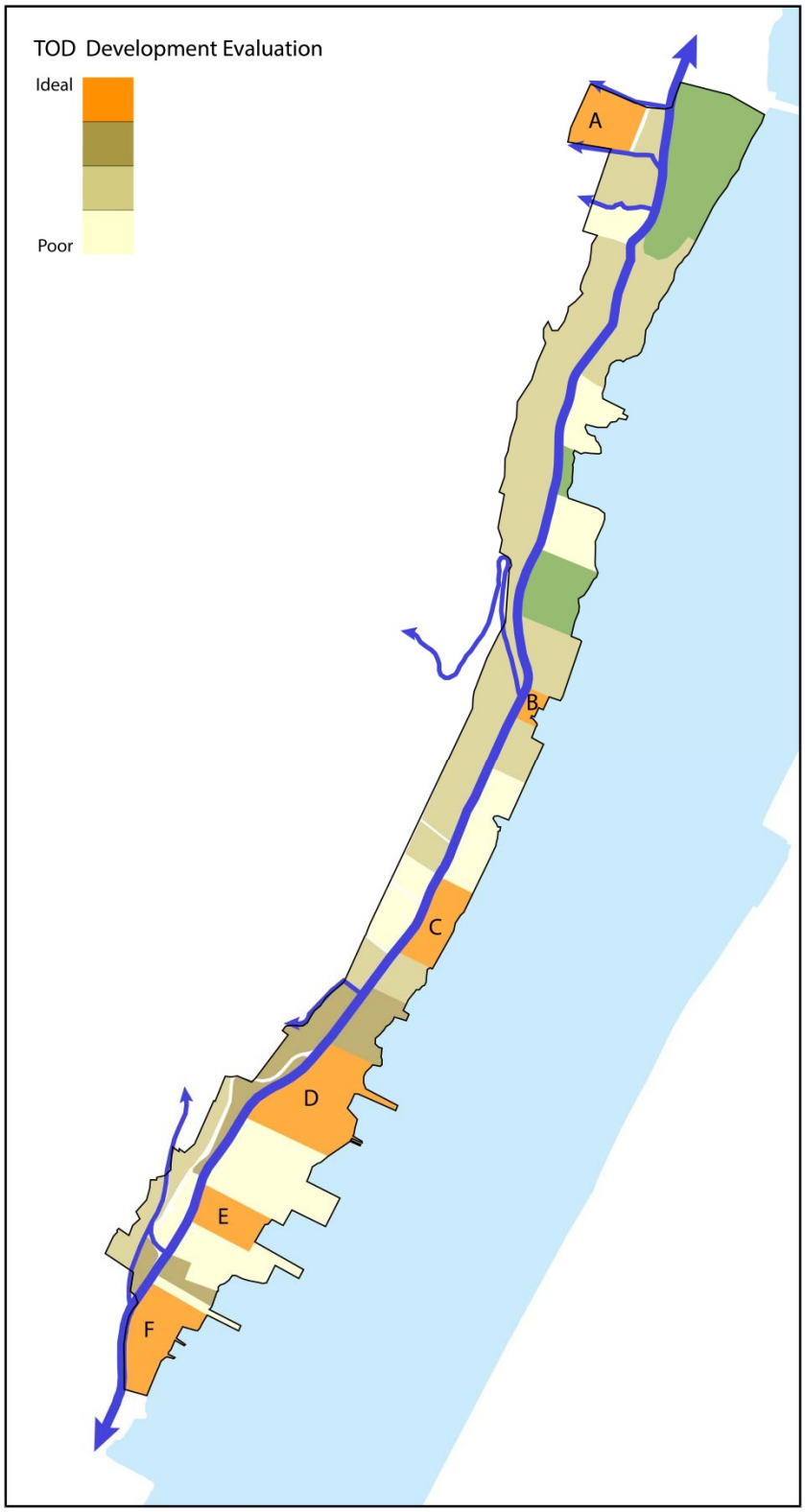
0- The current development is medium density & mixed use, or it is a park or public open space
1- The current development is medium density and single use
2- The current development is low density and single use
3- There is no development on the parcel(s)

10) What is the estimated age of the current development on the parcel(s)?

0- The development is brand new, or it is a park or public open space
1- The buildings are approximately 25% into their expected life
2- The buildings are approximately 50% into their expected life
3- The buildings are nearing the end of their expected life before substantial renovations are required, or the parcel(s) is vacant.

11) Are there economic reasons for re-development of the parcel(s)?

0- The parcel(s) is primarily owner occupied residential and does not intend to make money, or it is a park or public open space
1- The parcel(s) is not owner occupied residential and makes a large profit
2- The parcel(s) is not owner occupied residential, and makes a small profit
3- The parcel(s) is not owner occupied residential and does not make a profit



Ideal TOD Locations (Source: The RBA Group)

Mapping the evaluation reveals the locations best suited for future TOD development. (See Appendix P for more details on entire scoring system).

Ideal TOD Locations:

A. Hudson Lights / The Center at Fort Lee

B. Edgewater Ferry Terminal

C. Marketplace (Strip Mall)

D. Edgewater Commons

E. Edgewater Multiplex Cinema

F. Edgewater Harbor

➢ TOD Summary

The result of this evaluation shows that three of the areas with the most potential to be redeveloped as TODs are the proposed development areas of Hudson Lights, The Center at Fort Lee and Edgewater Harbor. Thus, it is no wonder that these parcels already have substantial development proposed. Other parcels within the study area also have potential for redevelopment, including the movie theater near the south end of the study area, Edgewater Commons, Market Place and the Ferry Terminal and surrounding parcels.

Although the ranking criteria were not expanded to look at *existing* sites for their potential to be retrofitted, it should be noted that elements of TOD can be incorporated into these types of sites without being triggered by redevelopment. For instance, providing an access road that creates better connectivity for motorists, pedestrians and bicyclists can instantly increase the potential for an existing development that is better oriented to transit.

6.4.2 Super Stop – Reverse TOD Analysis

➢ Super Stop Criteria

Traditionally, the TOD concept is applied to areas that have a substantial transit component and a large area to redevelop adjacent to or within the transit corridor. The above research shows that there is little room left for redevelopment. Thus creating a significant TOD project can be difficult and would probably do little to alleviate the existing transportation concerns. However, during the course of this study it occurred to the team that a reverse TOD concept called “super stops” may have the potential to improve the corridor within the existing development.

If TOD is new development that is built around existing transportation, a super stop is the addition of new or improved transportation around existing development. Because the River Road corridor is already well developed, applying this concept may improve public and personal transportation and stimulate redevelopment.

The term “super stop” is used to distinguish it from a traditional stop. Where a traditional stop can be a signpost on the sidewalk, a super stop has covered shelters, bus pull-off zones and other amenities discussed in the following section. The addition of this physical space and infrastructure demonstrates a commitment by public agencies to the transit system.

A super stop would require physical improvements and the space to build this improvement. Thus it is possible to apply the same logic and set criteria to determine ideal locations of super stops. The ideal locations for these transit improvements would follow a different but related set of criteria. The criteria were generated specifically for this project and the conditions found within the study area. Instead of evaluating whole parcels or collections of parcels as does the TOD criteria, the study of super stops only evaluates corners and intersections where a bus stop would be placed. The below criteria for super stops is also different than the TOD criteria above in that it is divided into two areas of evaluation; 1) those factors which affect the whole intersection and 2) those factors which affect one corner of the intersection. It is the total score of both of these ranking systems that will be used to determine the ideal locations for super stops. While mid-block locations are possible, they were not studied as a part of this report because they would have to be made with other improvements such as new cross walks and traffic signals in order to make them a true super stop. *The following section summarizes a parcel-based assessment of River Road intersections that are or more or less suitable for a super stop station. Tables that showing how criteria were scored and how the rankings we calculated are found in Appendix Q.*

This first section evaluates the whole intersection. These issues are important to either side of the street and affect both sides.

1) What is the density of residential development on the adjacent parcel(s) of this intersection? (See Residential Density map above).

0- There are less than 5 units per acre
1- There are between 5 – 10 units per acre
2- There are between 10 – 30 units per acre
3- There are more than an estimated 30 units per acre

2) What is the density of commercial development on the adjacent parcel(s) of this intersection? (See Commercial Density map (Figure 3))

0- There are less than 2,000 square feet of commercial development per acre
1- There are between 2,000 – 6,000 square feet of commercial development per acre
2- There are between 6,000 – 10,000 square feet of commercial development per acre
3- There are more than 10,000 square feet of commercial development per acre

3) What is the proximity to other forms of transit?

0- The location is > ½ mile from another form of transit
1- The location is ½ - ¼ mile from another form of transit
2- The location is < ¼ mile from another form of transit
3- The location is adjacent to a parcel with another form of transit

4) How well connected are the sidewalks leading up to this intersection?

0- There are disconnected sidewalks directly adjacent to the intersection
1- There are disconnected sidewalks within 1/8 mile of the intersection
2- There are disconnected sidewalks between 1/8 and 1/4 mile of the intersection
3- There are no disconnected sidewalks within 1/4 mile of the intersection

5) Does the intersection have a traffic signal and crosswalks?

0- The intersection does not have a traffic signal or crosswalk
1- The intersection has a crosswalk but no traffic signal
2- The intersection has a traffic signal but is missing at least one crosswalk
3- The intersection has traffic signals and crosswalks at every street crossing

The next set of criteria is applied to each corner of the intersection individually.

6) How well does the intersection score from the above criteria?

0- Poor
1- Low
2- Moderate
3- High

7) How susceptible to change is the rest of the parcel of which this corner is a part?

0- Poor
1- Low
2- Moderate
3- High

8) Does the corner belong to a parcel that is public or semi-public property?

0- It is not on public or semi-public property
1- n/a
2- n/a

3- It is on public or semi-public property

9) Is the corner on the southbound side? (To New York City in the morning, the time of the most congestion on the current system)

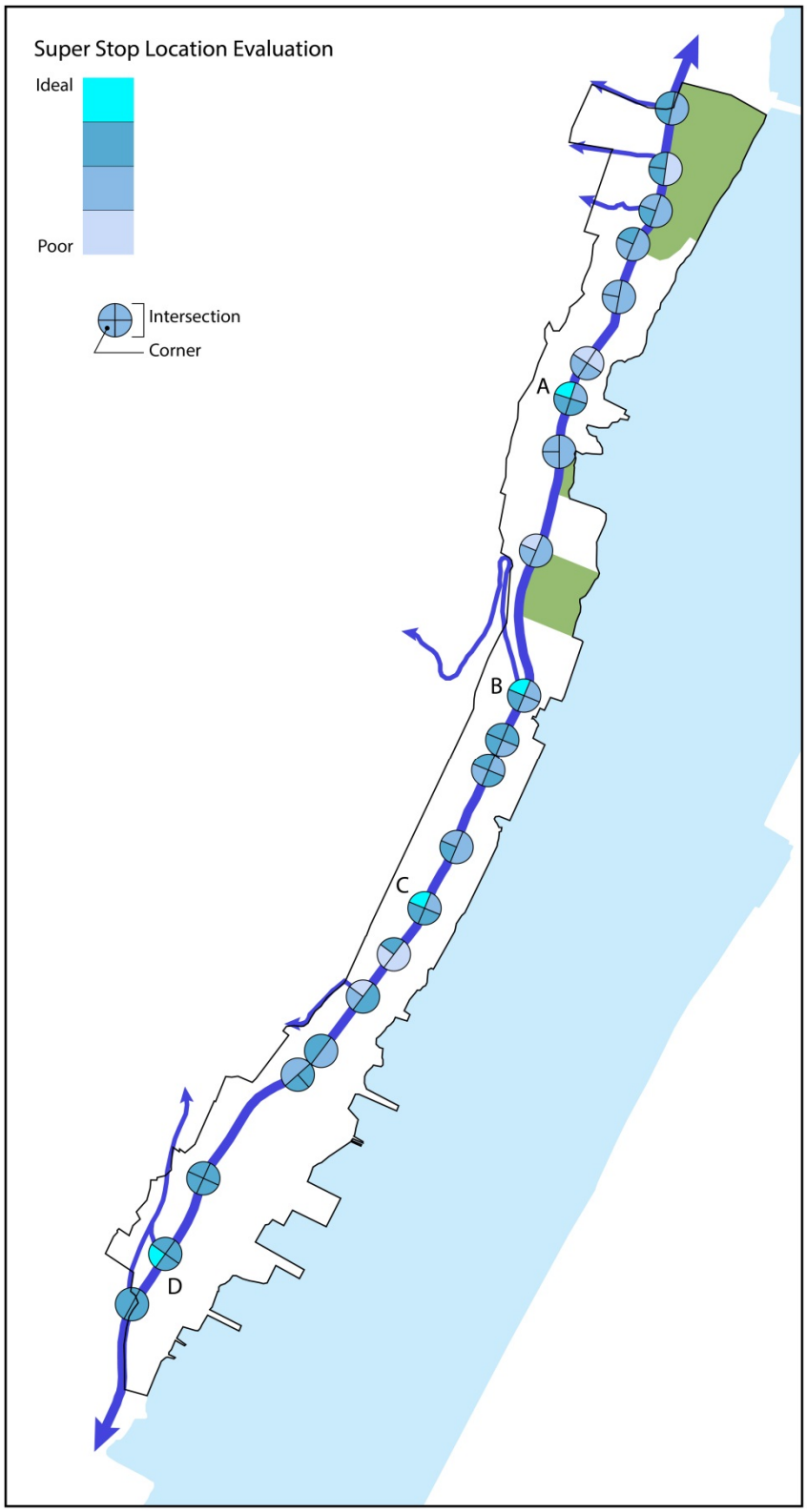
0- It is on the northbound side
1- n/a
2- n/a
3- It is on the southbound side

10) Is there enough length for a super stop along River Road?

0- There is less than 90 feet – not enough room for a bus pull off
1- There is between 90 – 160 feet – enough for 1 bus to pull off
2- There is between 160 – 230 feet – enough for 2 buses to pull off
3- There is more than 230 feet – enough for 3 buses to pull off

11) Is there enough depth for a super stop along River Road? (This depth must be measured at least 40 feet long).

0- There is less than 15 feet – no room for anything
1- There is between 15 - 20 feet – enough for a bus pull-off and a waiting area
2- There is between 20 - 25 feet – enough for a bus pull-off, a waiting area and ticket purchases or other amenity
3- There is more than 25 feet – enough for a bus pull-off and public space with several amenities.



Ideal Super Stop Locations (Source: The RBA Group)

Mapping the evaluation reveals the best locations for super stops. (See Appendix Q for more details on entire scoring system and details on each intersection)

Ideal Super Stop Locations:

A. Orchard Street & River Road

B. Hudson Terrace & River Road (near the Edgewater Ferry Terminal)

C. Russell Avenue & River Road

D. Gorge Road & River Road

Super Stop Summary

Super stops would be ideally located near densely populated residential areas or mixed-use developments. Super stop stations should be considered and planned-for as new development occurs along the corridor.

The Transit chapter of this report delineates specific locations where bus pull-offs could be located. As detailed in the next section, bus pull-offs are an important component of super stops. Considering the potential to integrate with development to create a TOD where none exists, other locations can be considered for super stops in addition to those specifically suggested in the previous chapter.

It should be noted that reducing the number of stops will enable a super stop strategy to achieve greater efficiency. This would allow buses to have less impact on traffic and it would reduce the total trip time of each bus through a reduction in the amount of time it would be stopped along the curb. Thus it can be concluded that there may be more opportunities for super stops than are needed. This principle will further be discussed in the section that follows.

6.5 Concept Plans

6.5.1 TOD Concepts

To begin to plan for TOD, it is important to reiterate the important components of TOD, how the current development pattern of the River Road corridor compares and how recommendations in this report can change the corridor

Table 6-1
TOD Principles within the River Road Corridor

TOD Principle	TOD	River Road (Today)	River Road (Potential)
• **Integration of Transit w/Development**	✓		✓
• **Heavy Transit Use**	✓	✓	✓
• **Mixed Use Development**	✓	✓	✓
• **High & Medium Development Density**	✓	✓	✓
• **Pedestrian Friendly**	✓		✓
• **Bicycle Friendly**	✓		✓
• **Increases Connectivity**	✓		✓

Legend

✓ Core TOD principle

✓ Expanded TOD principle for the River Road Corridor

✓ A principle the current River Road corridor already has

✓ A principle the current River Road has in a few locations

✓ TOD principle most easily achievable

✓ TOD principle that due to existing conditions would be most difficult to implement

As Table 6-1illustrates, if new developments follow TOD principles and super stops are implemented, the River Road corridor will be able to achieve many of the principles found in TOD. To develop TOD along the River Road corridor, the following principles should be applied to new developments or existing developments that are undergoing significant renovations.

➢ Encourage medium and high density developments that employ a mix of uses

TOD encourages a mix of uses in close proximity. In single use development, people must get in a car to go from one location to another. In mixed-use development they have an option not just to drive, but to easily walk or take transit. If the mixed use development makes it easy and attractive to walk instead of drive, people will choose to walk, making it easier for the people who live and work along the corridor to get around.

Mixed-use development tends to work better in medium to high density developments. Recent development along the corridor has not been low density, but may be single use. Because high density development can more easily support a mix of uses than low density development, the existing single use developments along the River Road corridor may be retrofitted into mixed use communities. For example, a residential development may convert some of its ground floor into retail. Alternatively, new buildings can be built into existing development to either increase their density or add additional types of uses.

➢ Increase Pedestrian Connectivity

Currently, it is difficult to walk along the River Road corridor. This report provides a plan to improve the walkability of River Road. To accomplish TOD objectives, pedestrian connections within individual parcels can also be improved. Consideration should be given to how a pedestrian would walk from the sidewalk and bus stop to the development found at any particular site. People should be able to walk from the street to the building safely. While the Hudson Riverfront Walkway helps enhance pedestrian connectivity across parcels, connection from the river to other buildings on site should also be made safe and pleasant. As shown to the right, the parking lot at Edgewater Multiplex Cinema could be improved to provide pedestrian pathways.

Diagram showing possible pedestrian connections within Edgewater Multiplex Cinema parking lot. (Source: The RBA Group)

➢ Increase Cross Parcels Connectivity

Diagram showing a north-south connection other than River Road between several parcels. (Source: The RBA Group)

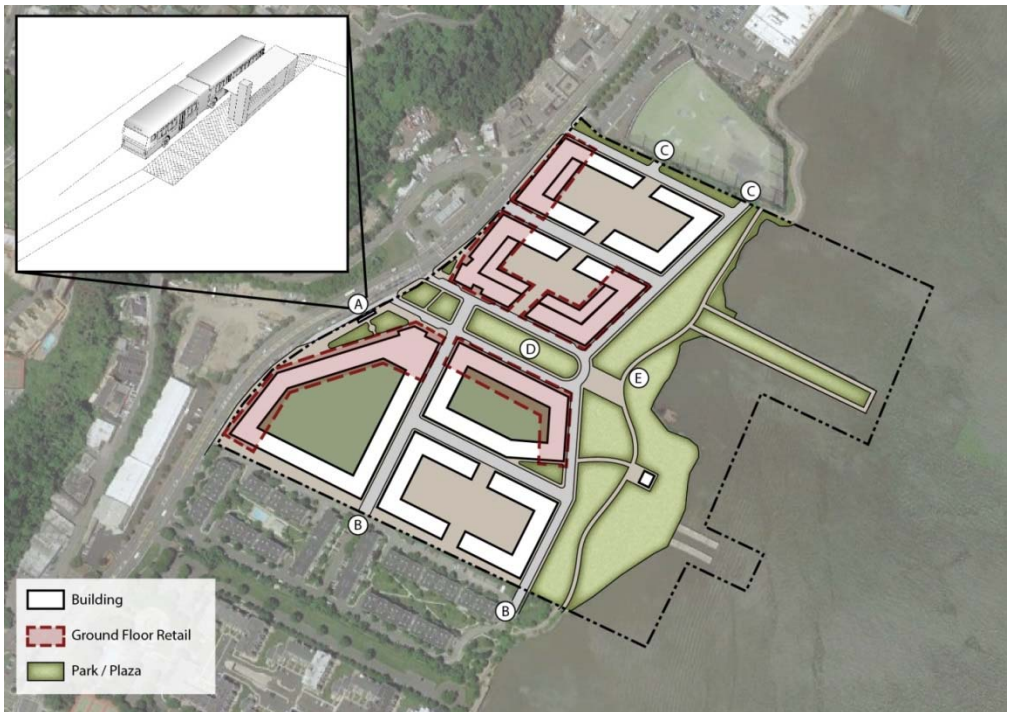
River Road is essentially the only north/south road in the area and, as a result, it carries nearly all vehicular travel – even short trips. New development should enhance connectivity across parcels. This can give automobiles and pedestrians routes to reach destinations other than River Road and help relieve congestion on River Road because people would not need to drive onto River Road to get from one development to another. Cross parcel connectivity can be accomplished incrementally. New or renovated developments should be encouraged to create internal circulation that has “stub-end” connections to the next parcel. When the adjacent parcel is redevelopment, it can connect the two parcels together.

➢ Become Bicycle-Friendly

This report extensively discusses bicycle improvements along the corridor. Implementing these changes could reduce congestion along the corridor and help attract TOD development.

➢ Integrate New Development with Transit & Increase Ridership

The illustration above is a diagrammatic representation of what future TOD development may look like. The site chosen for this study is Edgewater Commons, which scored high for potential TOD redevelopment. This illustration is just a concept. A final TOD design may look quite different in response to market conditions, actual site conditions and Borough requirements. However, this illustration does represent some major themes that can turn Edgewater Commons into a flourishing TOD.



Example TOD Diagram (Source: The RBA Group)

This development is composed of several buildings each containing a mix of uses. The buildings form a street edge along river road that is accommodating to the pedestrian. The illustration shows where ground floor retail would be ideal. This would occur along River Road, down a major entrance or public space and possibly along portions of the water's edge. Above the retail would be other compatible uses such as residential or office and range in height from just a few stories tall to a tower in select locations.

There is currently a bus station at Edgewater Commons. Redeveloping the parcel allows for an opportunity to provide a super stop at location **(A)**. As described in this report, super stops require a certain amount of space and, as is shown here, are partially built on private land. The super stop is integrated into the development by the incorporation of a small plaza that is fronted with retail. This plaza also provides an attractive and safe entrance for transit riders into the rest of the development.

The illustrated TOD shows how a large site can be divided into a block structure. This structure is designed for pedestrians as much as the automobile. At location **(B)** the streets creating this block structure can connect to internal streets in adjacent development. This will allow for the pedestrian and automobile network to connect to other development. Those traveling from one development to another will be able to do so without using River Road. At locations where the TOD cannot connect to other parcels **(C)**, stub end connections can be built so that when the adjacent parcel is redeveloped future connections are easily made.

Civic spaces are illustrated throughout the development. The plaza at the super stop **(A)** leads to a large public space that creates the main entrance to the development **(D)**. This long plaza provides a spacious setting for the retail. Civic space is also provided along the waterfront **(E).**This space connects the people to the river and the views of New York City beyond.

It also allows for the continuation of the Hudson River Waterfront Walkway. Any or all of the green space may be used for innovative storm water management techniques or to help control flooding.

Parking also needs to be considered. While shared parking will help reduce the total number of spaces needed, any development of this size would require a significant amount of parking spaces. In this illustration, with the exception of street parking, parking is always internal to the block and hidden behind buildings. This helps maintain the continuity of the place and is more attractive than visible parking lots. In some locations the parking may be in garages. While this illustration does not show it, a small amount of surface parking that is visible from River Road may be necessary to inform drivers where and how to park on site. Similarly, improvements to transit along the corridor are needed. Providing a strong connection between transit and existing and future development is critical to success of TOD program. New and existing development can assist in improving the current bus system by creating super stops.

6.5.2 Super Stop Concepts

The super stop concept is a way to take the existing bus system and integrate it into the existing development pattern of River Road. This is crucial because although the corridor is well developed, there is not a significant connection between transit and any individual parcel, which is crucial for future TOD developments or retrofits. Because the existing transit service is operating near its maximum capacity, in order to developer a new TOD, transit service needs to be improved to attract and accommodate new users. Furthermore, implementing super stops can help make existing developments more desirable for residents who will prefer the improved transit service. Super stops can also help reduce congestion by allowing buses to pull out of traffic when stopped, which allow for the rest of traffic to continue to flow.

Development of super stops employs a specific set of techniques that improve both the physical and operational aspects of the existing bus system. These include:

- Articulated Buses
- Bus Pull-Offs
- Bus Prioritization Signalization
- Pre-Board Ticketing
- Bus Shelters
- Branding
- Reorganizing Bus Stop Locations

➢ Articulated Buses

NJ TRANSIT already runs some articulated buses down the River Road Corridor. Articulated buses allow NJ TRANSIT to transport more people more efficiently because they are longer and can hold more people and often allow for entry and exit of the bus in multiple locations. They become even more efficient when they are combined with other techniques below, such as a pull-off.

Articulated Bus (Source: http://www.hybridmile.com)

➢ Bus Pull-off

One of the issues with the current corridor is that there is no room for a bus or any of the many jitneys to pull off to pick up passengers. This means that when buses stop, all traffic behind the bus must also stop. Fully implemented Bus Rapid Transit (BRT) projects typically have a dedicated lane for buses, but because of the lack of right-of-way space, that dedicated lane is unlikely to appear along River Road. However, providing locations for the bus to pull out of traffic to pick up passengers will allow for traffic to continue to flow and reduce congestion along the corridor. Specific locations for the

implementation of bus pull-offs are detailed in the previous chapter, which finds space for bus bull offs from both public and private land that is of the right dimensions to accommodate the depth and width required.

Bus Signalization Prioritization

While pull-offs would help keep traffic flowing along River Road, it would make it more difficult for the bus to pull back into traffic from the pull-off area. A way to alleviate this problem is to adjust the traffic lights to sense when a bus is present and give them a green light before the general traffic gets a green light. This would allow the bus to safely and easily return into the traffic lane. Signal prioritization could be implemented as part of a coordinated program of intersection improvements and equipment upgrades along the entire corridor.

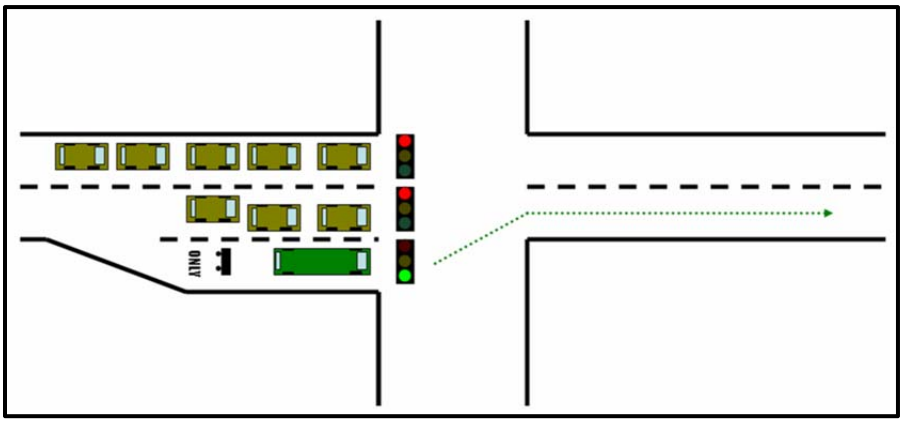


Diagram showing a bus pull-off and prioritized signalization (Source: http://commons.wikimedia.org)

➢ Pre-Board Ticketing

Currently, every time a passenger boards the bus they have to buy a ticket. This requires time and as a result slows down the bus. Without pull-offs, this in turn slows traffic. By requiring the passenger to have a ticket before entering the bus, the process can be sped up. This will help the flow of traffic and bus operations. Currently it is not uncommon for one bus to be waiting for another to load. Pre-board ticketing will speed the loading process and help prevent bus stacking.

Ideally there would be ticket machines at each super stop from which one could purchase tickets, but there are other methods that can achieve the same goal without these machines, such as allowing the door person at the closest residential building to sell tickets, smart cards and the emerging technology of pay by phone.

Image of a NJ TRANSIT ticket machine

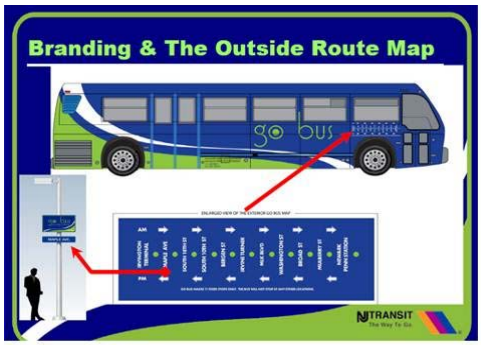
Bus Shelters

Example of a well-designed bus stop. Cleveland, Ohio Health Line BRT (Source: http://www.streetsblog.org)

One problem with bus service along River Road is that there are no comfortable places to wait for the bus. At points there is not even a sidewalk to stand on. When building a super stop, a bus shelter should be installed. Shelters provide protection against wind and rain and give a sense of separation from the traffic on the street. Super stops will be used by a large number of people, and bus shelters define and protect the place where people wait for a bus. The bus shelters can be equipped with display boards that show schedules and the time of arrival for the next bus.

Branding

Branding is a useful tool to bring the whole system together. People need to understand where bus stops are located and they need to take. Branding helps make these cognitive connections and makes for a legible transportation system. Successful branding should tie in bus design, route maps, signage, and shelter design.



NJT Go Bus Branding (Source: http://www.njtransit.com)

Reorganized Bus Stop Locations

There are more bus stops along River Road than may be needed to optimally serve the people using this transit corridor. Every time a bus stops, it slows down traffic and it takes longer to get the bus to its intended destination. Reducing the number of stops would allow travel speeds for both bus and automobile to increase because the less a bus stops in traffic (or pulls in and out of traffic) the less it slows, stops or otherwise impedes other automobiles. It is difficult to predict exactly how far people are willing to walk to a bus stop as it is determined by many factors including the speed of the transit, how far the average person is riding, the density of the surrounding development and human variables. However, a general rule of thumb, outlined in *Time Saver Standards for Urban Design*, is that people tend to have a maximum walking range to a transit stop of 5-7 minutes. At an average walking speed, a 5 minute walk equals about ¼ mile. This rule is often used to help determine the spacing of transit stops. Any area in a transit corridor only needs to be within ¼ mile of a transit stop to be well served. Looking at the current bus stop locations along River Road reveals that the entire corridor could be served with far fewer bus stops while still maintaining a five minute walk for all residents to the nearest stop. There are currently twenty-five stops within the study area. However, the area could be equally well served with as few as ten stops. Reducing the number of bus stops along the River Road corridor could go a long way to improving all modes of transportation along the corridor. Because there would be fewer stops, there would be more people coming to a single stop. This is why it is important to provide adequate space and shelter at each super stop location.

➢ Inserting Super Stops

Inserting a super stop would be a much easier task than adding a new rail line, a tramway or even a dedicated BRT route, but it still requires physical space and planning to achieve. Knowing the size of a super stop is important for knowing where it is possible to install a super stop. As such a dimensional analysis is an important criteria used to help identify super stop locations.

Based on standards outlined in the *Planning and Design for Transit Toolkit*, the preferred width of a super stop would be between 20 feet to 35 feet. A stop smaller than 20 feet would not allow room for a bus pull-off, a bus shelter, and room to walk around the shelter. Going larger than 35 feet would require too much land and make the space awkwardly large.

The length of a super stop would be between 130 feet to 270 feet. While 90 feet would provide enough space for a pull off for a standard bus, some of the buses that run down this corridor are articulated and require a longer pull-off. A super stop length of 130 feet can accommodate one articulated bus, while 270 feet can articulate up to three articulated buses. Because there are so many buses running down the corridor and stacking is a common occurrence, it would be ideal to provide super stops that allow enough space for them to stack. NJ TRANSIT reports that there are times when up to three buses may be stacked at any stop, and as such super stops can plan for this condition

Because there is little room within existing public right-of-way along River Road to accommodate a bus pull-off and an enhanced shelter, space would likely come not only from the existing public right-of-way, such as road shoulders or land the County controls for road widening projects, but also from private land. To help convince landowners to help with this effort, incentives can be used such as allowing a quicker permitting process or increasing the allowable height or FAR of a new development. However, it should be noted that locating a super stop in front of any property is an incentive in and of itself as it may generate higher rents; as people may prefer to live as close to a high-amenity bus stop as possible; and retailers may realize more walk-in traffic.

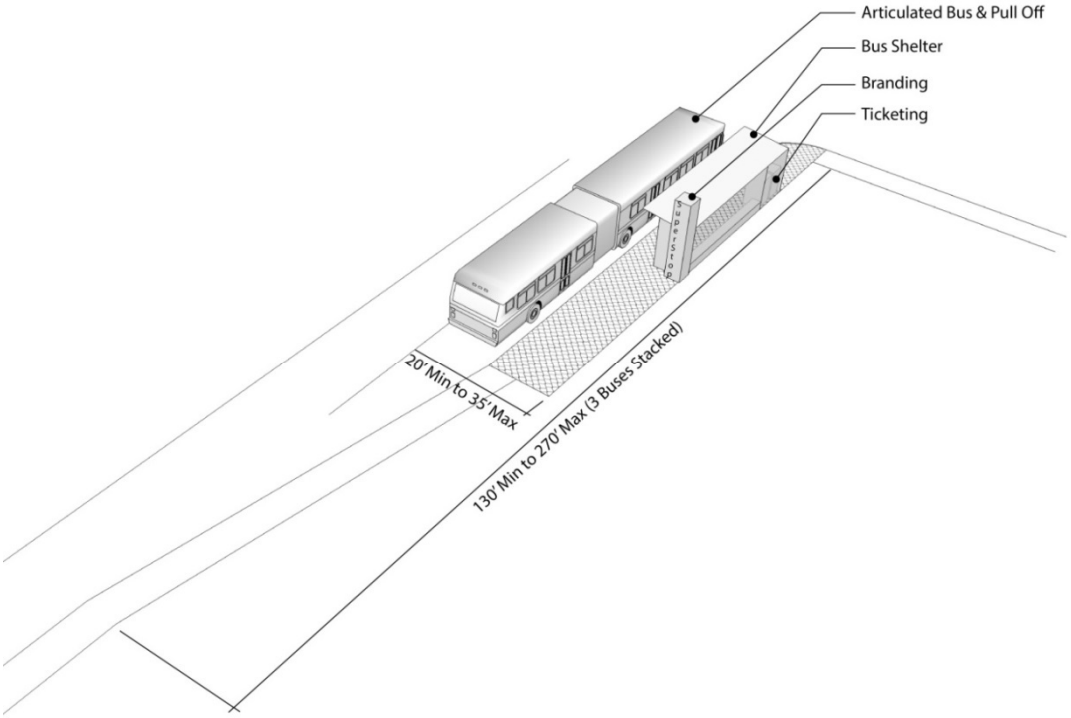


Diagram of a super stop and its required dimensions
(Source: The RBA Group)

Image showing how an enhanced bus shelter and pull-off area can be integrated into existing development (Source: The RBA Group)

6.6 Implementation Guidance

6.6.1 Fort Lee

Because of the parcel size, the lack of development opportunities (excluding Hudson Lights and The Center at Fort Lee) and the grade at the upper end of the River Road corridor, a TOD or a super stop is unlikely to be built within the Borough's boundary. As previously noted, Fort Lee's existing regulations are already supportive of TOD type development, and as such, Fort Lee's regulations are sufficient for the issues studied in this report.

6.6.2 Edgewater

For such a small Borough there are many different zoning districts, but very few districts that promote mixed-use development at medium to high density, both of which are required for TOD development.

However, this may be what the Borough prefers, as it can influence development through the planning approval process rather than allowing development as a right. Edgewater can move forward with TOD development by using the following techniques:

- Update the master plan to adopt the TOD principles as described in this report
- Amend the zoning code to allow for TOD (high density / mix of uses)
- Incentivize super stop development

➢ Update Master Plan

The Borough may be better served by updating their master plan to include a vision for the future which includes TOD. Updating the master plan is only the first step; the zoning code would also have to be amended to support the goals of the master plan. The updated master plan and zoning code would provide for a more efficient development process than the current planning approval process and as such would better promote the type of development the Borough wishes to have as it would more likely attract developers who have the skill and desire to build TOD.

➢ Amend Zoning

If the code is amended, zoning districts that promote TOD development should be included. It may be possible to update existing zoning districts to allow for the flexibility of the below criteria, or it may be desirable to create a new zoning district or overlay that specifically defines TOD principles and where they are to be implemented on the zoning map. The broad TOD principles that a zoning code needs to incorporate to promote TOD are:

- Mixed-use zones, particularly residential, commercial and office
- Allow for High Density by allowing for taller buildings and/or a large FAR.
- Allow for Shared parking. Shared parking only works in a mixed-use setting, but effectively requires less parking spaces while maintaining parking ratios, because some spaces are shared by different users, for example office workers who park during the day and residents who park at night.
- No front setbacks and small rear and side setbacks which create a more pleasant walking environment and increase the amount of developable land.
- Require connectivity to adjacent parcel. Encourage the connection of parking lots so not all traffic needs to go to River Road.
- Incentivize super stops for new developments

These are standard practices in any TOD development and will need to be added to the code if Edgewater is to attract this kind of development.

➢ Incentivize Super Stops

Since the corridor is largely built out, regulation should also be adopted that incentivizes the creation of better transit facilities and/or super stops for both new development and existing development. Because the private development would benefit from having a super stop adjacent to their properties, these developments may be willing partners. This could help relieve government agencies from having to front the entire cost.

Cities across the country have had success using incentives to achieve desired development outcomes. The most notable are from city governments who wish to promote sustainability and use incentives for developers to build LEED certified buildings. Similar techniques can be used to incentivize super stops in Edgewater and they include:

- A quicker approval process if the project includes a super stop. This may mean the development moves to the top of the agenda or that the Borough is required to respond in less time than that which the code now specifies. This will attract both new developers and those looking to redevelop or renovate an existing project.
- Increase density (Floor Area Ratio) for projects that include a super stop. This would allow new developments to build more densely than what an updated zoning code would allow by right, and it may also allow existing developments to build additional building space that it can lease or sell.
- Reduce setbacks along River Road for developments that build super stops. This will allow the development to better integrate with the super stop and may help a retail establishment thrive because they are better connected to the pedestrians along the side walk and the super stop, making it easier for customers to visit the establishment without a car.
- Allow existing development that is of a single use to integrate other uses into their development. For example, a building which is currently all residential could be allowed to incorporate ground floor retail if they build a super stop.

The mere fact that a super stop may replace several traditional stops may be incentive enough for a developer to install a super stop on their property. Not all developments can have a super stop, as the location of super stops need to be vetted with and regulated by the Borough, County and NJ TRANSIT. Those developments which have space and more quickly act to build a super stop will benefit because a super stop is a marketable amenity that will attract higher rents. It will be desirable to live as close to a super stop as possible, and as such development which build super stops on their property can charge a higher rent for this premium.

6.6.3 Bergen County / NJ TRANSIT

A super stop, or the concept of reverse engineering of a TOD, is a new idea that is relatively untested. The study of super stops in this report is just an outline of their potential. Further study will have to be conducted to conclude how best to implement the concept.

➢ NJ TRANSIT Super Stop Feedback

Step one would be to further investigate the super stop concept with NJ TRANSIT. The sizes of buses NJ TRANSIT uses, number of buses typically stacked, and typically used bus shelters are just a few of the examples that NJ TRANSIT could provide clear direction on moving forward. This kind of information will allow for greater accuracy in creating the dimensional requirements for super stops.

➢ NJ TRANSIT Stop Location Feedback

NJ TRANSIT could also provide guidance on how best to reduce the number of bus stops along the corridor. Further studies on bus speed, assumed increase in speed with the reduction of stops, travel distance and local surveys can all be used to help predict how far people would actually be willing to walk to a super stop. From this information, the appropriate spacing of stops can be determined and locations of super stops can be set. While some operational considerations on the existing system were given as a part of this study, a the full integration of bus stops with new and existing development was not considered and would have to be further studied.

➢ Right-of-Way Assessment

A closer look at the existing right-of-way to find places where a bus pull-off can ideally be located is also needed. Late in this study, it was revealed the County may have land available for road widening projects. These areas may be good locations to build super stops. If all public agencies agree to move forward with super stops, a more detailed look can be given to their ideal location. However, it is still likely that there will be more locations available for super stops than are needed. If the funding of super stops is going to come from public sources, then public agencies should pick the best locations to install the super stops. However, if super stops will be implemented in full, or in part, by private development, public agencies will still need to regulate the placement of the super stops so they will be built in preferred locations.

➢ Seek Funding for Updates to Master Plan and Zoning

Lastly, the Boroughs can seek funding to update their master plans and zoning to promote super stops and TOD along the River Road corridor. The County can also provide information on sources of funding and guidance on best practices through their Countywide Strategic Master Plan initiative.

7. Implementation Matrix

Utilizing information obtained during the evaluation of existing infrastructure, discussions with the Technical Advisory Committee and feedback from community outreach, an Action Implementation Menu was developed of recommended solutions to consider for the corridor. This menu of "actions" is intended to guide Edgewater, Fort Lee and Bergen County in developing a prioritized implementation strategy for improving the pedestrian, transit, and bicycle conditions along the corridor.

The table is categorized into 5 categories: Engineering, Education and Enforcement, Evaluation, Regulatory, and Maintenance. All of the "actions" are corridor wide except for some of the Engineering recommendations. All actions are further supplemented by three factors: **Responsibility**, **Timeframe**, and **Cost**.

Responsibility identifies the agency charged with the responsibility for leading implementation of the proposed action item.

Timeframe identifies the required amount of time to capture the full benefit of the recommendation, including development and implementation.

- Short-Term (1-3 years)
  - Improvements can be made with minor improvements to the corridor. Would include signing and striping changes. These changes could be made with minimal design effort and would provide "quick-fixes" to identified problems.
- Mid-Term (3-5 years)
  - Improvements can be made as part of future repaving. Would include signing and striping changes. All striping to be high visibility reflective markings
- Long-Term (5+ years)
  - Changes may include roadway widening, easements, right of way acquisitions, drainage and utility impacts, etc.

The **Cost** estimate includes the relative cost of implementing the strategy (low, medium, high). Any cost noted is an estimate and will vary depending on the type of materials, phasing, etc.

- Low (under $2,000)
- Medium ($2,000 - $10,000)
- High (over $10,000)

The matrix also includes recommendations from the three bicycle concepts addressing access to the George Washington Bridge. The action items included in the concepts will have the most impact if done together. However, implementation can be done in phases.

7.1 Action Implementation Matrix

7.1.1 Engineering

Action (corridor-wide)	Responsibility	Timeframe	Cost
Reduce the travel lanes to 11-foot wide lanes, striped with high visibility reflective markings, to accommodate both on-road and off-road bicycle facilities.	Bergen County	Long-Term	High
Install a 5-foot wide sidewalk where it is missing or is physically deficient on both sides of River Road to create a connected system of pedestrian facilities throughout the corridor	Bergen County	Short-Term	High[1]
Install ADA compliant curb ramps and detectable warning surfaces at locations where they are missing or substandard.	Bergen County	Short-Term	High[2]
Install pedestrian hybrid beacons at five (5) locations within the corridor to provide safe crossings for pedestrians.	Bergen County	Mid-Term	High
Adjust pedestrian crossing times at signalized intersections in order to provide adequate time for pedestrians to cross the roadway.	Bergen County	Short-Term	Low
Replace pedestrian signal heads with a countdown display pedestrian signal head to help pedestrians assess how much time they have to finish crossing the street.	Bergen County	Short-Term	High
Consolidate and/or eliminate bus stops to provide shorter bus trips due to less stops; and therefore less dwell time and higher speeds.	Boroughs/ NJ TRANSIT/ NY Waterway	Mid-Term	Low
Install a series of bus stop alternatives that provide bus bays at bus stops throughout the corridor; and therefore, a protected area for both the transit users and the stopped bus away from the travel lane,	Boroughs/ Bergen County/ NJ TRANSIT	Mid-Term/ Long-Term	High
Install bus shelters at existing bus stops.	Boroughs	Short-Term	Medium[3]

Install 5-foot wide bike lanes with a buffer where feasible along both sides of River Road from the border with Hudson Bergen County north until Old Palisade Road on the SB side and Main Street on the NB side	Bergen County	Long-Term	High
Install sharrows from the George Washington Bridge on the SB side until Old Palisade Road and Main Street on the NB side	Bergen County	Short-Term	Low
Install wayfinding signs to key destinations with the direction, distance, destination and riding time for bicyclists from current location including connections to the Hudson River Waterfront Walkway	Boroughs	Mid-Term	Low
Install "MAY USE FULL LANE" signs (R4-11) along sections of the corridor where no bicycle lanes or adjacent shoulders usable by bicyclists are present and lane widths are <14'	Bergen County	Short-Term	Low
Install bicycle "WRONG WAY" signs and "RIDE WITH TRAFFIC" plaques (R5-1b, R9-3CP) back-to-back with other signs to minimize visibility to other traffic where wrong-way riding by bicyclists is frequently observed	Bergen County	Short-Term	Low
Install colorized advance bicycle boxes at high conflict locations especially where there are frequent bicycle left-turns and/or motorist right-turns	Bergen County	Short-Term	Low
Install intersection crossing markings to guide bicyclists on a safe and direct path through intersections, including driveways and ramps	Bergen County	Short-Term	Low
Install "through bicycle lanes" where there are bike lanes and right-turn only lanes at intersections in order to assist bicyclists to correctly position themselves to avoid conflicts with turning vehicles. Where there isn't room for a through bicycle lane, a combined bicycle lane/turn lane should be considered.	Bergen County	Mid-Term	Low
Provide bicycle detection at all signalized intersections	Bergen County	Mid-Term	High
Enhance gateway treatments at the northern entrance of the corridor near Bruce Reynolds Blvd, at State Route 5 and the southern border of the Bergen County near Churchill Rd	Boroughs/Bergen County	Mid-Term	Medium
Create secure and safe bicycle parking at key bicycling destinations (or starting points) including schools, shopping centers, recreational facilities, public buildings, and parks throughout the corridor	Boroughs	Short-Term	Low – Medium

Provide and promote bicycle parking, showering and clothes changing facilities at worksites, transportation terminals, and other destinations	Boroughs/Bergen County/ NJTRANSIT/ NJTPA/ Meadowlink TMA	Short-Term	Low
Conduct a feasibility study to determine a suitable location to install a bicycle repair station for commuters and residents to ride their bikes to the ferry terminal with secure, sheltered parking.	Boroughs/Bergen County/ NJ TRANSIT/ NJTPA/ Meadowlink TMA	Short-Term	Low
Install yield priority signs along the shared use path to reinforce that bicycle traffic should yield to pedestrians	Boroughs/Bergen County	Long-Term	Low
Conduct a feasibility study to determine how to best implement the concept of super stops on the corridor and to gather information for the best location and design of the super stops.	Boroughs/ Bergen County/ NJ TRANSIT/ NY Waterway	Mid-Term	High
Provide bike racks on all public transit vehicles that travel through the corridor	NJ TRANSIT, NY Waterway	Mid-Term	Medium

1. Cost depends on length of segment being installed.
2. Cost depends on number of curb ramps being installed.
3. Cost depends on number of bus shelters being installed

Action (Access to/from GWB)	Responsibility	Timeframe	Cost
Stripe a high visibility crosswalk and bicycle specific crossing treatment ("crossbike") across Hudson Terrace at the GWB South walkway and a high visibility crosswalk across Hudson Terrace at the existing traffic signal adjacent to the North walkway access	Bergen County	Short-Term	Low
Stripe and sign a bicycle lane along Hudson Terrace between the GWB and Sylvan Street, preserving the on street parking where possible. This will target the high crash intersections of Hudson Terrace at both Merkle Street and Sylvan Street, increasing visibility and expectation of potential conflict.	Bergen County	Short-Term	Low
Install Pedestrian Hybrid Beacon style traffic light at the Hudson Terrace intersection with the GWB South walkway. This will work in conjunction with the existing traffic light at the ramp from the GWB westbound at Hudson Terrace. The signal will provide gaps in the Hudson Terrace motor vehicle traffic when actuated, allowing the pedestrian and bicycle traffic to cross to roadway safely. This will accommodate a wider range of bicyclists, not just those who are comfortable "taking the lane" in heavy traffic.	Bergen County/Port Authority	Mid-Term	Medium

Construct a shared use path along the eastern side of Hudson Terrace between Bruce Reynolds Boulevard and the GWB North walkway. This will require earthwork under the Palisades Interstate Parkway entrance ramp to the GWB extending the curb under the GWB and installing a barrier separation along the curb line. Constructing this path will provide a continuous off-road connection between the GWB South walkway and the existing path along Hudson Terrace that extends south to Henry Hudson Drive.	Bergen County/Port Authority /Borough of Fort Lee/ Palisades Interstate Park Commission	Long-Term	High

7.1.2 Education & Enforcement

Action	Responsibility	Timeframe	Cost
Conduct a Traffic Safety Fair to promote the various safety messages and distribute information.	Boroughs /Police Departments/ NJHTS	Short-Term/ ongoing	Low
Conduct bicycle education classes for all adults and mature teens, to improve their cycling skills	Meadowlink TMA/ Boroughs/ Local Advocacy Groups	Short-Term/ ongoing	Low
Introduce bicycle and pedestrian safety into the school curriculum through programs such as WalkSafe™ or BikeSafe™ or event based programs through SafeKids or the Brain Injury Association of New Jersey	Boroughs/ School Superintendents	Mid-Term	Low
Send borough staff to bicycle and pedestrian specific conferences/training/summits	Boroughs	Short-Term/ ongoing	Low - Medium
Create a SRTS plan for all elementary and middle schools	Boroughs /Meadowlink TMA	Short-Term	Low - Medium
Create web-based traffic safety quizzes that include bicyclist, pedestrian and motorist safety questions on the Bergen County's website	Bergen County	Short-Term	Low
Initiate a public education program/campaign, such as Street Smarts, that uses a dual approach of media and community relations to educate and raise community awareness about traffic safety issues for all users	Boroughs / Meadowlink TMA	Short-Term	Low - Medium
Work with Meadowlink TMA to incorporate a bike commuter reimbursement program for Borough employees	Boroughs / Meadowlink TMA	Mid-Term	Low
Install placards at bike parking locations instructing people how their bikes should be secured to the rack and what to do in the event of their bike being stolen	Boroughs	Short-Term	Low
Increase enforcement relating to cycling (cyclists under 17 not wearing helmets; not stopping for pedestrians at crosswalks or at stop signs and red lights.)	Police Departments	Short-Term	Low - Medium

Increase the presence of police bicycle patrol units	Boroughs / Police Departments	Short-Term	Medium – High
Create and publicize police bike registration program	Boroughs / Police Departments	Short-Term	Low
Provide comprehensive pedestrian and bicyclist-safety training to police officers	Police Departments/ NJ Bike & Walk Coalition	Short-Term/ ongoing	Low
Strictly enforce the Stop for pedestrian State law on River Road	Police Departments	Short-Term/ Ongoing	Low
Strictly enforce the 35 mph speed limit on River Road	Boroughs / Police Departments	Short-Term	Low

7.1.3 Evaluation

Action	Responsibility	Timeframe	Cost
Conduct student travel surveys in all schools to determine and measure how students travel to school	Meadowlink TMA/ Boroughs/Board of Education	Short	Low
Use data received from permanent traffic counts to establish baseline data and to regularly measure the number of bicyclists	Boroughs	Short-Term	Low
Use Plan4Safety to track and evaluate pedestrian and bicycle crashes, including crashes that do not involve a motor vehicle; take action to address problems that led to the crashes	Boroughs/ Bergen County	Ongoing	Low

7.1.4 Regulatory

Action	Responsibility	Timeframe	Cost
Update the master plan to include a vision for the future which includes TOD principles	Boroughs	Mid-Term	Low
Update the zoning code to support an updated master plan that includes TOD principles. Either update existing zoning districts or create a new zoning district or overlay that specifically defines TOD principles and where they are to be implemented.	Boroughs	Long-Term	Low

Adopt regulation that incentivizes the creation of better transit facilities and/or super stops for both new and existing development.	Boroughs	Long-Term	Low
Adopt a policy to install bicycle racks or other bicycle storage at all existing and public buildings and community facilities	Boroughs	Short-Term	Low
Adopt an ordinance allowing riding on sidewalks that includes: (1) No person shall ride a bicycle upon a sidewalk at a speed greater than the walking speed of pedestrians; (2) Persons riding a bicycle upon a sidewalk shall yield the right-of-way to any pedestrian and shall give an audible signal before overtaking and passing any pedestrian; (3) Persons riding a bicycle upon a sidewalk shall keep as close to the curb as is practicable to allow pedestrians to walk along sidewalks without impedance.	Boroughs	Short	Low
Adopt a Bicycle Parking Ordinance that: requires developers, submitting planning or zoning board applications, to offer a bicycle sharing facility as part of their site design; incorporates a residential bike parking ratio requirement into the municipal code; requires all commercial buildings to provide off-street parking with 5% of the required vehicle parking made available for bicycle parking	Boroughs	Short-Term	Low
Adopt an ordinance to require taxicabs to affix "watch for bikes" stickers in the following locations on the vehicle: 1) driver's side mirror 2) the left and right rear side window	Boroughs	Short-Term	Low
Adopt a law that requires all commercial buildings to provide off-street bike parking with 5% of required car parking made available for bike parking	Boroughs	Short-Term	Low

7.1.5 Maintenance

Action	Responsibility	Timeframe	Cost
Implement and publicize a spot Maintenance & Improvement Program that allows bicyclists and others to alert DPW to any poor maintenance conditions or hotspots for improvements such as potholes, abandoned bikes, etc.	Boroughs/ Bergen County	Mid-Term	Low
Regularly maintain a clear pathway on all sidewalks and shared use paths	Bergen County	Short-Term/ ongoing	Low
Regularly repaint crosswalks and bike lane	Bergen County	Short-Term/ ongoing	Low

8. Summary

The Hudson River waterfront in Bergen County is among the most densely populated landscapes in the entire state. This unique landscape is a narrow strip sandwiched between the Hudson River to the east and the Palisades to the west. The corridor represents a critical link for Bergen County and other North Jersey residents accessing job centers in New York City, Jersey City, and the region at large. This study is to promote regional and multi-jurisdictional strategies to better accommodate pedestrians, bicyclists and transit riders in the River Road corridor. This study has examined access and safety with respect to transit services, as well as continuity and connectivity for pedestrians and bicyclists.

The recommendations outline physical and programmatic actions that will help the corridor become more pedestrian and bicycle-friendly including education, enforcement, evaluation, maintenance and regulatory actions the County and Boroughs can implement to improve conditions. Recommendations also include broader regional connectivity of the nearby Hudson River Waterfront Walkway, access to the George Washington Bridge, and Palisades Interstate Park as well as links to Hudson County, ferry service to New York City and transit to other parts of the area.

As presented in this report, existing connections are missing or deficient in a number of locations within the study corridor. Feedback from the users of the corridor is that these connections are imperative to the safety of area residents. This report has provided the groundwork for making such improvements as well as provided an overall time frame of when the improvements can and should be made. With the construction of the noted improvements, the River Road corridor will provide a continuous pedestrian and bicycle connection from the Hudson County boundary line to the George Washington Bridge, providing users a safe and accessible passage for the length of the corridor.

It should be noted that a presentation to the Borough of Edgewater was conducted to outline the proposed concepts discussed in this report. The Borough Council passed a resolution that does not support the project. Given this occurrence it was decided not to conduct the last Technical Advisory and Public Information Meetings for the project. However, all comments received on this Draft Report will be incorporated into the report and become part of the record for any future considerations that this project may embark on.