4.9 Transportation and Infrastructure

4.9.1 Methodology

Transportation

The objective of the transportation analysis is to evaluate the impact on vehicle, pedestrian, and bicyclist movements in relation to the construction and operation of flooding mitigations within the Study Area. The data collected includes traffic volumes of vehicles, pedestrians, bicycles, and public transportation. Crash data was also provided by the City of Hoboken along with traffic signal timings at various intersections. This information was used to evaluate the impacts of temporary detours during construction and any permanent modifications to roadways, pedestrian walkways, and bikeways. A full discussion of existing traffic conditions within the Study Area can be found in Traffic Technical Memorandum, Rebuild by Design Hudson River Project, January 2017 (see Attachment 2).

Infrastructure

As part of the Project's feasibility study, the spatial locations of various surface and subsurface utilities were obtained in either digital or paper format from the following utility companies:

- North Hudson Sewerage Authority (NHSA) -Storm-Sewer network in Hoboken and Weehawken
- Public Service Enterprise Group (PSE&G) – Electric and Gas
- Verizon – Communications (Telephone and Internet)
- Cable Vision – Cable Television
- United Water – Drinking Water
- Jersey City Municipal Utilities (JCMUA) – Storm-Sewer network in Jersey City

Utility locations will be staked out and locations identified in coordination with utility providers prior to completion of final design and again in preparation for construction. It should be noted that surface and subsurface utility data such as electric conduits and others owned by NJ TRANSIT and the Port Authority of New York and New Jersey (PANYNJ) were not obtained.

4.9.2 Affected Environment

4.9.2.1 Transportation

Due to the natural topography and the presence of significant transportation system infrastructures, the Study Area has concentrated access to its immediate surrounding communities. The speed limit within the Study Area is an overall 25 mph, unless mentioned otherwise. To the north are the access ramps (NJ Route 495), toll facilities and the portal of the Lincoln Tunnel. To the south are the tracks and yards of NJ TRANSIT's Hoboken Terminal, and beyond that are the Holland Tunnel portal with toll plaza, NJ Turnpike Holland tunnel extension (I-78), and NJ Route 139 (leading to US Routes 1 and 9). These exclusive means of ingress and egress, though few, provide the Study Area with exceptional regional multi-modal accessibility to and from New Jersey and New York City.

Northern Ingress and Egress

To provide access to and from the north end of Hoboken, two north-south bridge viaducts (Willow Avenue and Park Avenue) convey traffic over the Hudson Bergen Light Rail (HBLR) system. These tracks run east-west across Hoboken's north border, limiting access of most north-south ground level roadways, including Clinton Street and Grand Street, as they dead-end approaching the HBLR tracks. The Willow Avenue and Park Avenue viaducts facilitate access between Hoboken and Weehawken (see **Figure 4.92**). There is a moderate amount of congestion, particularly in the morning hours. The Willow Avenue viaduct, a major arterial, contains narrow unprotected sidewalks on both sides that do not experience high pedestrian volumes. The Park Avenue viaduct contains a single six-foot wide sidewalk protected by half-section (Jersey) barrier on its northbound side.

Below the Park Avenue viaduct, Harbor Boulevard provides a connection to southbound Park Ave. Harbor Boulevard provides pedestrian and cycling access to the Hudson waterfront and southbound vehicular movement from regional connectors such as Port Imperial Boulevard to northern Hoboken.

There is a mild amount of congestion in this area, more so in the morning peak hours. NJ TRANSIT buses utilize all three viaducts. The area has moderate to low pedestrian traffic and low bicycle utilization.

Southern Ingress and Egress

A system of Interstate and major regional routes crossing north Jersey City connect with Hoboken by way of four north-south streets: Jersey Avenue, Grove Street, Marin Boulevard, and 18th St. Of these four, Grove Street, Marin Boulevard, and Jersey Avenue enter Hoboken (see **Figure 4.92**).

Similar to Weehawken in the north, the continuation of the Palisades and NJ TRANSIT railroad tracks limit the number of local connections to Jersey City in the south. The Hoboken Terminal rail yard prevents north-south access over the eastern half of Hoboken's southern border.

Just north and running parallel to the Hoboken Terminal rail yard is Observer Highway, a two-lane (one lane each way, with 14-foot striped median and parking along both sides) Urban Minor Arterial (average annual daily traffic 22,934 vehicles per day). Observer Highway contains a wide sidewalk along its northern edge and connects to a sidewalk along its southern edge after "crossing" Newark Street (see **Figure 4.93**). Adjacent to the south side of Observer Highway is a two-way protected bicycle lane for travel to and from Jersey City, Washington Street, the NJ TRANSIT Terminal, and Port Authority Trans Hudson (PATH station). The bicycle lanes see a moderate amount of bicycle traffic during both morning and evening peak hours.

Figure 4.92 Transportation Map

Newark Street, similarly a two-lane (one lane each way, with center turn lanes and striped wide medians but no parking) Urban Minor Arterial (average annual daily traffic of 7,496 vehicles/day) intersects with Observer Highway to the west and has a full sidewalk along its northern edge and a disjointed and poorly maintained sidewalk along its south edge with no designated bicycling infrastructure. This corridor experiences high levels of congestion in the morning hours and moderate to high congestion in the evening hours. In the areas of access to Jersey City, there is a moderate amount of pedestrians during both morning and evening hours.

Only three streets provide direct connectivity to and from Hoboken's south border and the regional transportation links. These access streets are: Marin Boulevard, Grove Street, and Jersey Avenue. All three of these streets have sidewalks on both sides. All three streets also convey bus transit. Jersey Avenue has a designated bicycle lane that comes from the western portion of 18th Street, along Jersey Avenue in Jersey City, under the NJ TRANSIT tracks and into Hoboken. This dedicated bicycle lane separates from the roadway and continues northward to the 2nd Street HBLR station.

Within Jersey City, 14th Street and 12th Street, (urban interstate roadways) provide connectivity between the Holland Tunnel , I-78 west, and NJ Route 139 west. The Holland Tunnel connects Jersey City to Lower Manhattan.

Interstate 78 is a four-lane (two lanes each direction) New Jersey Turnpike Authority toll road. This segment, leading to the NJ Turnpike, is also known as the Newark Bay Hudson County Extension, which provides connections to Newark Airport, north and central New Jersey, and Pennsylvania. Adjoining I-78 at both 12th and 14th street intersections in Jersey City is NJ Route 139. Westbound NJ Route 139 separates into a stacked roadway; the lower section is a two-lane principal arterial express section which runs in a cut and provides direct access to the Pulaski Skyway and US Routes 1 and 9, and the upper section is a two-lane surface minor collector, which provides local access through a succession of signalized intersections.

Western Ingress and Egress

Jersey City and Union City lie inland of Hoboken to the west. At 14th Street in Hoboken, a viaduct leads west from Willow Avenue over the HBLR tracks and Palisades to Union City. The 14th Street viaduct ends on the Palisades at an intersection with S. Wing Viaduct, which travels south along the Palisades, and Manhattan Avenue, which travels north along the Palisades. These roads both contain unprotected sidewalks for pedestrian access.

At the southeast end of Hoboken, Observer Highway continues west to New York Avenue. The roadway continues under Palisades Ave and surfaces to intersect with Ravine Avenue in Jersey City. This roadway has a sidewalk on one side with barrier protection east of the underground portion of the roadway.

Exclusive pedestrian access is available at the 9th Street HBLR station, where an elevator and pedestrian bridge provide access to the Congress Street Station from Paterson Plank Road.

4.9.2.1.1 *Roadway Operations*

Data Collection

Traffic data was gathered and analyzed for the roadways within the Study Area. Existing conditions for motor vehicles were established based on signal timings and traffic volumes including turning movements, lane configurations, and observations

Figure 4.93 Transportation Map; Map Source: Imagery © 2017 Google, Map data

Figure 4.94 Hoboken Northern Ingress/Egress LOS (PM Peak); Map Source: Imagery © 2017 Google, Map data

Figure 4.95 Observer Highway at Washington Street LOS (PM peak); Map Source: Imagery © 2017 Google, Map data

Figure 4.96 Observer Highway at Washington Street LOS (PM peak); Imagery © 2017 Google, Map data

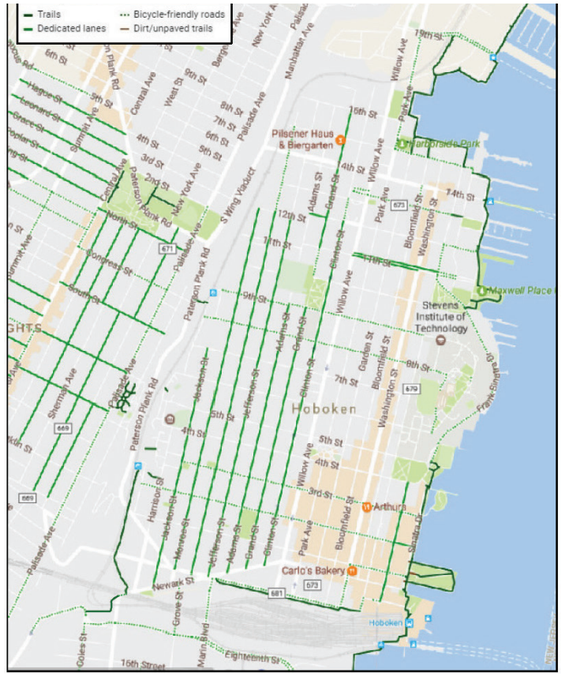

Figure 4.97 Hoboken Area Bike Network; Imagery © 2017 Google, Map data

Figure 4.98 Bikeshare Stations

of queue length. Data is typically gathered during peak hours. Level of service (LOS) is a common way of evaluating the functionality of a roadway or corridor based on its capacity and vehicle flow. LOS A and LOS B are considered very high functioning, LOS C is considered average and LOS D denotes an acceptable amount of congestion. LOS E signifies an unacceptable amount of congestion and LOS F is considered "failing." Intersections noted with "U" are unsignalized and have at least one approach as a free-flowing movement. No delay is calculated for these intersections. Typically LOS strongly correlates to vehicle delay and queue length, which in some cases affects adjacent roadways.

Study Area Operations

In general, the northern streets of Hoboken experience better flowing traffic according to recorded LOS data (see **Figure 4.94**). By comparison, the southern ingress/egress routes experience poorer levels of service. Marin Boulevard and Grove Street displayed high levels of congestion during morning peak hours (see **Figure 4.95**). While intersections closer to Hoboken Terminal displayed high levels of congestion in evening peak hours (see **Figure 4.96**). It should be noted that in addition to the roadways being over capacity, extremely high levels of pedestrian activity add to congestion and delays at and adjacent to Hoboken Terminal.

4.9.2.1.2 *Pedestrian Network*

Since about half of the Study Area population uses public transit according to 2015 American Community Survey (ACS) statistics, the Study Area is very pedestrian focused. Nearly all streets are lined with sidewalks and corresponding crosswalks that provided flexibility in pedestrian movements. The Study Area generally has high levels of pedestrian activities; however, the levels disperse throughout the community. Waterfront areas and adjacent intersections can see up to 500 pedestrians per hour. Levels typically drop below 100 pedestrians per hour towards the vehicular ingress and egress routes of Hoboken.

4.9.2.1.3 *Study Area Bike Network Routes*

Figure 4.97 indicates the Hoboken, Jersey City, and Weehawken bike trails, dedicated bike lanes, and bicycle-friendly roads. The Study Area contains several dedicated bicycle lanes in western Hoboken, in the south near Hoboken Terminal, and the east along the waterfront. In general, bicyclists traveling pedestrian routes can mostly be found closer to the Study Area's vehicular ingress and egress routes, with volumes of at most 20 bicyclist crossings per hour.

Bikesharing Programs

The municipalities within the Study Area participate

Figure 4.99 Bus Routes with Bus Stops; GTFS NJ TRANSIT GIS

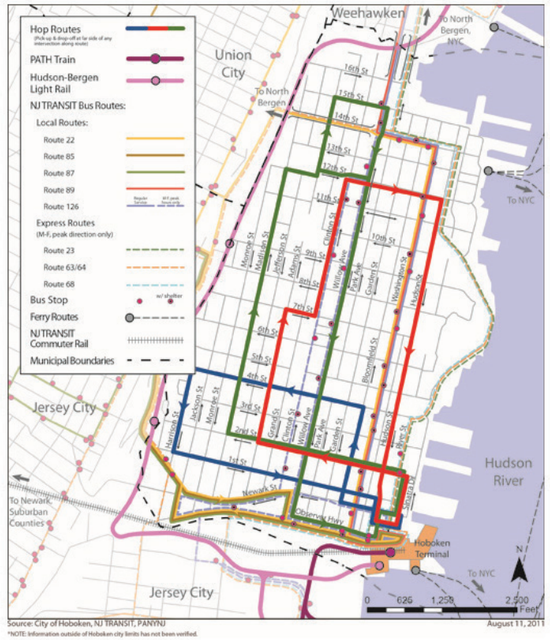

Figure 4.100 Hoboken "Hop" Shuttle Service Network; City of Hoboken, NJ TRANSIT, PANYNJ

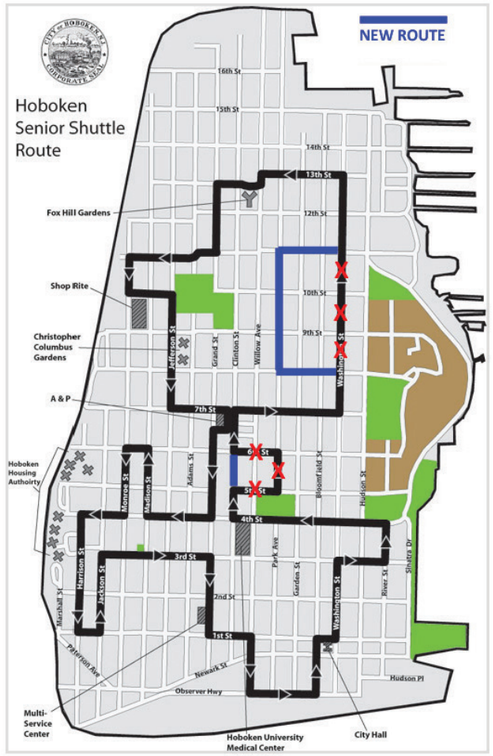

Figure 4.101 Hoboken Senior Shuttle Network; City of Hoboken

Figure 4.102 HBLR System; Source: NJ TRANSIT

in bikesharing programs. These programs allow individuals to rent bikes, use them as needed for their commute, and check them back in to rental stations or kiosks when not in use. Hudson Bike Share launched with 17 stations and has since expanded, currently operating over 25 rental stations throughout Hoboken and in the Lincoln Harbor neighborhood of Weehawken. Bikeshare stations are located throughout Hoboken, in general no more than a 3- to 5-minute walk from any given location. Bikes may be rented on a single use, monthly membership, or yearly membership basis, with free and reduced-priced membership to Hoboken residents of Hoboken Housing Authority and in Section 8 housing. Citi Bike operates a similar bikeshare program in Jersey City, although no Citi Bike rental stations or kiosks are located within the Study Area. **Figure 4.98** shows bikeshare stations within the Study Area.

4.9.2.1.4 *Bus Transit*

NJ TRANSIT bus routes provide circulation to, from, and within the Study Area and make use of the majority of the previously described perimeter access routes in and out of the Study Area, including:

- Park Avenue (Local Routes 23/63/64H/68)
- Willow Avenue (Local Routes 64H/89; PABT Routes 119/126)
- 14th Street (Local Routes 22/64H; PABT Routes 119)
- Paterson Avenue (Local Routes 22X/85/87/64H)
- Jersey Avenue (Local Route 64H)
- Grove Street (PABT Route 126)
- Marin Boulevard (Local Routes 63/64/68)

Figure 4.99 identifies the Hoboken, Jersey City, and Weehawken streets that contain NJ TRANSIT bus routes and bus stops within and beyond the Study Area.

Figure 4.100 shows the Hoboken "Hop" shuttle service network. The Hop runs three lines within Hoboken that connect various parts of the city to the Hoboken Terminal. The Hop shuttle service runs between 7 am to 8 pm every half hour.

Figure 4.101 shows the Hoboken Senior Shuttle service network with information confirmed within the

Photograph 4.46 View of Hoboken Rail Yard from HBLR

Photograph 4.47 View of Hoboken Terminal

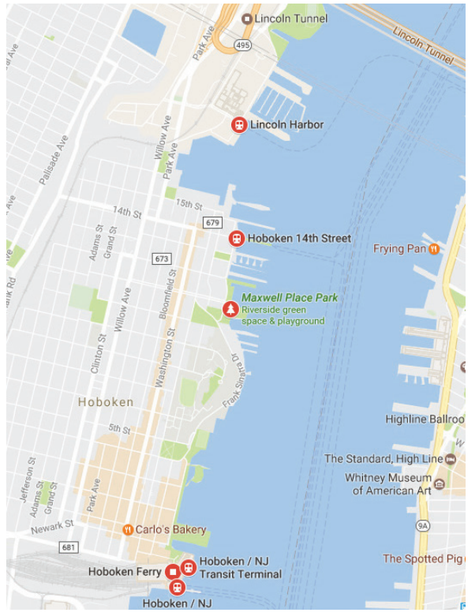

Figure 4.103 Study Area Ferry Locations; Imagery © 2017 Google, Map data

city limits. The Senior Shuttle is only within the city limits of Hoboken and runs every hour.

4.9.2.1.5 *Rail Transportation*

Hoboken Terminal is located in the southeastern portion of the Study Area. The Hoboken Terminal serves as a transportation hub for a variety of transportation modes (**Photographs 4.46 and 4.47**).

PATH trains originate at the site of Hoboken Terminal with service to New York City and Jersey City, with connections to Harrison and Newark. According to the 2016 PATH Ridership Report, released by the PANYNJ, approximately 28,000 passenger trips were served by the Hoboken PATH station on an average weekday in 2016, and nearly 270,000 served by the entire PATH system.

NJ TRANSIT rail lines that originate in Hoboken include the Main Line with service to Suffern and Port Jervis, the Bergen County Line, the Pascack Valley and Port Jervis Line, the Spring Valley Line, the Montclair and Boonton Line, the Morris and Essex Line, and the North Jersey Coast Line. According to the Fiscal Year 2016 report, revised February 2017, the terminal served approximately 16,000 weekday boardings in 2016 for these service lines.

The HBLR also operates within the Study Area. This system serves over 51,000 unlinked passenger trips on an average weekday in 2016, according to the NJ TRANSIT report noted above. North of Hoboken, the HBLR runs along Port Imperial Boulevard and Waterfront Terrace. Once entering Hoboken, the HBLR follows just inside the city's northern border and continues along Hoboken's west edge where they make two stops at 9th Street-Congress Street and 2nd Street. The HBLR then travels along the southern border of Hoboken where it connects with Hoboken Terminal. The HBLR also connects residential Bayonne and western Jersey City with Jersey City's Exchange Place and Newport Center (see **Figure 4.102**).

In the event of disruption of service, NJ TRANSIT uses a variety of resources to reach its customers. As stated in NJ TRANSIT meeting minutes from the January 11, 2017 board meeting:

"In times of emergency or severe weather, NJ TRANSIT uses the web and social media, as well as press releases, live interviews, and push alerts, in order to provide up-to-the minute information regarding service, conditions, schedule, and other factors affecting NJ TRANSIT's customers. When NJ TRANSIT's Emergency Operations Center is activated both in times of emergency or of significant public events, NJ TRANSIT's public information team monitors social media channels in real time and informs the New Jersey Transit Police Department, customer service, as well as the respective operating lines of any imminent situation that requires attention being posted by customers."

NJ TRANSIT performed an Environmental Assessment (EA) for the Long Slip Fill and Rail Enhancement project. The EA identified NJ TRANSIT emergency operation procedures. According to the EA, emergency preparations at the Hoboken Terminal are started four days prior to a storm. Removal of track switch motors would be initiated at that time; after removal, only four of the sixteen passenger tracks can be in service until after the storm event is over and the switches can be reinstalled. This means that the coordination activities can be integrated into the NJ TRANSIT emergency procedures well before a storm event.

4.9.2.1.6 *Ferry Service*

Ferry service to New York City is available in the Study Area at three locations (see **Figure 4.103**). The Lincoln Harbor ferry stop (located at the end of 19th Street and Harbor Boulevard in Weehawken)

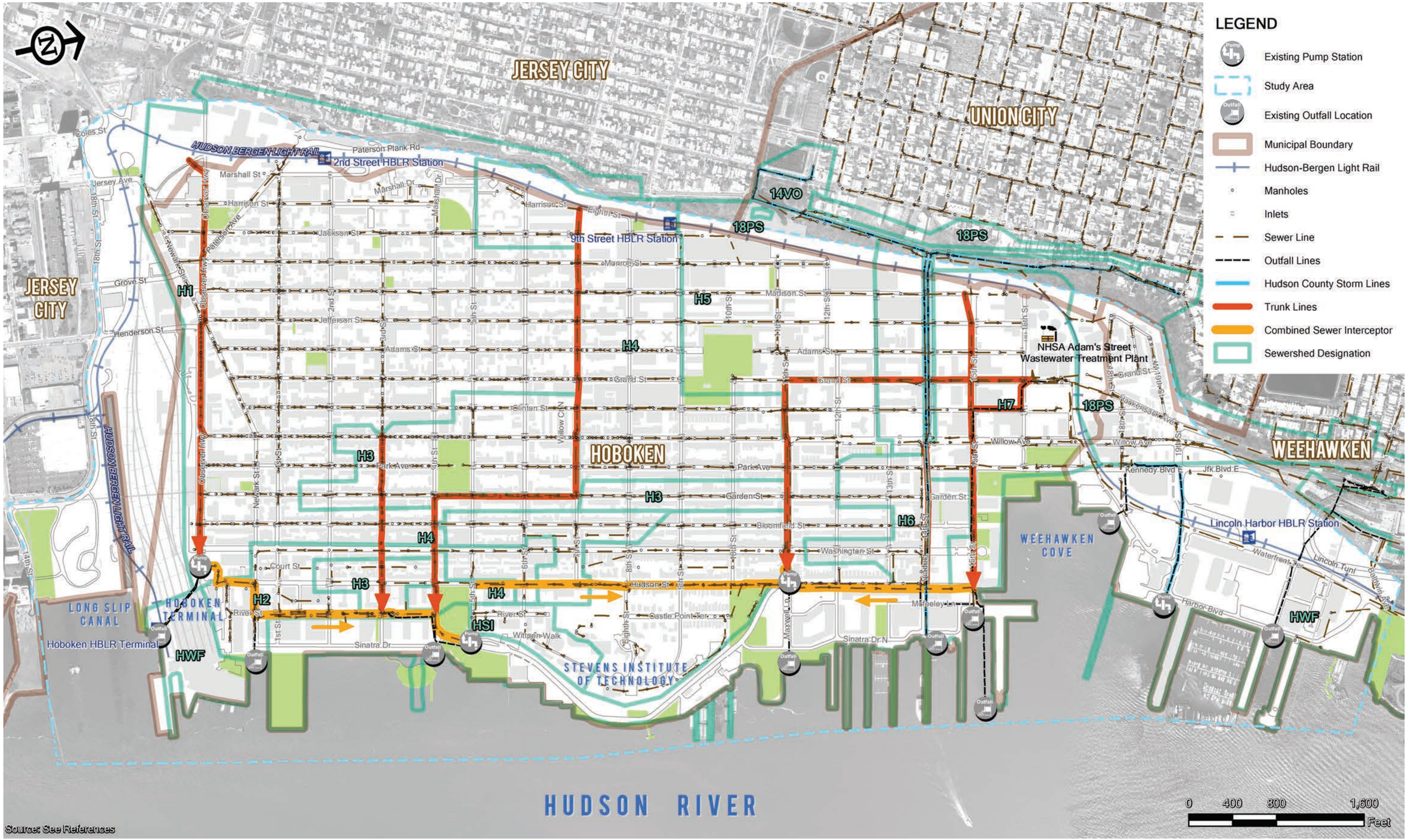

Figure 4.104 Sanitary and Storm Sewer Map

provides a connection to Midtown New York/West 39th Street. The Hoboken 14th Street ferry stop provides connections to Midtown/West 39th Street, as well as the World Financial Center. The third ferry stop is located at the Hoboken Terminal and it provides connections to Paulus Hook in Jersey City and Pier 11/Wall Street and the World Financial Center in Lower Manhattan.

4.9.2.1.7 *On Street Parking*

According to Hoboken Department of Transportation and Parking, most streets are designated on one side (the north or west side) as "Resident Permit Parking Only" and the other side (south or east side) as "Permit Parking Only". The streets that are not designated in that way are typically in commercial areas and are instead designated as metered parking.

4.9.2.1.1 *Off Street Parking*

Within the Study Area, the city of Hoboken manages five municipal parking garages. Three are located along Hudson Street near the Hoboken Terminal, one is located adjacent to the Hoboken University Medical Center (at Clinton Street between 4th and 3rd Streets), and one is located on Garden Street, between 9th and 10th Streets. Also within the Study Area limits are approximately 20 privately owned parking lots, including garages and surface lots.

According to the City of Hoboken's website in the event of an emergency, the City alerts residents which municipal parking lots will be made available for residents who typically use street parking. Such lots will have limited parking, and will be "available on a first-come-first-serve basis, usually in 12 or 24 hour increments," after which normal rates resume.

4.9.2.2 Infrastructure

The following is a discussion of the utilities within the Study Area.

Sanitary and Storm Sewer

NHSA provided mapping of the existing combined sewer system for the purposes of this discussion. The system consists of inlets, manholes, pipes, outfalls, and related facilities. The network within the study area has 1,639 manholes, 781 inlets, 12 miles of gravity driven sewer pipes, and four pump stations. In addition to the gravity sewers, there are 0.61 miles of interceptors, 0.70 miles of siphons, and 0.53 miles of forced mains within the Study Area. Hoboken sewage is conveyed and treated at the NHSA - Adams Street Wastewater Treatment Plant, located in northwest Hoboken. The Adams Street Wastewater Treatment Plant also treats approximately 83 percent of sewage generated in Weehawken and 45 percent of sewage generated in Union City as of 2011 (NHSA Fiscal Year 2011 Annual Report).

Within the Study Area, NHSA has several drainage areas, also referred to as "sewersheds", identified as H1 through H7, as shown on **Figure 4.104**. Stormwater and sanitary sewage are collected in gravity sewers that are located along each street, mostly running in a north-south orientation; however, there are some east-west oriented sewers along Observer Highway, 1st Street, 3rd Street, 7th Street, 11th Street, 14th Street, and 15th Street. Drainage flows in a generally west to east direction and is collected in the interceptor lines that run along River Street between Observer Highway and 5th Street, as well as along Hudson Street from 5th Street to 15th Street. Pump stations, located near the intersection of Washington Street and Observer Highway, 5th Street and Sinatra Drive, and 11th Street and Hudson Street, provide pressure to convey the flow northwest to the wastewater treatment plant. **Figure 4.104** shows the layout of the NHSA system and direction of sewer flows. During longer duration and higher intensity storms events that cause combined sewer overflows (CSOs), stormwater and sewer are conveyed to the wastewater treatment plant as usual until the maximum capacity of the treatment plant is reached. At these maximum capacity points, flow regulators (also known as weirs) within the sewer system allow the excess capacity to overflow into the CSO outfall pipes and flow directly into the Hudson River.

Water

United Water provides potable water to the Study Area. The service connections are privately-owned and maintained. No water supply wells are located in Hudson County. The Study Area's water supply comes from the Jersey City Reservoir in the Town of Boonton and the Split Rock Reservoir in Rockaway Township.

Electric and Gas

PSE&G provided information on the existing aboveground and underground electric utilities. There are major underground lines running along portions of Washington, 1st, 2nd, 11th, 12th, and Grand Streets, as well as southeast and northeast areas of Hoboken. Transmission lines run along the western side of the Study Area, from the vicinity of Hoboken Housing Authority through Monroe Street and continues along Waterfront Terrace.

Telecommunications

Cablevision's utilities exist both underground and aboveground; however, the majority of the utility is located aboveground. Verizon's utilities consists of conduits, duct banks, and manholes. One duct bank consisting of six conduits is located along the western curb line on Washington Street between Observer Highway and 15th Street. The conduits are interconnected and accessible via manholes at each intersection along the corridor. Other Verizon conduits are located along Newark Street and portions of 14th Street and Willow Avenue.

4.9.3 Environmental Consequences

4.9.3.1 Impacts on Transportation

The location of the Resist features and gates are, for the most part, adjacent to buildings and streets along sidewalks and the edges of streets. The construction of these features would result in temporary inconvenience for residents and business owners with regard to pedestrian and vehicular access. The intervening streets, which require gates, break up the construction work into segments, which may serve

to contain the construction and localize the effects of closures.

During construction of a Resist structure within a sidewalk area, one or more lanes occupied by traffic would likely have to be closed off and, for the duration of construction, all adjacent parking, sidewalks, and bicycle lanes would also have to be closed off.

Alternative 1

Short -Term, Construction Impacts

The construction of Alternative 1's Resist component would have short-term, moderate adverse impacts on traffic and circulation within the Study Area. Under Alternative 1, there are more gates than any other alternative (29 gates in Option 1 and 31 gates in Option 2) and the length of the Resist structure is longer than under any other alternative. For these reasons, the impacts on traffic and circulation during construction are greatest under Alternative 1 compared to the other alternatives.

Much of the northern and southern waterfront Resist feature of Alternative 1 are located in park areas. Since significant portions of this alternative's northern Resist feature would be constructed atop relieving platforms, wharves, and other structures, temporary pedestrian detours would need to be implemented for ferry travelers at the 14th Street Station. Some restrictions on pedestrian access, such as to Maxwell Place and Cove Parks, are anticipated during construction. Additionally, the roadways in these areas are limited in their widths and the adjoining Frank Sinatra Drive and Sinatra Drive North are also narrow and typically not appropriate for trucks. One-way traffic, or even full closure of Frank Sinatra Drive may be required in the north. Pedestrian and bicycle traffic would be re-routed similar to vehicular traffic in the event of any closure.

For Alternative 1, in Weehawken, Harbor Boulevard is only two lanes wide. To a certain extent this alternative's Resist feature work, as developed at the south end of the Project, is principally in the promenade area. Thus, user groups such as pedestrians and bicyclists would be impacted in these areas and would be temporarily re-routed. Access to parking garages at waterfront properties may be temporarily suspended. A bus stop on Harbor Boulevard would need to be temporarily relocated.

The Port Imperial Boulevard at Harbor Boulevard/ Baldwin Avenue crossing consists of a sliding gate (northbound side), as well as a swinging gate (southbound side). The Resist structure runs along the north side of the intersection before turning to run in the east-west direction. Port Imperial Boulevard at this location is a four-lane road (two lanes each direction) with a large 25-foot median. It has sidewalks on both sides and runs parallel to the overhead HBLR train tracks. Port Imperial Boulevard provides access to waterfront condominiums, parks, the Lincoln Harbor Light Rail Station, and the HBLR train tracks, which run parallel on the west side. It carries approximately 1,800 vehicles during peak hour. On both sides of the roadway, including under the HBLR tracks, there is ample room for construction vehicles and activities. In the event of a full road closure, the southern access to Port Imperial Boulevard would be closed, thus detouring traffic to John F. Kennedy Boulevard via either Baldwin Avenue or Pershing Road. Due to the limited access to Port Imperial Boulevard, detours would be extensive. Night construction may be required to minimize impacts.

Gate construction under Alternative 1 in the southern portion of the Study Area would impact all three of the major routes providing ingress and egress to Hoboken, as well as the primary east-west access route. The four-lane Jersey Avenue carries up to 1,800 vehicles during the peak hour. Most of the work at this gate location would be off the road, but construction would require periodic closures of up to two lanes and relocation of pedestrian and bicycle traffic to the non-construction side of the road. Impacts are expected to be similar on the two-lane Grove Street, which has traffic volume of 1,000 vehicles during the peak hour. The two-lane Marin Boulevard carries 1,200 vehicles during the peak hour. During construction, the crossing has a setback from the track way in which to work, with multiple options to avoid full roadway closure. One option would be to utilize an existing unpaved roadway alongside the track, from the parking stalls along the property line of NJ TRANSIT's facilities. The other option would take the east curb lane of Luis Munoz Marin Boulevard and the south parking stalls. In the event of a full road closure, traffic would have to be detoured to the remaining two access points, which are Jersey Avenue and Grove Street, both of which intersect with Newark Street once inside Hoboken.

Observer Highway, a main east-west access corridor in the southern part of the Study Area has a peak volume of 900 vehicles per hour and a moderate amount of pedestrian use. Both sides of Observer Highway have areas for construction vehicles and work zone phasing. To the south is a paved "no parking" area that can easily be occupied for construction. To the north is a parking lot that may also be occupied for construction activity. In the event of a full closure, drivers would have to be detoured north on either Bloomfield Street or Washington Street in order to continue east on Newark Street to reach waterfront attractions. The bicycle lane along the south side of Observer Highway would likely be temporarily closed for Alternative 1 Option 2. A temporary bicycle lane would likely not be set in place. Bicyclists may dismount and travel as pedestrians. Closure of any kind would affect NJ TRANSIT, Hoboken Hop green line, and Hoboken Senior Shuttle service. There are several bus stops along the length of Observer Highway. Depending on the length of the construction zone, stops may be moved to another location along the roadway and bus routes would need to be detoured.

Alternative 1 also includes construction of Resist structure and gates along 1st Street, continuing northward onto Frank Sinatra Drive. The one-way 1st Street carries up to 4,400 vehicles per day and closure of one side of the street would be likely for Resist

installation. Frank Sinatra drive would become a one-way northbound route during construction, though full closure of the road could also be required. NJ TRANSIT and HOP bus line routes would need to be relocated, but no bus stops would be impacted.

Construction of Resist features under Alternative 1 would result in no impacts to ferry or rail service. Minor, short-term impacts to vehicular, bus, pedestrian, and bicycle traffic are as described above. Once construction is complete, flood gates would remain in the open position until a flood event occurs. Motorist and bicycle traffic, as well as public transit, would continue to operate as it did before construction. Access to waterfront pedestrian and recreational space would be altered; however, all amenities would remain accessible.

As part of the DSD infrastructure, 61 ROW storage tanks, typically 25 feet by six feet in size, would be located under sidewalks throughout Hoboken. "Clustered tanks," classified as at least two or more tanks located near or next to each other, would most likely cause a longer closure during construction. "Isolated tanks" are fairly separated from any other tank and are usually located in between intersections. Due to the size of the tanks, full roadway or intersection closures would not be likely. Construction vehicles would occupy the sidewalk and parking spaces adjacent to the work zone during installation. If a portion of the roadway needs to be occupied, all parking and bike lanes for the length of the work zone would be suspended in order to accommodate vehicles. Pedestrian traffic would need to be routed to the opposite side of the road at the nearest crosswalk. No impacts to rail, ferry, or bus traffic is anticipated from installation of the ROW tanks.

The DSD infrastructure also includes three large storage tanks: the BASF, Block 10, and NJ TRANSIT sites. During construction, road closure should not be necessary at these sites. The work can be expected to remain within the property limits. Sidewalks and parking surrounding the construction site would likely be temporarily unavailable. In the event that roadways need to be temporarily closed, traffic would be re-routed onto adjacent roadways. However, residential parking lots at the NJ TRANSIT site would need to be temporarily relocated during construction. In addition, road closures would be required for installation of the high-level storm sewer collection system in the vicinity of each of these large stormwater storage sites. These road closures could impact both vehicular and bus traffic and require relocation of all pedestrian and bicycle traffic to one side of the road. Construction at these three large stormwater storage site would not result in any impacts to rail or ferry traffic.

Long-Term Operational Impacts

During non-emergency conditions, circulation throughout the Study Area would continue similar to pre-construction conditions. Flood gate storage has been designed as not to inhibit daily movements and activities. However, periodically the gates would need to be maintained and tested, which may result in short-term roadway closures. Closures would be

Figure 4.105 Southern Emergency Access; Imagery © 2017 Google, Map data

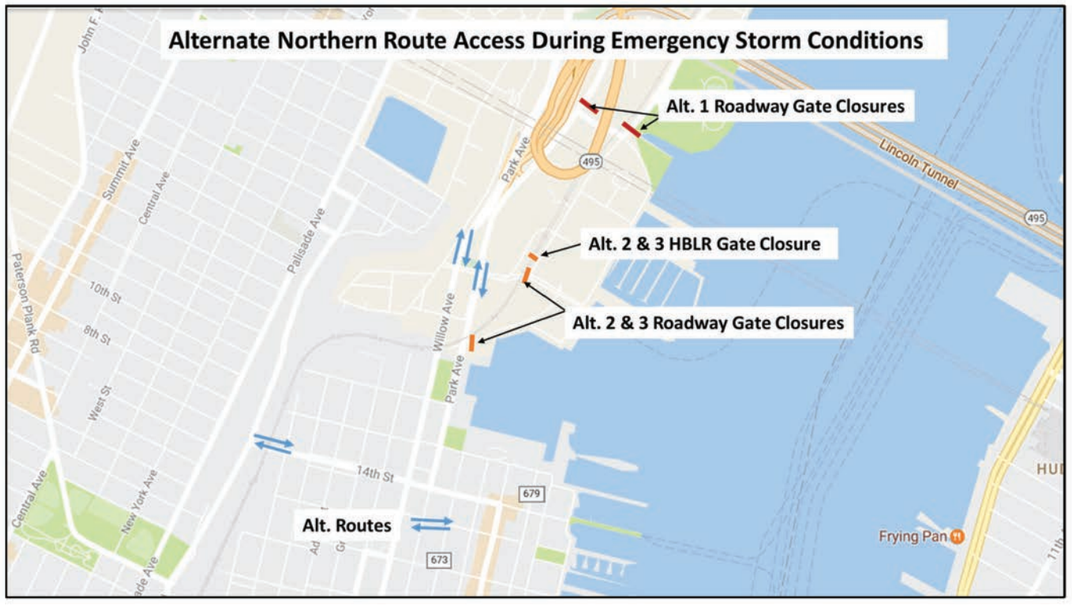

Figure 4.106 Northern Emergency Access; Imagery © 2017 Google, Map data

planned to minimize inconvenience to residents and businesses. For motorists, bicyclists, and pedestrians, the long-term effects would be negligible. No roads would be permanently closed. With the exception of a few locations where roads are slightly narrower, the Resist structures should not cause issues for vehicle travelers and commuters. Additionally, required set-backs at intersections would be adhered to in the final design. The public would be affected by periodic maintenance and testing, but would be able to resume regular activity at all other times.

As described in Section 3.6, Alternative 1 includes two options along the Hoboken Terminal rail yard; Option 1 is located within the rail yard, whereas Option 2 parallels Observer Highway, just north of the rail yard property. Option 2 would not involve long term operational impacts to the rail yard; however, Option 1 would require NJ TRANSIT to decommission infrastructure north of the Resist structure. It is noted that the area to the north of Option 1, within the rail yard, is part of the Hoboken Yard Redevelopment Area, as described in Section 4.8.2.2, and the decommission of rail infrastructure within the area north of Option 1 would occur as part of that redevelopment plan. NJ TRANSIT, the property owner, is aware of both Option 1 and Option 2 on their property. The option constructed will be determined when a final agreement is made concerning the Hoboken Yard Redevelopment Area between NJ TRANSIT, the developer of record and the City of Hoboken.

Emergency Operation Impacts

Recognizing the extensive coordination effort between the municipalities, agencies, and the community, an Operations and Maintenance (O&M) plan for the RBD-HR project is being prepared. The plan will describe the procedures and responsibilities for routine maintenance, communication, and timing of activation (closure of gates) in the event of an impending storm condition, and detail the coordination between the project's gate closures and suspension of services pursuant to transit agencies' existing emergency management procedures. The O&M plan will include the procedures to be followed by the various stakeholders, such as NJ TRANSIT, other public transit operators and local officials so that the timing of gate closures and public transit service closures is coordinated. An O&M Subcommittee is currently developing the O&M plan. The participants in the O&M subcommittee currently include, but are not limited to, entities such as the NJDEP; the cities of Hoboken, Jersey City, and Weehawken; NJ TRANSIT; PANYNJ; Hudson County; JCMUA; NHSA; and the New Jersey Office of Emergency Management.

In a flood gate deployment condition, some areas would be impassible whether by vehicle, bicycle, or on foot. Under Alternative 1, with an alignment along the waterfront, access would be restricted onto properties located on the piers in Weehawken and Hoboken east of the Resist structure upon deployment of the gates. The gate closures would be similar to detours in place during construction. Flood gates would remain in the deployed position for the duration of the flood

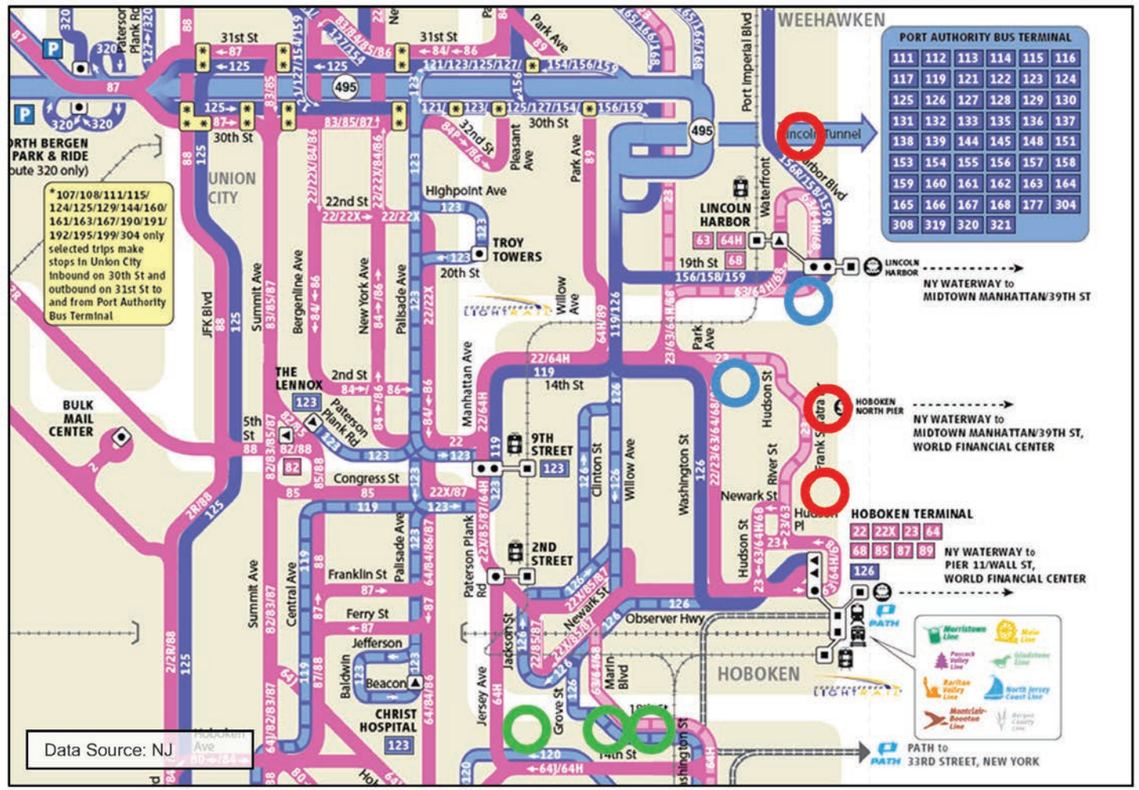

Figure 4.107 NJ TRANSIT Hoboken Bus Routes; NJ TRANSIT

event as outlined in the O&M plan and would open once water recedes to a safe level. Access to the NJ TRANSIT rail yard and certain maintenance areas would be impacted, but not entirely isolated. The closure of gates would impact accessibility to transit stops and could impact bus routes. The closure of gates along Observer Highway (at Hudson Street for Option 1 and at Washington Street for Option 2) would impact accessibility for those individuals who access Hoboken Terminal from Observer Highway. Under a gate closure condition, these individuals would still be able to access Hoboken Terminal, but would

require walking one block to the north, to Newark Street, before proceeding south along Hudson Street to Hudson Place. Detours and evacuation routes will be identified as part of the project's O&M plan, in coordination with transit providers, and routes would be clearly marked in the event of a storm (accessibility to public transit under a gate deployment condition is also described in Section 4.8.3.8).

Once flood gates are in the closed position, there would be no direct access between southern Hoboken and Jersey City. Jersey Avenue, Grove Street, and Marin Boulevard. Alternate routes would be available from western Hoboken via New York Avenue/ Observer Highway (see Figure 4.105) and Paterson Plank Road. Access to Hoboken Terminal would be limited to Hudson Street and points east.

Gate deployment under this alternative would not impact train service of NJ TRANSIT trains (i.e., the structure and gates would not involve track crossings at the Hoboken Terminal rail yard). The Resist structure's Option 2 gate deployment would block access to the NJ TRANSIT Engine House, and both Options 1 and 2 would block access to NJ TRANSIT employee parking lots south of the rail yard upon gate deployment and reduce NJ TRANSIT staff access to the yard itself.

Closure of gates to access these areas will be closely coordinated with NJ TRANSIT operations, Hudson County and municipal area emergency management operations and activities. The timing of gate closures will be incorporated into NJ TRANSIT, Hudson County and Municipal revised emergency management plans, but it is not anticipated that gate closures for this project would impact Hoboken Terminal train operations. According to NJ TRANSIT's Comprehensive Emergency Management Plan (CEMP), HBLR and heavy rail cease operations 12 to 18 hours prior to a storm event. It is anticipated that gate closures will be coordinated with NJ TRANSIT to occur after NJ TRANSIT has already ceased operations per their own emergency management operational procedures. This would reduce impacts to NJ TRANSIT service and emergency evacuation procedures.

In northern Hoboken, existing access via Willow Avenue and Park Avenue bridges would remain open. Under Alternative 1, Weehawken ferry and piers would be inaccessible including some waterfront properties. Lastly, Alternative 1 proposes Port Imperial Boulevard to be closed just north of Baldwin Ave during an emergency. Proceeding west, the structure would continue under the HBLR tracks. Alternative 1 would not require a gate crossing or closure of the HBLR tracks during a storm event (see **Figure 4.106**).

Pedestrians would experience the same limitations as motorists. Efforts would be made to accommodate bicyclists during construction; however, there may be times when bicyclists should utilize the same detour as motorists.

NJ TRANSIT Bus Route Impacts

Under Alternative 1 deployment of the gates would interrupt bus routes using Jersey Avenue, Grove Street, and Marin Boulevard. The locations of these Resist elements are adjacent to the NJ TRANSIT rail viaduct, and are depicted by green circles on **Figure 4.107).** Deployment of the Resist gates for Alternative 1 would, in addition to the above, interrupt NJ TRANSIT Bus Route 23, which makes use of Frank Sinatra Drive, where there would be gate structures located just south of its intersection with Sinatra Drive North, and just north of its intersection with Sinatra Drive. It would also interrupt NJ TRANSIT Bus Routes 156R, 158, and 159R at their southern entry onto Port Imperial Boulevard, where there would be a gate structure just north of its intersection with Baldwin Avenue/Harbor Boulevard. These three locations are depicted with red circles on **Figure 4.88**. Closures on Observer Highway would also impact bus routes.

While gate closures in the north and south would impact bus routes, it is not anticipated that gate closures would impact public transit service because at the time of closure, prior to a flood, transit operators would already have had to suspend service in order to relocate vehicles and equipment out of vulnerable areas. The details of the timing of gate closure would be developed as part of the O&M plan. Gate deployment under Alternative 1 would result in loss of access to piers and waterfront amenities.

Additional Flooding

As described in Section 4.1.3.5, the coastal flood computer model results show that the project's Resist infrastructure may cause an increase in flooding to the western part of the Hoboken Terminal rail yard by up to 6.5 inches at the peak of a 100-year coastal storm event. The RBD-HR Project has been coordinating with NJ TRANSIT to identify vulnerable critical infrastructure within the yard to evaluate specific impacts based on the elevation of infrastructure components compared to the projected increase in flooding. This coordination is being done in conjunction with NJ TRANSIT's own resiliency efforts, and will continue into final design, which will also involve further site-specific floodplain and hydrology analysis.

While the peak coastal flooding amount is anticipated to be up to 6.5 inches greater than under the No Action Alternative within the western portion of the rail yard, the actual duration of flooding is anticipated to be less. This is because under the No Action Alternative, coastal surge waters pass through the rail yard and flood western Hoboken and Jersey City. When the coastal surge begins to recede, these waters drain back out through the rail yard to the Hudson River. With the Resist infrastructure in place, this water is prevented from entering western Hoboken and Jersey City; therefore, no water is draining back out through the rail yard at the end of the storm. Because flood durations are anticipated to be reduced for any given coastal event, this could allow NJ TRANSIT operations to begin post-storm recovery efforts earlier, which could allow for service restoration sooner than under current conditions.

Based on flood modeling, the privately owned surface parking lot at 1 Washington Street will also experience slightly higher flood levels at the peak of a coastal storm. As discussed in Section 4.1.3.5, this lot may experience about 2.5 inches of additional flooding greater than what currently exists at the peak of a coastal storm event. This lot holds approximately 200 vehicles; however, resident evacuation notifications would occur before water levels reach this lot. For additional information regarding impacts to this property and mitigation requirements pursuant to N.J.A.C. 7:13, please see Section 4.1.3.5.

Alternative 2

Short-term, Construction Impacts

Alternative 2 would have short-term, moderate adverse impacts on traffic and circulation within the Study Area. Under Alternative 2, there are 21 gates in Option 1 and 25 gates in Option 2 and the length of the Resist structure is substantially shorter than under Alternative 1. For these reasons, the impacts on traffic and circulation are less under Alternative 2 compared to Alternative 1.

For Alternative 2, the northern area impacts would be principally in the two blocks of Washington Street between 13th and 15th Street. The western sidewalk of Washington Street would be reconstructed under Alternative 2 and the very high volume of pedestrians would be routed to the eastern sidewalk. Due to roadway widths and existence of roadside parking, full closure would not be likely; however, in the event of a full closure, traffic would be detoured north to 15th Street using either Bloomfield Avenue or River Street, to continue in the east/west direction. Two NJ TRANSIT bus stops along Washington Street would need to be temporarily relocated or suspended.

A barrier crossing is proposed at the west side of 14th Street and Washington Street. Fourteenth Street is striped as two lanes in the eastbound direction and one lane in the westbound direction with both sidewalks and parking on either side. The intersection has bulb outs for parking and brick crosswalks on all sides. Fourteenth Street carries approximately 600 vehicles during peak hour. This crossing generally does not experience congestion during peak hours.

The proposed Resist structure would run along the west side of the intersection of 15th Street and Washington Street. Fifteenth Street is a two-lane road with sidewalks on both sides and diagonal parking along the eastbound side. The proposed barrier would run through existing bulb outs on the south ends, which support the diagonal parking on both 15th Street and Washington Street. Fifteenth Street carries approximately 650 vehicles during peak hour and operates with little congestion. Due to the roadway width of both streets, and the existence of parking, full closures would not be likely. During construction, similar to the 14th Street crossing, the large volume of pedestrians would need to be rerouted from the western sidewalk to the eastern sidewalk. In the event of a full closure, traffic would need to be detoured south to 14th Street via either Hudson Street or Park Avenue to continue in the east-west direction.

Under Alternative 2, there is a gate required on Harbor Boulevard and a Resist structure along the length of the road from Park Avenue to 19th Street. The road is a minor road with no sidewalks or parking. It is fairly narrow once it converts to a one-way road due to its proximity to the bridge supports on the south side, as well as the train tracks on the north side. This road can be used to access Hoboken via Park Avenue. Despite the width of the road, full closure during construction is not anticipated. Any impacts to vehicles, pedestrians, and bicyclists from this construction would be short-term.

Under Alternative 2, a gate would be installed at the 19th Street and Waterfront Terrace Intersection. The barrier would be located on the west side of the intersection next to a set of at-grade train tracks. Nineteenth Street is a four-lane (two lanes in each direction) road with sidewalks on both sides and a small painted median. It forms a three-legged signalized intersection with Waterfront Terrace. Nineteenth Street carries approximately 1,400 vehicles during peak hour. The widths of the crossing roadways should allow for staged construction. In the event of a full closure, vehicles would have to be detoured around the barrier using Harbor Boulevard, as well as Baldwin Avenue and John F. Kennedy Boulevard. There is a gate west of Waterfront Terrace that would cross the HBLR tracks. Construction of the gate across the HBLR tracks and other work in the area would need to be coordinated closely with NJ TRANSIT. Given the HBLR is a 7-day, 24 hour operation, there would be some outages associated with construction of the gate across the tracks; however, impacts to service would be limited to weekends and off-peak hours whenever possible.

Construction impacts for Resist infrastructure in the southern portion of the Study Area and for DSD are as described under Alternative 1.

There would be no impacts to ferry service under Alternative 2.

Once construction is complete, flood gates would remain in the open position until a flood event occurs. Motorist and bicycle traffic, as well as public transit would continue to flow as it did before construction.

Long-Term Operational Impacts

The long-term operational impacts would be as described under Alternative 1.

Emergency Operation Impacts

Emergency Operation Impacts for Alternative 2 are similar to Alternative 1 and will be addressed through the implementation of the RBD-HR O&M plan.

Under Alternative 2, some roads would be closed off to vehicular, bicycle, and pedestrian access while gates are deployed. Gate deployment for Alternative 2 would require alternate routes, but properties would still be accessible. The gate closures would require detours similar to those put in place during construction.

Under Alternative 2 deployment, Harbor Boulevard would be closed off just north of Hoboken, limiting access to Weehawken through Willow Avenue and Park Avenue. Additionally, under Alternative 2, 19th Street would be closed just west of the intersection of 19th Street and Waterfront Terrace. This closure should not have an effect on resident evacuations. Lastly, Alternative 2 proposes Port Imperial Boulevard to be closed just north of Baldwin Avenue. Proceeding west, the Resist structure would continue across the HBLR tracks with a gate just south of the Lincoln Harbor Light Rail Station. This would be the only track closure for Alternative 2. The HBLR track closure associated with a gate closure, should not affect evacuation routes because the O&M plan would time the gate closure after train service has stopped operations due to a pending storm event. As per NJ TRANSIT's CEMP, the HBLR train service ceases operations and secures light rail vehicles at designated storage locations between 12 and 18 hours prior to a coastal storm event. Gate closure timing procedures will be coordinated with NJ TRANSIT and the overall emergency management plan for the area. As in Alternative 1, gate deployment under this alternative would not inhibit movement of NJ TRANSIT trains at Hoboken Terminal, but Option 2 deployment would block access to the NJ Transit Engine House, and both Options 1 and 2 would block access to NJ TRANSIT employee parking lots south of the rail yard upon deployment. See Alternative 1 impacts for additional discussion regarding operational impacts.

Pedestrians would experience the same limitations as motorists. Efforts would be made to accommodate bicyclists during construction; however, there may be times when bicyclists should utilize the same detour as motorists.

NJ TRANSIT Bus Route Impacts

Deployment of the Resist gates under Alternative 2 would interrupt routes using Jersey Avenue, Grove Street, and Marin Boulevard. The locations of these Resist elements are adjacent to the NJ TRANSIT rail viaduct and are depicted by green circles on **Figure 4.107**.

In addition to the three locations previously described on the south end of Hoboken, deployment of the Resist elements for Alternative 2 would interrupt bus service with a gate across 19th Street just east of the HBLR tracks, NJT Bus Routes 63, 64H and 66, which utilize 19th Street to make a loop at Lincoln Harbor using Waterfront Terrace and Harbor Boulevard, returning via 19th Street. It would also, via a gate across 14th Street immediately west of Washington Street, interrupt NJ routes 22, 23, 63, 64, 68, 89 & 126. Closures on Observer Highway would also impact bus routes.

Hoboken HOP and Senior Shuttle services are limited to Hoboken. Closures in the North at 14th and 15th Street and in the South on Observer Highway would impact bus routes; however, during emergency conditions it is likely that these shuttle services would already be suspended. While gate closures in the north and south would impact bus routes, and the closure in the north would impact the HBLR, it is not anticipated that gate closures would impact public transit service because at the time of closure, prior to a flood, transit operators would already have had to suspend service in order to locate vehicles and equipment out of vulnerable areas. The details of the timing of HBLR and gate closure would be developed as part of the O&M plan.

Additional Flooding

Additional flooding impacts to the Hoboken Terminal rail yard would be the same as described under Alternative 1.

Alternative 3

Short-term Construction Impacts

Alternative 3 would have short-term, moderate adverse impacts on traffic and circulation within the Study Area. Alternative 3 has the least number of gates of any alternative (19 gates in Option 1 and 23 gates in Option 2) and the length of the Resist alignment is shortest among all alternatives. For these reasons, the impacts on traffic and circulation are least under Alternative 3 compared to the other alternatives.

Alternative 3 would have similar impacts on Washington Street to Alternative 2, except over a shorter distance.

The Bloomfield Street gate crosses Bloomfield Street between 14th Street and 15th Street. Bloomfield Street is a one-way road northbound with both sidewalks and parking on either side. The proposed gate location runs through the paved pedestrian pathway that crosses Bloomfield Street. During construction, traffic and pedestrians would have to be detoured east to Washington Street via 14th Street or 15th Street.

The gate at 15th Street and Garden Street crosses 15th Street at a 45 degree angle between the northwest corner of the intersection and the southeast corner of the intersection. Garden Street is a dead-end road that ends between 25th Street and 14th Street with a loading zone on the west side of the street and no street parking. It carries minor traffic, mainly used for truck deliveries. Fifteenth Street is a two-lane road with sidewalks on both sides. It widens, moving westward through the intersection, transitioning to a two-lane approach as it intersects Park Avenue. It carries approximately 650 vehicles during peak hour. Due to the width of the roadways, construction staging may be possible. In the event of a full closure during construction, traffic would be detoured south to 14th Street via Washington Street to continue in the east-west directions.

Construction impacts for Resist features in the southern portion of the Study Area and for DSD are as described under Alternative 1.

There would be no impacts to ferry service under Alternative 3.

Once construction is complete, flood gates would remain in the open position until a flood event occurs. Motorist and bicycle traffic, as well as public transit,

would continue to flow as it did before construction.

Long-Term Operational Impact
The long-term operational impacts would be as described under Alternative 1 and include periodic mechanical testing and maintenance.

Emergency Operation Impacts
The long-term operational and emergency impacts under Alternative 3 would be similar to the impacts under Alternative 2.

Additional Flooding
Additional flooding impacts to the Hoboken Terminal rail yard would be the same as described under Alternative 1.

No Action Alternative
Under the No Action Alternative, there would be no short-term impacts on traffic or circulation. It should be noted; however, that traffic and circulation would be impacted during future storm events (both coastal surge and rainfall flood events), as streets and transit systems are forced to close due to high water. This impact would be expected to continue with increased frequency and intensity into the future due to sea-level rise and climate change.

4.9.3.2 Mitigation Measures and BMPs included in Alternatives 1, 2, and 3

The following measures would be implemented to minimize impacts from the Resist component of the project on transportation:

Traffic closures for gate installation would be minimized and performed during off-peak hours. Gate testing and maintenance activities following installation would be performed during non-peak traffic hours to the extent practicable.

Recognizing the extensive coordination effort between the municipalities, agencies, and the community an O&M plan for the RBD-HR project is being prepared. The plan will describe the procedures and responsibilities for routine maintenance, communication and timing of activation in the event of an impending storm condition. The O&M plan will include the procedures to be followed by the various stakeholders, such as NJ TRANSIT, other public transit operators, and local officials so that the timing of gate closures and public transit service closures is coordinated. The participants in the O&M planning and development currently include, but are not limited to, entities such as NJDEP; the cities of Hoboken, Jersey City, and Weehawken; NJ TRANSIT; PANYNJ; Hudson County; JCMUA; NHSA; and the New Jersey Office of Emergency Management.

The following measures would be implemented to minimize impacts from the Resist and DSD components of the project on traffic and transportation:

- All closures for traffic and pedestrians, including temporary detour routes, would be coordinated well in advance with local jurisdictions

4.9.3.3 Infrastructure

Alternative 1
Minor to moderate short-term impacts would occur to properties adjacent to proposed construction locations. This would be in the form of short-term disruption of service due to necessary relocation of utilities for the construction of project infrastructure. Alternative 1 would require approximately 86 to 87 utility crossings and the relocation of approximately 4,860 to 4,600 linear feet of utilities for Options 1 and 2, respectively.

Alternative 2
Minor short-term impacts would occur to properties adjacent to proposed construction locations. This would be in the form of short-term disruption of service due to necessary relocation of utilities for the construction of project infrastructure. Alternative 2 would require approximately 69 utility crossings and the relocation of approximately 2,300 to 2,060 linear feet of utilities for Options 1 and 2, respectively.

Portions of the Resist structure for Alternative 2 would be located in upland areas. As a result, areas on the river side of the structure would still experience flooding during a 100-year coastal storm surge event. To prevent backflow from this area from flooding areas on the inland side of the Resist feature, the combined storm and sanitary sewer would be separated. This would involve construction of a new high-level storm system that intercepts stormwater from this area and discharges into new outfalls. The existing storm sewer system would be sealed and lined to prevent surface water infiltration and backflow preventers would be installed to prevent a reverse flow of water into the system on the inland side of the Resist structure.

Alternative 3
Minor short-term impacts would occur to properties adjacent to proposed construction locations. This would be in the form of short-term disruption of service due to necessary relocation of utilities for the construction of project infrastructure. Alternative 3 would require approximately 64 utility crossings and the relocation of approximately 1,280 to 1,030 linear feet of utilities for Options 1 and 2, respectively. Alternative 3 would result in the fewest impacts to utilities out of all three Build Alternatives.

Portions of the Resist structure for Alternative 3 would be located in upland areas. As a result, areas on the river side of the structure would still experience flooding during a 100-year coastal storm surge event. To prevent backflow from this area from flooding areas on the inland side of the Resist structure, the combined storm and sanitary sewer would be separated. This would involve construction of a new high-level storm system that intercepts stormwater from this area and discharges into new outfalls. The existing storm sewer system would be sealed and lined to prevent surface water infiltration and backflow preventers would be installed to prevent a reverse flow of water into the system on the inland side of the Resist structure.

No Action Alternative

Under the No Action Alternative, there would be no short-term impacts to infrastructure or utilities. However, inundations from future coastal storm surge or rainfall flood events would continue to represent challenges for utility providers, potentially disrupting service to customers and residents within the Study Area.

4.9.3.4 Mitigation Measures and BMPs included in Alternatives 1, 2, and 3

Coordinate with utilities and local property owners/ residents to address any utility disruptions during construction of Resist and DSD components of the project.