Frank E. Rodgers Boulevard at Warren Street
Harrison, NJ

West Hudson Circulation & Connectivity Study

Data Collection & Analysis Technical Memorandum

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1. Introduction

The West Hudson Circulation and Connectivity Study evaluates the existing transportation in the study area, which is comprised of the Borough of East Newark, the Town of Harrison, and the Town of Kearny to improve accessibility and mobility for all travelers, including pedestrians, bicyclists, transit riders, motorists, and trucks.

To further inform the development of the West Hudson Circulation and Connectivity Study, the project team has evaluated data and conditions in a number of areas. This memo contains analyses and data summaries in the following thematic areas:

Travel Patterns

- Analyses of key origins and destinations, trip patterns, routing, and traffic volumes and speeds, informed by *Replica* analytics

Transit

- Summary of transit service and ridership and planned infrastructure investments

Active Transportation

- Analyses of walk trip potential, walksheds around study area attractors, bicycle demand, and Level of Bicycle Compatibility

Roadway Safety

- Summary of key statistics and findings from the recent Hudson County Vision Zero study

Stormwater Management

- Analysis of low points within the study area to understand drainage issues, presence and condition of inlets, and opportunities for improvement

Electric Vehicles

- Analyses of the projected electric vehicle growth in West Hudson, the number of public chargers needed to meet the demand, and the most suitable areas for charging ports

Each section above contains a brief description of the methodology and/or data sources used, analytical outputs (including maps, tables, etc.), and key takeaways.

The West Hudson Circulation and Connectivity study is funded through the North Jersey Transportation Planning Authority's (NJTPA's) Subregional Studies Program (SSP), which assists subregions in refining and developing transportation strategies rooted in the NJTPA's Long Range Transportation Plan (LRTP).

2. Travel Patterns

This section provides a comprehensive understanding of existing and future mobility patterns within the West Hudson study area (the study area). This Travel Patterns analysis investigates several topics to understand existing and projected multimodal circulation patterns. The analysis consists of two parts: a Travel Patterns analysis and a Traffic Volumes analysis. Each of these analyses and their constituent topics are briefly introduced below with additional details of their methodology and takeaways provided in subsequent sections.

2.1 Methodology

The Travel Patterns and Traffic Volumes analyses used various mobility metrics queried from *Replica's* Trend Dashboard. *Replica* is an online data-driven platform that integrates traffic modeling with land use, socio-demographic, and mobility data to provide detailed insights into travel patterns. It provides mobility metrics based on a nationwide activity-based travel model. The model is updated quarterly with the latest socio-demographic, economic, land use, location-based (cellphone and GPS), and other datasets. The various mobility metrics offered by *Replica* cover different time periods, as is appropriate for each analysis. *Replica* data does not indicate real-world traffic volumes but provides relative traffic movement and trend estimates based on estimated data. Therefore, when using *Replica* data, overall mobility trends are only described as part of this section.

Travel Patterns Analysis

- Key Trip Generators: Identifies the presence and location of important local and regional trip generators including but not limited to libraries, schools, bus stops, and bus routes. Sources: New Jersey Geographic Information Network and New Jersey Department of Environmental Protection.
- Origins & Destinations: Identifies the spatial distribution of regional trip-making patterns to and from the study area during a typical weekday. Source: *Replica's* Origin-Destination Trip Count application for a typical weekday in October 2024.
- Trip Distribution & Routing: Examines traffic distribution after passing critical network links to understand regional travel demand, access patterns, and connectivity. Source: *Replica's* Places application for a typical Thursday in Spring 2024.

Traffic Volumes Analysis

- Annual Average Daily Traffic (AADT): Illustrates the scale of motor vehicle and truck movements across roadways. Source: *Replica's* AADT Explorer for average annual daily traffic calculated for 2023.
- Traffic Speeds: Evaluates traffic congestion using speed as a proxy during AM and PM peak periods. Source: *Replica's* Network Speeds Viewer for a typical weekday in 2023, reviewing data in 15-minute intervals during the AM peak period (6:00-9:00 AM) and the PM peak period (3:00-7:00 PM).

- Forecasted Traffic Conditions: Identifies areas with continued or new congestion in the future based on traffic forecast from the North Jersey Regional Transportation Model – Enhanced (NJRTM-E). Source: The North Jersey Transportation Planning Authority's North Jersey Regional Transportation Model-Enhanced (NJRTM-E), a traffic demand model designed to predict future traffic patterns and evaluate system performance. Baseline (2024) and Projected (2050) scenarios were evaluated.
- Event Circulation: Shows the impact of Sports Illustrated Stadium events on local and regional traffic. Source: The Regional Integrated Transportation Information System (RITIS) was queried to obtain Speed information for four game and four non-game dates. Speeds were evaluated and compared between game and non-game dates to identify congestion.

2.2 Travel Patterns Analysis

2.2.1 Key Trip Generators

Methodology

All land uses produce and receive trips, to some degree. This activity, in turn, generates different travel patterns. Therefore, to gain an understanding of travel mobility in the study area, data concerning land uses and sites estimated to produce more trips was obtained from the New Jersey Geographic Information Network dataset for libraries, schools, bus stops, train stations, commercial and industrial land uses, and other major trip generators such as Sports Illustrated Stadium.

Results

Figure 1 shows these key trip generators in the study area. Trip generators are mainly located in the western part of the study area, including several schools, libraries, and bus routes, the Harrison Port Authority Trans-Hudson Corporation (PATH) station, and Sports Illustrated Stadium. Commercial land uses are mainly located in the western part of the study area along major County routes. The western area is also where most of the dense grid roadway network and other major public transit infrastructure are located. Industrial uses are primarily located in South Kearny. South Kearny is a key employment destination for the study area and region, but lacks direct transportation access from the remainder of Kearny.

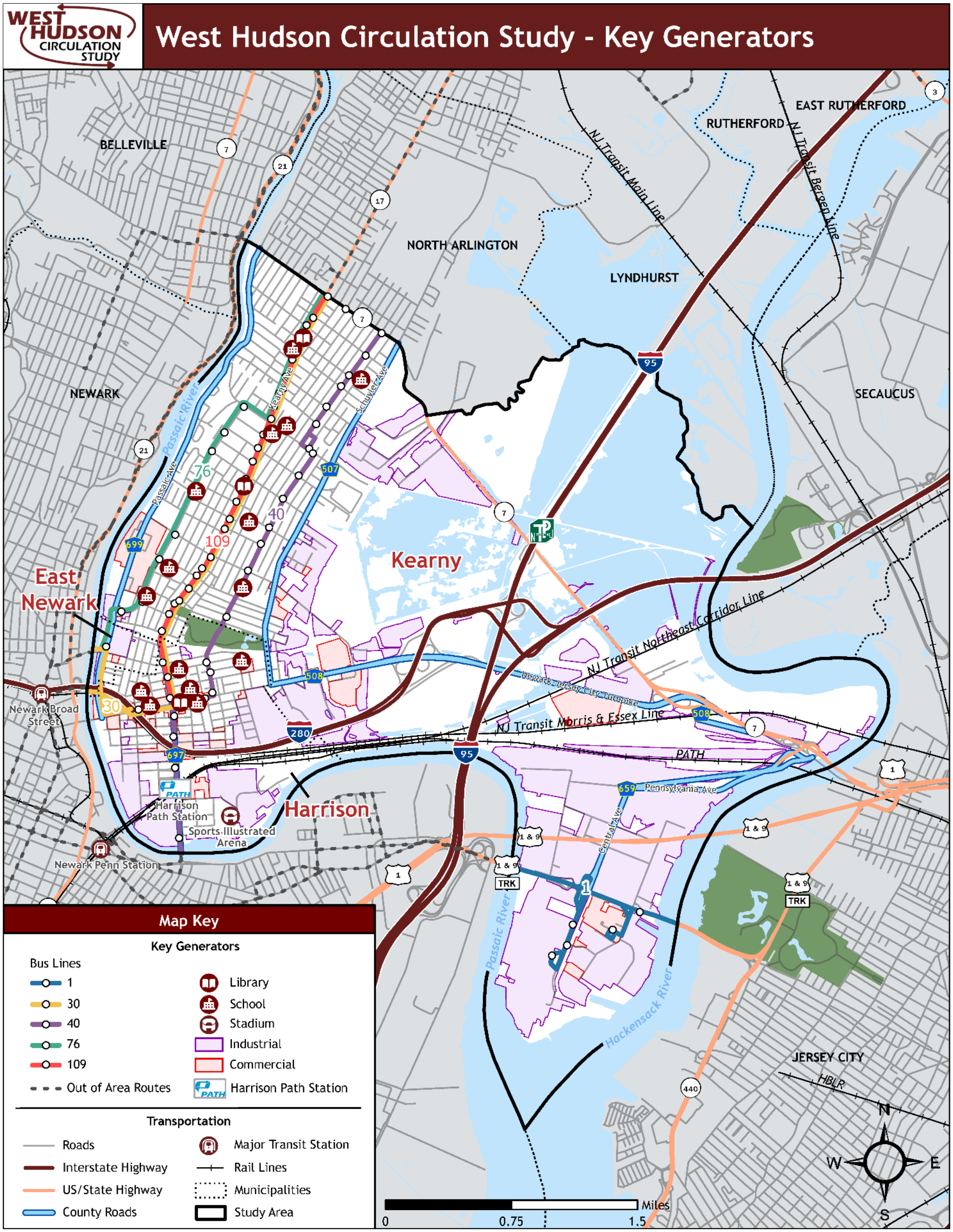

Figure 1 – Key Trip Generators

2.2.2 Origins & Destinations

Methodology

The Origins & Destinations (O-D) analysis was developed using *Replica's* weekly origin-destination pairs dataset, focusing on regional travel patterns within the study area during a typical weekday of October 2024, the most recent timeframe available at the time of the analysis. This dataset was summarized at the census tract level. The origins & destinations analysis focused on vehicular trips entering or exiting the study area. The data was examined and processed to create graphical displays highlighting areas, i.e., census tracts, where trips either start or end. The analysis emphasizes typical commuting and travel behaviors by focusing on weekday patterns.

Results

Figure 2 shows the destinations of trips that originated within the study area. Thirty-nine percent of trips originating within the study area concluded within the study area itself, 22 percent concluded in Essex County, and most of the other remaining trips traveled semi-locally to Hudson, Bergen, or Union counties. Other destinations with many trips include the adjacent cities of Jersey City and Newark. A small number of trips travel further east to places like New York.

Similarly, the analysis of trip origins ending within the study area showed very similar patterns, with 39 percent of trips destined for the study area originating in the study area. Another large percentage of trips (22 percent) originated in Essex County, and smaller trip distributions were identified semi-locally in Hudson, Bergen, and Union counties.

The two figures below visualize areas with a higher percentage of trip origins and destinations with brighter colors.

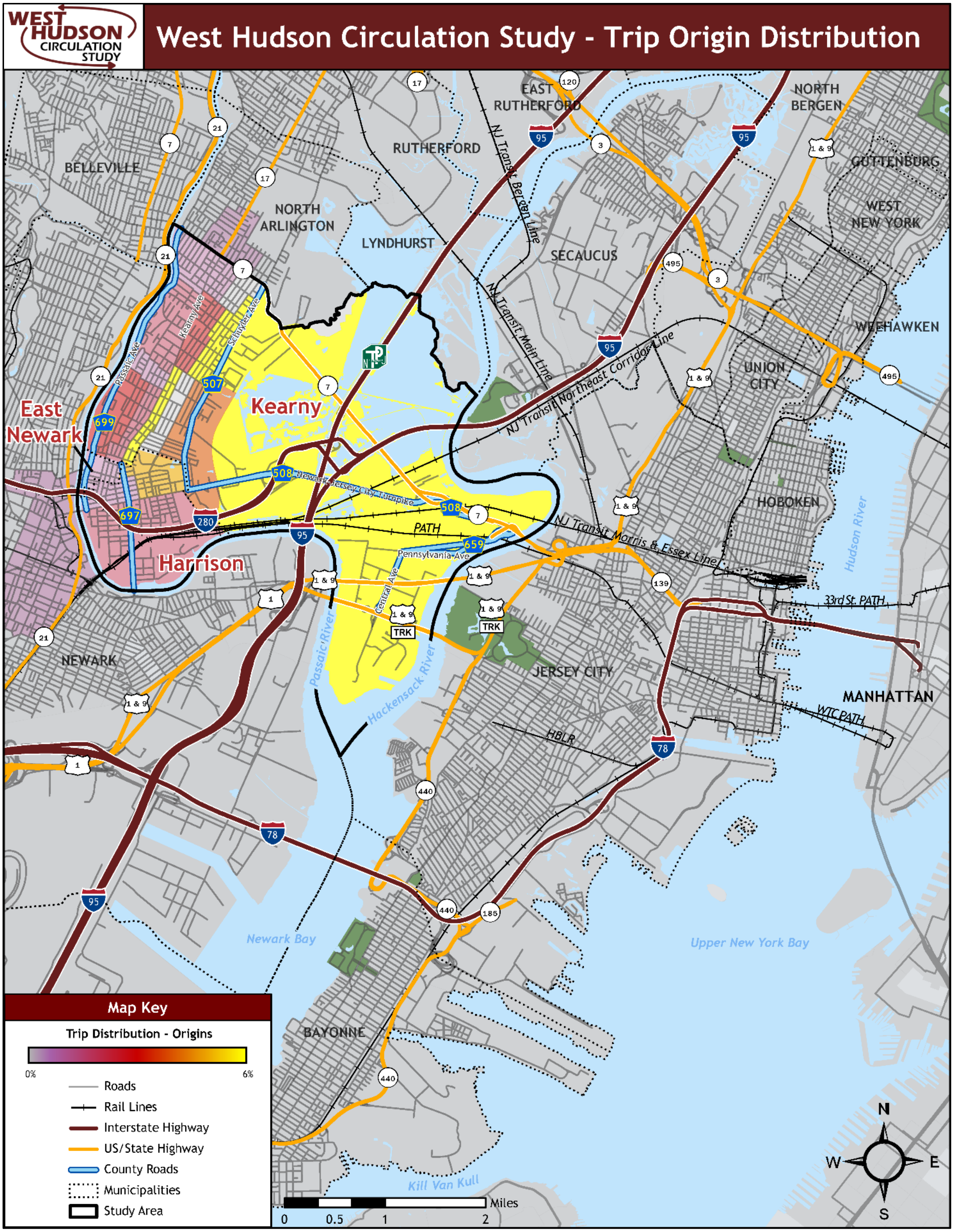

Figure 2 – Destinations – Trips Originating in West Hudson

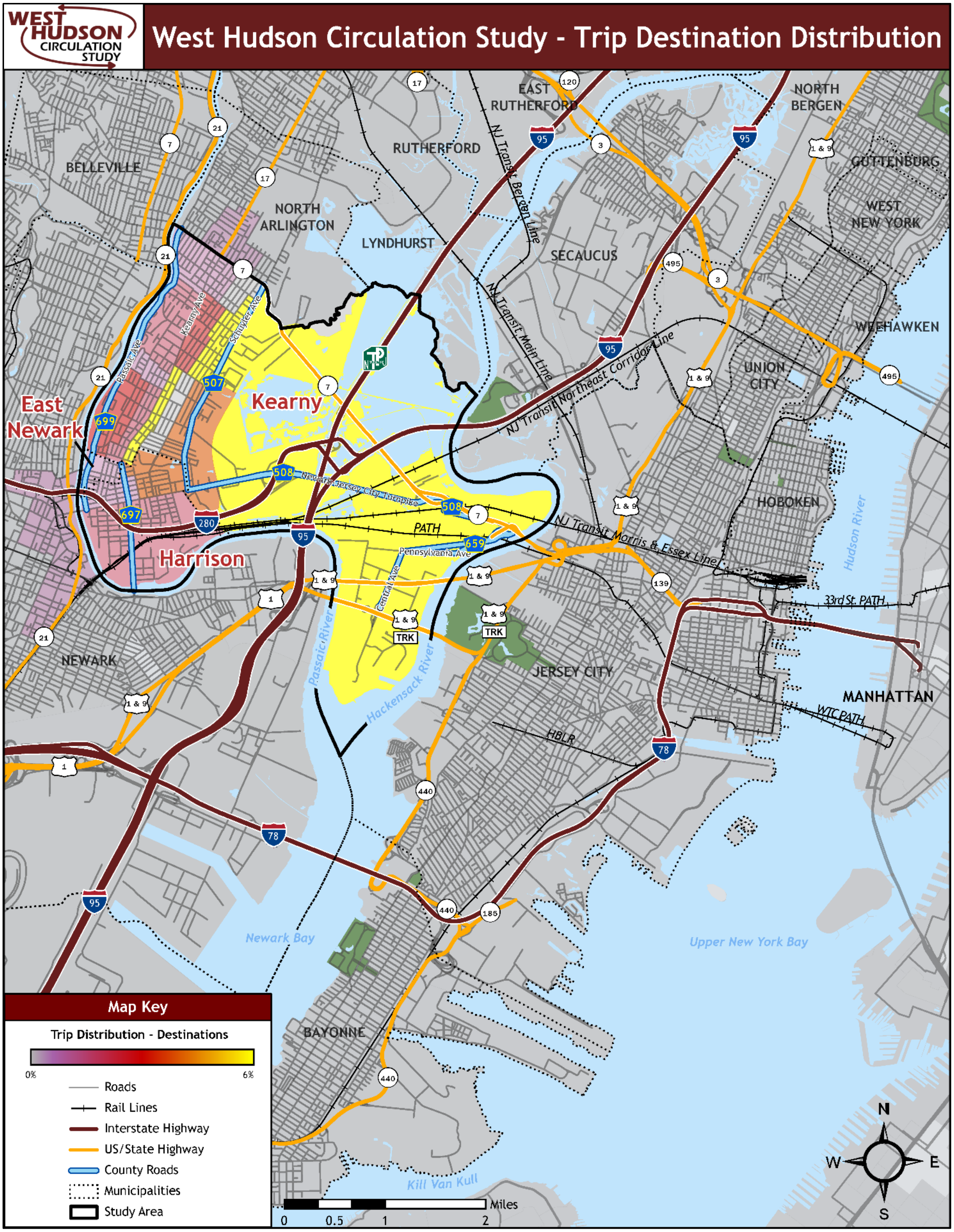

Figure 3 – Origins – Trips Destined to West Hudson

2.2.3 Trip Distribution & Routing

Methodology

A Trip Distribution & Routing analysis traces traffic flows entering and exiting specific paths, revealing their origins, destinations, and routing. This was conducted to examine traffic flows along critical network links that serve as primary access points to the study area. Seven key roadways entering the study area were selected for analysis because these routes are the primary roadway access points between the West Hudson study area and adjacent areas. They appear below, clockwise from the north.

From the North

- Passaic Avenue (CR 699)
- Kearny Avenue (CR 697)
- Schuyler Avenue (CR 507)

From the East

- Route 7

From the South

- Frank E. Rodgers Boulevard (CR 697)

From the West

- Central Avenue (CR 659)
- Harrison Avenue (CR 508)

These are County and State primary routes connecting the West Hudson study area to Newark and other major arterials and are essential corridors for regional traffic and mobility in the area. Interstate highways were not selected for their analysis because of their diminished importance for local travel compared to their regional and interstate value.

Data from *Replica's* seasonal model was used to analyze trips traveling these roads, focusing on travel patterns using the latest data source during a typical Thursday in Spring 2024. This represents the most recently available dataset at the time of the analysis. Both spring and fall represent typical commuter patterns. *Replica's* Spring dataset includes a 13-week modeling season that includes March, April, and May.

Passaic Avenue (CR 699) connects North Arlington and Kearny. Only seven percent of trips entering the study area along the corridor continue into East Newark and Harrison. The vast majority of traffic entering Kearny along the corridor have local destinations in Kearny. These travel patterns are shown in Figure 4.

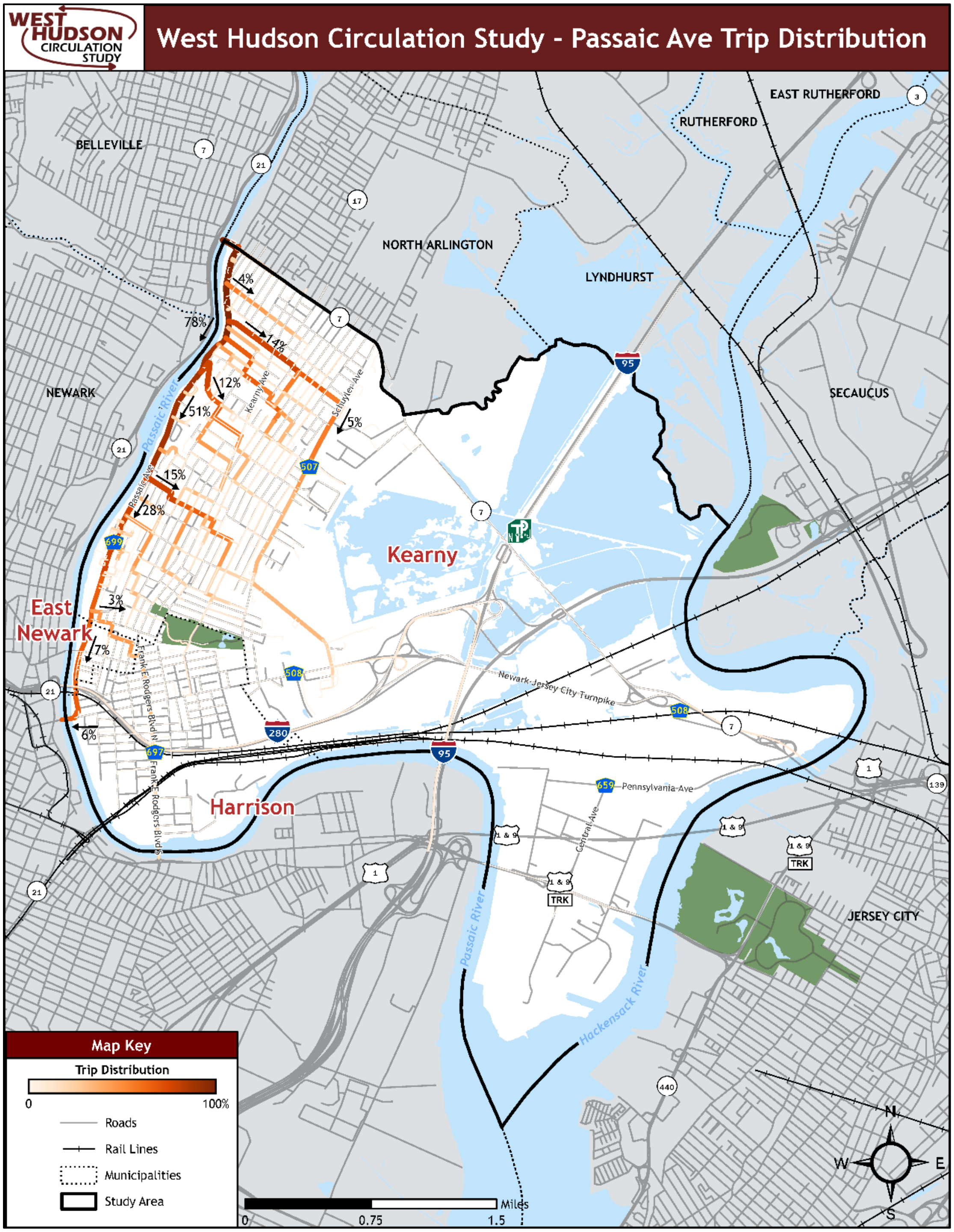

Figure 4 – Passaic Avenue (CR 699) Southbound Trip Distribution

Kearny Avenue (CR 697) connects North Arlington and Kearny. Most trips (72 percent) travel south past Midland Avenue. Another 53 percent travel south past Bergen Avenue. Half of trips entering the study area along Kearny Avenue end locally in northern Kearny. Thirty-four percent of trips continue south on the corridor where it transitions to Frank E. Rodgers Boulevard. Eighteen percent of trips cross into Newark via the Clay Street Bridge (CR 659) and an additional 18 percent cross into Newark via the Bridge Street Bridge (CR 508). These travel patterns are shown in Figure 5.

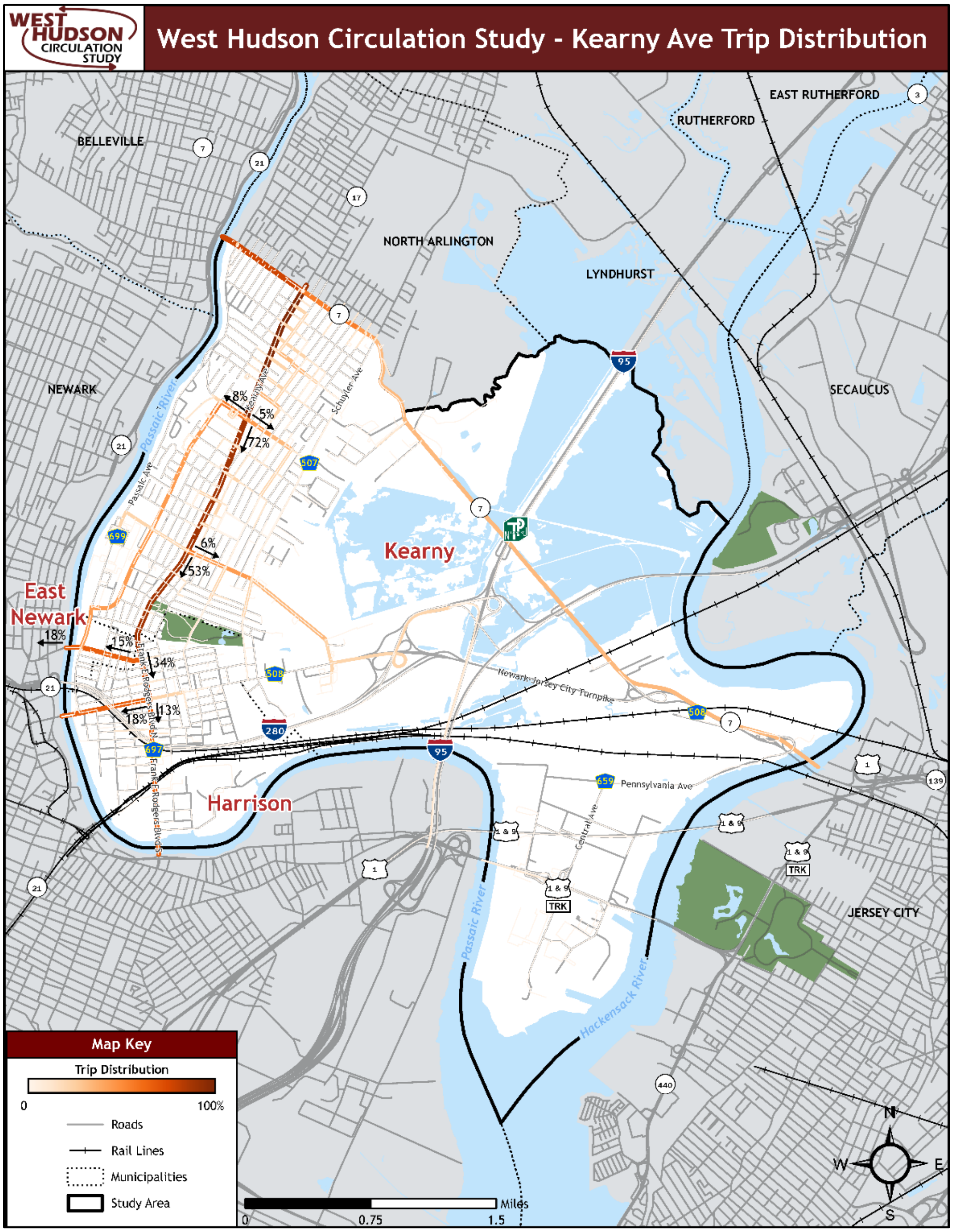

Figure 5 – Kearny Avenue (CR 697) Southbound Trip Distribution

Schuyler Avenue (CR 507) connects North Arlington and Kearny. After entering the study area via Schuyler Avenue (CR 507), most trips are destined for locations within Kearny. 21 percent of trips turn onto Bergen Avenue to eventually access the New Jersey Turnpike or Interstate 280. Ten percent of trips continue south on Schuyler Avenue to Harrison Avenue (CR 508). From there, 10 percent of trips access Newark via the Bridge Street Bridge. These travel patterns are shown in Figure 6.

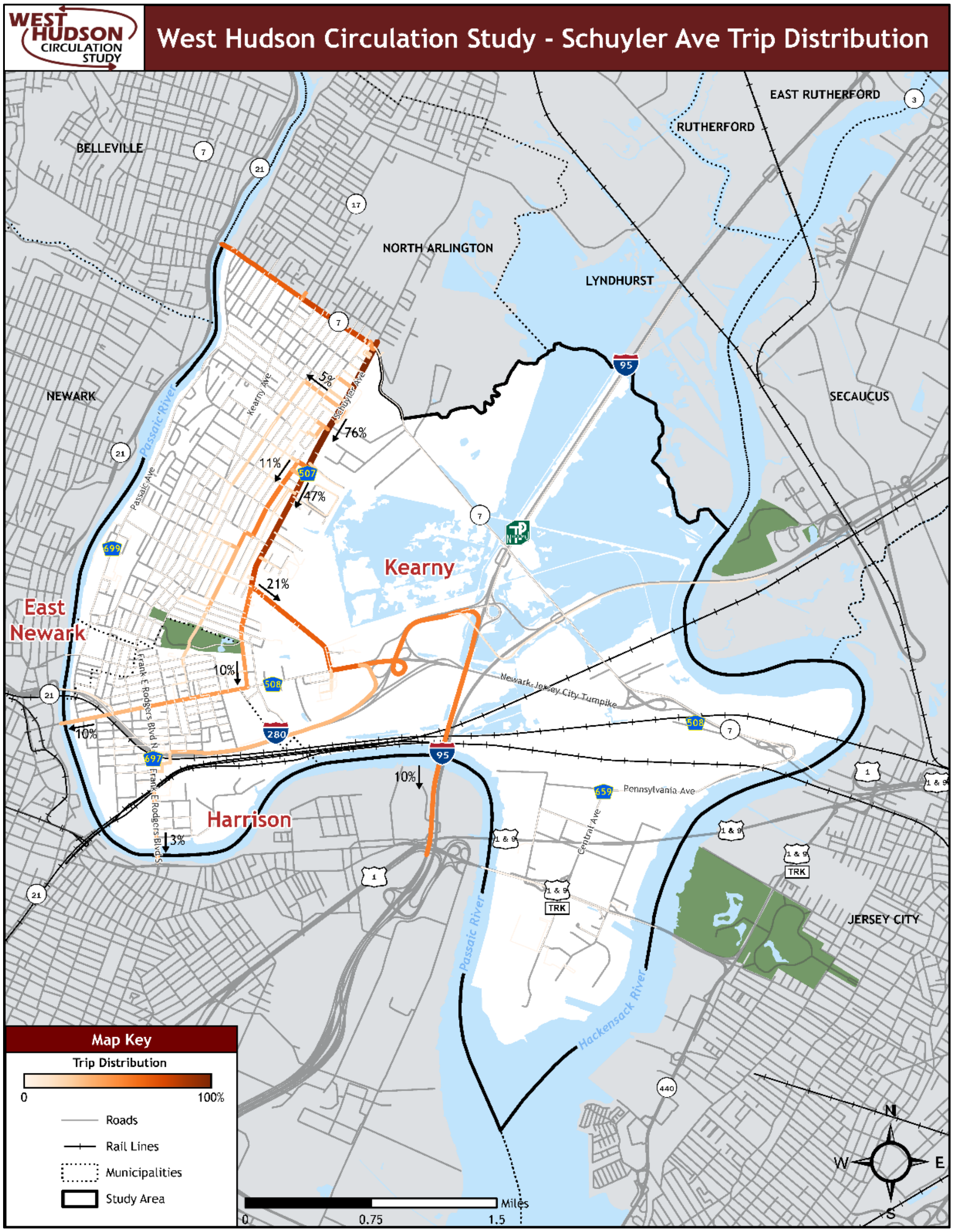

Figure 6 – Schuyler Avenue (CR 507) Southbound Trip Distribution

Route 7 connects Jersey City and Kearny north of South Kearny via the Witt Penn Bridge. Upon entering the study area, most trips (95 percent) continue west on Route 7. At the interchange with Newark-Jersey City Turnpike (CR 508), 26 percent of trips continue westbound on Route 7, while 70 percent travel west along CR 508. Of those trips continuing west onto Newark-Jersey City Turnpike (CR 508), 32 percent access Interstate 280 westbound, while 29 percent continue west on CR 508. Forty percent of trips pass into Newark via Interstate 280, while 13 percent of trips pass into Belleville via the Belleville Turnpike (Route 7). These travel patterns are shown in Figure 7.

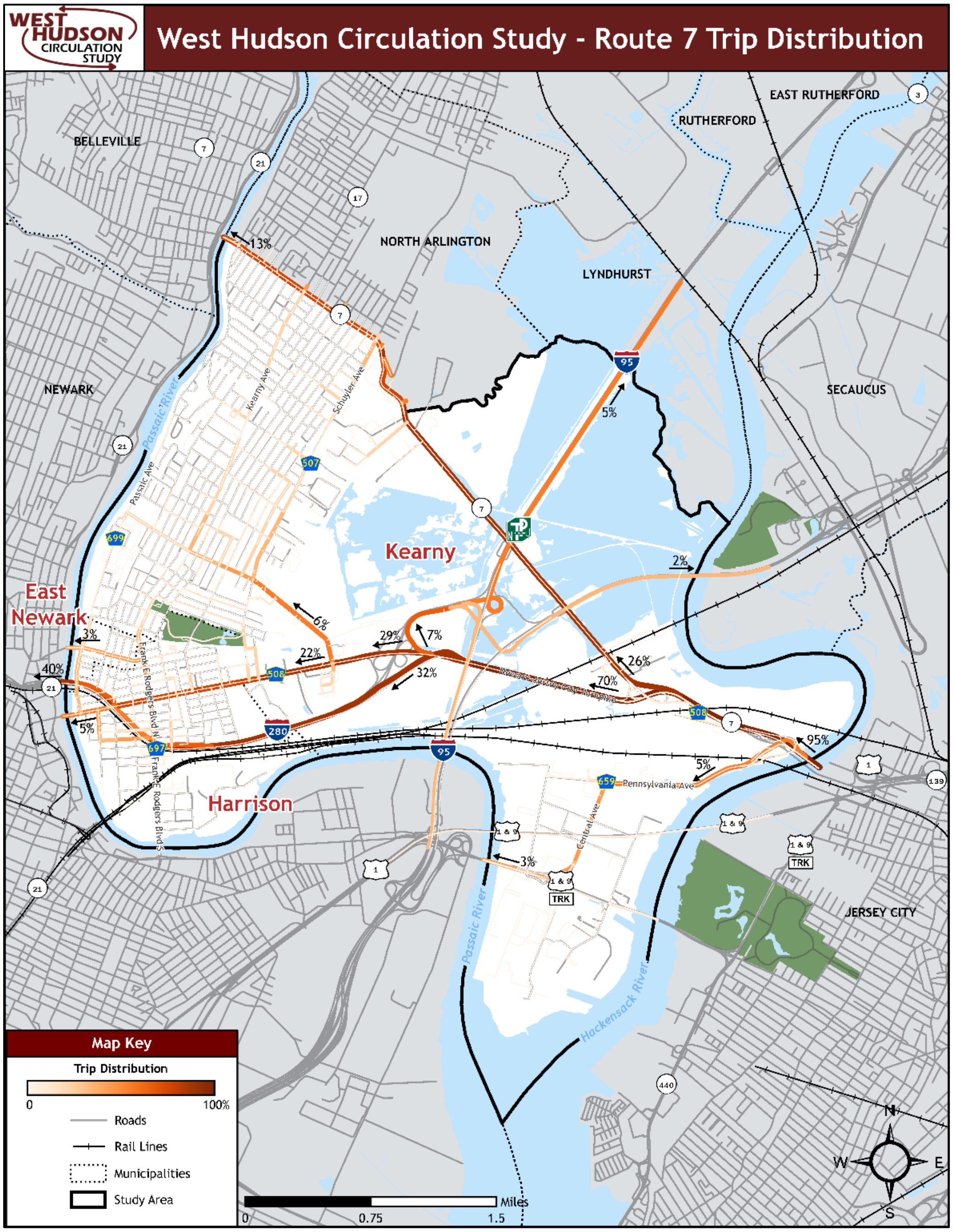

Figure 7 – Route 7 Westbound Trip Distribution

Frank E. Rodgers Boulevard (CR 697) connects Harrison and Newark via the Jackson Street Bridge at the south side of Harrison. Frank E. Rodgers Boulevard primarily serves trips to the interior of the study area (Figure 8). Upon entering the study area, almost all (97 percent) trips continue north on Frank E. Rodgers Boulevard. 18 percent access residential areas to the east of Frank E. Rodgers Boulevard, while 20 percent access Interstate 280 westbound at Bergen Street. Half of trips continue north into the study area with 12 percent continuing north along Kearny Avenue (CR 697) into North Arlington. These travel patterns can be seen in Figure 8.

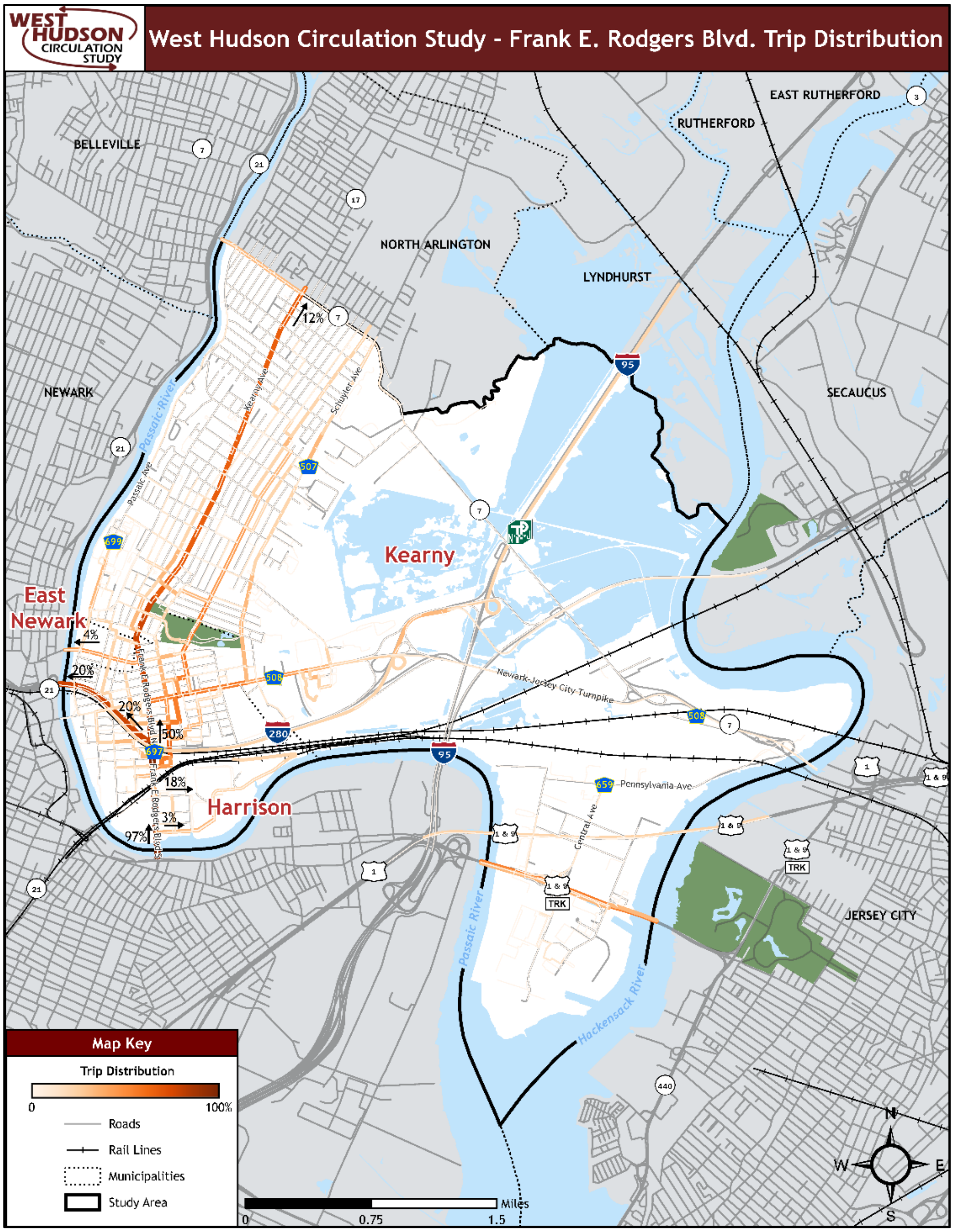

Figure 8 – Frank E. Rodgers Boulevard (CR 697) Northbound Trip Distribution

Central Avenue (CR 659) connects Harrison and Newark via the Clay Street Bridge. Most trips crossing the bridge into the study area end within residential areas of Kearny and Harrison (shown in Figure 9). Upon crossing into Harrison, 53 percent of trips travel north along Passaic Avenue (CR 699), and nearly half of these continue north through East Newark and into Kearny. After crossing into the study area, 41 percent of trips continue east along Central Avenue (CR 659). Forty percent of trips traveling across the bridge travel into Kearny along Passaic Avenue (CR 699), Kearny Avenue (CR 697), or Schuyler Avenue (CR 507). Only two percent of the trips continue east via Route 7, while another two percent travel north into North Arlington via Kearny Avenue. While 14 percent of trips connect to Frank E. Rodgers Boulevard from Central Avenue, only four percent continue south to the Jackson Street Bridge. These travel patterns can be seen in Figure 9.

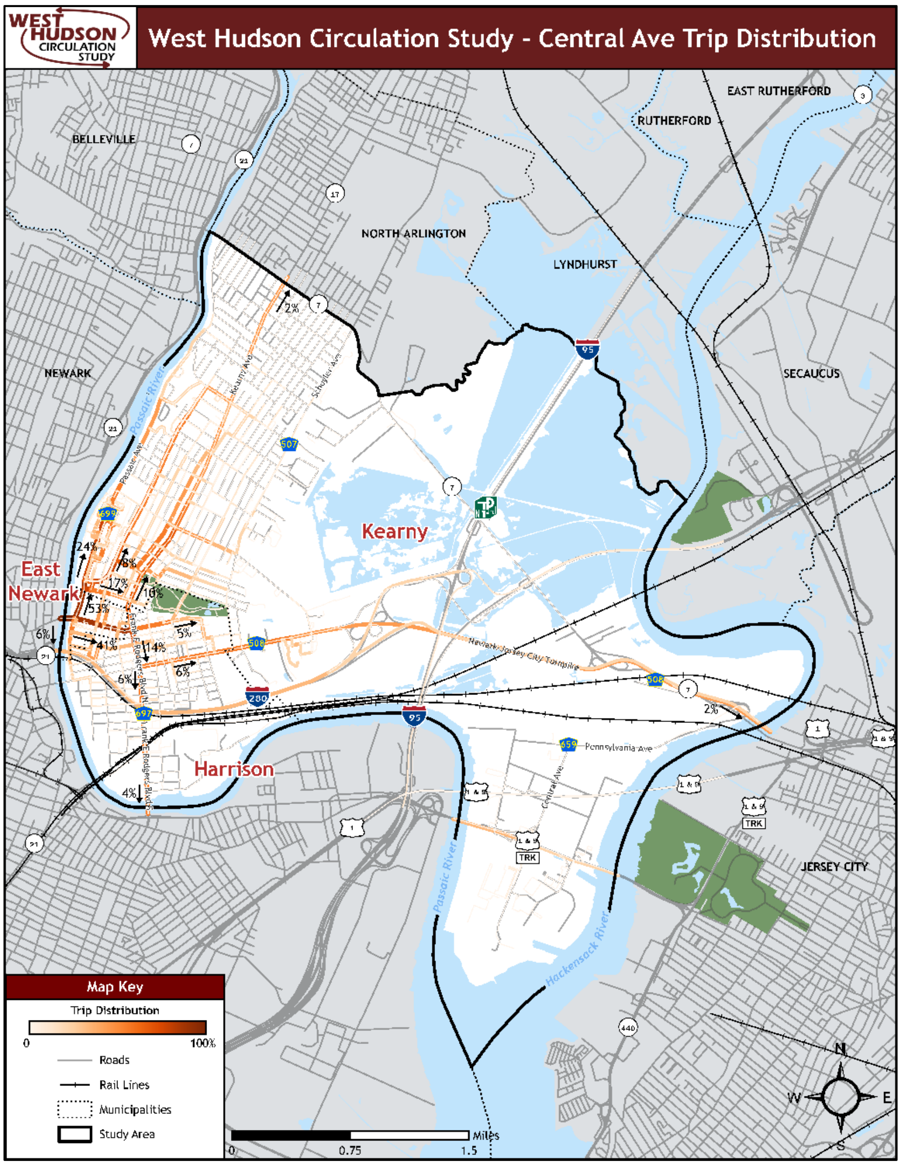

Figure 9 – Central Avenue (CR 659) Eastbound Trip Distribution

Harrison Avenue (CR 508) connects Harrison and Newark via the Bridge Street Bridge. Upon entering the study area, 80 percent of trips continue east, while 19 percent travel north onto Passaic Avenue (CR 699). 28 percent of trips access Interstate 280 eastbound, and 21 percent travel north onto Kearny Avenue (CR 697). Fifteen percent of trips continue north on Kearny Avenue into North Arlington. Fifteen percent of trips continue east into Jersey City along Route 7, while 24 percent access Interstate 95 northbound via either the eastern or western spur. These travel patterns can be seen in Figure 10.

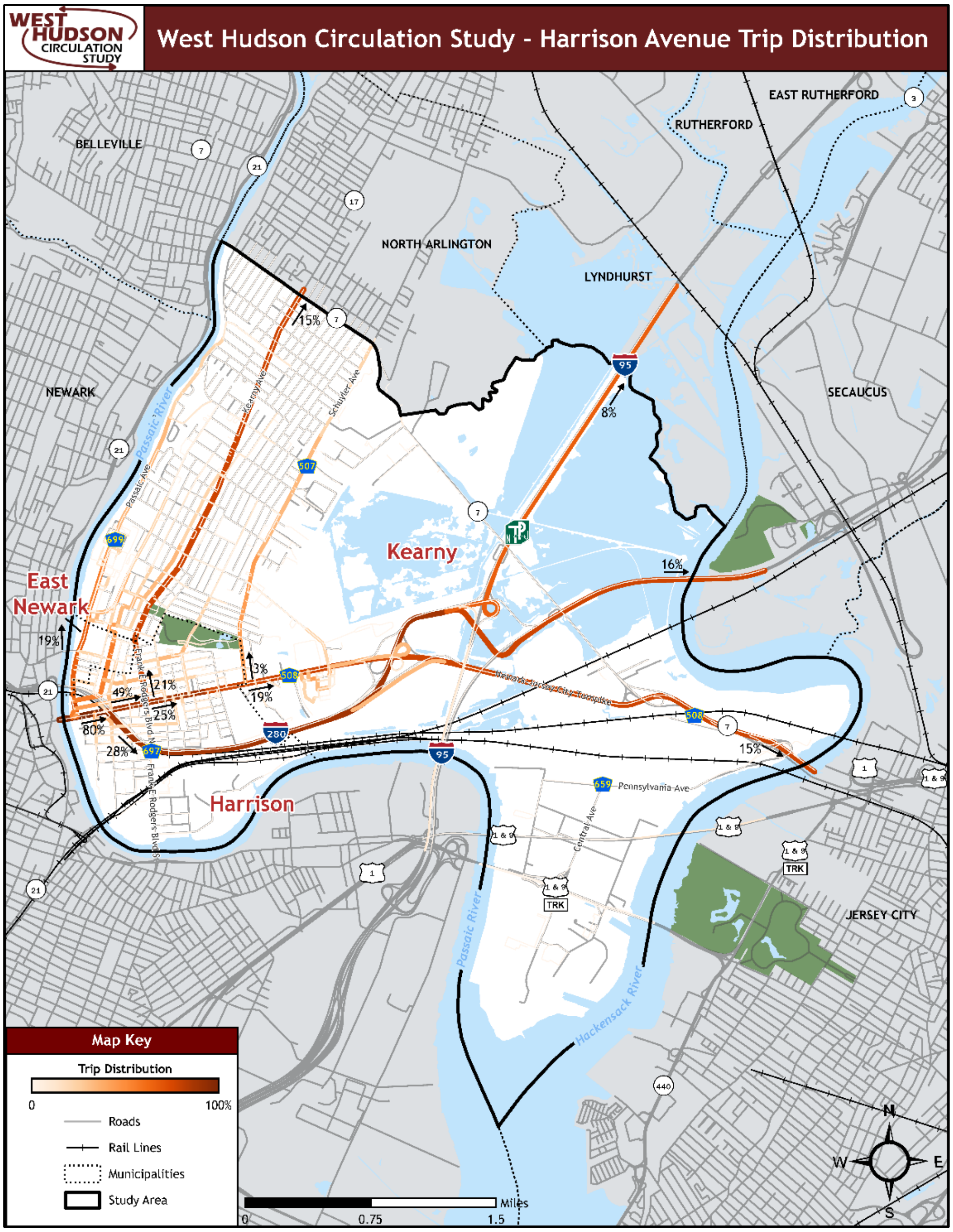

Figure 10 – Harrison Avenue (CR 508) Eastbound Trip Distribution

2.3 Traffic Volumes Analysis

2.3.1 Annual Average Daily Traffic

Methodology

The Annual Average Daily Traffic (AADT) metric is an annualized measure of traffic normalized by averaging daily traffic volumes over a twelve-month period. The New Jersey Department of Transportation (NJDOT) estimates this metric using traffic count data collected for the Traffic Monitoring System (TMS) program. While there are many count locations on Interstates, U.S., and State Routes, fewer locations with classified count data (split into motor vehicles, buses, trucks, etc.) are present on the County roadway system.

Due to the limitations of NJDOT's available traffic count dataset in the study area, AADT data was sourced from *Replica* for 2023. This represents the most recently available dataset at the time of the analysis. This dataset includes traffic volume estimates for major roads, with specific breakdowns for all vehicles and combination truck volumes. The analysis focused on studying traffic volumes to better understand travel patterns and freight movement in the region.

Results

Figure 11 shows the AADT for all vehicles within the study area. The highest motor vehicle volume is concentrated on the NJ Turnpike/I-95, which is a major interstate serving Hudson County, New Jersey, and the larger region. Daily traffic on I-95 ranges from 60,000 to 81,000 vehicles, with the southbound segment of I-95 West carrying the highest volume at 75,000 to 81,000 vehicles. Interstate 280 and its connection to Interstate 95 also have high volume. I-280 carries between 29,000 and 43,000 vehicles eastbound and 30,000 to 39,000 vehicles westbound. The Interstate 280 corridor becomes Route 7 and travels east to U.S. 1&9, connecting further east to New York City and North Jersey. These major highways play an important regional mobility role and are therefore crucial to the connectivity of the study area.

In addition, Harrison Avenue/Newark-Jersey City Turnpike (CR 508), Passaic Avenue (CR 699), and Schuyler Avenue (CR 507) are important county roadways in the study area. These corridors connect the major highways and the study area's largest residential areas in Kearny and Harrison, as well as connecting to North Arlington. Frank E. Rodgers Boulevard (CR 697) is also an important roadway, connecting Harrison with Kearny to the north and Newark to the south.

Interstates 95 and 280 also carry the highest truck volumes because these Interstates serve more regional trips, including those beyond New Jersey. Combination trucks make up approximately six percent to 11 percent of daily traffic on I-95, with the highest proportion observed on I-95 West Southbound, where trucks comprise up to 11 percent of total vehicles. On I-280, trucks represent about five (5) percent to seven (7) percent of daily traffic in both directions. As shown in Figure 12, U.S. 1&9 Truck carries high truck volumes and passes through industrial areas in South Kearny. On this corridor, trucks account for roughly five (5) percent to nine (9) percent of the total traffic. Traveling between South Kearny and the remainder of Kearny requires exiting the study area, as environmental features and NJ TRANSIT's

Meadowlands Maintenance Complex prevent direct access. The U.S. 1&9 Truck corridor connects the industrial clusters through Central Avenue (CR 659).

High traffic volumes on these corridors highlight their importance to the economic activity of the study area. Table 1 and Table 2 below show the AADT for the major facilities within the study area split between all vehicles and combination trucks. The interstate and state routes cater to high volumes of combination trucks, while the County routes cater to low volumes of combination trucks and moderate volumes of other vehicles.

Table 1 – AADT on Interstate and State Roadway

Interstate/State	All Vehicles	Combination Trucks
I-95 Northbound	60,000-68,000	3,800-4,000
I-95 Southbound	64,000-72,000	5,200-5,900
I-95 West Northbound	63,000-67,000	5,800-7,000
I-95 West Southbound	75,000-81,000	7,700-9,300
I-280 Eastbound	29,000-43,000	2,000-2,200
I-280 Westbound	30,000-39,000	1,900-2,000
Route 1&9 Eastbound	23,000	<10
Route 1&9 Westbound	33,000	<10
Route 1&9 Truck Eastbound	19,000-23,000	900-1,700
Route 1&9 Truck Westbound	17,000-21,000	500-1,200
NJ Route 7	14,000 – 43,000	40-300

Table 2 – AADT on County and Major Arterials

County/Major Arterial	All Vehicles	Combination Trucks
Harrison Ave (CR 508)	9,000-33,000	70-560
Frank E. Rodgers Blvd/Kearny Ave (CR 697)	7,000-18,000	<100
Passaic Ave (CR 699)	10,000-18,000	<10
Schuyler Ave (CR 507)	6,000-14,000	<10
Central Ave/Pennsylvanian Ave/Fish House Rd (CR 569)	6,000-8,000	<10
Bergen Ave	7,300-14,000	<10

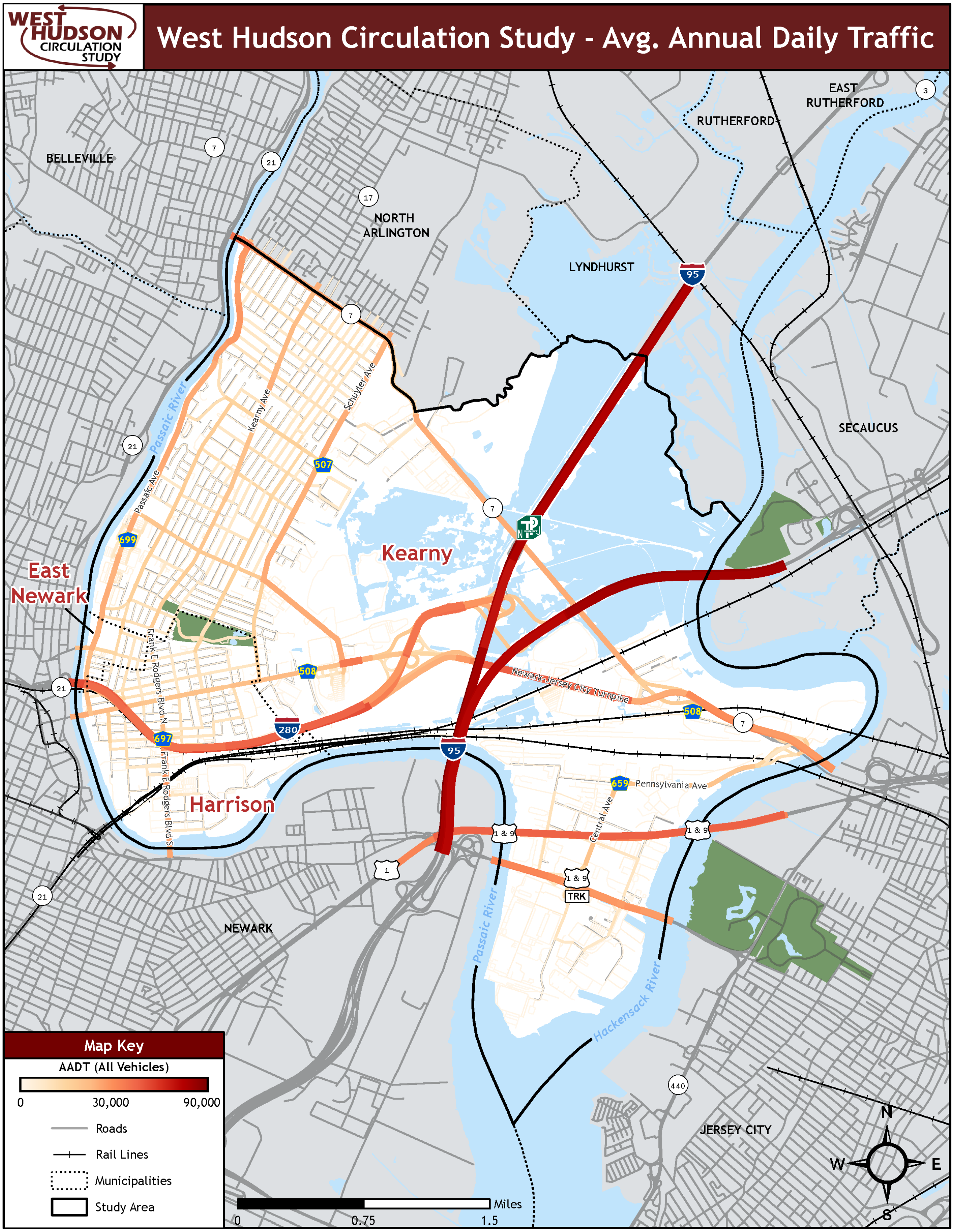

Figure 11 – Average Annual Daily Traffic

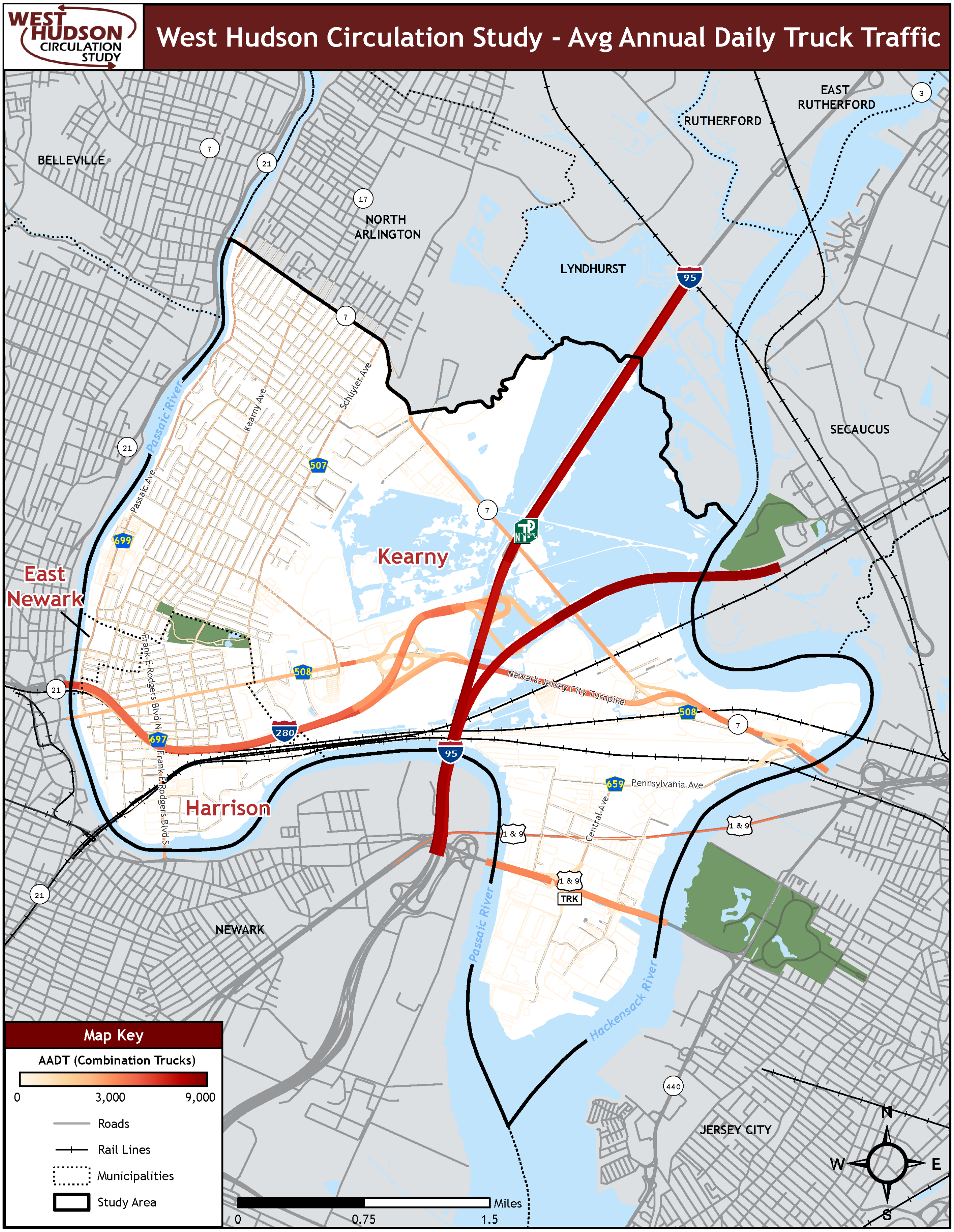

Figure 12 – Average Annual Daily Truck Traffic

2.3.2 Traffic Speeds

Methodology

The speed analysis utilized *Replica's* quarter-hourly speed profile data for Hudson County to focus on the study area during an average weekday in 2023. This dataset is computed based on time-stamped GPS traces collected over a six-month period. Speed values represent average speeds computed from the measured time to traverse the length of a network line and the length of that segment of roadway. This represents the most recently available dataset at the time of the analysis. The analysis targeted two key time periods: the AM peak period (6:00–9:00 AM) and the PM peak period (3:00–7:00 PM). These two broad peak periods were used based on the typical peak hour volume range experienced in North Jersey, as identified in the NJTPA's NJRTM-E model.

The analysis examined data in 15-minute intervals within these periods to determine when most roadway links experienced the lowest estimated speeds. A statistical analysis that included key metrics, such as the average, mode, and standard deviation, was applied to identify the most congested (lowest speeds) 15-minute window. Based on the overall study area traffic network, this time window was selected to represent the worst-case condition or the equivalent to the "peak of the peak" period. Speeds were then compared to free-flowing conditions, and the results were mapped as a percentage of free-flow speed to highlight areas with significant congestion during peak periods. This analysis provides an overview of traffic conditions and identifies the most affected roadways in the study area.

Results

Figure 13 and Figure 14 illustrate the speeds using the following color schema:

- Green represents free-flowing traffic (speed near or above the speed limit)
- Yellow means moderately slowed traffic (speed slightly below the speed limit)
- Red indicates congested conditions (speed significantly below the speed limit)

These figures show the "peak of the peak" 15-minute intervals for typical AM and PM peak periods. The specific 15-minute time interval is not identified because this analysis is not intended to pinpoint a specific timespan when speeds are lowest, but to illustrate the traffic flow and speeds during the worst conditions.

Generally, the most severe AM peak hour in West Hudson starts at 7:30 AM. However, earlier peak times are observed on certain corridors—U.S. 1&9 peak hour starts at 7:15 AM, while peak volumes on Harrison Avenue start even earlier at 6:30 AM. During the PM peak period, the peak hour starts at 4:30 PM. However, Harrison Avenue and Kearny Avenue show a later peak, starting at 5:00 PM.

In the AM peak period (Figure 13), most major roadways within the study area experience significant congestion, including Interstate 280 westbound, starting east of Frank E. Rodgers Boulevard (CR 697), the entirety of Frank E. Rodgers Boulevard (CR 697), Kearny Avenue (CR 697), Passaic Avenue (CR 699), Schuyler Avenue (CR 507), and Harrison Avenue (CR 508). These roadways experience significant congestion in both directions. Additionally, Interstate 95 northbound south of Interstate 280 and along the

Eastern Spur experiences congestion. In South Kearny, both directions of U.S. 1&9 Truck experience significant congestion while U.S. 1&9 eastbound experiences more moderate congestion.

Congestion in the PM peak period (Figure 14) is worse than during the AM peak period. In general, this is due to less variability in the time that people depart work than when arriving at work, as well as the additional social, cultural, and entertainment trips made during the PM peak period. Most major roadways in the study area experience significant congestion, including Interstate 280 westbound, starting east of Frank E. Rodgers Boulevard (CR 697). Additionally, most County routes experience significant congestion, including the entirety of Frank E. Rodgers Boulevard (CR 697), Kearny Avenue (CR 697), Passaic Avenue (CR 699), Schuyler Avenue (CR 507), and Harrison Avenue (CR 508). These roadways experience significant congestion in both directions. Route 7 westbound, west of Interstate 95, and Newark-Jersey City Turnpike (CR 508) westbound, east of Interstate 95, also experience significant congestion. Additionally, Interstate 95 northbound, south of Interstate 280, and along the Eastern Spur, and the entirety of Interstate 95 southbound experience congestion. In South Kearny, both directions of U.S. 1&9 Truck experience significant congestion, while U.S. 1&9 experiences more moderate congestion. The major highways play an important role in the study area for both peak periods. They not only carry pass-through traffic to/from regional destinations but also carry traffic originating within or destined for the study area. They provide connections to the surrounding municipalities and truck accessibility due to the heavy presence of industrial land uses in South Kearny.

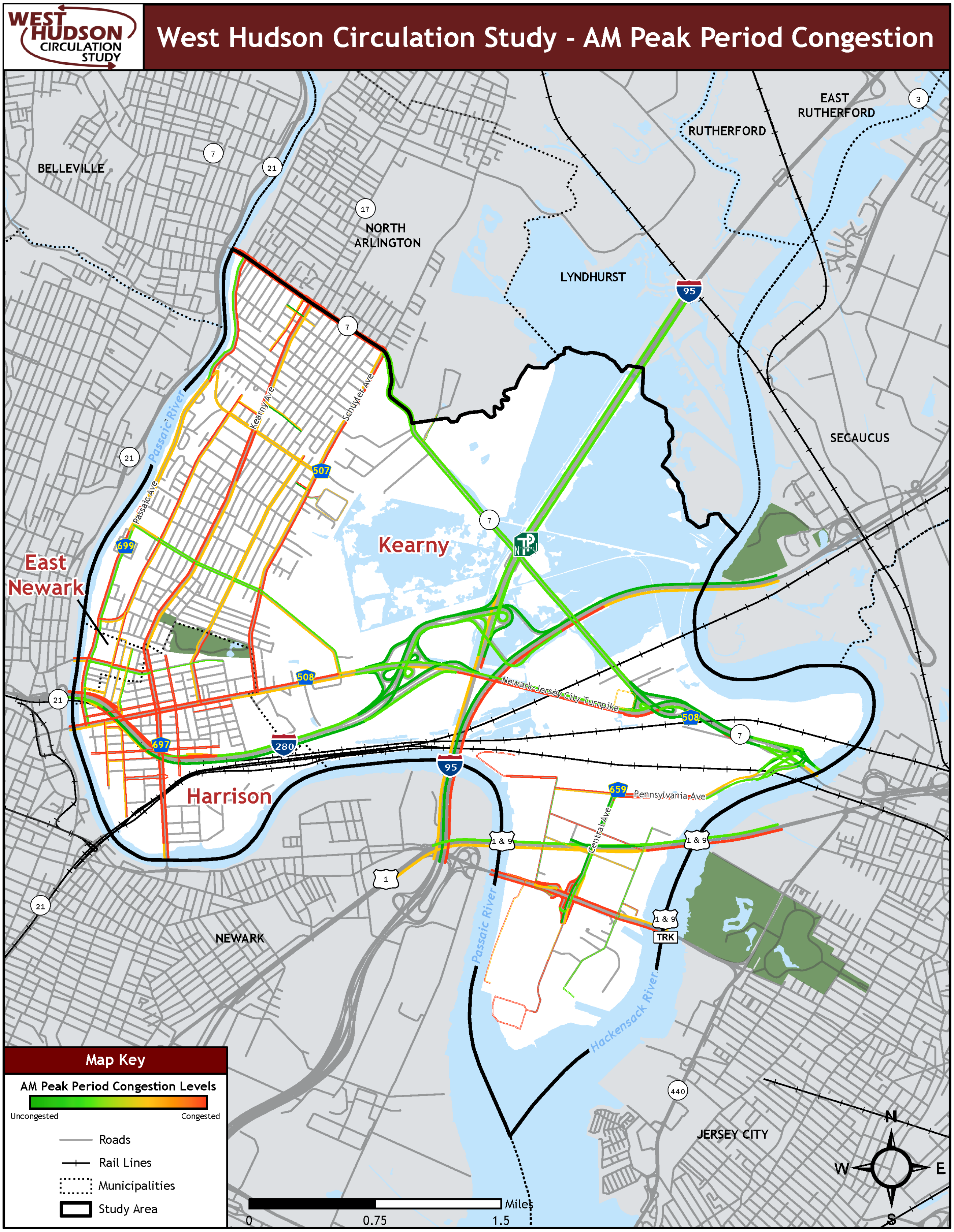

Figure 13 – AM Peak Period ("Peak-of-the-Peak") Speeds

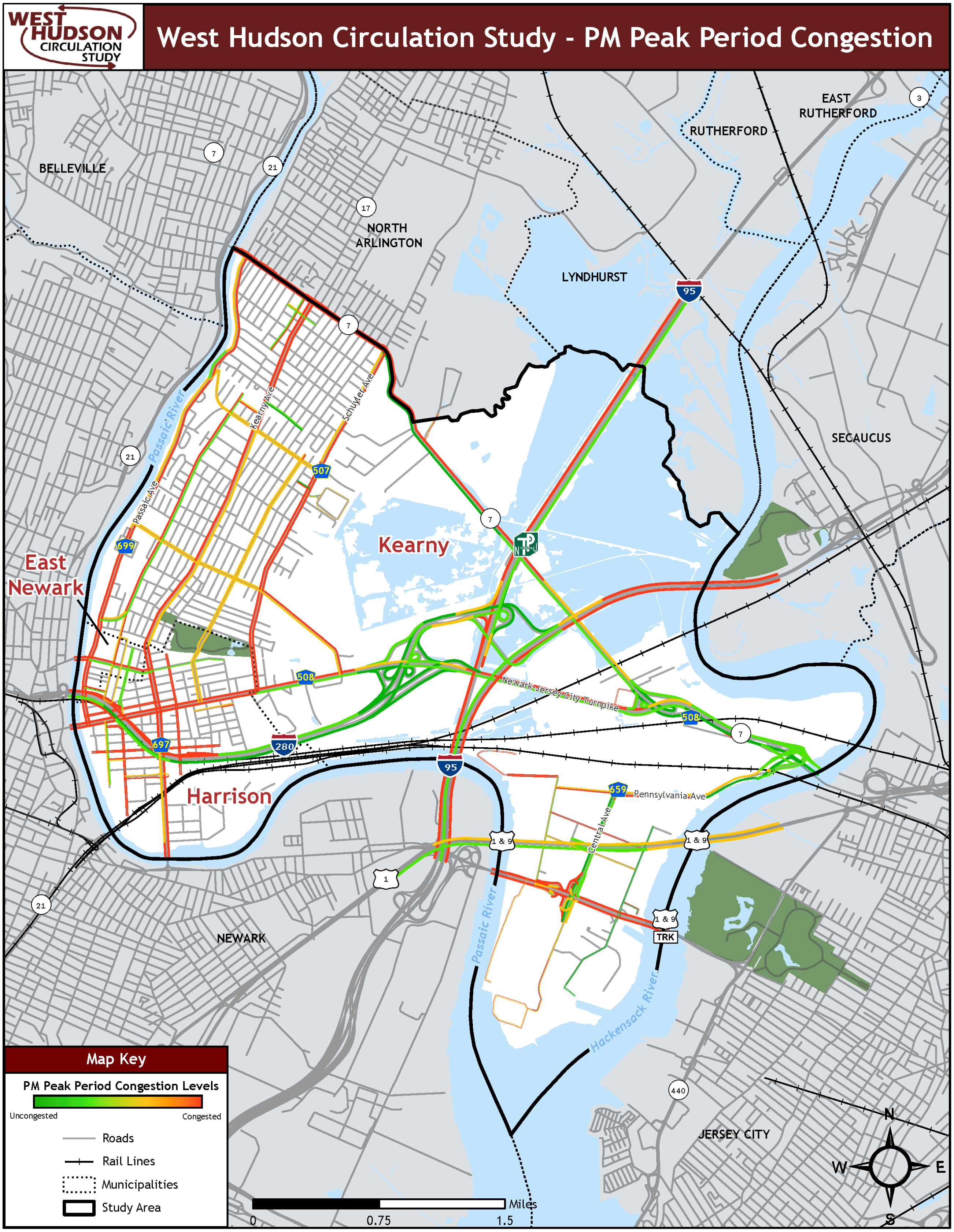

Figure 14 – PM Peak Period ("Peak-of-the-Peak") Speeds

2.3.3 Forecasted Traffic Conditions

Methodology

Future travel patterns were assessed by comparing projected travel patterns in 2024 and 2050 using the North Jersey Regional Transportation Model – Enhanced (NJRTM-E). This is a regional travel demand model developed by the NJTPA. These forecast years were selected for analysis to represent existing and future year, as commonly used in the NJRTM-E by the NJTPA. This model uses socio-demographic and employment projections along with planned infrastructure changes to forecast travel patterns. The fiscal year 2023 conformity model runs projections for forecast years 2024 through 2050 obtained from the NJTPA. This analysis highlighted roadways expected to remain congested or experience new congestion in the future by comparing volume-to-capacity ratios, providing critical insights for long-term planning. It also investigated the expected traffic growth, hours-of-delay, and miles-of-travel by 2050. Figure 15 shows a screenshot of the NJRTM-E, major roadways included in this analysis.

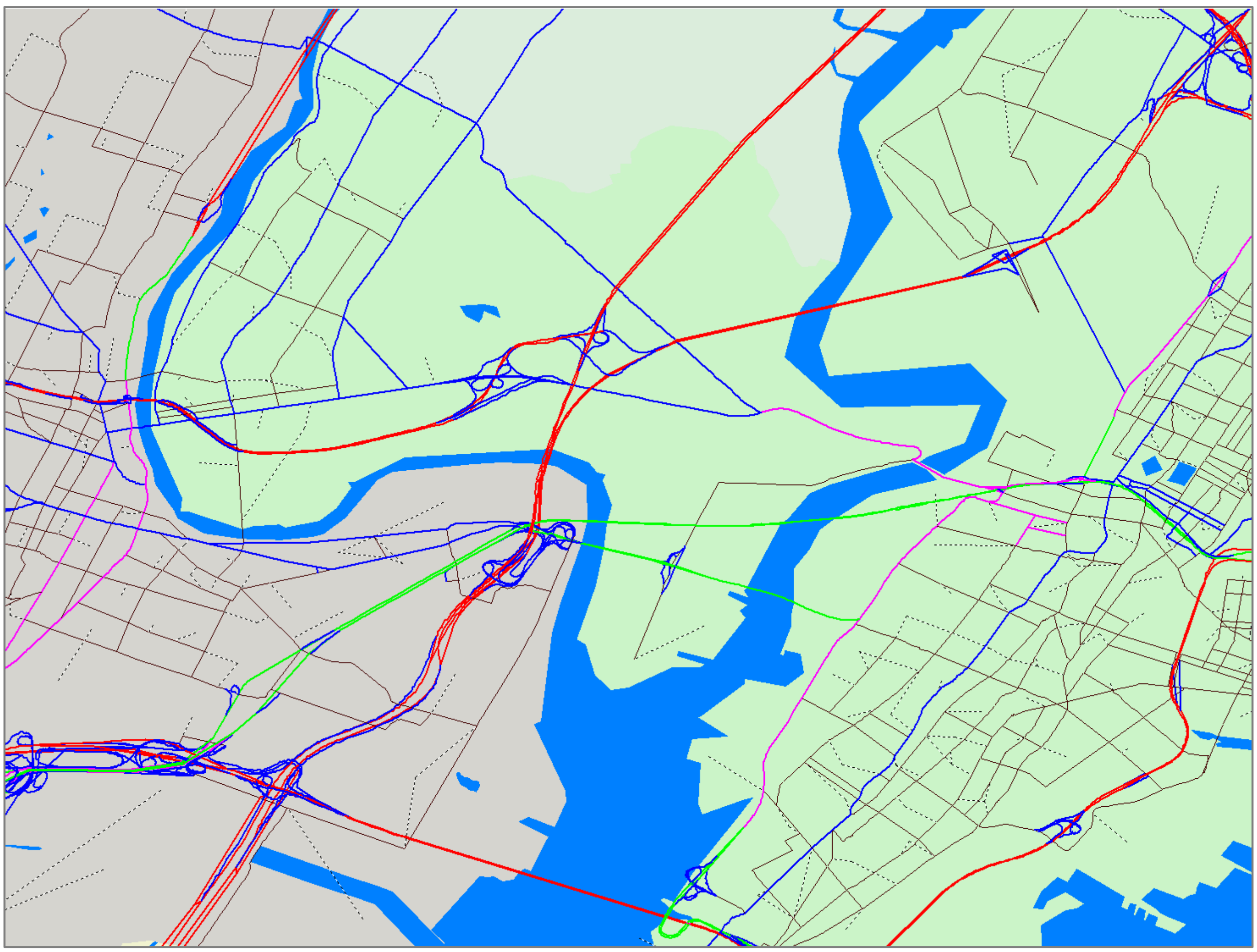

Figure 15 – NJRTM-E Roadway Network Coverage Source: NJTPA NJRTM-E

The forecasted congestion analysis compared traffic demand model results using the volume-to-capacity ratio to identify areas of congestion. A volume-to-capacity (V/C) ratio of less than 1.0 indicates that the road is operating within its capacity, allowing a smooth (or near smooth) traffic flow. A value greater than 1.0 signifies that demand exceeds capacity, reflected in congestion and lower levels of service.

To identify future traffic congestion points, this study examines the V/C ratio under two scenarios: a 2024 baseline and a 2050 projection. The analysis evaluated all modeled roadways within the study area to identify corridors that are expected to remain congested over time or develop new congestion by 2050 for an AM peak period (6:00-9:00 AM) and PM peak period (3:00-6:00 PM). Data showing hourly or 15-minute interval volumes are unavailable in the NJRTM-E model.

It is worth noting that the congestion forecasts are model estimates and, therefore, could exhibit variation from actual conditions. Additionally, the precise geography or location of each roadway segment in the model may not match the actual location or alignment of the roadway, although the traffic congestion patterns remain valid.

Results

Evaluating congestion for the base year (2024), the PM peak period (Figure 17) shows higher congestion than the AM peak period (Figure 16). Heavy congestion is mostly present on U.S. Route 1&9 Truck moving outside of the study area. Both southbound directions for Interstate 95 and U.S. Route 1&9 show heavy to moderate congestion.

For future conditions (year 2050), the PM peak period continues to show more corridor segments with higher congestion than the AM peak period. Most of the AM peak period congestion is focused on Interstate 95 northbound, showing moderate to mild congestion (see Figure 18). Some roads located in Harrison showing mild congestion are Harrison Avenue (CR 508) and Frank E. Rodgers Boulevard (CR 697). The PM peak period shows congestion on Interstate 95 in both directions. U.S. Route 1&9 shows heavy congestion southbound on its segment traversing South Kearny and U.S. Route 1&9 Truck extending beyond the study area (see Figure 19).

Figure 20 and Figure 21 show the segments that exhibit congestion in both the existing (2024) and future (2050) condition. When comparing the AM peak period future conditions to its counterpart in the base year, most major highways remain with the same congestion levels (between moderate and mild). Bridges connecting Newark to the western boundary of the study area remain congested at moderate to heavy levels. For the PM peak period, the Interstate 95, U.S. 1&9, U.S. 1&9 truck, and the bridges connecting west to Newark remain congested, with the addition of the Jackson Street Bridge at Frank E. Rodgers Boulevard (CR 697) to the south.

Continuing the comparison to identify the corridor segments with new congestion (congested in 2050 but not 2024), the AM peak period shows an increase in congestion along U.S. Route 1&9 northbound and U.S. Route 1&9 Truck arriving at the industrial cluster in South Kearny. For the Interstates, congestion remains at the same levels as the base year. Harrison Avenue (CR 508) and Frank E. Rodgers Boulevard (CR 697) in Harrison showed new mild to heavy congestion during the AM peak period. Figure 22 shows this comparison.

Compared to the PM peak period, while most segments that showed moderate to heavy congestion remain, the segment of Interstate 95 south of Interstate 280 shows a reduction in congestion. In contrast, both directions of Interstate 95 at the connecting ramps with Interstate 280 show an increase in mild to moderate congestion. Frank E. Rodgers Boulevard (CR 697) and Harrison Avenue (CR 508) are anticipated to experience an increase in congestion. Figure 23 highlights roadway segments projected to experience congestion in 2050 but not in 2024 comparison.

The NJRTM-E model was also reviewed for overall regional growth, traffic volumes, hours-of-delay, miles-of-travel, and speed projections. Overall, daily traffic (volume) in the West Hudson study area is expected to increase 12.9 percent from 2024 to 2050. This includes an 8.1 percent decrease in speeds (a sign of increased congestion), a 6.4 percent increase in vehicle hours of travel (VHT, a sign of delay), and a 2.2 percent decrease in vehicle miles traveled (VMT, a sign of miles-of-travel). The projected traffic metrics for the study area, Hudson County, and neighboring Bergen and Essex counties are shown in Table 3. The overall increase in traffic is expected to worsen delays and cause a shift in traffic from major arterials, highways, and freeways to lower functional class roadways. Compared to Hudson County overall, the West Hudson study area is anticipated to experience a slightly lower growth in traffic volumes, a slightly higher decrease in speeds, a significantly lower increase in vehicle hours traveled, and a slight decrease in vehicle miles traveled compared to a significant increase in vehicle miles traveled Countywide.

Table 3 – NJRTM-E Regional Traffic Metric Changes (2024-2050)

Area	VMT	VHT	Speed	Daily Volume
Study Area	-2.2%	6.4%	-8.1%	12.9%
Hudson County	13.7%	23.0%	-7.5%	14.8%
Bergen County	11.3%	20.0%	-7.2%	11.1%
Essex County	9.8%	15.7%	-5.1%	9.5%

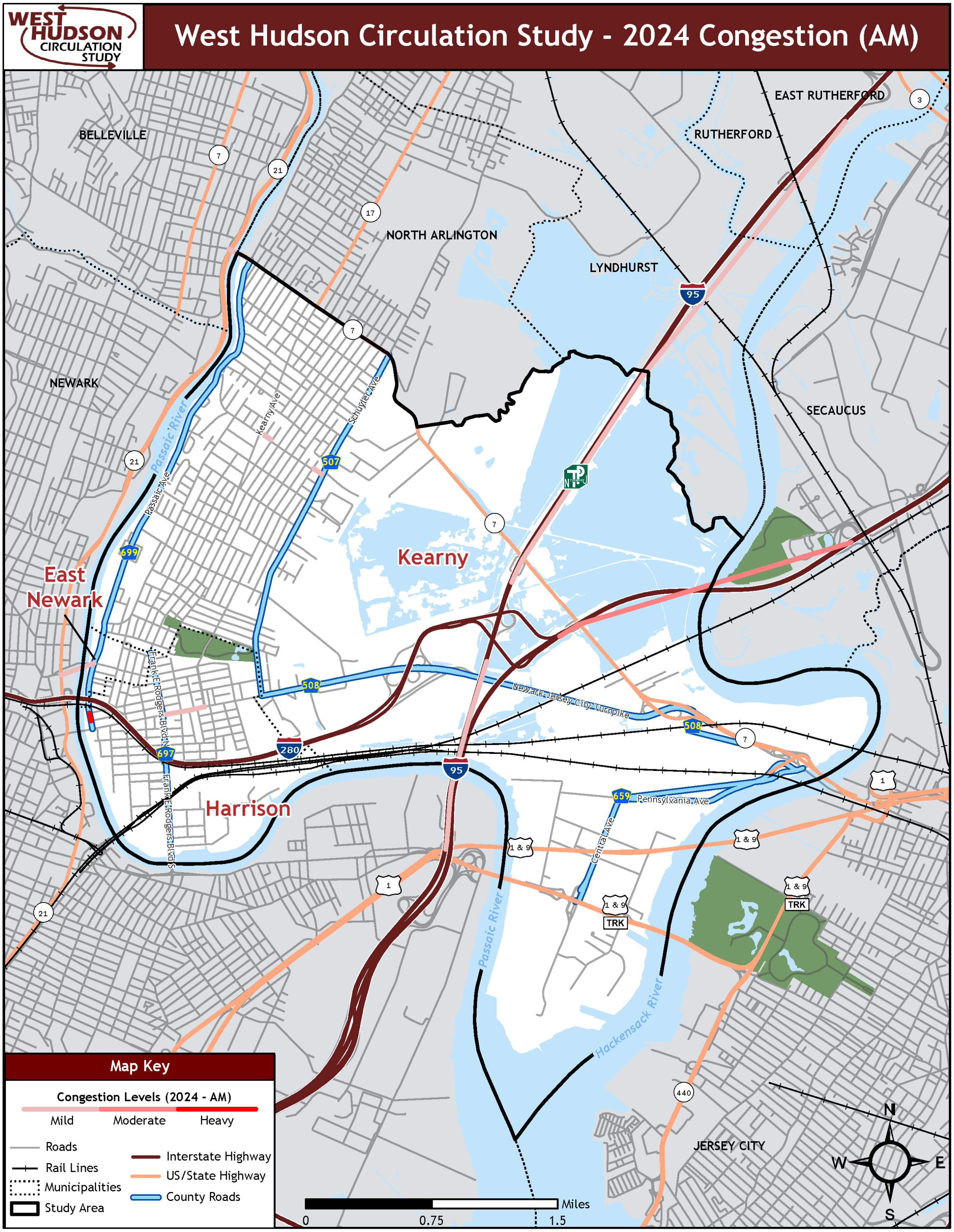

Figure 16 – 2024 AM Peak Period Forecasted Congestion

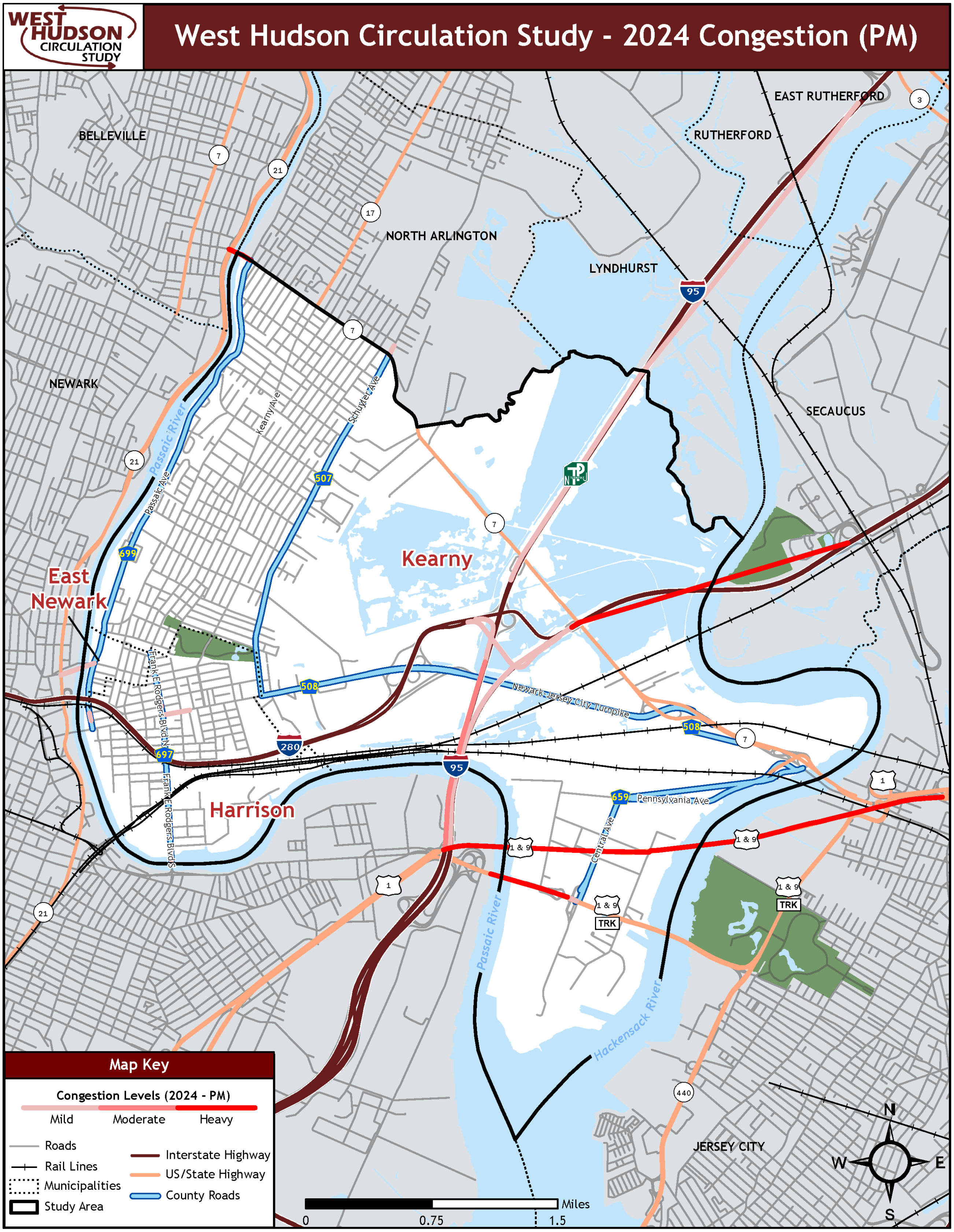

Figure 17 – 2024 PM Peak Period Forecasted Congestion

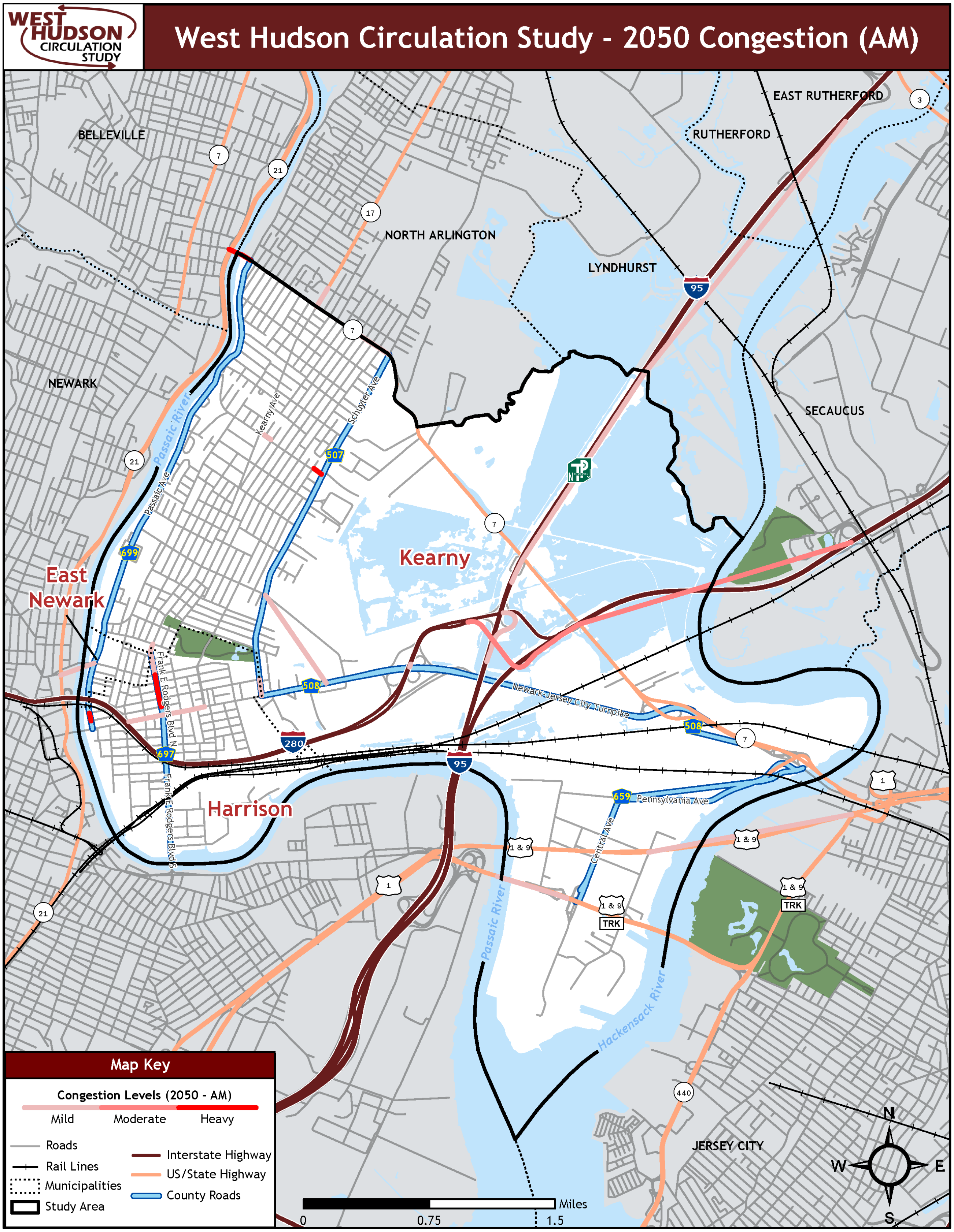

Figure 18 – 2050 AM Peak Period Forecasted Congestion

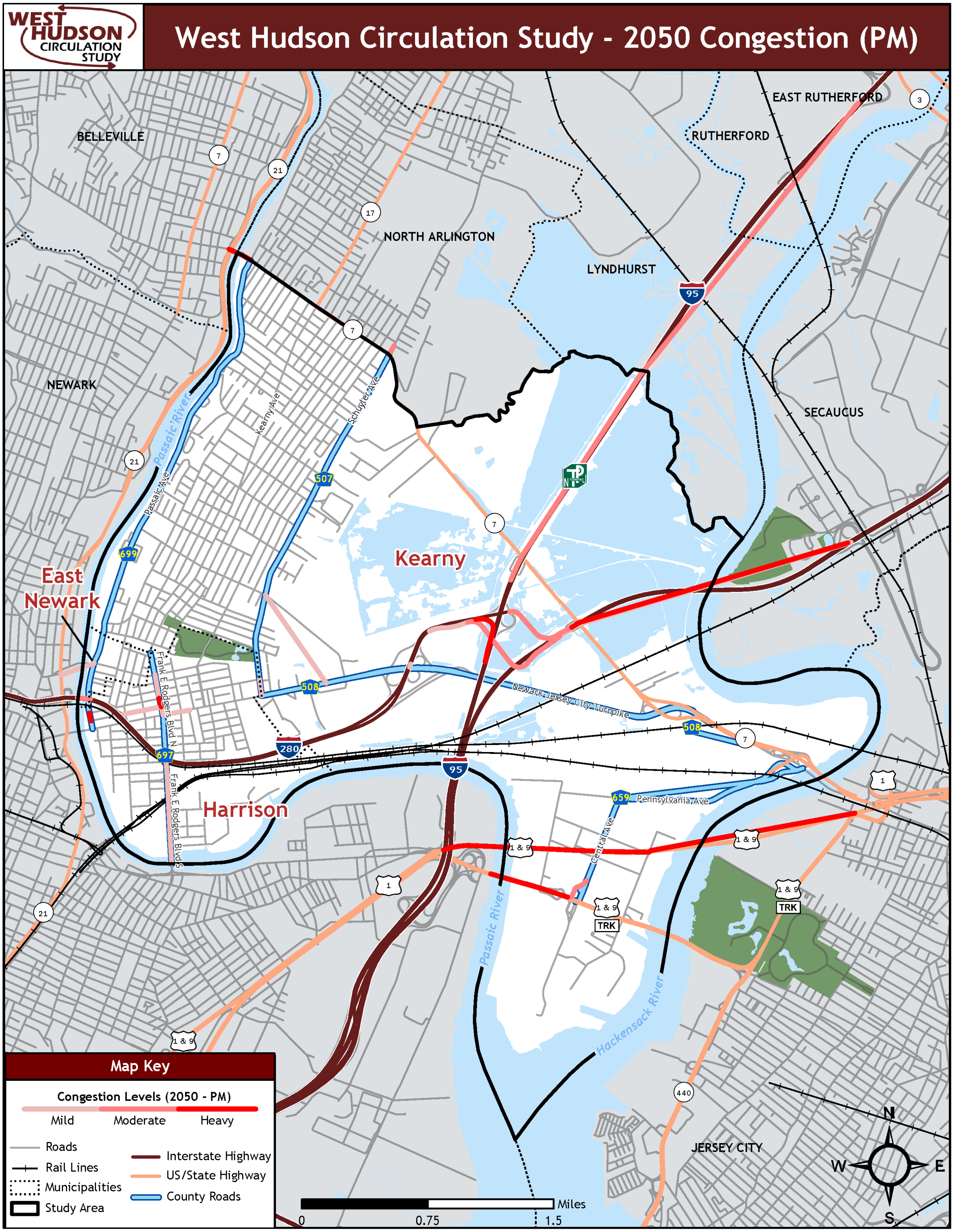

Figure 19 – 2050 PM Peak Period Forecasted Congestion

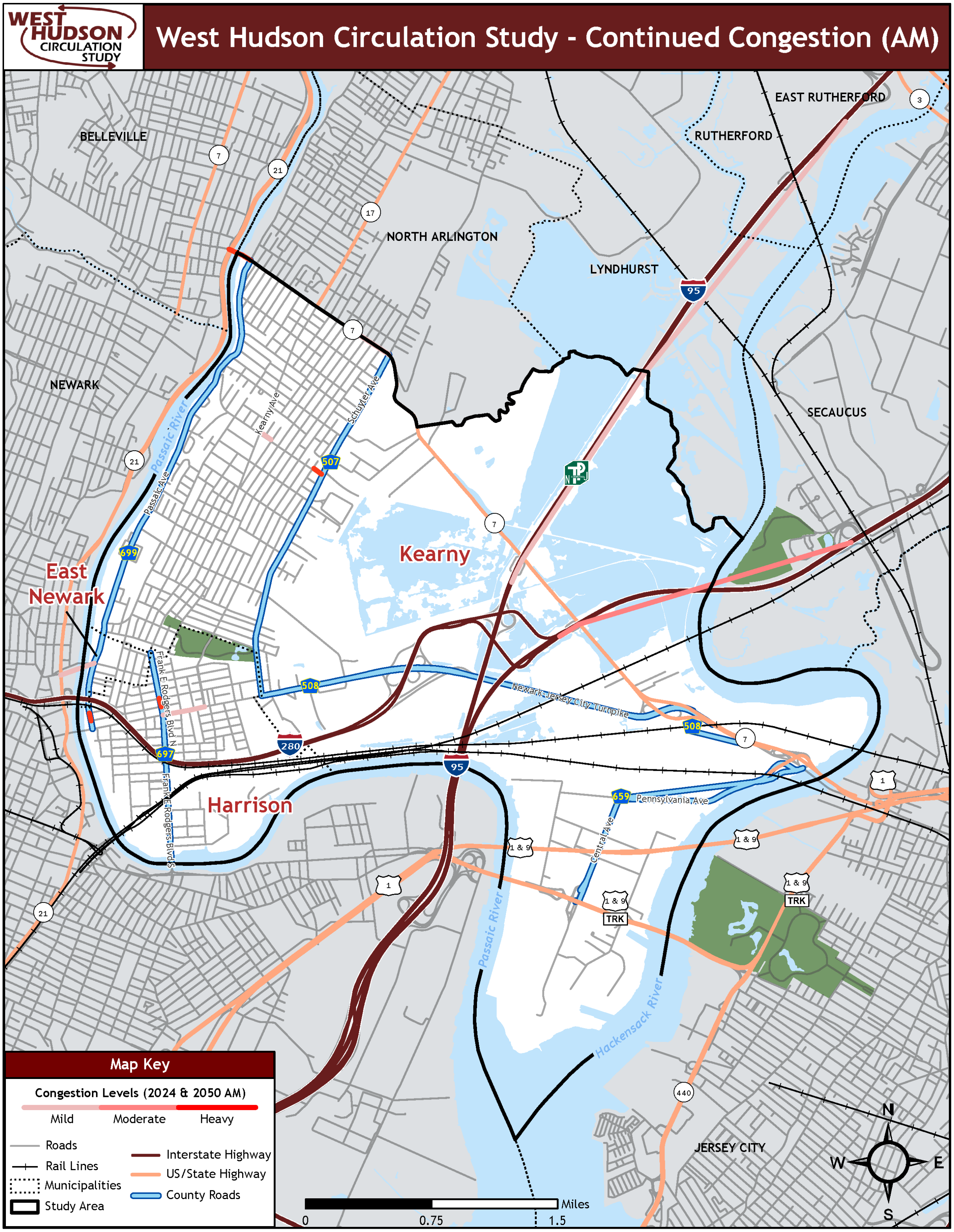

Figure 20 – AM Peak Period Forecasted Congestion (Congestion in both 2024 and 2050)

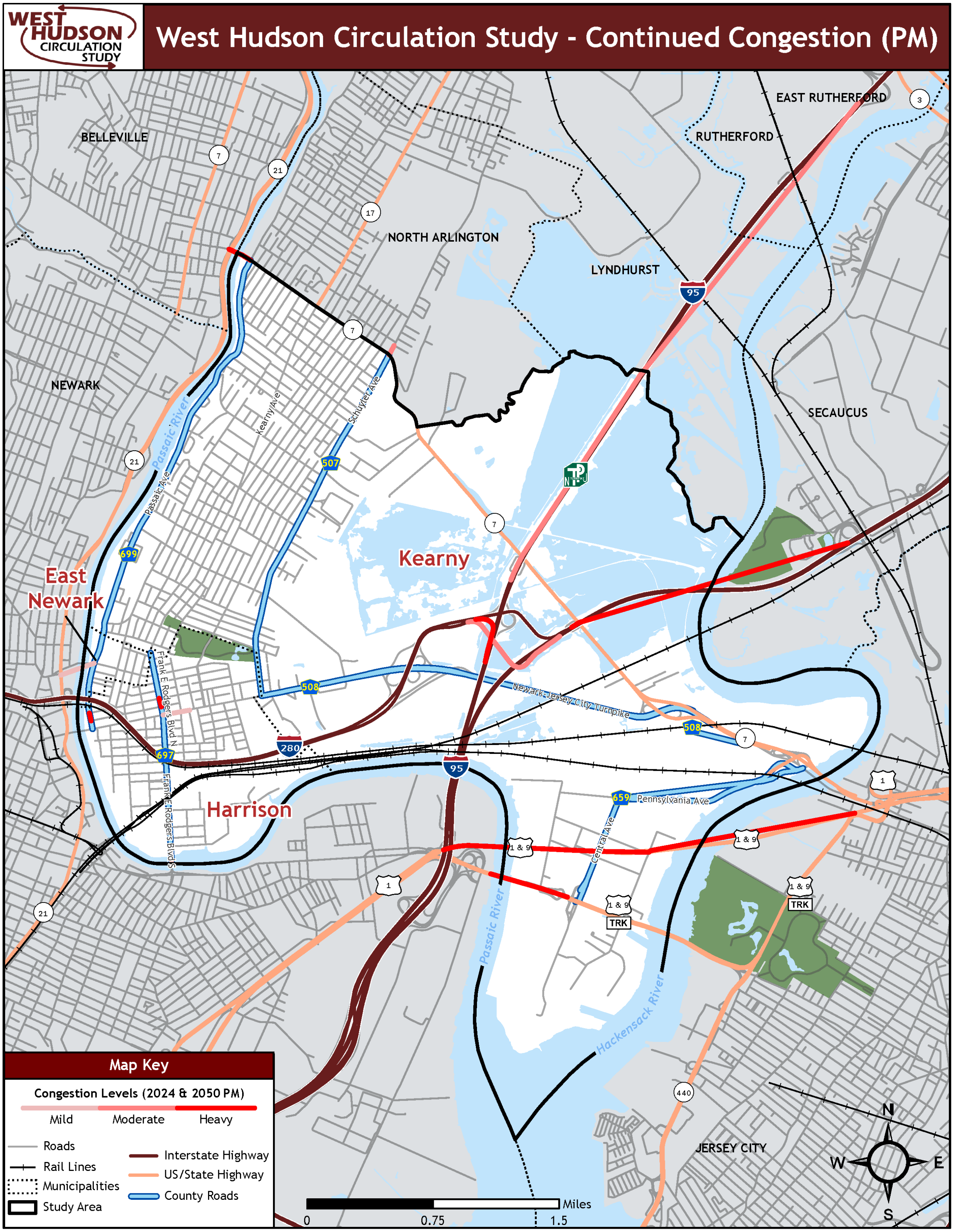

Figure 21 – PM Peak Period Forecasted Congestion (Congestion in both 2024 and 2050)

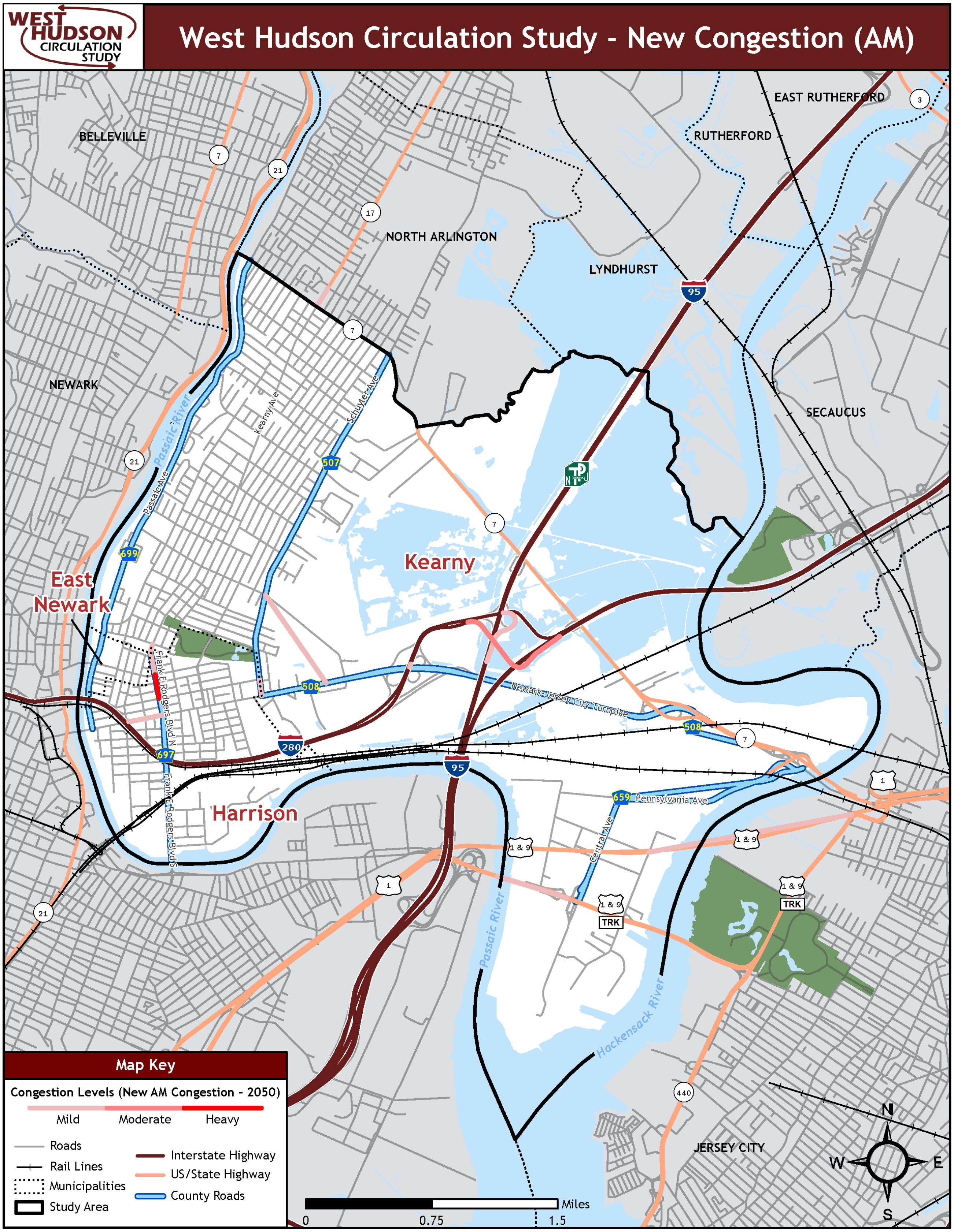

Figure 22 – 2050 AM Peak Period Forecasted Congestion (Congested in 2050 but not 2024)

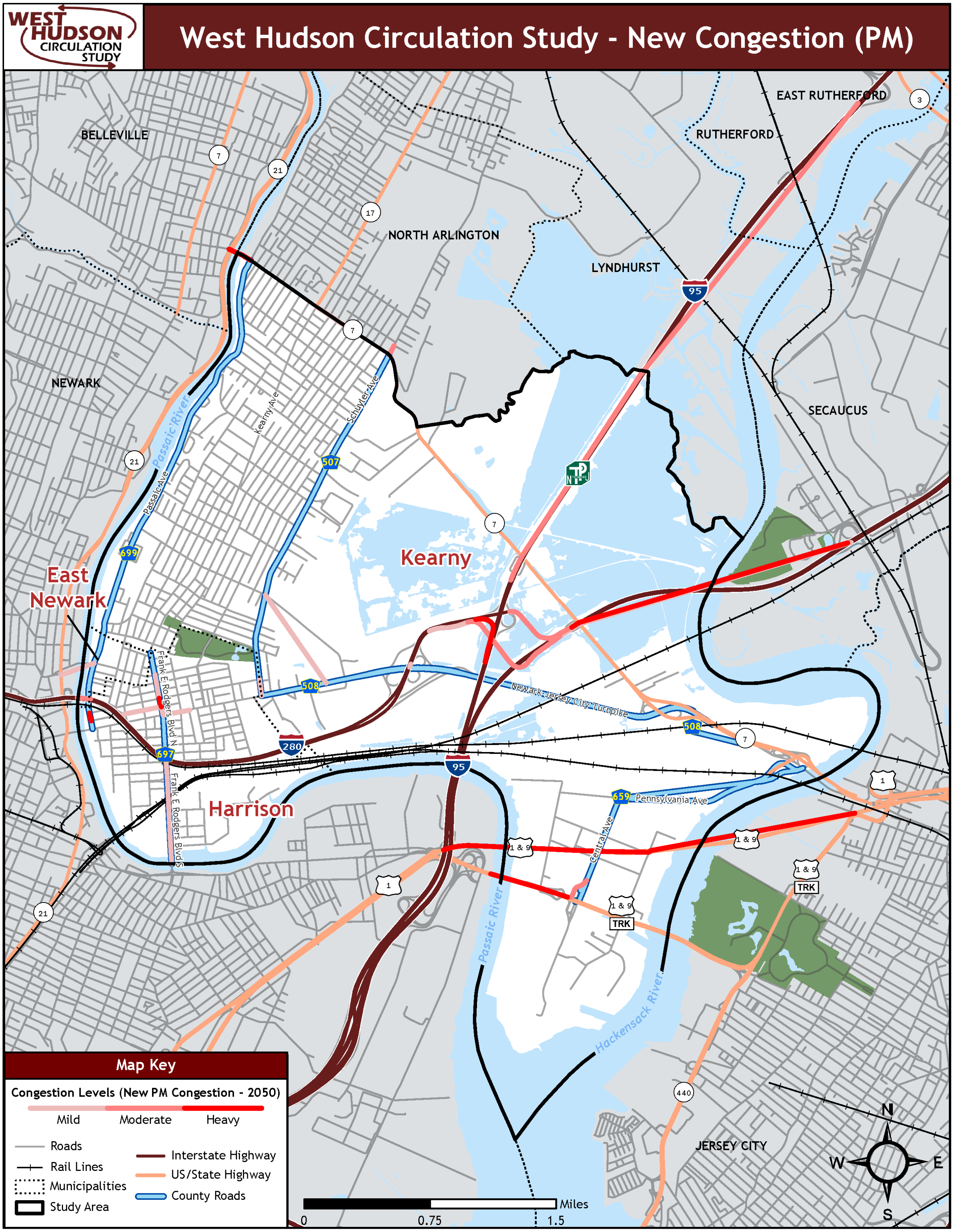

Figure 23 – 2050 PM Peak Period Forecasted Congestion (Congested in 2050 but not 2024)

2.3.4 Event Circulation

Methodology

The Sports Illustrated Stadium is a major trip generator in the study area, holding approximately 25,000 people. In addition to hosting 17 annual regular season home matches for Major League Soccer's New York Red Bulls, the stadium hosts various other exhibition matches, concerts, and smaller events, such as corporate outings, trade shows, and banquets. Access to Sports Illustrated Stadium is highly limited; all visitors traveling by car must reach the stadium via Frank E. Rodgers Boulevard (CR 697). The area northeast of the arena is industrial, while five-story apartment buildings have been developed west of the stadium, between the stadium and Frank E. Rodgers Boulevard (CR 697). Circulation on game and event days affects nearby areas of Harrison as well as the Jackson Street Bridge. Frank E. Rodgers Boulevard (CR 697) accommodates local as well as regional and event traffic for motor vehicles, buses, pedestrians, cyclists, and ride-sharing. Additionally, the Harrison PATH station is located a quarter mile from Sports Illustrated Stadium.

Event circulation patterns for the Sports Illustrated Stadium were investigated in relation to their impacts on the West Hudson study area. The Sports Illustrated Stadium website identifies three parking lots (Lots A, B, and C) next to the stadium as options for drivers. However, the website does not indicate road closures or routes for cars. The website also provides links to NJ TRANSIT and PATH service, suggesting NJ TRANSIT rail riders take the PATH from Newark Penn Station. The website also suggests that ridesharing apps follow for VIP/Valet Parking to Pete Higgins Boulevard.

The Regional Integrated Transportation Information System (RITIS) was the data source used to query speed data for four selected event and non-event dates. RITIS was used for this analysis because it provides data for specified dates whereas *Replica* provides data summarized for a season. Each event was paired with a proximal non-event day. The information collected included 24 hours of data binned into 15-minute time intervals for each date. Table 4 lists the four event and non-event dates. The Pre-Event for each event was the "Bullevard" which offers pregame activities and music for themed night home games. Special guests, including musicians and influencers are typically invited to participate in Bullevard activities with fans.[1]

Table 4 – Event Circulation Dates

Day	Date	Pre-Event Start	Game Start	Game End	Attendance	Paired Non-Event Day
Saturday	8/26/23	4:00 PM	7:30 PM	9:30 PM	26,276	8/19/23
Saturday	9/21/24	4:30 PM	7:30 PM	9:30 PM	19,751	9/14/24
Wednesday	5/29/24	4:30 PM	7:30 PM	9:30 PM	16,516	5/22/24
Wednesday	7/17/24	4:30 PM	7:30 PM	9:30 PM	15,128	7/24/24

[1] https://www.newyorkredbulls.com/sportsillustratedstadium/bullevard

Results

Key findings of the Event Circulation data are summarized below. Figure 24 and Figure 25 show data for weekend events and Figure 26 and Figure 27 show data for weekday events. All four figures include an inset zooming into the Harrison/Newark area.

Key findings for weekend events are below:

- Two to two-and-a-half (2-2.5) hours before the games start, vehicles on arterial streets within one mile experience reduced speeds more on game days for the Bullevard pre-game activities organized by the team.
- Frank E. Rodgers Boulevard (CR 697) and Harrison Avenue (CR 508) see the most significant reduction in speed. On Frank E. Rodgers Boulevard (CR 697), northbound speeds drop from 12 mph on non-event days to nine (9) mph on game days, and southbound speeds decrease from nine (9) mph to seven (7) mph. The corridor had almost no congestion southbound on the non-event day.
- Vehicles on Interstate 280 eastbound slow further west of the interchange with NJ 21 on the event day, with speeds decreasing from 45 mph on non-event days to 16 mph. This is the closest exit west of the stadium.
- Vehicles experience a reduction in speed throughout the two-hour pregame time period on the event day.
- In the evening after the event, speed reductions on arterial streets in the mile radius around the stadium are more severe than on a non-event day.
- On Harrison Avenue (CR 508) eastbound, vehicle speeds drop from 25 mph on non-event days to 14 mph on game day.

Key findings for weekday events are below:

- Vehicles reduce in speed at the start of the pregame event look similar to the non-event day Wednesday.
- About an hour and a half before kick-off, Frank E. Rodgers Boulevard (CR 697) and Harrison Avenue (CR 508) present a small decrease in vehicle speeds as compared to the non-event day. On Frank E. Rodgers Boulevard (CR 697), southbound speeds toward the stadium decrease from 12 mph to eight (8) mph, and northbound speeds passing the arena drop from 12 mph to nine (9) mph. Nevertheless, commuting traffic seems to impact the area more than the event-day traffic.
- Traffic Frank E. Rodgers Boulevard (CR 697) and Harrison Avenue (CR 508) are slower just before the event's start. On Harrison Avenue (CR 508) eastbound toward the arena, speeds drop from nine (9) mph on non-game days to 0 mph on game days.
- A half hour before the event's start, arterial streets, and major highways within a mile of the stadium operate with slower traffic than those without the game. On Interstate 280 eastbound, speeds drop from 41 mph to eight (8) mph when crossing the Passaic River before the off-ramp to the stadium, and from 22 mph to five (5) mph just before the on-ramp from West Hudson. Westbound before the off-ramp to the stadium slows from 64 mph to 57 mph.

- After the event, most arterial streets show slightly slower or similar speeds to the non-event day speeds.

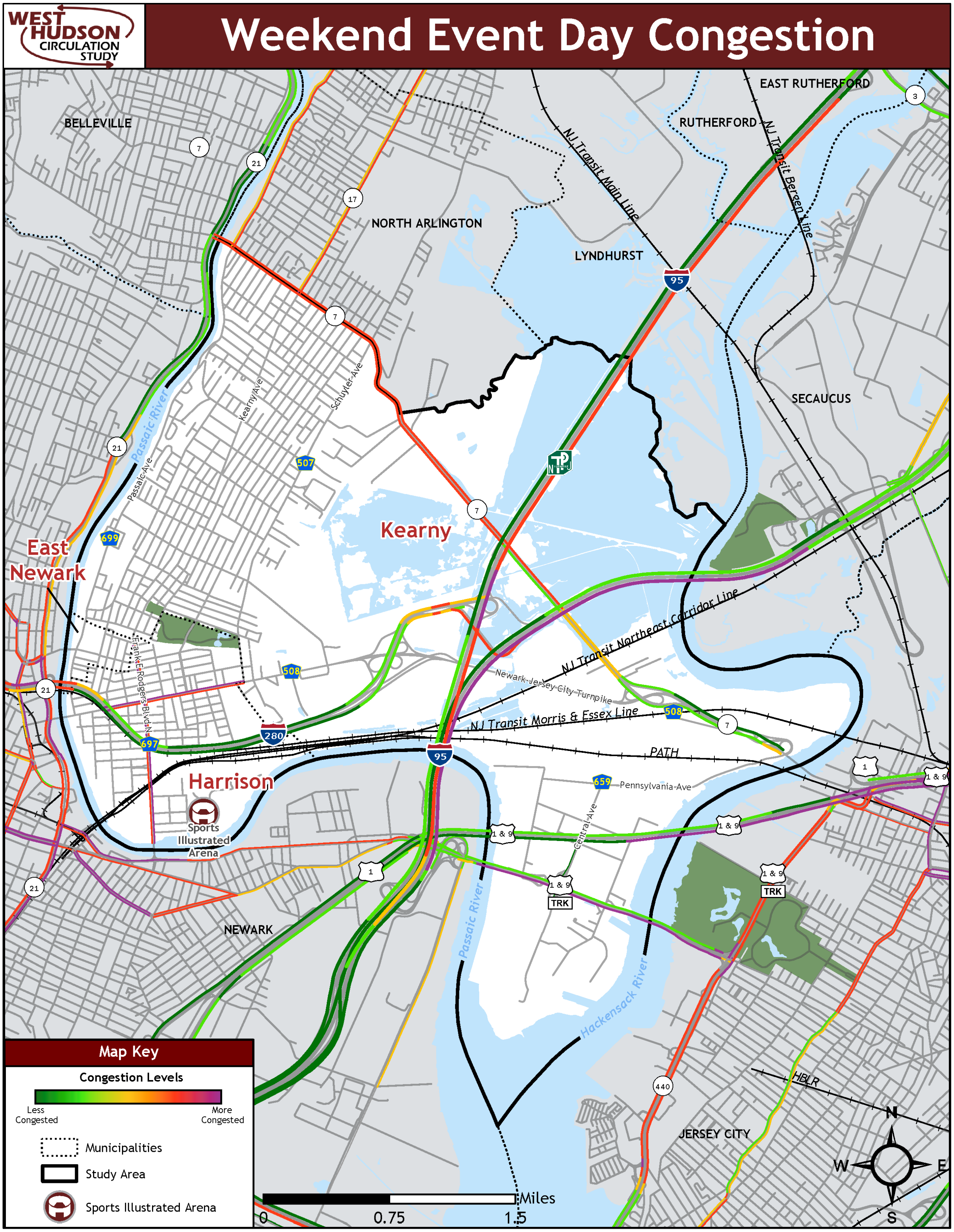

Figure 24 – Weekend Event Day Traffic Speeds

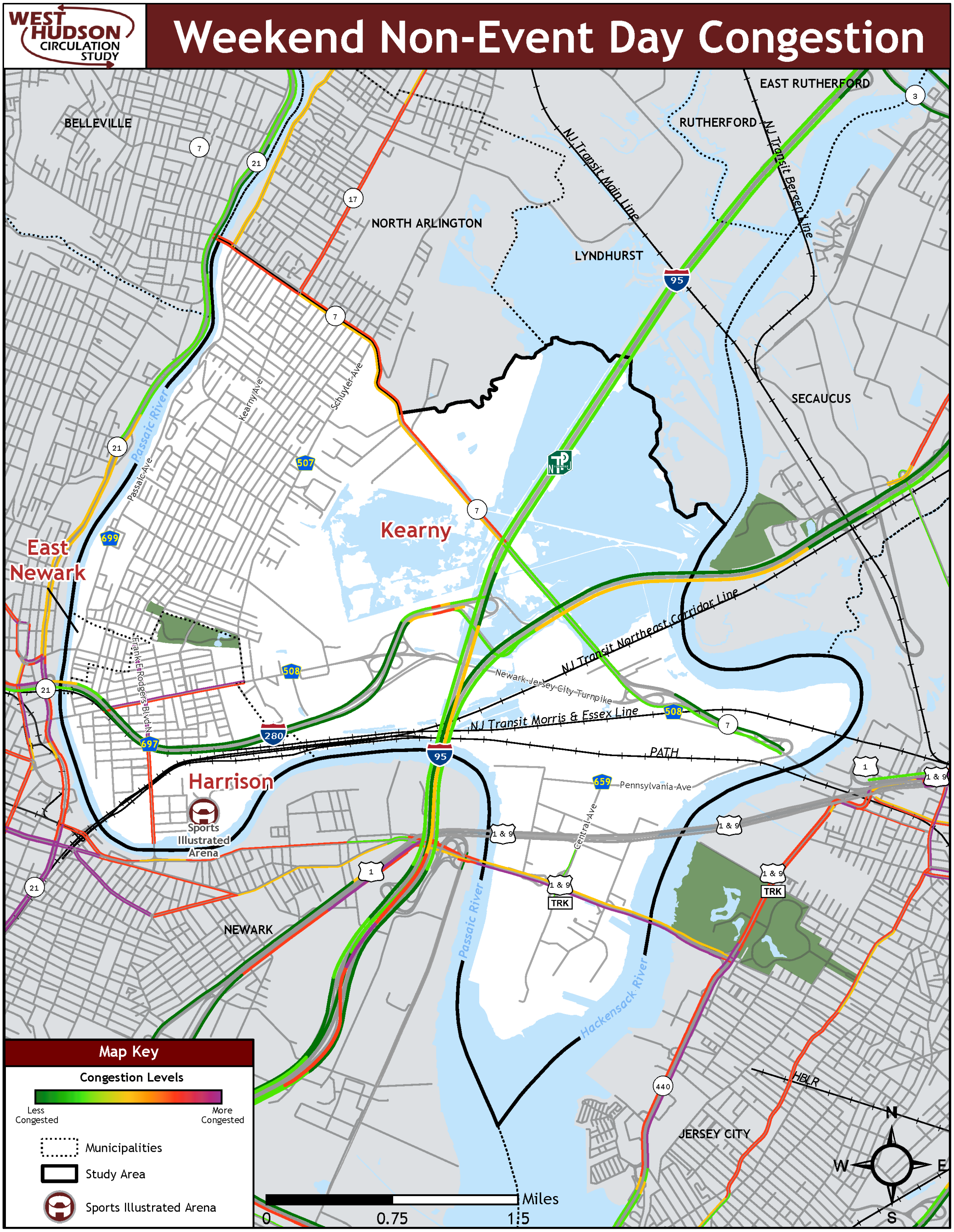

Figure 25 – Weekend Non-Event Day Traffic Speeds

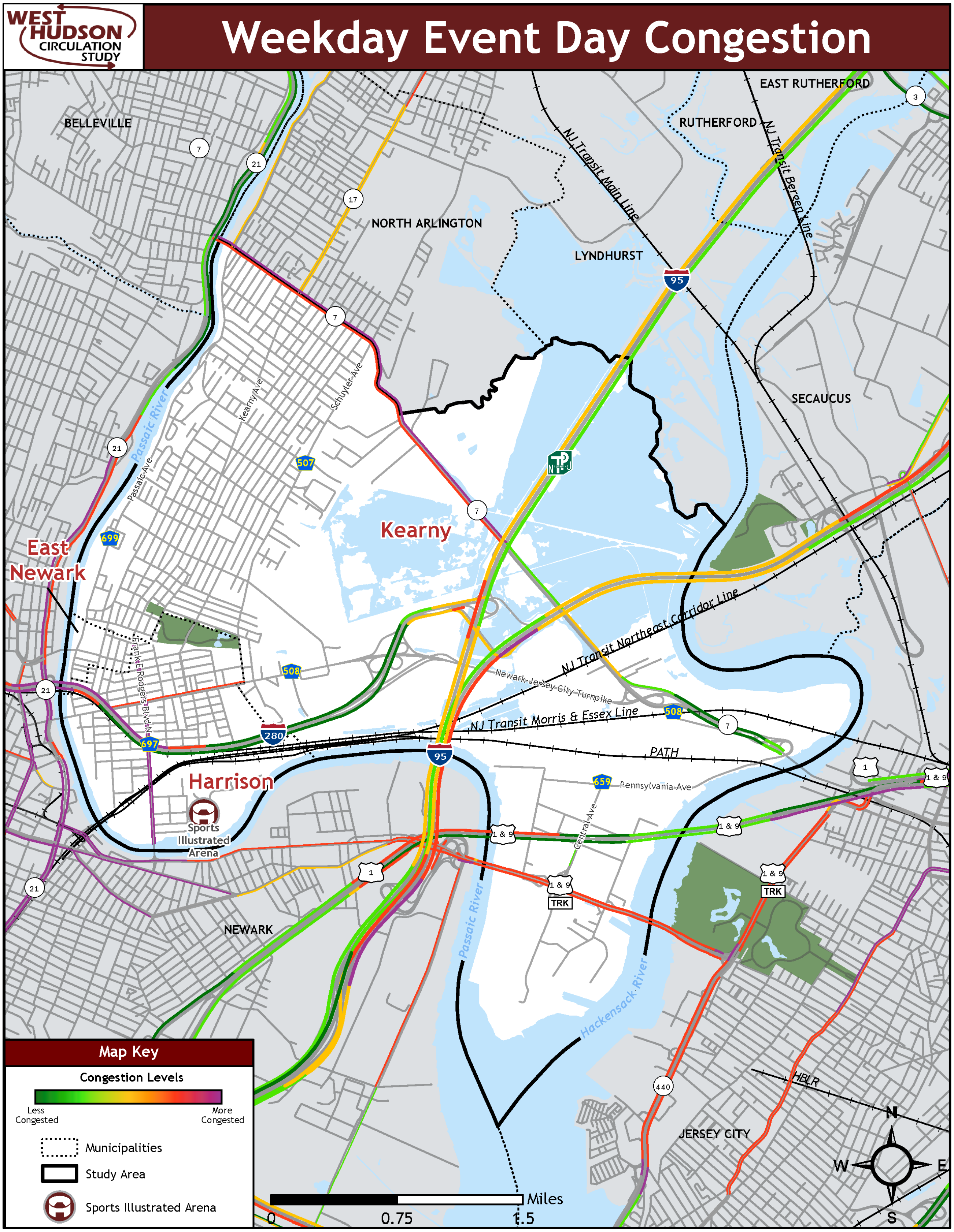

Figure 26 – Weekday Event Day Traffic Speeds

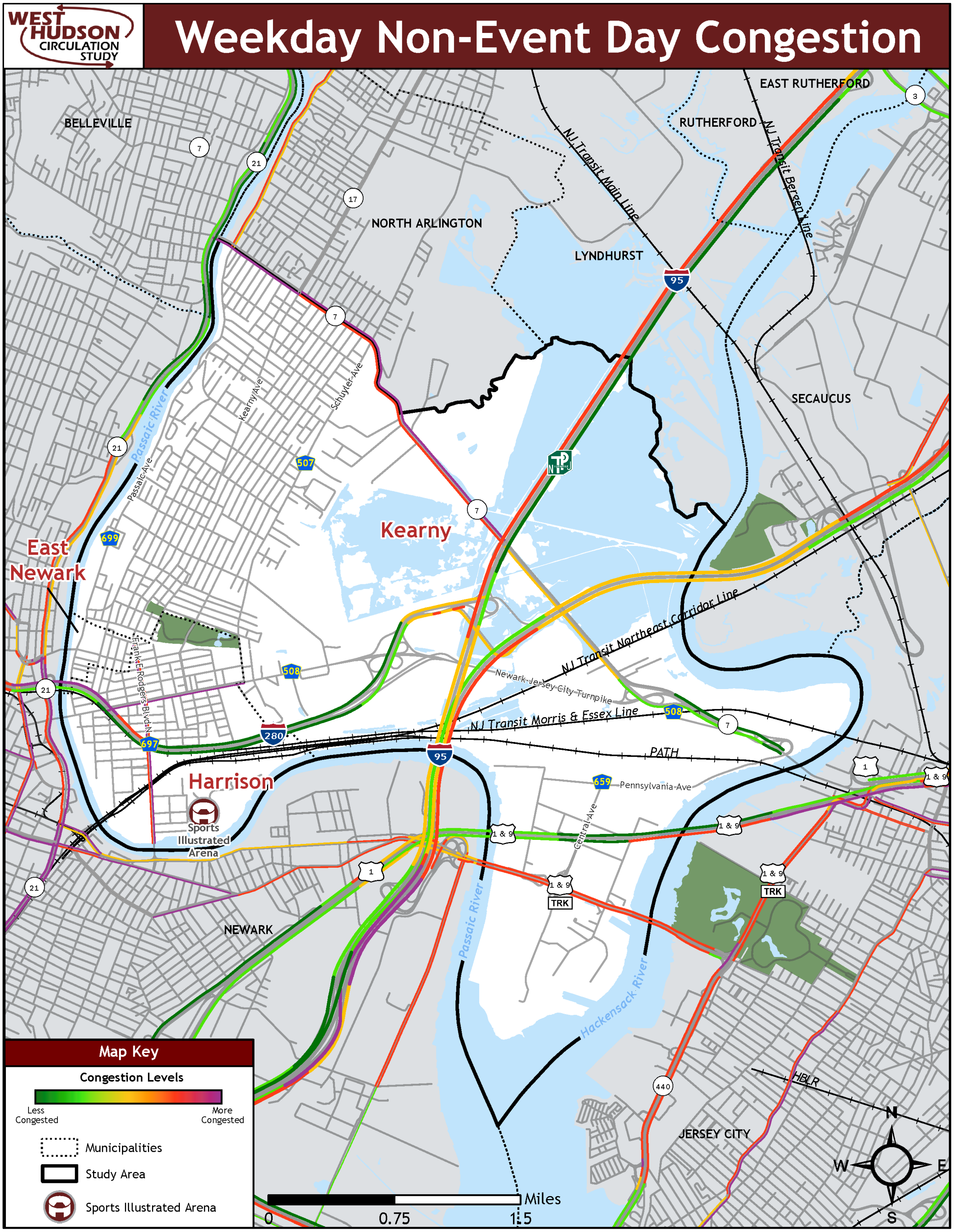

Figure 27 – Weekday Non-Event Day Traffic Speeds

2.4 Takeaways

The following conclusions can be drawn from each of the analyses:

Travel Patterns Analysis

- Key Trip Generators: Many trip generators are located in the western part of the study area, specifically those related to residential, office, commercial, and recreational uses. South Kearny is a key employment destination for the study area and region but lacks direct transportation access from the remainder of Kearny and shares the largest concentration of industrial land uses.
- Origins & Destinations: Many trips (38 percent) originating in the study area are destined for the study area itself, with the second largest share traveling to the adjacent cities of Newark and Jersey City. The nearby municipalities of Belleville, North Arlington, Lyndhurst, and Secaucus are also important origins and destinations for the study area. Traffic patterns of trips originating in the study area are similar to trips ending in the study area. A plurality of trips starting in the study area also end in the study area, and a plurality of trips ending in the study area also begin in the study area. Most of the remaining trips either start or end in nearby areas including Hudson, Essex, and Bergen counties.
  - While there is demand for connections between West Hudson and eastern Hudson County (particularly Jersey City and Secaucus), based on the identification of origins & destinations, there is greater existing demand between West Hudson and areas to the south, west, and north, including Newark, Elizabeth, Belleville, and Lyndhurst, as shown in Figure 2 and Figure 3.
- Trip Distribution & Routing: Central Avenue (CR 659), Frank E. Rodgers Boulevard (CR 697), Kearny Avenue (CR 697), and Passaic Avenue (CR 699) mainly serve local traffic, while Harrison Avenue (CR 508) and Route 7 serve more regional traffic.

Traffic Volumes Analysis

- Annual Average Daily Traffic: The interstates (Interstate 95 and Interstate 280) carry the highest motor vehicle and truck volumes in the study area. Harrison Avenue/Newark-Jersey City Turnpike (CR 508), Passaic Avenue (CR 699), and Schuyler Avenue (CR 507) offer important local and regional connections between the major interstates and residential areas of Kearny and Harrison.
- Traffic Speeds: The AM peak period operates with higher speeds than the PM peak period. Slower speeds are present in the AM peak period to/from Interstate 280 in Harrison. Roadways experiencing significantly slower speeds during the PM peak period include Interstate 95 northbound, U.S. 1&9 northbound, U.S. 1&9 Truck in both directions, and Passaic Avenue (CR 699), Frank E. Rodgers Boulevard (CR 697), and Harrison Avenue (CR 508). Major north-south County roads serving as connecting arterials and residential collectors show congestion during both peak periods, including Frank E Rodgers Boulevard (CR 697), Harrison Avenue (CR 508), and Schuyler Avenue (CR 507).
- Forecasted Traffic Conditions: During the base year (2024), there is more congestion during the PM peak period than the AM peak period. Heavy to moderate congestion is experienced on U.S.

Route 1&9 Truck moving beyond the study area and southbound on Interstate 95 and U.S. 1&9. Congestion is expected to remain along these roadways under projected (2050) conditions with an increase in AM peak period congestion along U.S. 1&9 northbound and U.S. 1&9 Truck northbound. During the PM peak period, Frank E. Rodgers Boulevard (CR 697) is expected to be newly congested (after not being congested in 2024 conditions). Approximately 13percent traffic growth is expected in the study area. Given the few expected roadway or capacity improvements in the study area, traffic conditions are projected to worsen.

- Event Circulation: On event days, roadway congestion is experienced near Sports Illustrated Stadium two – two and half (2-2.5) hours before the game's start on weekends and one hour before the game's start on weekdays. For weekend events, Frank E. Rodgers Boulevard (CR 697) and Harrison Avenue (CR 508) are heavily impacted by event circulation while for weekday events, these roadways are more impacted by daily commuting patterns than event traffic. At the conclusion of an event, speeds are more greatly impacted on weekends than weekdays.

3. Transit

3.1 Methodology

NJ TRANSIT bus route and stop data was obtained from the New Jersey Geographic Information Network. NJ TRANSIT bus ridership data for the week of January 13, 2024, was obtained from NJ TRANSIT. Monthly 2023 ridership for the Harrison PATH station was obtained from the Port Authority of New York & New Jersey. This represents the most recently available dataset at the time of the analysis.

3.2 Results

Bus ridership is generally higher on NJ TRANSIT Routes 30 and 109 in the western portion of the County, although there is one high ridership stop on NJ TRANSIT Route 1 in South Kearny. The highest ridership stop is on Frank E. Rodgers Boulevard (CR 697) at Cleveland Avenue (NJ TRANSIT Routes 30 and 109). Bus ridership by stop is shown in Figure 29 and the 10 highest ridership bus stops based on weekly riders are listed in Table 5.

Annual ridership at the Harrison PATH station was 1.7 million in 2023. As shown in Figure 30, monthly ridership peaked in October at approximately 163,000 and dipped below 112,000 in February.

NJ TRANSIT, PATH, and Amtrak data for Newark Penn Station was not obtained, but the station is located approximately 0.6 miles from the Clay Street Bridge and may offer a more convenient option for some travelers than taking the PATH from Harrison and transferring to NJ TRANSIT or Amtrak at Newark.

Table 5 – NJ TRANSIT Bus Stops by Ridership (week of January 13, 2024)

Municipality	Roadway	Cross Street	Weekly Riders	Routes
Harrison	Frank E. Rodgers Boulevard (CR 697)	Cleveland Avenue	621	30, 109
Kearny	U.S. 1&9 Truck	Hackensack Avenue	523	1
Kearny	Kearny Avenue (CR 697)	Bergen Avenue	517	30, 109
Kearny	Belgrove Drive	Woodland Avenue	493	76
Kearny	Kearny Avenue (CR 697)	Midland Avenue	422	30, 76, 109
Kearny	Belgrove Drive	Bergen Avenue	407	76
Harrison	Davis Avenue	Harrison Avenue (CR 508)	347	40
Kearny	Kearny Avenue (CR 697)	Johnston Avenue	312	30, 109
Harrison	Frank E. Rodgers Boulevard (CR 697)	Angelo Cifelli Drive	249	40
Kearny	Davis Avenue	Bergen Avenue	235	40

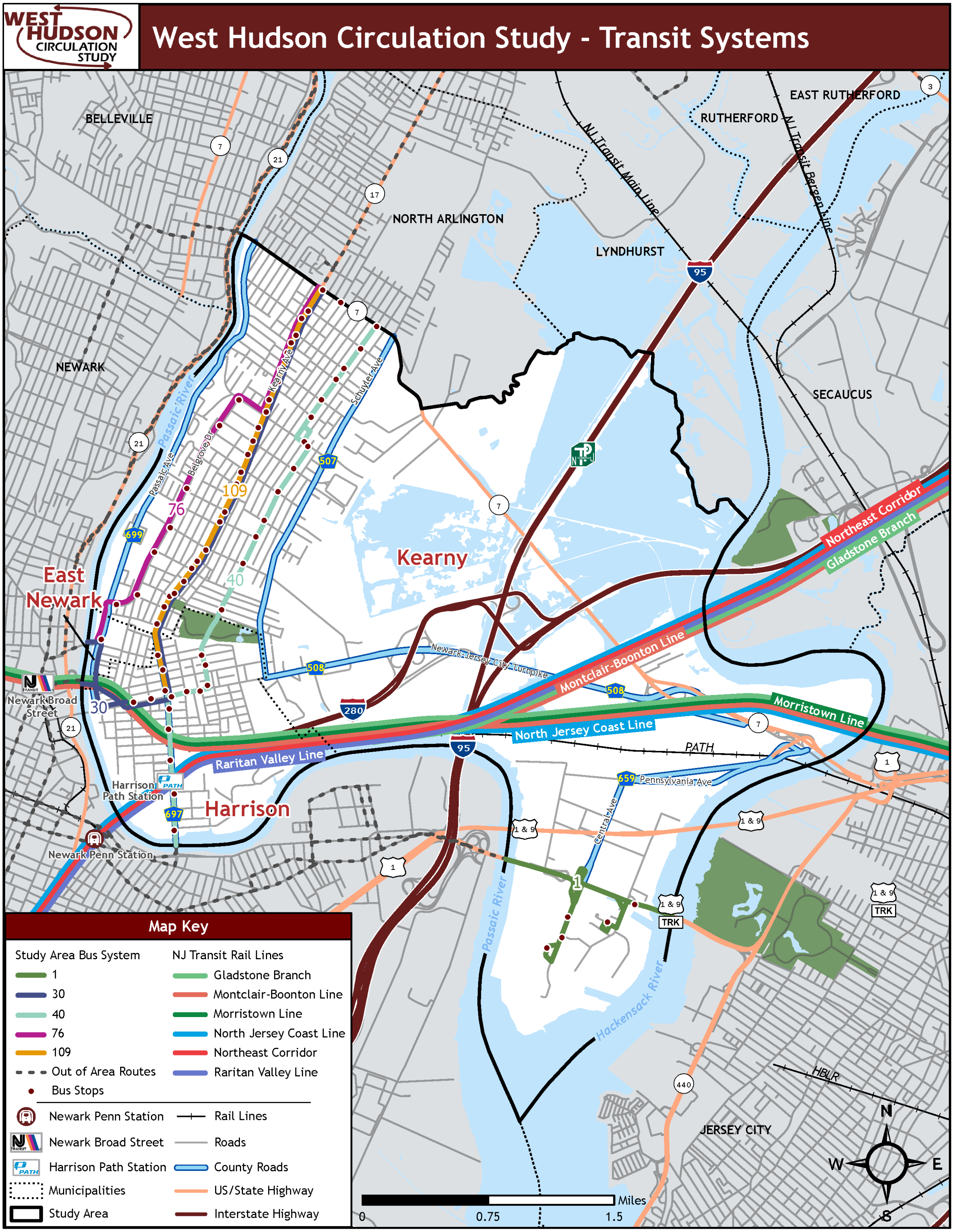

Figure 28 – Transit System

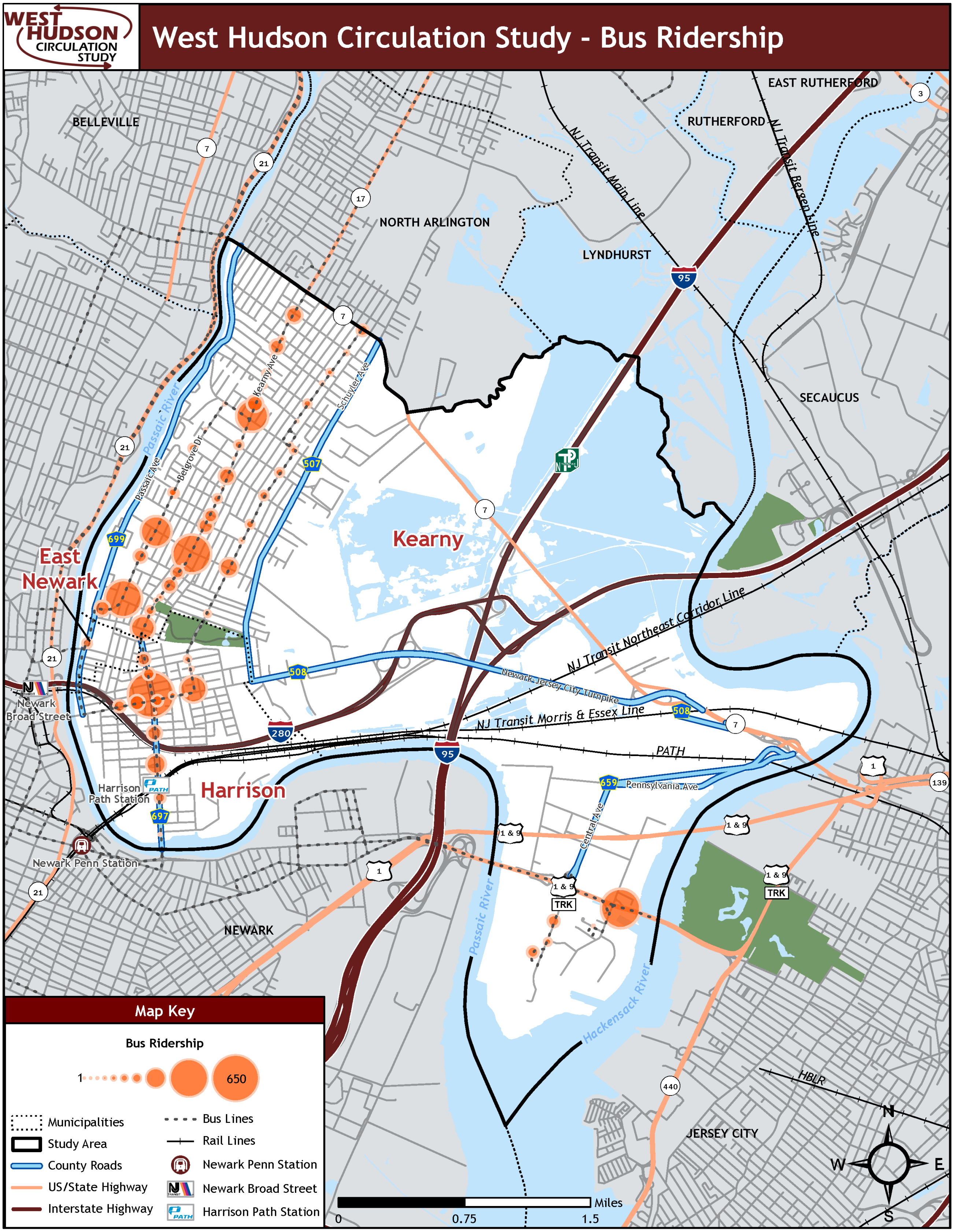

Figure 29 – Bus Ridership

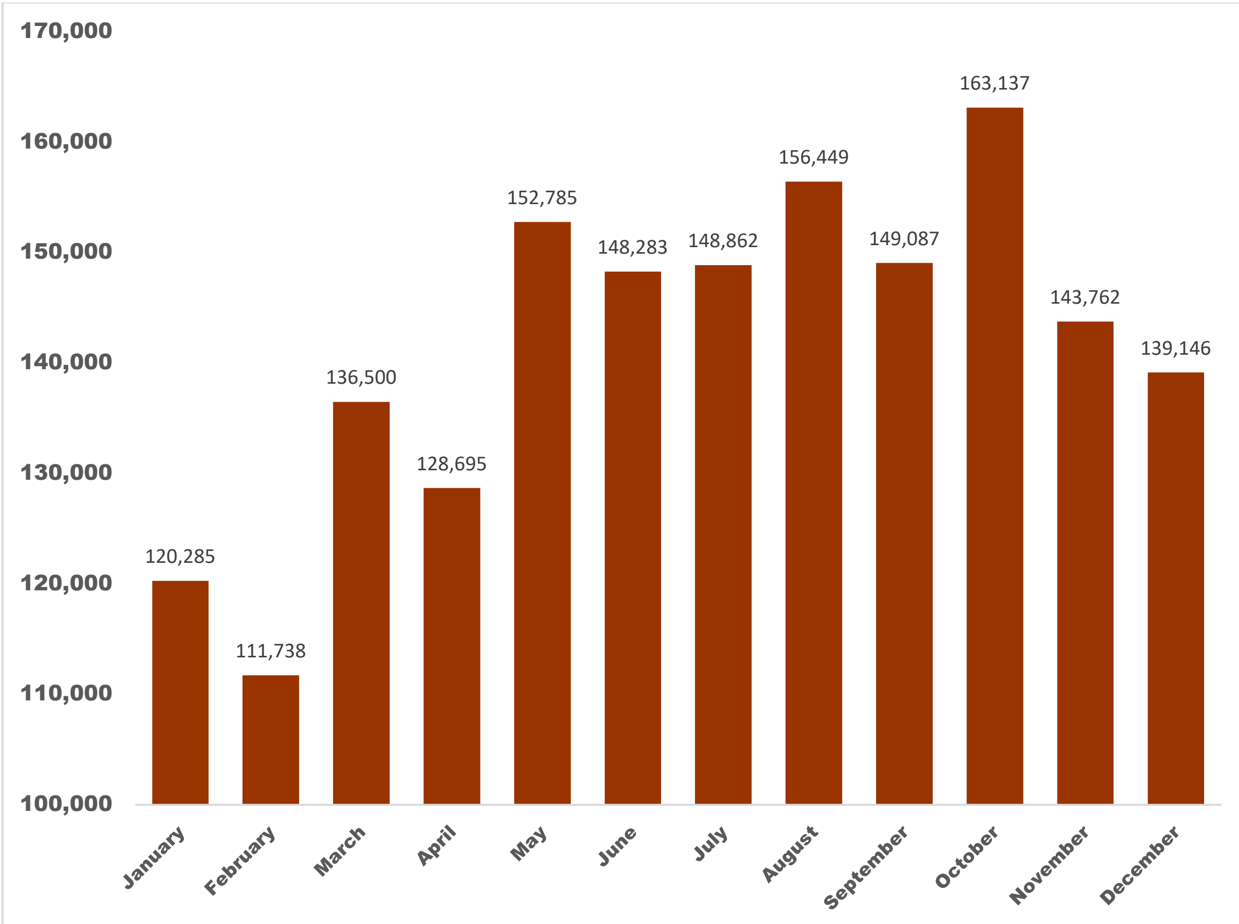

Figure 30 – Harrison PATH Ridership, Monthly Total (2023)

3.3 Ongoing and Future Rail Transit Enhancements

The Gateway Program is a major infrastructure project between Newark and Penn Station in New York City, along the Northeast Corridor (NEC), that seeks the replacement and modernization of rail infrastructure to improve capacity and other challenges in the busiest passenger rail corridor in the United States. Together, components of the Gateway Program will improve rail service reliability and capacity, while enhancing the region's competitiveness. Across the West Hudson study area, there are four critical components described below (and mapped in Figure 31) that will improve rail transit between the study area, Newark, and New York City:

Sawtooth Bridges Replacement

This project seeks to replace the deteriorating, two-track Sawtooth Bridges, built in 1907, with structures carrying four Northeast Corridor through tracks (two NEC tracks over the NJ TRANSIT Morris and Essex

Line, Conrail Center Street Branch, and the PATH tracks).[2] The bridges are located on the south side of Kearny, near the border with Harrison. The project website lists the estimated construction completion as 2032 while a 2024 Environmental Assessment states that the project could be completed and operational by 2029.

Harrison Fourth Track

This project's objective is to relocate a PATH track and signaling equipment further north to accommodate a fourth Northeast Corridor track.[3] It is located east of the Harrison PATH station, and its design includes the construction of approximately 2,000 feet of additional track along the NEC corridor. This project was completed in June 2024.

Dock Bridge Rehabilitation Project

Located on the western side of the West Hudson area, the Dock Bridge crosses the Passaic River between Newark and Harrison.[4] The project will replace an almost 90-year-old movable bridge with a fixed bridge to reduce delays on PATH, NJ TRANSIT, and Amtrak trains. It would also repair steel and concrete, as well as remediate and repaint the bridge. As of 2024, the project is in Final Design and construction is expected to be complete in 2029.

Portal Bridges

Located on the east side of the area, in Kearny, the Portal Bridge is a continuation of the Gateway Project.[5] The Portal North and South Bridges will see the construction of a second two-track bridge over the Hackensack River to improve the capacity and reliability of the current Portal Bridge. Together, the bridges will contain four tracks to match the rest of the Northeast Corridor. As of December 2024, the project is under construction and is expected to be completed in 2027.

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[2] https://amtraknewera.com/sawtooth/
[3] https://www.eclimited.com/market/rail/amtrak-gateway-harrison-fourth-track/
[4] https://www.amtrak.com/about-amtrak/new-era/infrastructure-projects/dock-bridge-rehabilitation.html
[5] https://amtraknewera.com/gateway/pnb/

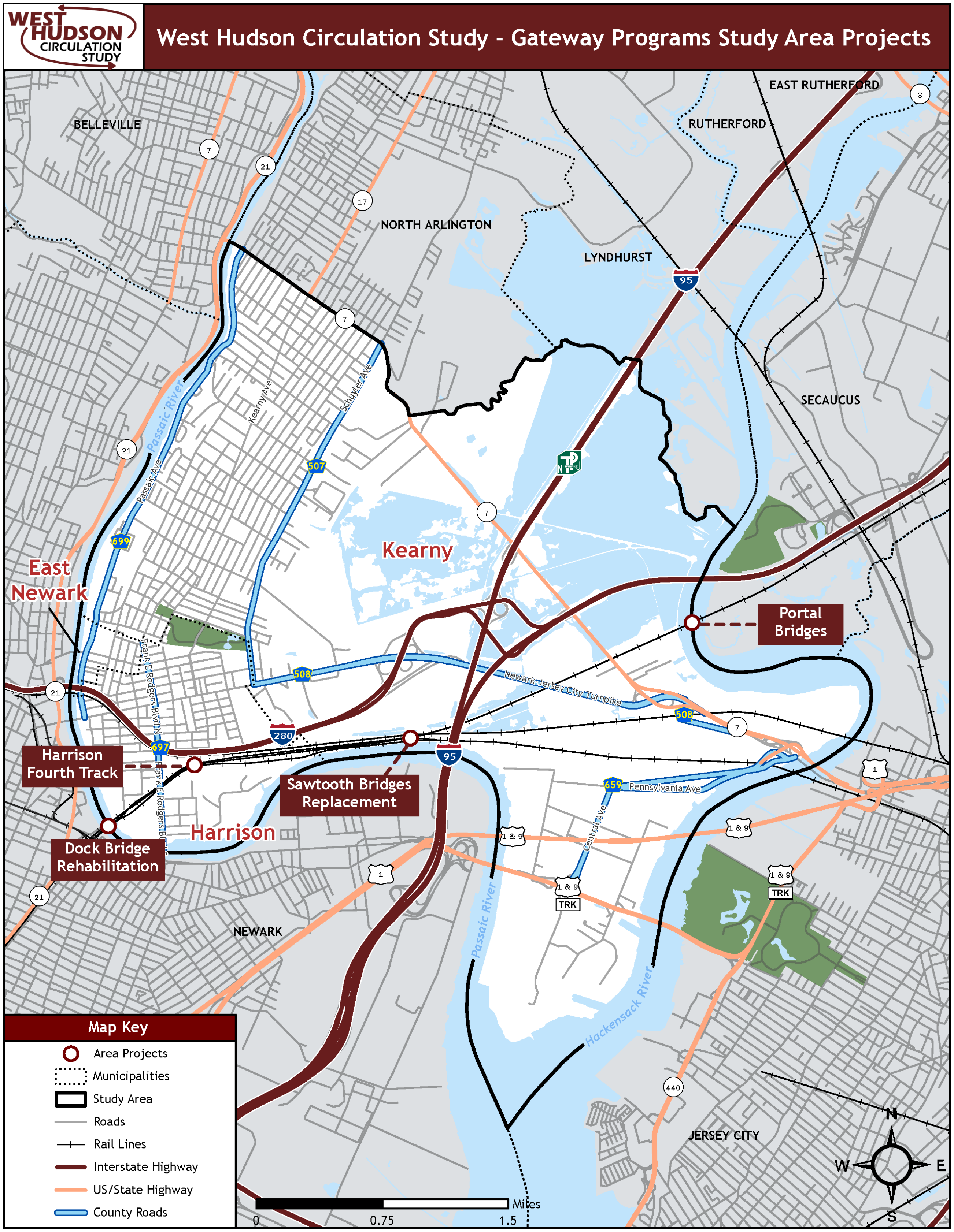


Figure 31 – Gateway Program Study Area Projects

3.4 Takeaways

- Bus ridership is generally higher on NJ TRANSIT routes 30 and 109 in the western portion of the County as well as a stop on NJ TRANSIT route 1 in South Kearny.
- In 2023, ridership at the Harrison PATH station peaked in October and reached its lowest point in February.
- The most direct means of accessing eastern Hudson County by transit is PATH. Additionally, taking NJ TRANSIT commuter rail from Newark accesses Secaucus Junction. Due to the numerous highways, environmental constraints, and proximity to New York City, several bus routes pass through but do not stop in the study area. Most bus routes in West Hudson connect to the Newark and/or Harrison transit stations. NJ TRANSIT Route 1 stops in South Kearny.
- Newark Penn Station provides an important local and regional transit connection for light rail, commuter rail, rapid transit, intercity rail, and local and regional bus.
- There is substantial planned rail transit investment in the study area, both in terms of infrastructure and operational improvements. However, much of that is focused on regional intercounty travel or travel to/from New York City.

4. Active Transportation

4.1 Walk Trip Potential

Methodology

A walk trip potential metric was utilized from the NJTPA's Regional Active Transportation Plan.[6] This metric determines where people are most likely to walk based on factors that are positively associated with pedestrian trip attraction or generation. Input variables include population, employment, intersection density, poverty, vehicle access, transit stops, and land use mix.

Results

The highest walk trip potential is in the southwestern part of the study area, which also has the highest population density. Walk trip potential is very low in the northeastern part of the study area where land is environmentally constricted. Walk trip potential is medium in South Kearny where land uses are primarily industrial and most of these walking trips are to reach manufacturing jobs. The walk trip potential is shown in Figure 32.

[6] 2023_06_16_Trip_Potential_Memo_FINAL_REVISED.pdf

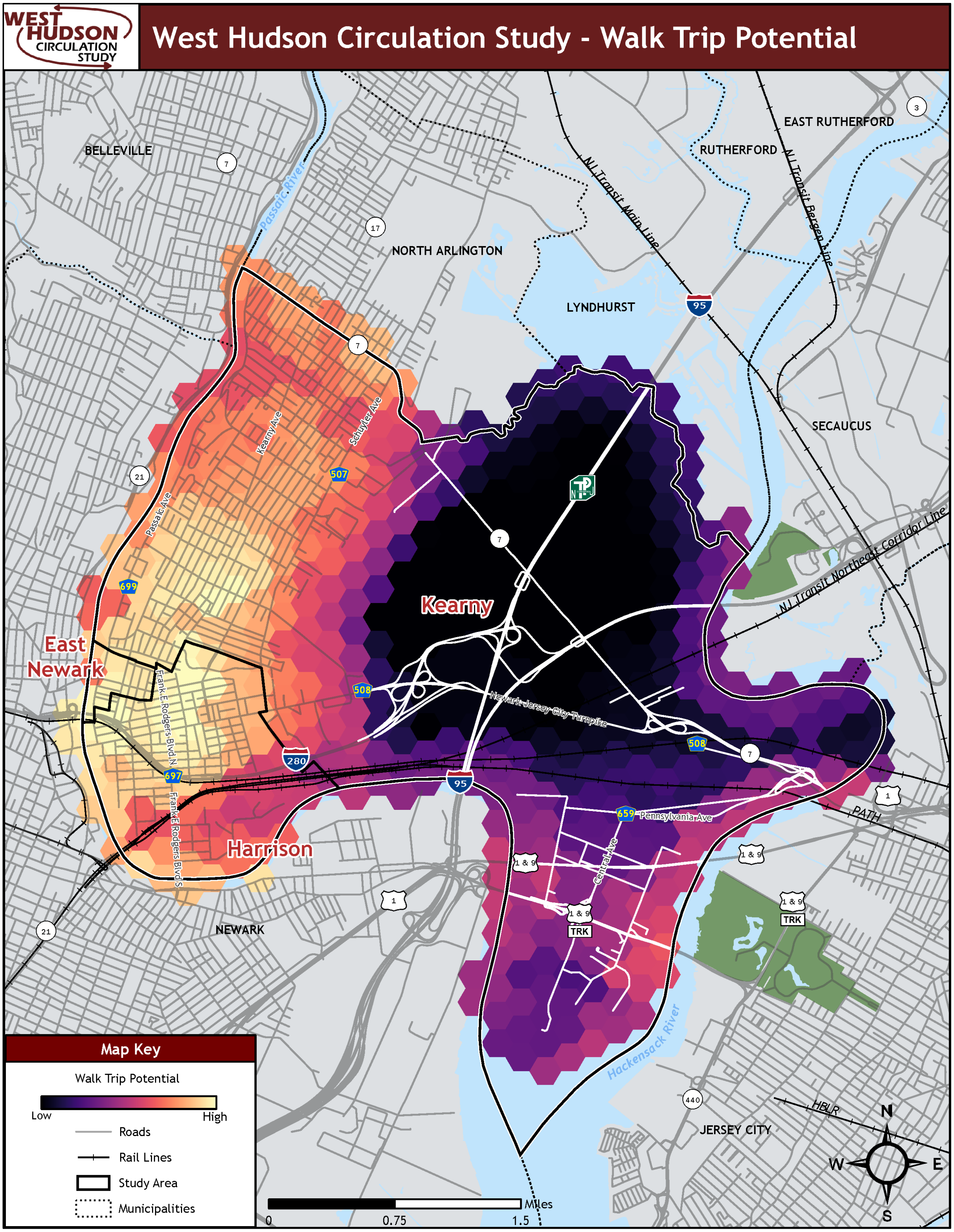


Figure 32 – Walk Trip Potential

4.1.1 Trip Attractors

Trip attractors are destinations that draw individuals for various purposes, such as work, shopping, education, or recreation. These locations typically serve as endpoints for trips originating from homes or residential areas. Identifying the origins (generators) and destinations (attractors) of trips enhances an understanding of travel patterns within a study area.

For the West Hudson accessibility analysis, four types of trip attractors have been considered: schools, recreational destinations (including parks and stadiums), transit, and civic amenities (such as town halls and libraries). A detailed list of these locations is provided in Table 6.

Table 6 – Trip attractors in West Hudson

Type of Attractor	Names	Municipality
Transit	Harrison PATH Station	Harrison
Recreational Destinations	Kearny Riverside Park Gunnell Oval East Newark Waterfront Park West Hudson Park Raymond J. McDonough Riverside Park (under construction)	Kearny Kearny East Newark Harrison Harrison
	Sports Illustrated Stadium	Harrison
Civic Facilities	Kearny Town Hall Harrison Town Hall East Newark Municipal Complex	Kearny Harrison East Newark
	Kearny Public Libraries (2) Harrison Public Library	Kearny Harrison
	Harrison Community Center	Harrison
Schools	Roosevelt Elementary School Schuyler Elementary School Franklin Elementary School Washington Elementary School Garfield Elementary School East Newark Public Elementary School Lincoln No. 3 Elementary School Kennedy Elementary School	Kearny Kearny Kearny Kearny Kearny East Newark Harrison Harrison
	Lincoln Middle School Washington No. 1 Middle School	Kearny Harrison
	Kearny High School Harrison High school	Kearny Harrison
	Hudson Arts And Science Charter School Kearny Christian Academy Marwah Academy Hamilton Intermediate School	Kearny Kearny Harrison Harrison

4.1.2 Walkshed Analysis

Methodology

A walkshed analysis is a method used to determine the area around key locations, such as transit stations or parks, that is accessible on foot within a certain time distance, typically covered by an individual walking at an average assumed speed of 3 mph. This analysis helps identify areas that are well-connected to these key locations via a manageable walk of generally five to 15 minutes and those that are less accessible. This information is crucial for enhancing community walkability and improving access to key pedestrian locations.

Transit Walkshed

The Harrison PATH Station is the only rail transit station in the study area. As shown in the following map, walkability to and from the station is generally limited to neighborhoods in the southern half of the study area – mainly in Harrison – while transit connectivity in the northern half is limited. Neighborhoods north of Bergen Avenue in Kearny are more than a 30-minute walk from the PATH station, indicating minimal pedestrian accessibility from the upper half of the study area. If cycling were a viable mode of transportation with safer facilities for cyclists, the station's accessibility would improve significantly by facilitating another mode of travel that is faster than walking.

A similar walkshed analysis was conducted for NJ TRANSIT bus stops within the study area. As shown in the following map, most of the western portion of the study area – Harrison, East Newark, and western Kearny – is located within a 5-minute walk of a bus stop given the sheer number of bus stops. This reinforces the role that buses play in serving local trips within the study area. There are few bus stops in South Kearny, mainly located at or south of Route 1&9 Truck, so accessibility within a 5-minute walk is more limited here.

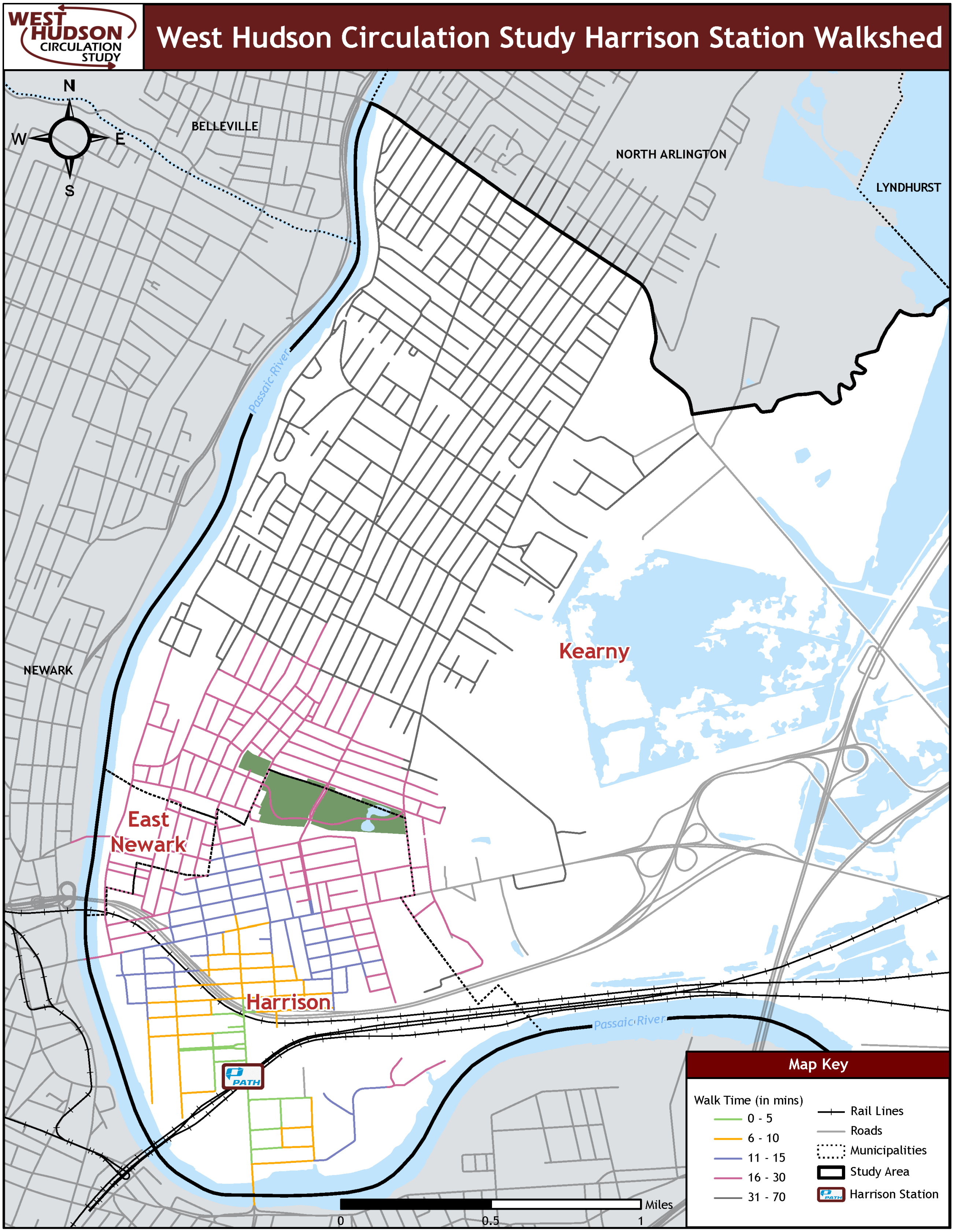


Figure 33 – Harrison PATH Station Walkshed

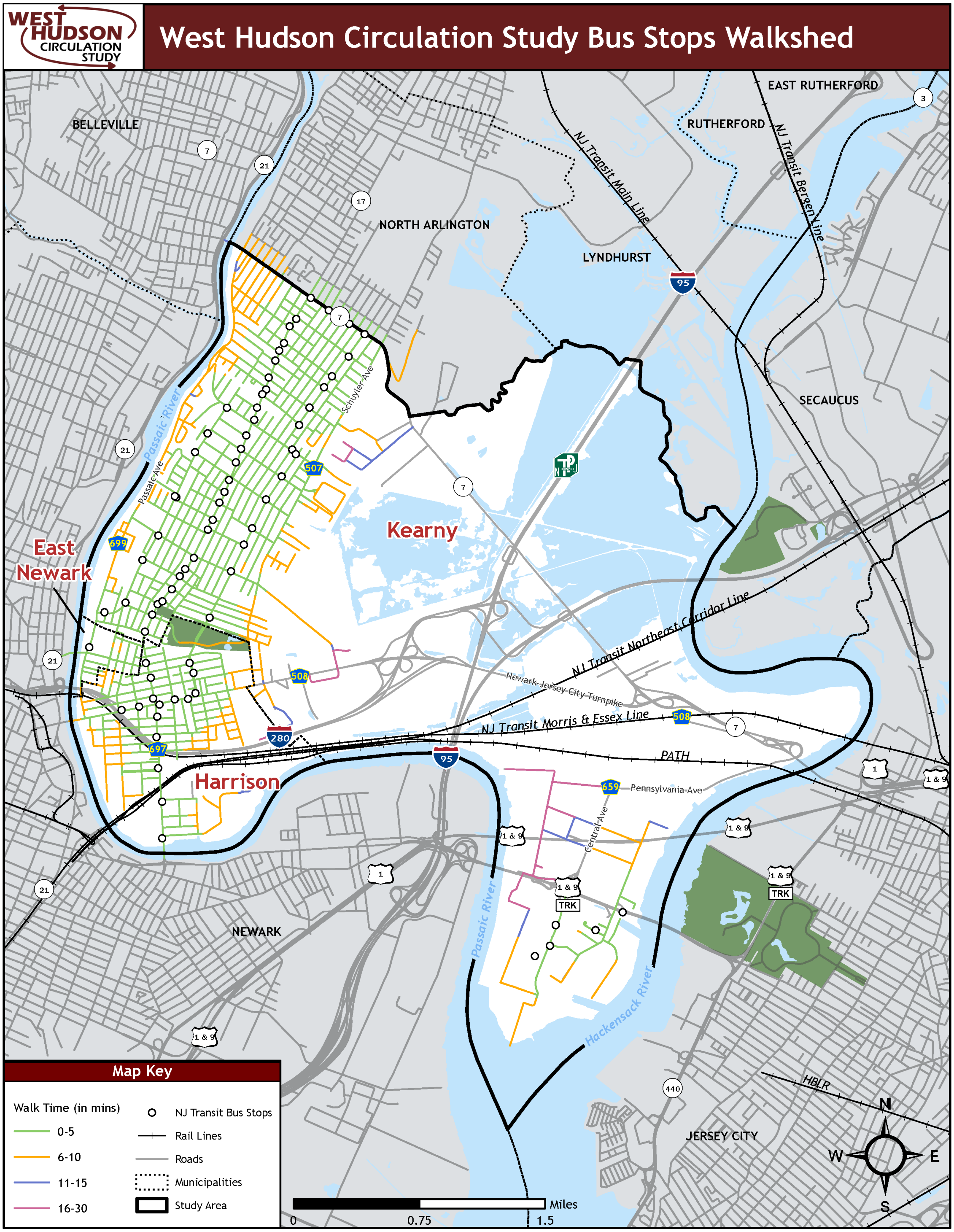


Figure 34 – NJ TRANSIT Bus Stops Walkshed

Recreation Walkshed

The study area has three major parks: West Hudson Park in Harrison, Kearny Riverbank Park along the Passaic River, and Gunnell Oval in Kearny. In addition, Raymond J. McDonough Riverside Park in south Harrison is currently under construction. Various park access points, as shown in the following map, are generally within a 15-minute walk from most neighborhoods in the study area, except for a small portion in northeast Kearny. The opening of Raymond J. McDonough Riverside Park will significantly improve accessibility to recreational facilities for nearby neighborhoods in south Harrison. However, pockets in west-central Harrison and north Kearny remain beyond a 15-minute walk access. These areas could be better connected with the addition of bicycle facilities to support biking as an alternative mode of travel and recreation.

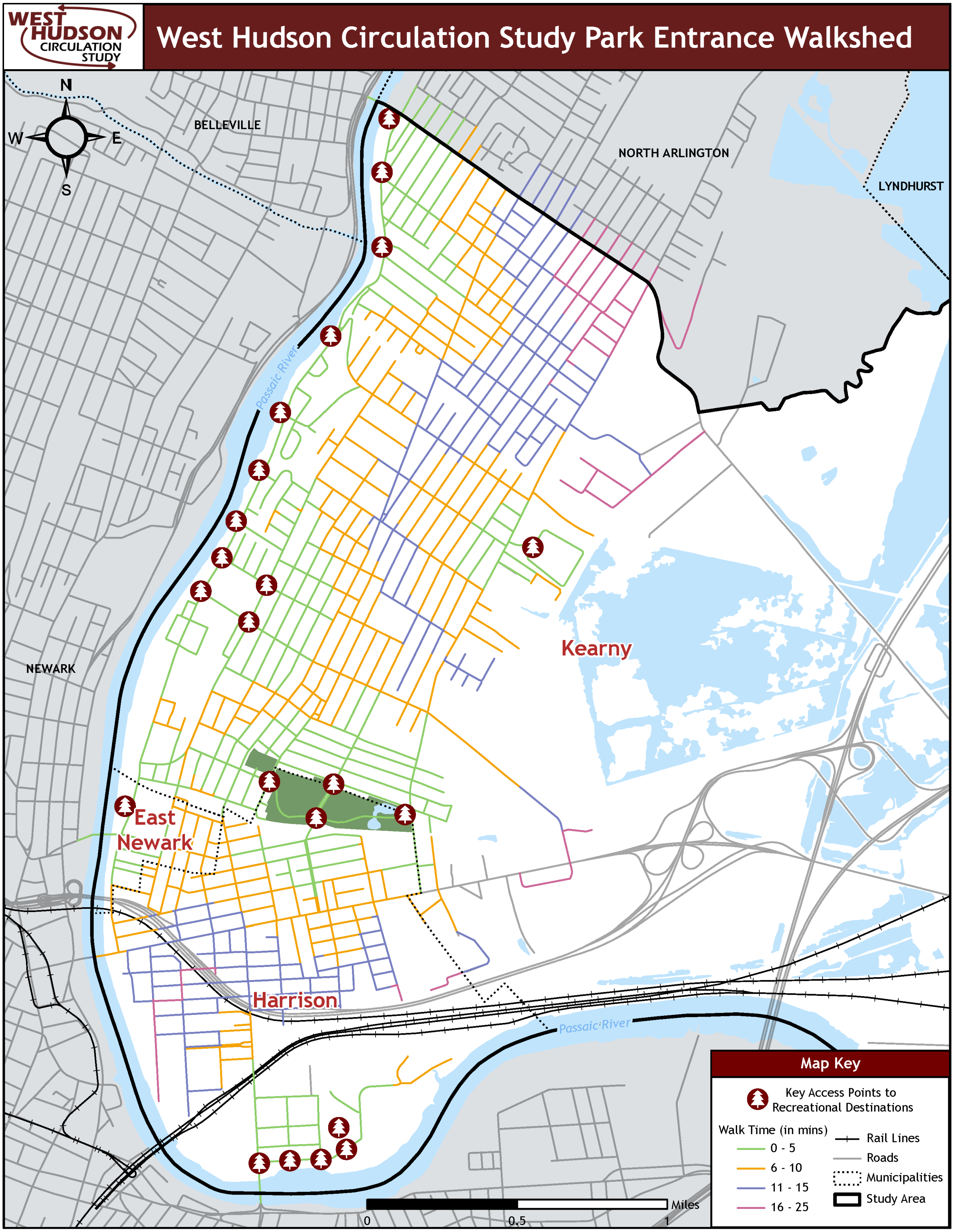


Figure 35 – Recreational Destinations Walkshed

Schools Walkshed

The study area includes 16 schools: eight elementary schools, two middle schools, four academies/institutions, and two high schools (Harrison High School and Kearny High School). Most of these schools are accessible within a 10-minute walk from any part of the study area, except for the southern part of Harrison, south of the Northeast Corridor/PATH rail lines.

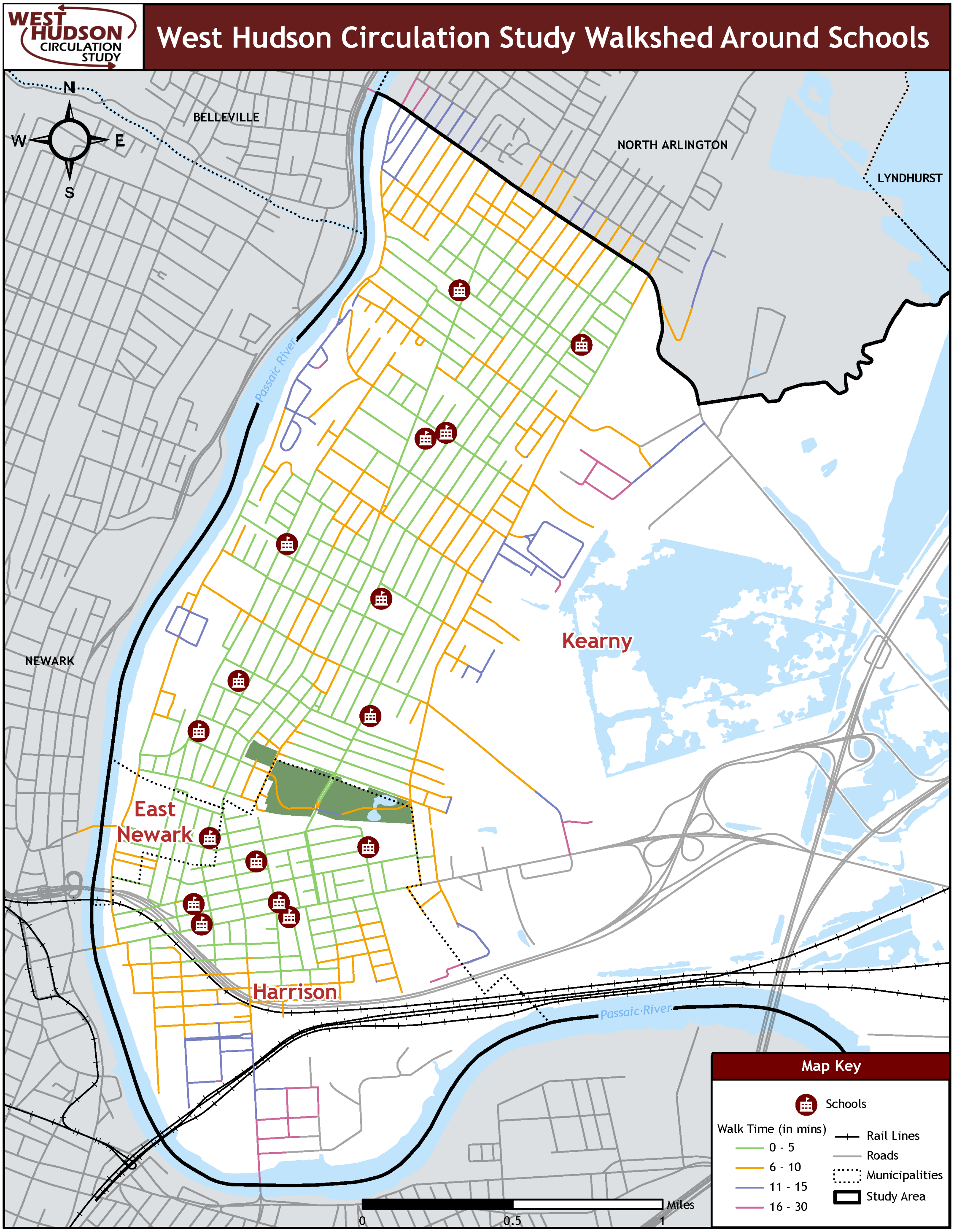


Figure 36 – School Walkshed

Civic Facilities Walkshed

There are three town halls (one in each municipality), three public libraries, and one community center in the study area. These amenities are all within a 15-minute walk from any part of the study area, except for a few areas in the west of Kearny, which are primarily commercial with big-box stores and two apartment complexes, and a large portion of north Kearny that is more than a 15-minute walk from the Kearny Town Hall. Almost all of East Newark is within a 10-minute walk of the East Newark Municipal Complex given the municipality's small geographic footprint.

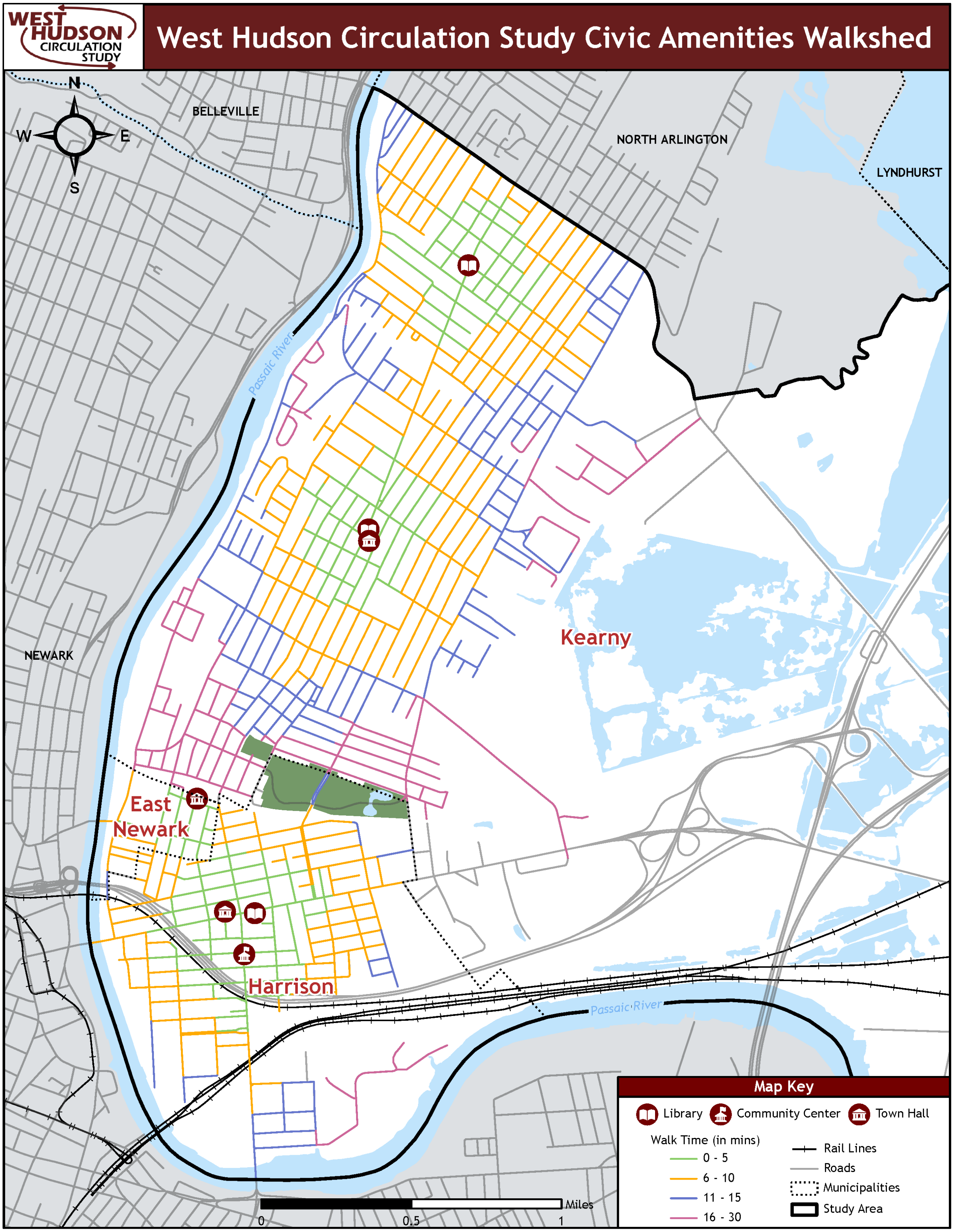


Figure 37 – Civic Amenities Walkshed

Walkshed Analysis Takeaways

- The study area's historic street grid creates a highly interconnected network of local streets and walking routes that provide accessibility to/from many key destinations, including transit, parks, schools, and community facilities. This street grid supports walking and trip distribution over multiple routes.
- The Harrison PATH Station is accessible within a 15-minute walk from many parts of Harrison. However, northern parts of the study area, north of Bergen Avenue in Kearny, are more than a 30-minute walk from the only rail station in the study area. New and safer facilities for cyclists would improve the PATH station's accessibility.
- Residential areas in the West Hudson study area are generally well served by parks within a 15-minute walk, with three regional facilities providing access to most neighborhoods and the riverfront. The development of the new Raymond J. McDonough Riverside Park will significantly enhance accessibility for neighborhoods in south Harrison.
- Schools are the most accessible facilities in the area, given their number and geographic distribution throughout the study area. Most neighborhoods in the study area are within a 10-minute walk of a school.
- Civic facilities are available in each municipality and are accessible within a 15-minute walk for the majority of the study area, with the exception of certain neighborhoods in north and south Kearny, as well as south Harrison.

4.1.3 Gaps

Table 7 – Identified Gaps in West Hudson by type of trip attractor.

Type of Attractor	Identified Gaps
Rail Station	The northern parts of the study area, north of Bergen Avenue in Kearny, are more than a 30-minute walk away from the only rail transit station in the study area.
Recreational Destinations	There are pockets of west-central Harrison and north Kearny that are beyond 15-minute walk access from the area's recreational destinations, which could be more connected if there were bicycle facilities available to support biking as an alternative mode for travel and recreation.
Civic Amenities	There are gaps in accessibility to civic amenities in north and south Kearny and south Harrison.
Schools	The southern part of Harrison, south of I-280, has relatively low accessibility to schools that are primarily concentrated in central Harrison.

4.2 Biking

4.2.1 Bicycle Demand

Methodology

Bicycle Demand reflects the potential or latent demand for bicycle facilities for residents, employees, visitors, and customers who are more likely to bike if the appropriate facilities are available. A variety of factors influence bicycle demand, including where population and job centers are located, the presence of key destinations, and demographic characteristics. A bicycle demand analysis helps to identify the bicycle accommodations and latent demand of people who would be more interested in bicycling if appropriate facilities were available.

The bicycle demand analysis follows the comprehensive analysis developed by WSP for the BIKEIRONBOUND bicycle plan (2015) and the BIKENewark bicycle plan (2024). This proven method was used for the West Hudson Circulation Study due to the availability of input data, proximity of the study areas, and comparable urban contexts. The analysis includes several indicators that were aggregated at the U.S. Census Block level for population and jobs and at the U.S. Census Block Group level for the remainder of demographic indicators. These indicators were normalized to the block area to account for the differences in block size. Data was collected within a one-mile radius of the West Hudson study area to allocate for any nearby demand generators outside of the boundary and avoid an isolated result on the periphery of the study area.

Population and jobs data was gathered at the block level (rather than block group) because of the greater weight given to these variables (discussed later in this section), and thus greater need for granularity. Block level data is not available for the other Census variables. Thus, block group level data was obtained for additional Census items. The 2018-2022 American Community Survey data obtained for the additional variables is the most recent five-year Census dataset available. Employment numbers in the study area were compared for 2019, 2020, and 2022 to determine the impacts of the COVID-19 pandemic and ensure a dataset that best reflects existing conditions was used. The data showed a slight dip in employment from 2019 to 2020 and a strong rebound of jobs in 2022. Due to what appears to be a "new normal" for employment, the most recently available jobs dataset (2022) was used. While using 2022 population data at the block level would maintain consistency with the other variables, this granularity of data is not available. Thus, it was decided to prioritize the granular geography provided by block level data rather than use 2018-2022 American Community Survey population data. Additionally, population numbers change more gradually than employment, allowing slightly older population data to reflect existing conditions.

Data sources for each factor are listed below.

<u>Census data:</u>

- Population (Block Level) – U.S. Census Bureau, 2020 Census Demographic and Housing Characteristics File

- Jobs (Block Level) – U.S. Census Bureau, LEHD Origin-Destination Employment Statistics, 2022, Version 8
- Age (Block Group Level) – U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates
- No Car Access Age (Block Group Level) – U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates
- Income < 125 percent Poverty Level (Block Group Level) – U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates
- Bike to Work (Block Group Level) – U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates
- Walk or Transit to Work (Block Group Level) – U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates

Additional GIS datasets:

- Land Use – Land Use/Land Cover 2020 Update, Edition 20231121, NJDEP
- Schools – New Jersey public, private and charter school point locations (2022-2023), NJ Office of Information Technology, Office of GIS (NJOGIS)
- Colleges and Universities – College and University Boundaries in New Jersey by Parcel, NJ Office of Information Technology, Office of GIS (NJOGIS)
- Parks – State, Local and Nonprofit Open Space of New Jersey, NJDEP
- Trails – New Jersey State Park Service - Parks and Forests Trail System, NJDEP
- Bus Stops – NJ TRANSIT Bus Stops by Line, NJ TRANSIT
- Train Stations - Light Rail Stations and Rail Stations of NJ TRANSIT, NJ TRANSIT, PATH Stations, Port Authority of New York and New Jersey

Each indicator was assigned a weight to prioritize certain variables over others and balance those indicators associated with trip generators (origins) and attractors (destinations). Weights were assigned based on earlier bicycle demand analysis conducted locally for BIKEIRONBOUND and the Newark Bike Plan.

Table 8 – Bicycling Demand Factors from Newark Bike Plan

Factors for Bicycling Demand			
Factor	Weight	Factor	Weight
Population Density	18%	Demographic Factors	29%
Job Density	18%	Under 18	6%
Key Destinations	35%	No Car Access	8%
Schools	4%	Income < 125% Poverty	5%
Universities	7%	Bike to Work	6%

Parks	4%	Walk or Transit to Work	4%
Regional Trails	3%		
Commercial	7%		
Bus Stops	3%		
Train Stations	7%		

Results

Based on the model results, a heat map was prepared to represent the potential bicycle demand across the West Hudson study area, as shown in Figure 38. The areas with the highest potential for bicycle trips are concentrated in the western residential areas of Harrison, East Newark, and Kearny, close to the city of Newark. This area coincides with where most activities and job opportunities are located. The eastern side of the study area presents lower demand for bicyclists due to the predominantly industrial character of the area and lack of residential areas or other trip generators.

The Essex-Hudson Greenway (shown on the map), a nine-mile former rail line planned to connect eight municipalities in Essex and Hudson counties, is anticipated to provide a new alternative east-west biking connection between Montclair (Essex County) and Jersey City (Hudson County). The project's current planned alignment would cross northern Kearny, improving biking and walking access to the West Hudson study area.

When evaluating potential bicycle demand, it is important to consider the need for routes between higher-demand locations. Areas with lower bicycle demand may benefit from bicycle infrastructure due to the ability to connect locations with higher demand. The bicycle network should be considered at both the local and regional levels, like the motor vehicle network.

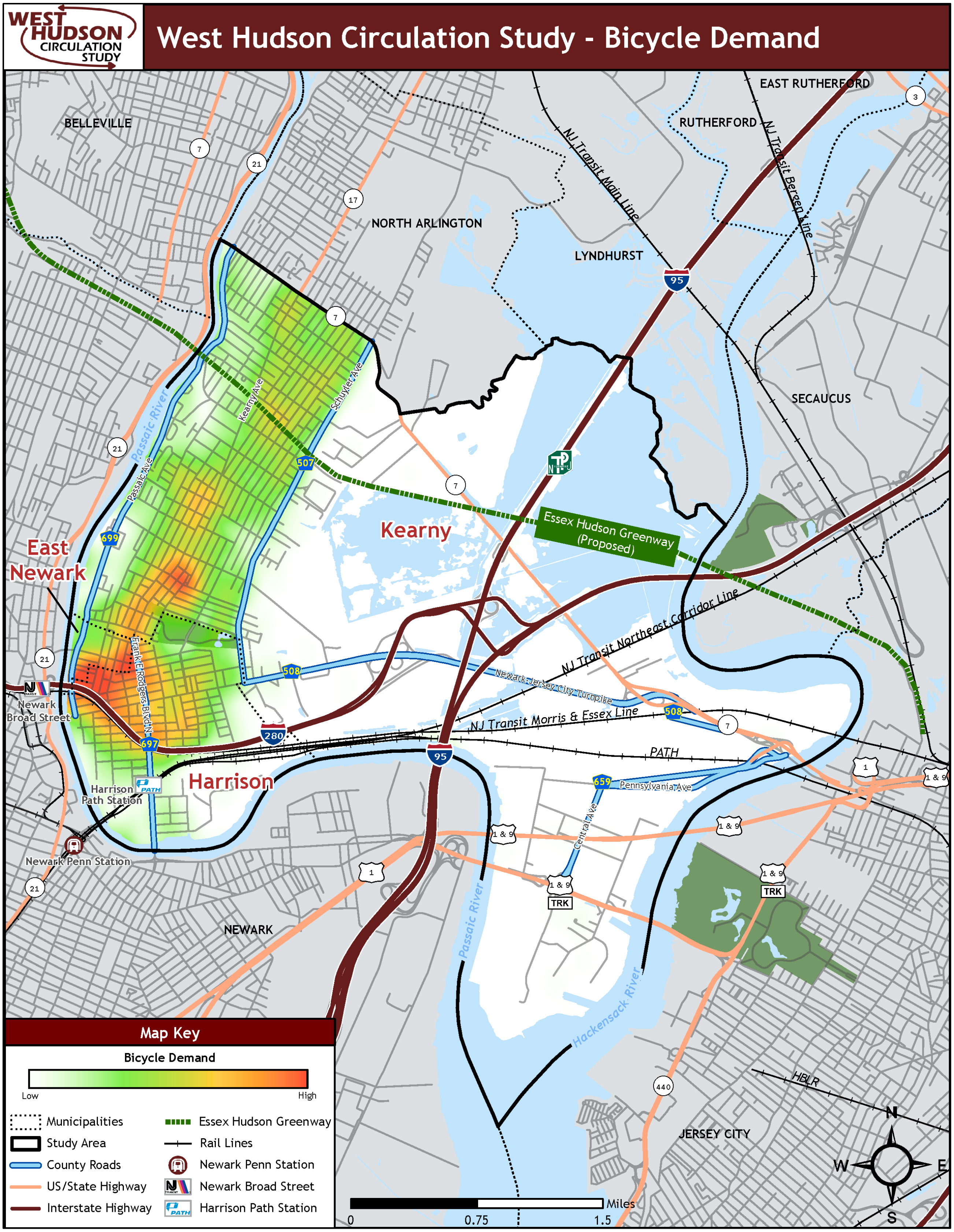


Figure 38 – Bicycle Demand

4.2.2 Bicycle Level of Bicycle Compatibility

The NJTPA has analyzed bicycle compatibility (also called level of traffic stress) of the roadway network to guide efforts at creating a regional connected bicycle network.[7] All roadways in the NJTPA region are assigned a Level of Bicycle Compatibility (LBC) score of 1 to 5. LBC 1 segments provide the most separation from higher motor vehicle volumes and speeds and the most comfort for cyclists. LBC 4 segments are typically wider roadways with higher vehicular travel speeds, while LBC 5 segments are roadways that prohibit cyclists, including limited-access highways. LBC 1 segments are suitable for comfortable and safe bicycle traffic under current conditions. LBC 2-4 segments may be suitable for new dedicated bike facilities. Specific bicycle facility recommendations will depend on roadway width, traffic volumes, traffic speeds, and proximal bicycle trip generators.

A screenshot of the LBC analysis for the study area is shown in Figure 39. Most local roadways in the West Hudson study area have an LBC of 3. Several collectors and minor arterials, including Passaic Avenue (CR 699), Bergen Avenue, Belgrove Drive, Hamilton Street, and Schuyler Avenue (CR 507) have a rank of LBC 2. Many of the larger streets serving industrial parts of West Hudson have an LBC of 4, including Route 7 / Belleville Turnpike, Central Avenue (CR 659), and US 1&9 Truck. Portions of Harrison Avenue (CR 508) and Frank E. Rodgers Boulevard (CR 697) are split between LBC 2 and 4; higher-stress sections of Harrison Avenue (CR 508) are located between North 2nd Street and Frank E. Rogers Boulevard (CR 697) and east of Sanford Avenue, while higher-stress sections of Frank E. Rogers Boulevard (CR 697) include the four-lane section between Bergen Street and the Jackson Street Bridge.

[7] https://www.njtpa.org/NJTPA/media/Documents/Planning/Regional-Programs/Bicycle-Pedestrian/Bicycle-Level-Compatibility-Analysis_1-25-23.pdf

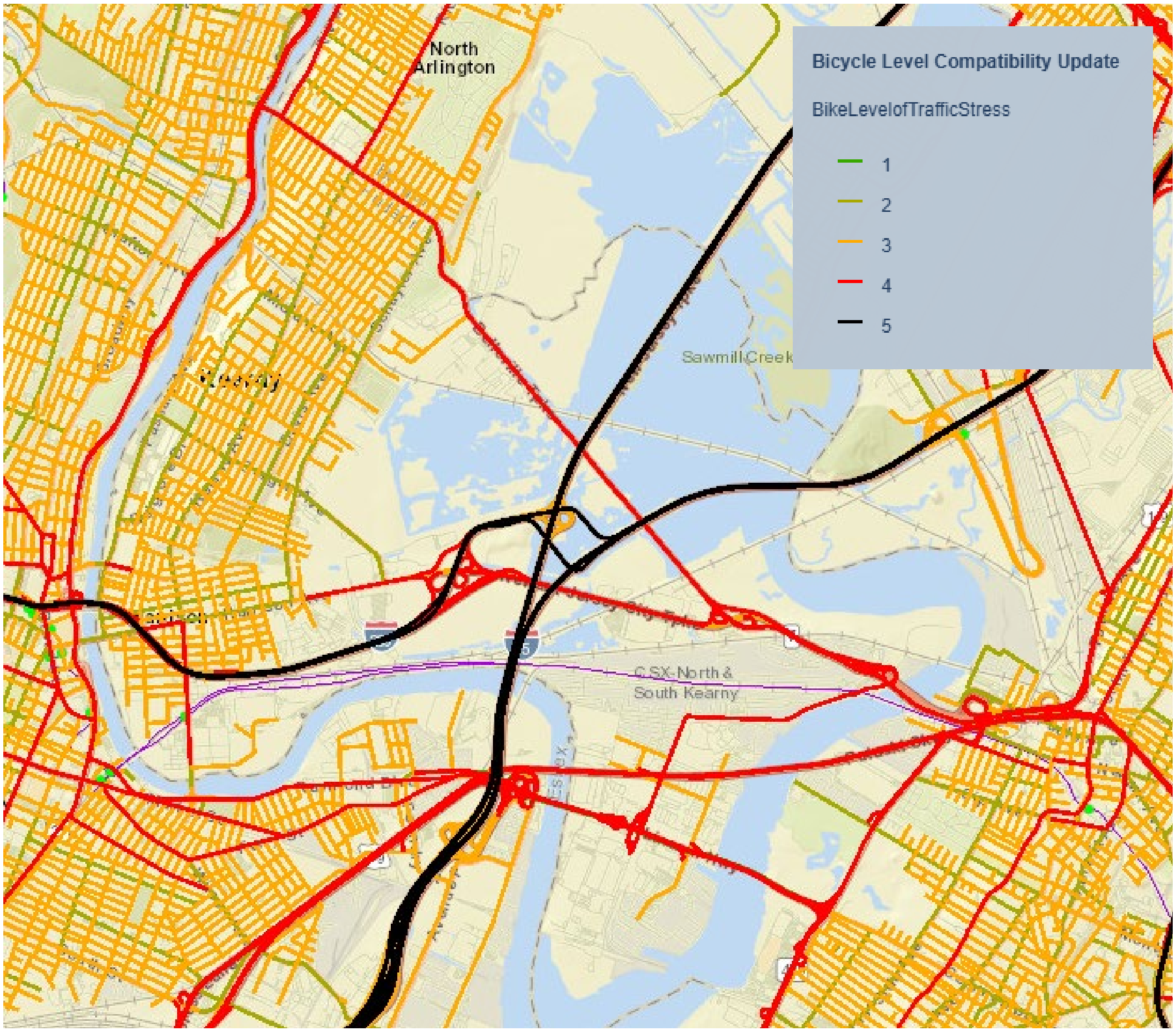


Figure 39 – NJTPA Level of Bicycle Compatibility
Source: NJTPA

4.3 Future Conditions

Planned active transportation facilities in the West Hudson study area, listed below, present an opportunity to develop walking and bicycling infrastructure and support active mobility in and around the study area. These enhancements aim to support walking and bicycling as viable modes of travel, reduce car dependency and parking demand, and improve the overall accessibility to key destinations within the study area.

- Passaic River Walkway: This 4.2-mile walkway along the Passaic River, from Belleville Turnpike to Cape May Street, provides space for walking and biking in West Hudson. The section through Kearny is mostly complete, while the section in East Newark and Harrison, between Marshall Street and Cape May Street (roughly 1.83 miles), is not yet built.

- Hackensack Avenue: This approximately 0.5-mile stretch between Campus Drive and Route 1&9 Truck is planned to be developed as an extension of the existing shared use path south of Campus Drive.
- 911 Memorial Trail: The 9/11 National Memorial Trail is a 1,500-mile system of trails and roadways linking the World Trade Center, Pentagon, and Flight 93 Memorial. It offers a safe, scenic path for walkers, runners, and cyclists to access and explore historic sites associated with the events of September 11, 2001.
- Essex-Hudson Greenway: The Greenway is a nine-mile former rail line through Essex and Hudson Counties, planned to connect eight municipalities between Montclair (Essex County) and Jersey City (Hudson County). The NJDEP is working on converting it into a linear park with recreation and transportation amenities. The planned alignment crosses northern Kearny, improving biking and walking access to the West Hudson study area and East Hudson.
- East Coast Greenway: The East Coast Greenway is a 3,000-mile walking and biking route from Maine to Florida, connecting 15 states and 450 communities.

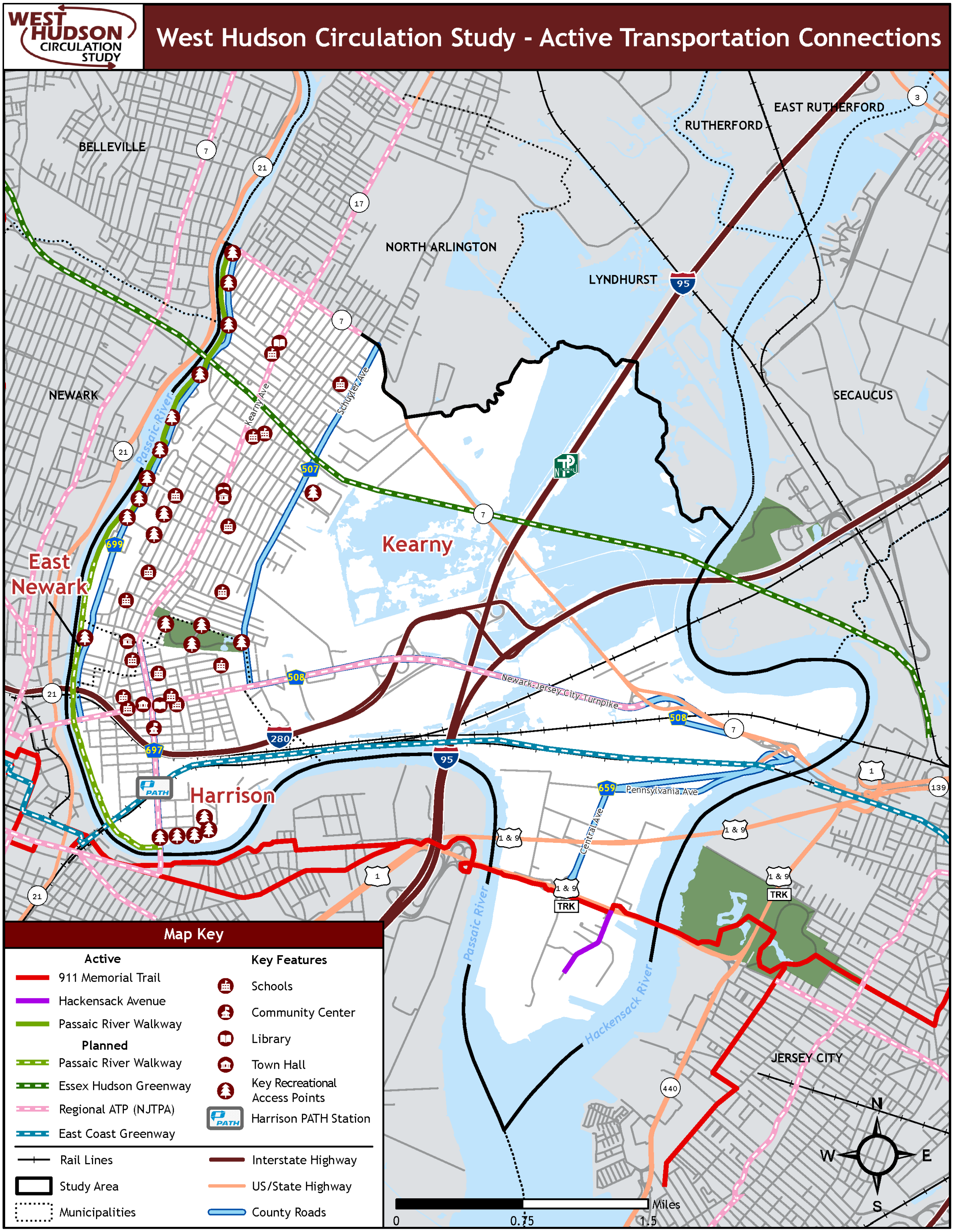


Figure 40 – Current and Future Active Transportation Improvements

4.4 Considerations

The following generalized considerations should be considered in developing more specific recommendations to improve mobility within the West Hudson study area.

- Improve east-west connectivity: Consider enhancing local bicycle and pedestrian connections within the study area to The Greenway to improve connectivity to other bikeable and walkable locations in eastern Hudson County, such as Jersey City and Hoboken. When built, The Greenway will provide a new east-west biking route between Montclair and Jersey City. The existing Greenway alignment would traverse northern Kearny, offering regional biking and walking access between the West Hudson study area and eastern Hudson County, where no such connections currently exist. Additional opportunities to enhance bicycle and pedestrian connections should be considered in future bridge projects, as bridges play a key role in linking the West Hudson study area to the larger region. Since bridge construction occurs infrequently, planning is crucial to incorporate suitable bicycle and pedestrian facilities in bridge design at an early stage.
- Improve Pedestrian Pathways: Upgrade sidewalks and pedestrian crossings to ensure safe and convenient walking routes, particularly in areas with limited walkability. Implement traffic calming measures to make walking safer and more appealing. Implement safe routes to school programs to ensure children can walk or bike to/from school safely.
- Enhance Cycling Infrastructure: Develop safe and dedicated cycling lanes, especially in areas with poor bikeability, such as the northern half of the study area. Install bike-sharing stations near key locations like the Harrison PATH Station, parks, schools, and civic amenities to encourage cycling as an alternative mode of transportation. There is potential to coordinate these efforts with the already planned bicycle facilities in the area.
- Expand Public Transit Options: Consider adding shuttle services or bus routes to connect neighborhoods in the northern half of the study area with the Harrison PATH Station. Improve transit frequency and coverage to reduce the reliance on walking for accessing transit stations.
- Develop New Recreational Facilities: Consider additional recreational spaces in underserved areas, such as west-central Harrison and north Kearny. Enhance existing parks with amenities that encourage walking and cycling, such as trails and bike racks.
- Improve navigability: Improve signage and wayfinding to help residents easily locate and access civic amenities.

In addition to the above sets of considerations, the North Jersey Transportation Planning Authority's June 2023 Regional Active Transportation Plan should be utilized to identify targeted improvements and methods in the study area. Network recommendations, as well as policy and program recommendations are included in the Regional Active Transportation Plan.

4.5 Takeaways

- Walk Trip Potential: The highest walk trip potential is in the western part of the study area, which also has the highest population density. South Kearny experiences medium walk trip potential, as expected, given its land uses.
- Bicycle Demand: The greatest bicycle demand is experienced in the southwestern residential areas, closest to Newark. Areas bordering the West Hudson study area, including Newark and Jersey City, may also experience high bicycle demand, creating a demand for adding bicycle facilities within the study area, between these two cities.
- Bicycle Level of Traffic Stress: Most local roadways in the study area have an LBC of 3. Many of the wider streets serving industrial land uses have an LBC of 4. Higher-stress segments are present on Harrison Avenue (CR 508) and Frank E. Rodgers Boulevard (CR 697).
- Connectivity: There are currently no bikeable or walkable routes connecting the study area to eastern Hudson County. The future Greenway is anticipated to provide an east-west biking connection between Montclair (Essex County) and Jersey City (Hudson County), with a current planned alignment traversing northern Kearny, improving biking and walking access to and from the study area.

5. Roadway Safety

5.1 Introduction

Hudson County adopted a Vision Zero Action Plan in March 2025 aimed at eliminating deaths and serious injuries from its roadways. With this document, Hudson County has launched a Vision Zero Initiative. The Plan signifies the County's commitment to urgently address the public health crisis of deaths and serious injuries on County roadways. This was preceded by announcing the creation of a Vision Zero Task Force in August 2023. Utilizing a data driven approach, the Plan lays out a roadmap to eliminate traffic deaths and severe injuries on county roads by 2034. The Plan features 20 strategies and more than 90 specific actions that cut across agency boundaries to better address current traffic safety issues in Hudson County. The Plan used 2017-2021 crash data from the New Jersey Division of Highway Traffic Safety (NJDHTS) Numetric tool. No new roadway safety analysis was conducted after the Hudson County Vision Zero Action Plan for this Circulation Study.

5.2 High Injury Network

The high injury network established as part of the Hudson County Vision Zero Safety Action Plan was used for the West Hudson Circulation Study. A high injury network consists of roadway segments where there is a higher concentration of severe crashes than other segments in a set geographic area. It is a data-driven process that helps identify the high-crash locations to prioritize further study and investment to achieve Vision Zero (zero roadway fatalities and serious injuries). To avoid duplicating efforts with other ongoing safety studies, crashes on local and state roads in Hoboken, Jersey City, and the Meadowlands District, and all U.S./Interstate roadways (except for Tonnelle Avenue/U.S. 1&9) were excluded from the analysis.

The Priority High Injury Network was combined with environmental justice data from the NJTPA. The two metrics (interim high injury network and environmental justice data) were normalized to operate on the same scale and given equal weight in determining the prioritized high injury network. The prioritized high injury network includes ten corridors accounting for 52 percent of crashes that result in a fatality, incapacitation, or moderate injury, 73 percent of fatal crashes, and 57 percent of severe injury crashes. Prioritized high injury networks were also defined for pedestrian and cyclist crashes. Priority high injury network roadways in the West Hudson study area are listed in Table 9.

Table 9 – Priority High Injury Network Roadways in West Hudson Study Area

High Injury Network	Road Name	Cross Streets	Municipality	Jurisdiction
All	Passaic Avenue (CR 699)	Central Avenue (CR 659) and MP 0.9	East Newark Kearny	County
Pedestrian	Bergen Avenue	Kearny Avenue (CR 697) and Schuyler Avenue (CR 507)	Kearny	Municipal

Next steps identified in the Vision Zero Action Plan include changing the culture of traffic safety, designing and building streets that are safe for everyone, partnering and collaborating through multi-jurisdictional projects, and enhancing transit and active transportation.

5.3 Crash Analysis Memorandum

The Vision Zero Action Plan's crash analysis memorandum provides a quantitative overview of crashes from 2017 to 2021 in Hudson County, identifying patterns, trends, and disparities in road safety outcomes. Key findings reveal fluctuations in the severity of road incidents over time, with certain age groups and driving behaviors implicated more than others. The analysis also highlights the disproportionate severity of crashes involving pedestrians and cyclists. The same crashes that were excluded from the high injury network analysis were excluded from the overall crash analysis. Most data in the memorandum are presented at the County level.

Municipal-level crash data for the municipalities in the West Hudson study area is shown in Table 10, Table 11, and Table 12.

Table 10 – Crashes in West Hudson Study Area

Municipality	Study Area Roadways				County Roads			
	Crashes	Crashes per Mile	KSI	KSI per mile	Crashes	Crashes per Mile	KSI	KSI per Mile
East Newark	231	95.56	0	0.00	47	101.10	0	0.00
Harrison	1,434	80.39	6	0.34	409	292.51	1	0.72
Kearny	2,581	43.64	27	0.46	612	67.00	9	0.99

KSI= killed or severely injured crashes

Table 11 – Pedestrian (PED) Crashes in West Hudson Study Area

Municipality	Study Area Roadways				County Roads			
	Ped Crashes	Ped Crashes per Mile	KSI	KSI per mile	Ped Crashes	Ped Crashes per Mile	KSI	KSI per Mile
East Newark	2	0.83	0	0.00	0	0.00	0	0.00
Harrison	76	4.26	2	0.11	17	12.16	1	0.72
Kearny	64	1.08	8	0.14	6	0.66	1	0.11

KSI = killed or severely injured crashes

Table 12 – Cyclist Crashes in West Hudson Study Area

Municipality	Study Area Roadways				County Roads			
	Cyclist Crashes	Cyclist Crashes per Mile	KSI	KSI per mile	Cyclist Crashes	Cyclist Crashes per Mile	KSI	KSI per Mile
East Newark	3	1.24	0	0.00	1	2.15	0	0.00
Harrison	26	1.46	0	0.00	9	6.44	0	0.00
Kearny	35	0.59	4	0.07	6	0.66	1	0.11

KSI = killed or severely injured crashes

5.4 Takeaways

Roadway Safety: Passaic Avenue (CR 699) (East Newark and Kearny) is on the County's overall priority high injury network and Bergen Avenue is on the County's pedestrian priority high injury network. Kearny faces more overall crashes, killed or severely injured (KSI) crashes, and crashes per mile than East Newark and Harrison. Harrison experiences the most pedestrian crashes and crashes per mile. Kearny experiences the most cyclist crashes overall and Harrison experiences the most cyclist crashes per mile. Hudson County's roadway safety analysis is ongoing, and new analyses may change which roadways are part of the various high injury networks.

6. Stormwater Management

6.1 Introduction

Localized roadway flooding and ponding significantly impact the transportation network, leading to reduced performance and an increased need for maintenance. Flooding can disrupt traffic through temporary roadway closures or lane reductions, resulting in congestion that affects both commercial and emergency operations. Additionally, flooding or ponding can cause hydroplaning or create slippery road surfaces under freezing conditions, posing safety concerns and further impacting network performance. Moreover, flooding and ponding can damage transportation infrastructure by seeping into concrete and widening cracks in asphalt.

Stormwater management is crucial in mitigating some of the negative effects of flooding on the transportation network. A brief analysis of drainage and stormwater management was conducted to aid in determining green infrastructure recommendations. This was done by gathering the environmental and water resources information for the study area, including the Hydrologic Unit Code (HUC) information, FEMA floodplains, and environmental constraints. HUC14 areas represent an area of landscape classified by the U.S. Geological Survey (USGS) that drains to a portion of a stream network and are characterized by a 14-digit code. Watershed Management Areas (WMA) are regions of New Jersey's watersheds classified by NJDEP. The low points were found using Lidar and then checked on Google Streetview to note the status of inlets and erosion. Recommendations for green infrastructure, such as bioswales, pervious pavement, and rain gardens, were then made based on this information. Maps were created for the flood hazard area, threatened and endangered species, groundwater contamination, and green infrastructure recommendations.

6.2 HUC 14

The HUC14 area codes within each WMA for the study area are noted below. See attached Watershed Management Areas (WMA) Map in Appendix A.

- WMA 4, Lower Passaic and Saddle: 02030103150030, 02030103150040, 02030103150050
    - Contains study areas: Kearny, East Newark, and Harrison
    - Contains redevelopment areas: Passaic Avenue, East Newark, Harrison Waterfront, Kearny Area, Schuyler Avenue, Belleville Turnpike
- WMA 5, Hackensack, Hudson, and Pascack: 02030103180090, 02030103180100
    - Contains study areas: Kearny
    - Contains redevelopment areas: Kearny Point Redevelopment, Kearny Area, Koppers Coke, Industrial Park

6.3 Flood Hazard Areas

- Most of Kearny is in the 100-year flood hazard area. Areas of Harrison and East Newark bordering the Passaic River are in the 100-year flood zone. Redevelopment areas in the 100-year flood zone include: Kearny Point Redevelopment Area, Kearny Area Redevelopment, Koppers Coke

Redevelopment Area, Belleville Turnpike Redevelopment Area, Harrison Waterfront Redevelopment, East Newark Redevelopment, and Passaic Avenue Redevelopment Area.

- Portions of the 500-year flood hazard area cover the Passaic Avenue Redevelopment Area, East Newark Redevelopment Area, and Harrison Waterfront Redevelopment Area.
- See attached Flood Hazard Areas Map in Appendix A.

6.4 Environmental Constraints

6.4.1 Threatened and Endangered Species

- Most of eastern Kearny has areas that contain the four rankings of Threatened & Endangered Species (Rank 1 – Habitat specific requirements, Rank 2 – Special concern, Rank 3 – State Threatened, Rank 4 – State Endangered). Lands bordering the Passaic River and Hackensack River are either designated as having Habitat Specific Requirements or being state threatened or endangered.
- See attached Threatened and Endangered Species Map in Appendix A.

6.4.2 Groundwater Contamination Areas

- All municipalities contain sites of groundwater contamination, except some of the higher elevated residential areas in Kearny.
- See attached Groundwater Contamination Area Map in Appendix A.

6.5 Google Streetview Survey

Google screenshots of low points within the study area are displayed below with a short description regarding the condition of the pavement or inlet, i.e., whether the inlets are bicycle-safe; whether they have "Dump No Waste" signage; or whether the inlet is visibly obstructed. Bicycle-safe grates prevent cyclists' wheels from getting stuck in the grate, which could lead to injury. "Dump No Waste" signage is important to deter people from discarding garbage that can block inlets and cause ponding on the roadway. Low points were all found to have an inlet nearby. The Object ID refers to the location where each Google Streetview was captured, and Google Streetview dates are provided for context.

See attached Google Streetview Survey Map in Appendix A to locate where each Google Streetview screen capture was taken.

6.5.1 Kearny

Object ID 1 and 2 (October 2021): Near the intersection of Hackensack Avenue and Campus Drive, ponding in parking lot and manhole. Pervious pavement recommended.

Object ID 3 (October 2021): Near the intersection of Hackensack Avenue and Campus Drive, inlet - no "fish sticker/dump no waste" present on inlet at low point. Updates to inlet grate is recommended.

Object ID 6 (October 2021): Along Central Avenue, in between Mack Boulevard and Distribution Avenue, ponding and inlet at low point. Regrading is recommended.

Object ID 7 (October 2021): Along Central Avenue, in between Mack Boulevard and Distribution Avenue, eroded curb and possible for green infrastructure. Grass swale recommended.

Object ID 48 (August 2022): Along Newark Turnpike median barrier inlets at low point, near the intersection of Newark Turnpike and Fish House Road, in good condition.

Object ID 49 (July 2022): Along Belleville Turnpike, offramp of Newark Turnpike, inlet at low point is filled with debris along ramp. Maintenance and updates to inlet recommended to prevent blockage.

Object ID 45 (July 2018): Along Harrison Avenue adjacent to a large shopping center (Walmart), inlets at low point – “fish sticker/dump no waste” sign present. Many potholes/eroded pavement. Rain garden is recommended.

Object ID 50 (June 2023): Along the Essex Freeway, double inlet below guiderail on ramp at low point. Google Streetview inconclusive due to distance from inlet.

Object ID 51 (October 2020): Along Newark Turnpike offramp to Essex Freeway, inlet – no “fish sticker/dump no waste” present on inlet, not bicycle safe. Updates to inlet grate or curb piece recommended.

Object ID 52 (August 2022): Along Harrison Avenue, in between Essex Freeway and Bergen Avenue, inlet is overgrown with vegetation at low point. Maintenance is recommended.

Object ID 53 (August 2021): Along Harrison Avenue, in between Essex Freeway and Bergen Avenue, inlet is blocked by debris and overgrown materials at low point. Maintenance is recommended.

Object ID 54 (September 2021): Along Bergen Avenue, near the intersection with Harrison Avenue, inlets both with “fish sticker/dump no waste” present, in good condition.

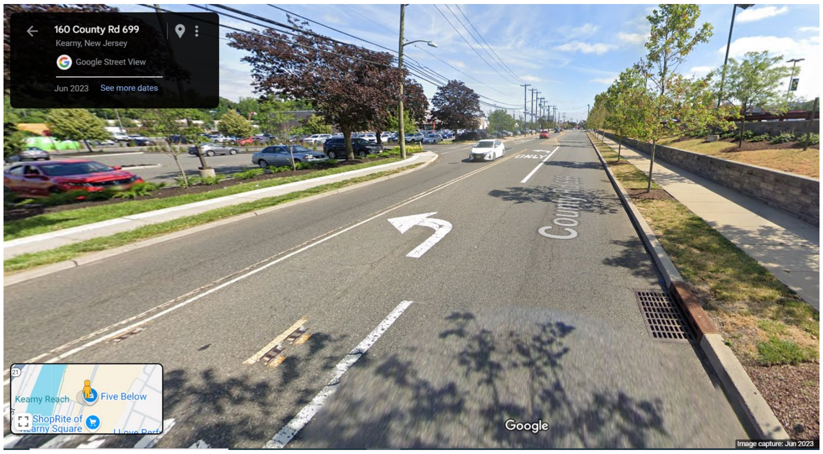
Object ID 55 (September 2021): Along Bergen Avenue, near the United States Post Service Priority Mail Processing Center, inlets in good condition on both side of the road.

Object ID 56 (March 2023): Along Essex Freeway near the Kearny Toll Plaza (15w), inlets at median barrier – "fish sticker/dump no waste" not present. Updates to inlet grates recommended.

Object ID 57 (March 2023): Along the Essex Freeway, under the New Jersey Turnpike overpass, inlets at median – "fish sticker/dump no waste" not present. Updates to inlet grates recommended.

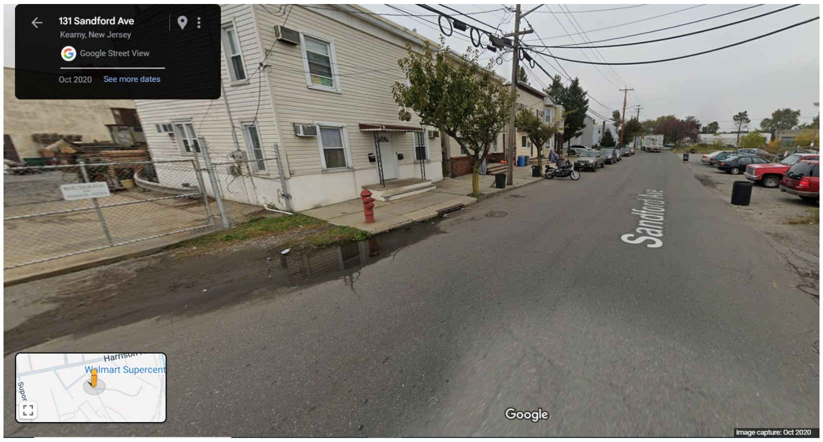
Object ID 69 (June 2023): Inlets at low point on Passaic Avenue under rail (Consolidated Rail Corporation), in good condition.

Object ID 22 (June 2023): Along Passaic Avenue near its intersection with Marshall Street, inlets in good condition – "fish sticker/dump no waste" present on inlet. Trees present.



Object ID 47 (June 2023): At the intersection of Passaic Avenue and Bergen Avenue, inlet in good condition – "fish sticker/dump no waste" present on inlet.

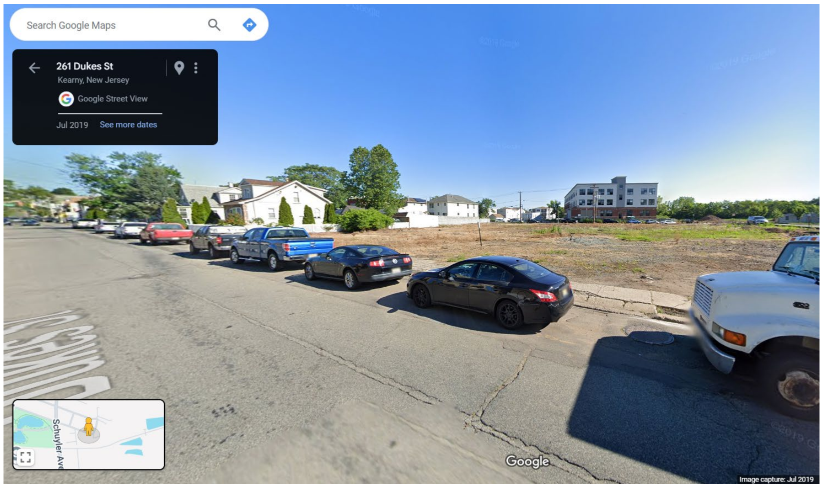
Object ID 23 (October 2020): Along Sandford Avenue, near to its intersection to Ann Street, ponding and inlet nearby – "fish sticker/dump no waste" present. Pervious pavement is recommended.



Object ID 24 (July 2018): At the intersection of Boylan Avenue and Greenfield Avenue, inlet is blocked by debris, not bicycle safe. Curb eroded. Maintenance and updates to inlet grate and curb recommended.

Object ID 25 (August 2021): At the intersection of Sandford Avenue and Radley Street, many inlets in good condition – "fish sticker/dump no waste" present on inlets.

Object ID 26 (July 2019): At the intersection of Dukes Street and Breiderhoft Road, Google Streetview seems outdated and inconclusive. There seems to be residential lots currently according to satellite imagery. Site visit is recommended.



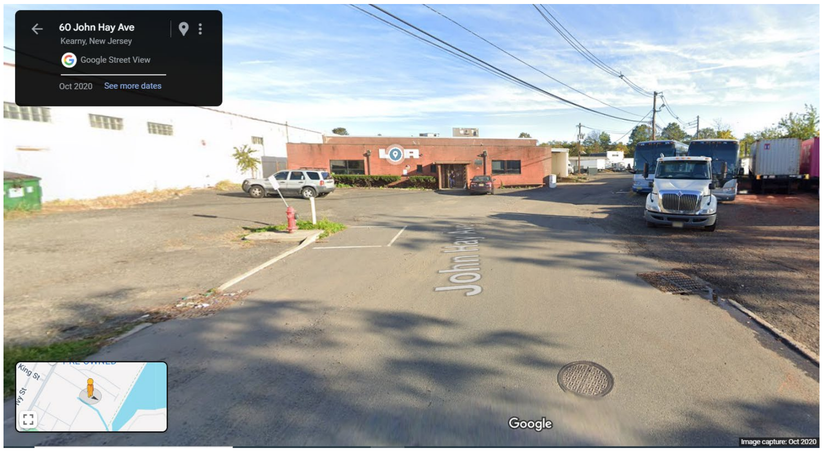
Object ID 27 (June 2019): Along Devon Terrace, east of its intersection with Schuyler Avenue, inlets at low point, cannot determine if “fish sticker/dump no waste” is present. Google Streetview is inconclusive.

Object ID 28 (September 2021): Along Bergen Avenue, near an abandoned rail overpass, inlets at low point, “fish sticker/dump no waste” not present on inlet. Updates to inlet grate recommended.

Object ID 29 (July 2022): Along Schuyler Avenue, in between Bergen Avenue and Garfield Avenue, many inlets at low point – "fish sticker/dump no waste" not present. Updates to inlet grates recommended.

Object ID 30 (July 2019): Along 3rd Avenue, northeast of its intersection with Garfield Avenue, Google Streetview inconclusive – cannot see inlets because of parked cars.

Object ID 31 (October 2020): Along John Hay Avenue, near to its intersection with Arlington Avenue, double inlet at low point, pavement slightly eroded near inlet. Repaving near inlet recommended.



Object ID 32 (October 2020): Along Arlington Avenue, in between its intersection with Schuyler Avenue and Arlington Avenue, double inlet and inlet in good condition – “fish sticker/dump no waste” present.

Object ID 33 (September 2021): Along Camman Drive, on the east side of the sport fields, inlet at low point in good condition – “fish sticker/dump no waste” present. Relatively new development, minimal signs of wear.

Object ID 34 (November 2024): At the intersection of Windsor Street and Bergen Avenue, inlets in good condition – “fish sticker/dump no waste” present. Minimal signs of wear.

Object ID 35 (October 2020): At the intersection of Afton Street and Maple Street, inlets in good condition – “fish sticker/dump no waste” present.

Object ID 36 (October 2020): At the intersection of Halstead Street and Maple Street, inlets in good condition– “fish sticker/dump no waste” present. Minimal signs of wear.

Object ID 37 (November 2024): At the intersection of Liberty Street and Maple Street, inlets in good condition – “fish sticker/dump no waste” present. Minimal signs of wear.

Object ID 38 (July 2018): At the intersection of Quincy Avenue and Kearny Avenue, inlets in good condition – “fish sticker/dump no waste” present. Minimal signs of wear.

Object ID 39 (November 2020): At the intersection of Passaic Avenue, and Park Avenue, double inlet – “fish sticker/dump no waste” not present. Some ponding in the parking lot. Updates to inlet grates and repaving recommended.

Object ID 41 (November 2024): Along Passaic Avenue, in between Stevenson Place and South Midland Avenue, inlets on both sides of the road – “fish sticker/dump no waste” not present. Updates to inlet grates recommended.

Object ID 58 (July 2019): At the intersection of Midland Avenue and Davis Avenue, inlets at low point in good condition -- "fish sticker/dump no waste" present. Minimal signs of wear.

Object ID 59 (July 2019): At the intersection of Oakwood Avenue and Ivy Street, inlets at low point in good condition – no "fish sticker/dump no waste" present. Minimal signs of wear. Updates to inlet grate or curb piece recommended.

Object ID 60 (July 2022): At the intersection of King Street and Schuyler Avenue, inlets at low point -- no "fish sticker/dump no waste" present. Updates to inlet grate or curb piece recommended.

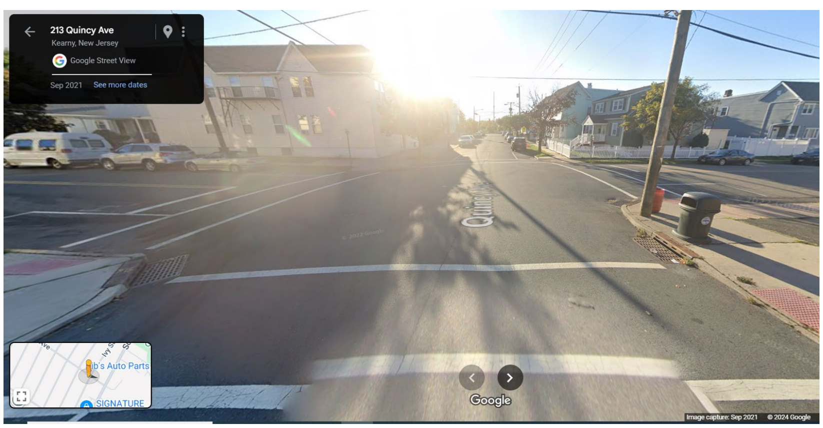
Object ID 62 (October 2020): At the intersection of Dukes Street and Schuyler Avenue, inlets at low point in good condition -- “fish sticker/dump no waste” present.

Object ID 63 (October 2020): At the intersection of Seeley Avenue and Devon Street, inlets at low point in good condition -- “fish sticker/dump no waste” present.

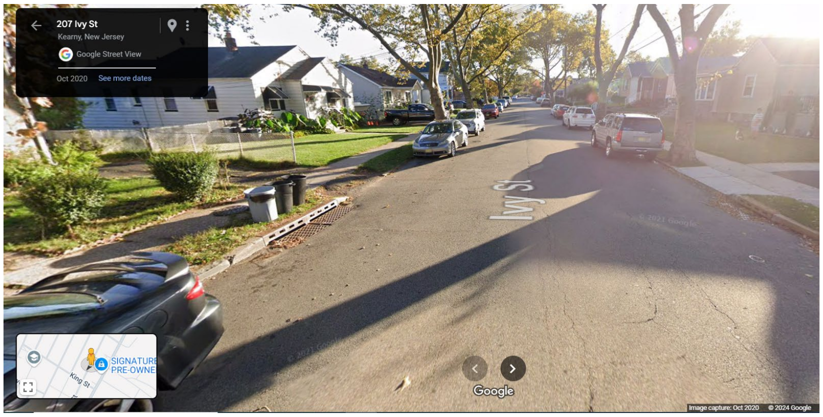
Object ID 64 (October 2020): At the intersection of Stuyvesant Avenue and Elm Street, inlets at low point in good condition -- “fish sticker/dump no waste” present.

Object ID 65 (October 2020): Along Elm Street, in between Garafola Place and Midland Avenue, slight low point where there is slight ponding along curb near Arlington Depot Park on Elm Street. Repaving is recommended.

Object ID 66 (September 2021): At the intersection of Quincy Avenue and Ivy Street, inlets at low point in good condition -- “fish sticker/dump no waste” present. Minimal signs of wear.



Object ID 67 (October 2020): Along Ivy Street, between King Street and Quincy Avenue, inlets at low point in good condition -- “fish sticker/dump no waste” present. Minimal signs of wear.

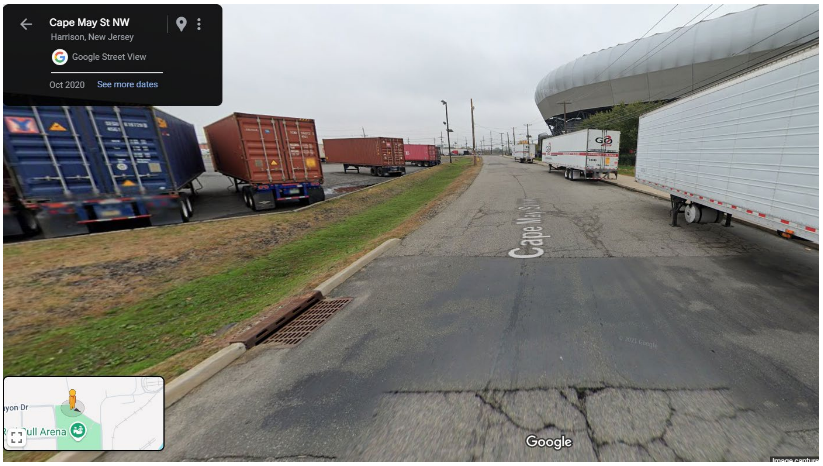


Object ID 68 (July 2019): Along Passaic Avenue, near to its intersection with Ross Lane, inlets – no “fish sticker/dump no waste” present. Updates to inlet grate or curb piece recommended.

Object ID 43 (June 2018): At the intersection of Barszcewski Street and Belleville Turnpike, inlets at low point – “fish sticker/dump no waste” not present. Updates to inlet grate recommended.

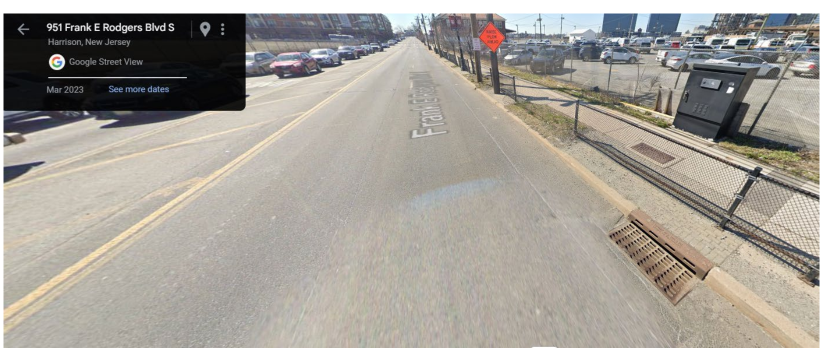
6.5.2 Harrison

Object ID 8 (October 2020): Inlets along Cape May Street Northwest, near to its intersection with Cape May Street at Sports Illustrated Stadium – "fish sticker/dump no waste" present on inlet. Grass or bioswale recommended.

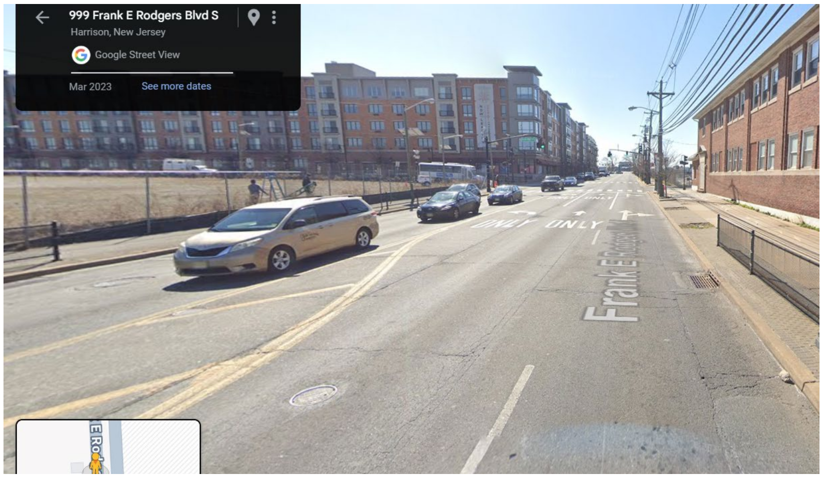


Object ID 9 (July 2018): Inlets near low point at Port Authority of New York/New Jersey Maintenance Yard on Cape May Street – "fish sticker/dump no waste" not present on inlet. Updates to inlet grate or curb piece recommended.

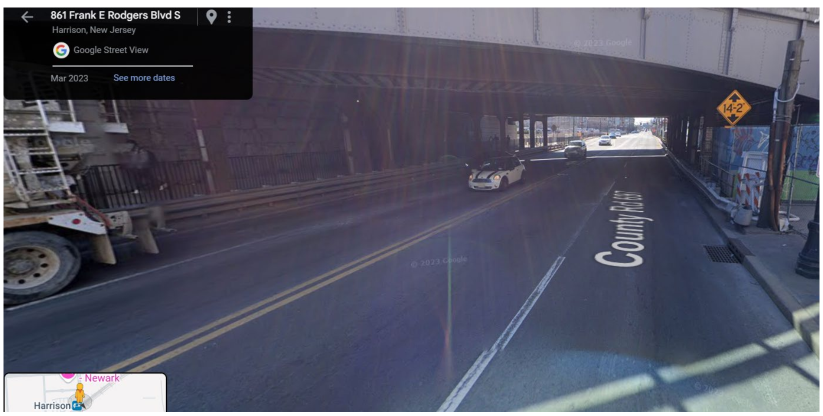
Object ID 10 (March 2023): Along Frank E. Rodgers Boulevard, near to its intersection with Guyon Drive, inlet near low point in good condition – "fish sticker/dump no waste" present. Minimal signs of wear.



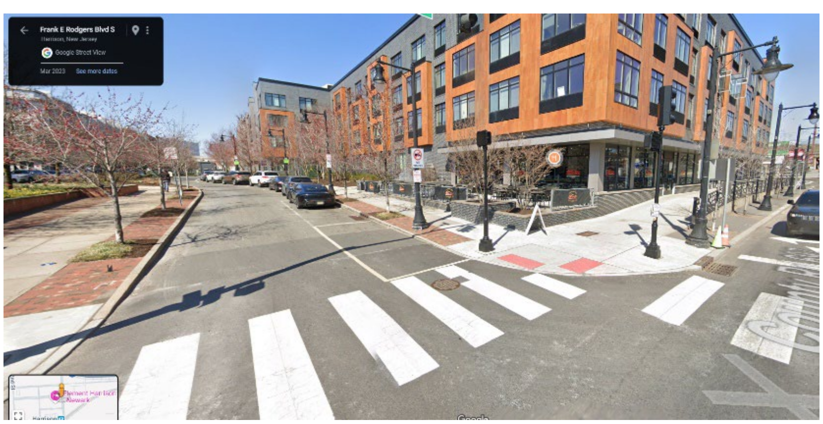
Object ID 11 (March 2023): Along Frank E. Rodgers Boulevard, in between Guyon Drive and River Bend Drive, inlet in good condition, trees present.



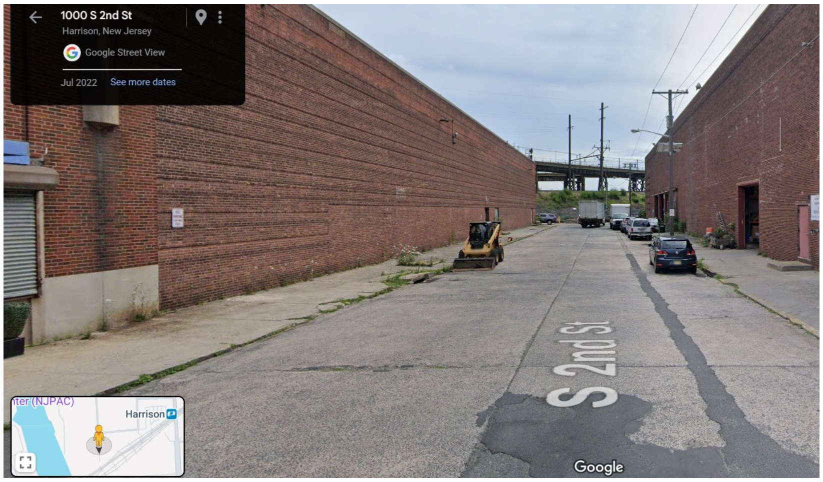
Object ID 12 (March 2023): Along Frank E. Rodgers Boulevard, under the Northeast Corridor Line, inlets – one inlet has "fish sticker/dump no waste" present. Flooding at this location is being addressed as part of the NJTPA's Local Safety Engineering Assistance Program (LSEAP) improvements along Frank E. Rodgers Boulevard between Cape May Street and Harrison Avenue.



Object ID 13 (March 2023): At the Frank E. Rodgers Boulevard and Angelo Cifelli Drive intersection, inlets in good condition – "fish sticker/dump no waste" present on inlet.

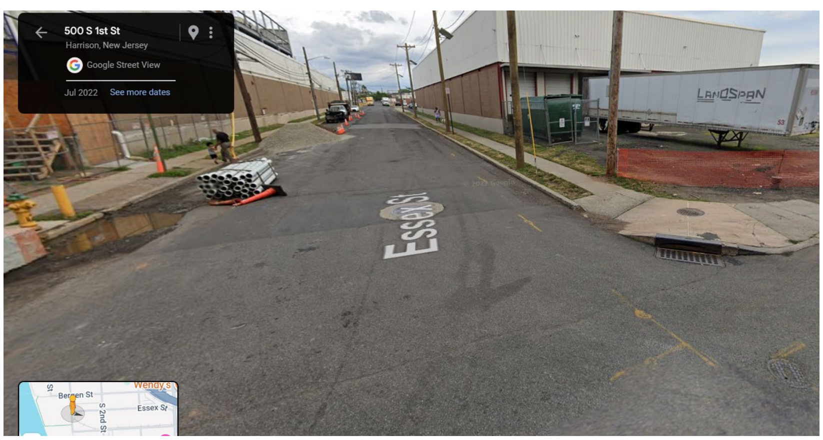


Object ID 14 (July 2022): Along South 2nd Street, in between Burlington Street and the Northeast Corridor Line, inlets at low point – "fish sticker/dump no waste" not present on inlet. Curb piece is broken or has been removed. Replacement of inlet grate and curb piece recommended.



Object ID 15 (July 2022): At the intersection of South 2nd Street and Middlesex Street, inlets in good condition and existing green infrastructure – some inlets have "fish sticker/dump no waste" present. Minimal signs of wear.

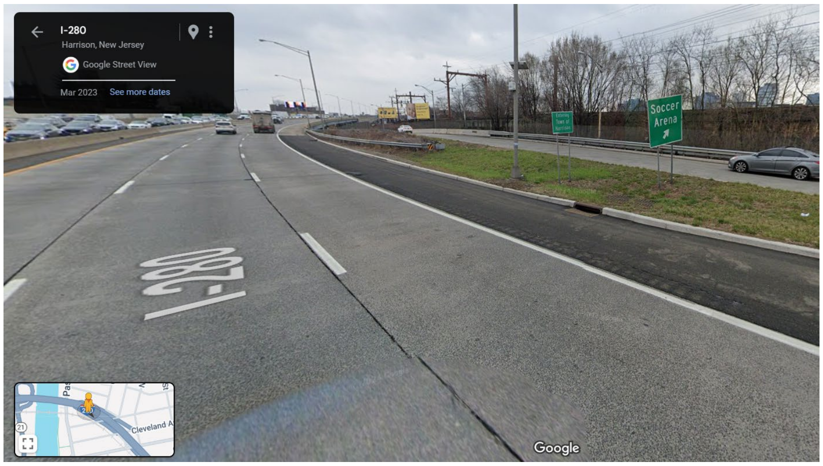
Object ID 16 (July 2022): At the intersection of 1st Street and Essex Street, inlet, "fish sticker/dump no waste" present. Some ponding. Repaving is recommended.



Object ID 17 (October 2020): At the intersection of Dey Street and Jersey Street, many inlets at low point, “fish sticker/dump no waste” not present on inlets. Updates to inlet grate or curb piece recommended.

Object ID 18 (June 2019): At the intersection of Passaic Avenue and Cleveland Avenue, inlets in good condition, “fish sticker/dump no waste” present on inlets. Minimal signs of wear.

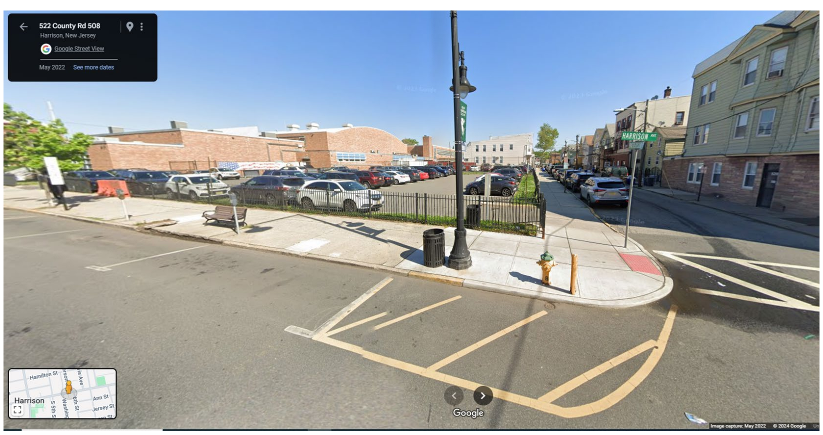
Object ID 19 (March 2023): Along Essex Freeway, near the offramp to Harrison Avenue, inlet – “fish sticker/dump no waste” not present on inlet. Updates to inlet grate or curb piece recommended.



Object ID 20 (October 2020): At the intersection of Supor Boulevard and Bergen Street, ponding, roadway is eroded, inlet is nearby (left of picture) and "fish sticker/dump no waste" not present. Rain garden and updates to inlet grate or curb piece is recommended.

Object ID 70 (October 2020): At the intersection of Frank E. Rodgers Boulevard and Scott-Mobus Place, inlet in parking lot – "fish sticker/dump no waste" present.

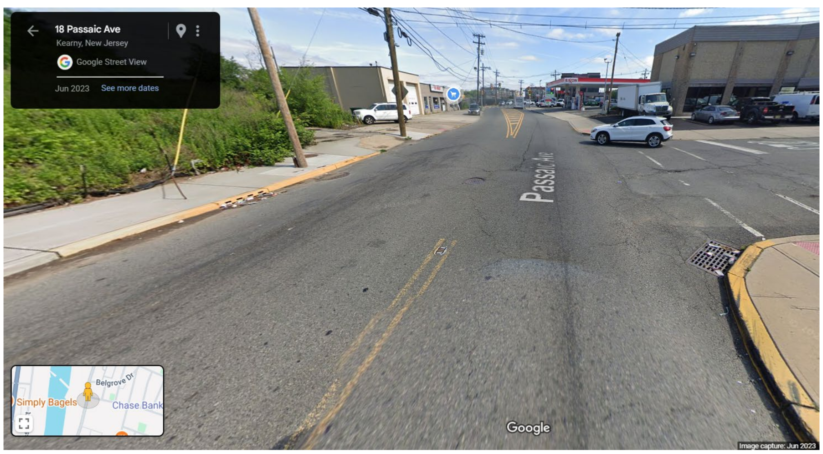
Object ID 72 (May 2022): Ponding at intersection of Patterson Street and Harrison Avenue, near Washington Middle School, and slight curb erosion. Repaving and curb improvement is recommended.



Object ID 73 (October 2020): Along Central Avenue in between Davis Avenue and Kingsland Avenue, ponding in parking lot. Repaving and green infrastructure including pervious pavement and/or rain gardens are recommended.

6.5.3 East Newark

Object ID 46 (June 2023): At the intersection of Passaic Avenue and Johnston Avenue, inlets in good condition – "fish sticker/dump no waste" present on inlet.



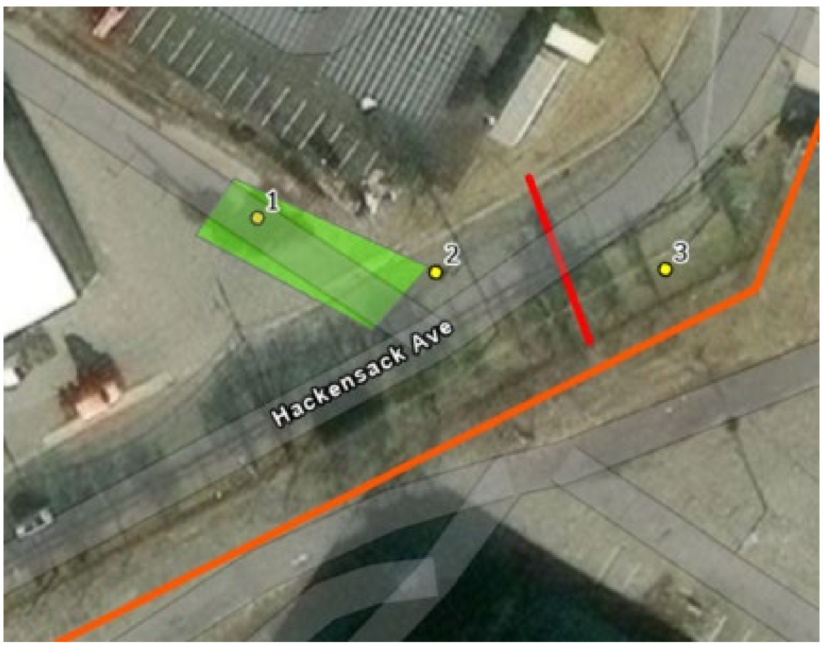
6.6 Recommendations

Many inlets were noted to not have signage indicating to "Dump No Waste" and are recommended to be updated to include bicycle-safe grates. Green infrastructure best management practices (BMPs) are suggested to be implemented throughout the study area, such as bioswales, previous pavement, and rain gardens, to remove pollutants from runoff and reduce ponding. Screenshots from the Google Streetview Survey or from GIS are included below. Where applicable, green polygons indicate the area recommended for the BMP, red lines indicate a low point, and purple polygons indicates area with groundwater contamination. In general, areas that are adjacent to parking lots and buildings and outside of areas designated to have contaminated groundwater were considered for implementing green infrastructure. See the Green Infrastructure Recommendations Map.

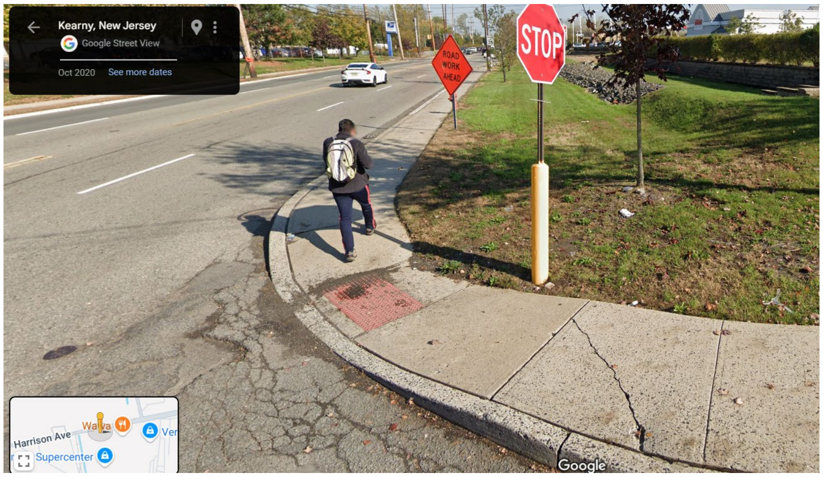
6.6.1 Kearny

- Along Central Avenue, in between Mack Boulevard and Distribution Avenue, a bioswale is recommended in barrier between Central Avenue and the railroad tracks, with discharge at the low point. This area is in the 100-year flood plain and is not noted to have contaminated groundwater. This will remove pollutants and slow down runoff from nearby buildings, roads, or other impervious surfaces.

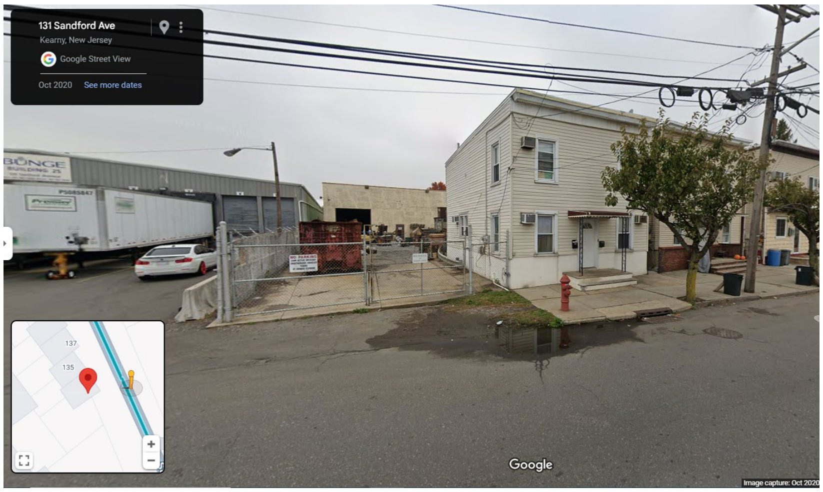
- Near the intersection of Hackensack Avenue and Campus Drive, pervious paving is recommended near this parking lot along Hackensack Avenue. This area is in the 100-year flood plain and is not noted to have contaminated groundwater. This will reduce surface ponding and filter stormwater runoff.



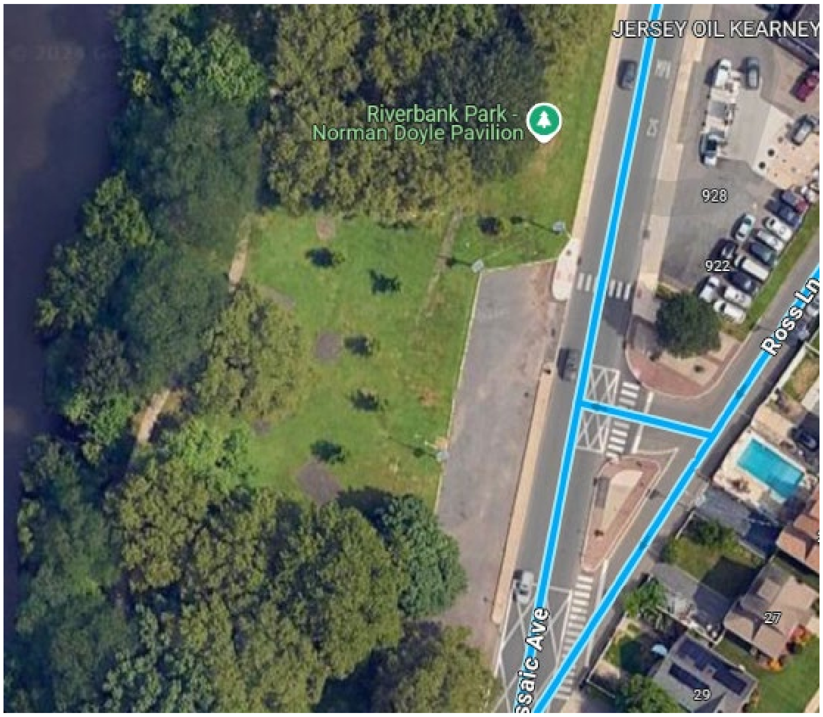
- Along Harrison Avenue, adjacent to the Walmart shopping center at Bergen Street, a rain garden is recommended to capture runoff from the shopping center. This area is in the 100-year flood plain and is not noted to have contaminated groundwater. There is an existing retention pond and ditch lined with rip rap. There are signs of heavy erosion on the curb and sidewalk. This would reduce the volume and filter the stormwater runoff.



- Along Sandford Avenue, near the intersection with Ann Street, new pavement and regrading, with potential for pervious pavement, is recommended where ponding is occurring. This area is outside the flood plain and is not noted to have contaminated groundwater. This would reduce the ponding and filter the stormwater. Right of way would have to be checked in this area since it is close to a residence.

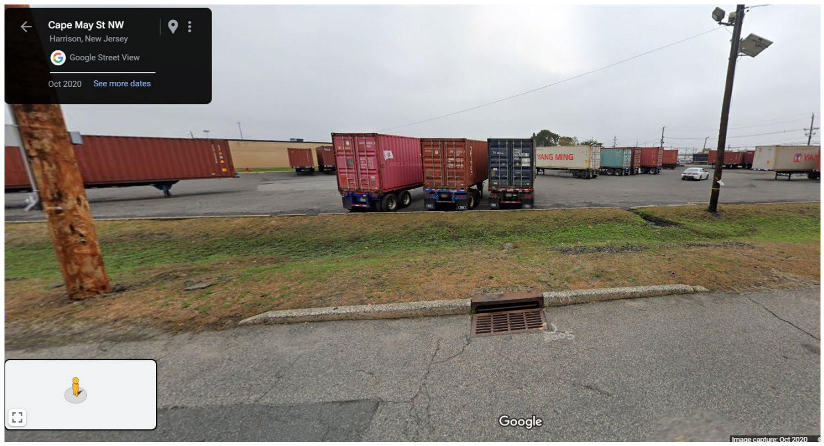


- Along Passaic Avenue, in the Riverbank Park parking lot near Norman Doyle Pavilion, the pavement is slightly eroded close to the inlet, and the curb around the parking lot is slightly eroded. A rain garden could be installed close to this area, especially since it is close to a low point.

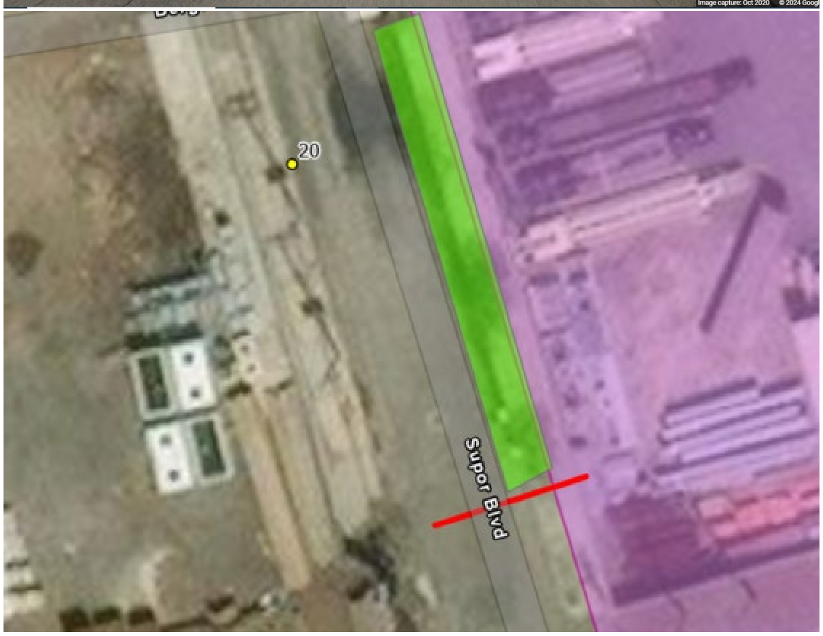


6.6.2 Harrison

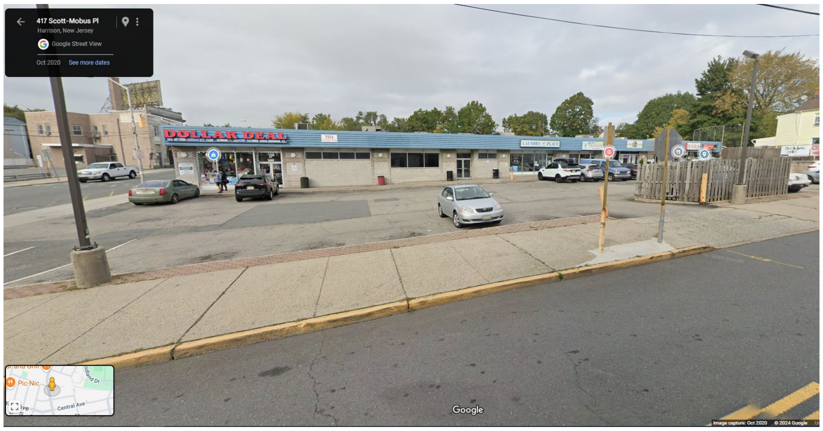
- Inlets along Cape May Street Northwest, near to the intersection with Cape May Street, a grass swale or bioswale can be implemented right outside Sports Illustrated Stadium. This area is outside the flood plain and is not noted to have contaminated groundwater. In addition to removing pollutants and reducing runoff from the parking lots and building, this could improve aesthetics near the venue.

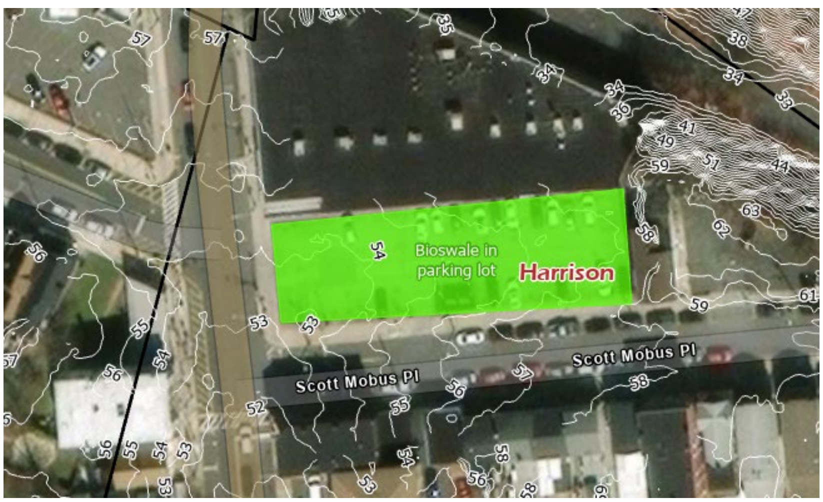


- At the intersection of Supor Boulevard and Bergen Street, a rain garden is recommended on this sidewalk where ponding and erosion is occurring along Supor Boulevard. It is adjacent to a groundwater contamination area and is outside of the floodplain. This would mitigate the ponding occurring through infiltration and filter the stormwater.

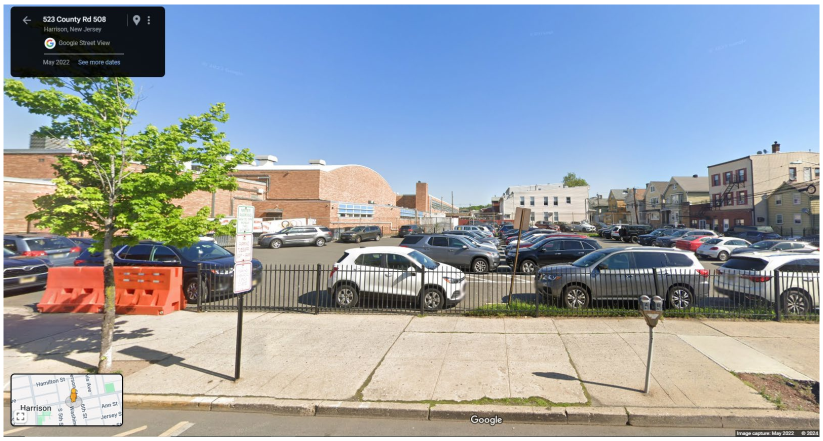


- The parking lot at the intersection of Kearny Avenue and Scott-Mobus Place in Harrison has pavement that is eroded. This area is outside the flood plain and is not noted to have contaminated groundwater. A small-scale bioswale can be implemented on the outskirt of the parking lot, adjacent to the sidewalk, to remove pollutants, reduce runoff from the parking lot and building, and improve the aesthetics of the venue.



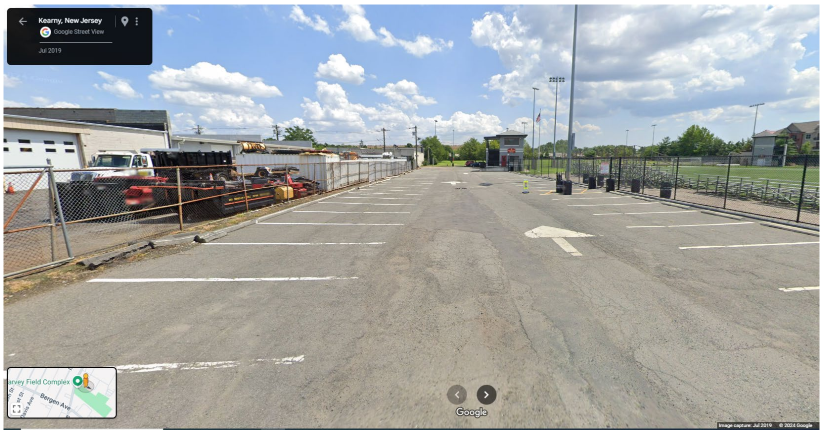


- The parking lot of the Harrison School District, at the intersection of Harrison Avenue and Patterson Street, lacks greenery and may present an opportunity for rain gardens or bioswales. This area is outside the flood plain and is not noted to have contaminated groundwater. Trees or a small-scale bioswale can be implemented on the outskirts of the parking lot to remove pollutants, reduce runoff from the parking lot and building, and improve aesthetics.



- The informal parking area along Central Avenue, near the intersection of Central Avenue and Kingsland Avenue, exhibits ponding. This area is outside the flood plain and is not noted to have contaminated groundwater. Pervious pavement, rain gardens, or bioswales could be installed here. If parking is maintained in the future, it is recommended to repave and regrade this area. This may offer an opportunity to utilize pervious pavement to mitigate ponding and filter stormwater. A rain garden or bioswale could also remove pollutant and reduce runoff before it is discharge to the nearby Fairy Lake.

- The parking lot for Harvey Field Complex (soccer field and baseball field) along Schuyler Avenue, in between Garfield Avenue and Bergen Avenue, presents an opportunity to implement a bioswale. This area is outside the flood plain and is not noted to have contaminated groundwater. Several of the parking bumpers are broken, and the parking lot is prone to ponding since it is a low point. A bioswale or rain garden can be implemented within the parking lot to remove pollutants, reduce runoff from the parking lot and building, and improve aesthetics.



7. Electric Vehicles

The purpose of this section is to forecast the growth of electric vehicle (EV) adoption over the next five years within the West Hudson study area, estimate the number of charging ports needed to meet future demand, and identify suitable locations for EV charging infrastructure. The projections within this section are based on existing adoption rates, current EV registration data, and the application of growth models to estimate EV adoption scenarios.

7.1 Existing Conditions

Per Plugshare[8], there are currently 36 publicly accessible chargers[9] and 43 publicly accessible EV charging ports[10] within the West Hudson study area. These chargers are located in five different places (see the table below). Of the 43 ports, 27 are DC Fast ports, and 16 are Level 2 ports.[11] The Level 2 ports are almost entirely part of the ChargePoint network, while the DC Fast ports are a blend of Tesla and Electrify America ports. It's important to note that these numbers are focused on publicly accessible charging stations, and this assessment is not inclusive of locations like The Eddy or 9 Basin Drive, where charging access is restricted and provided as an amenity to permitted residents/employees/guests. The locations of these existing publicly accessible charging stations are shown in the following tables.

Table 13 – Existing Publicly Accessible Level 2 Port Locations

Charging Site	Site Address	Network	Charging Speed	# Stations	# Ports
Target	200 Passaic Avenue, Kearny	ChargePoint	Level 2	8	15
Walmart	150 Harrison Avenue, Kearny	Electrify America	Level 2	1	1
LEVEL 2 TOTAL				9	16

[8] "EV Charging Station Map." PlugShare, www.plugshare.com/.
[9] The term "charger" is defined in accordance with 23 CFR §680.104 as "a device with one or more charging ports and connectors for charging EVs."
[10] The terms "charging port" or "port" are defined in accordance with 23 CFR §680.104 as "the system within a charger that charges one EV. A charging port may have multiple connectors, but it can provide power to charge only one EV through one connector at a time."
[11] The term "Level 2", per 23 CFR §680.104 is a charging speed "that operates on a circuit from 208 volts to 240 volts and transfers alternating-current (AC) electricity to a device in an EV that converts alternating current to direct current." "DC Fast" refers to a charging speed that "enables rapid charging by delivering direct-current (DC) electricity directly to an EV's battery."

Table 14 – Existing Publicly Accessible DC Fast Port Locations.

Charging Site	Site Address	Network	Charging Speed	# Stations	# Ports
Walmart	150 Harrison Avenue, Kearny	Electrify America	DC Fast	3	3
GNC	220 Harrison Avenue	Tesla	DC Fast	16	16
Wawa	200 Harrison Avenue, Kearny	Tesla	DC Fast	8	8
DC FAST TOTAL				27	27

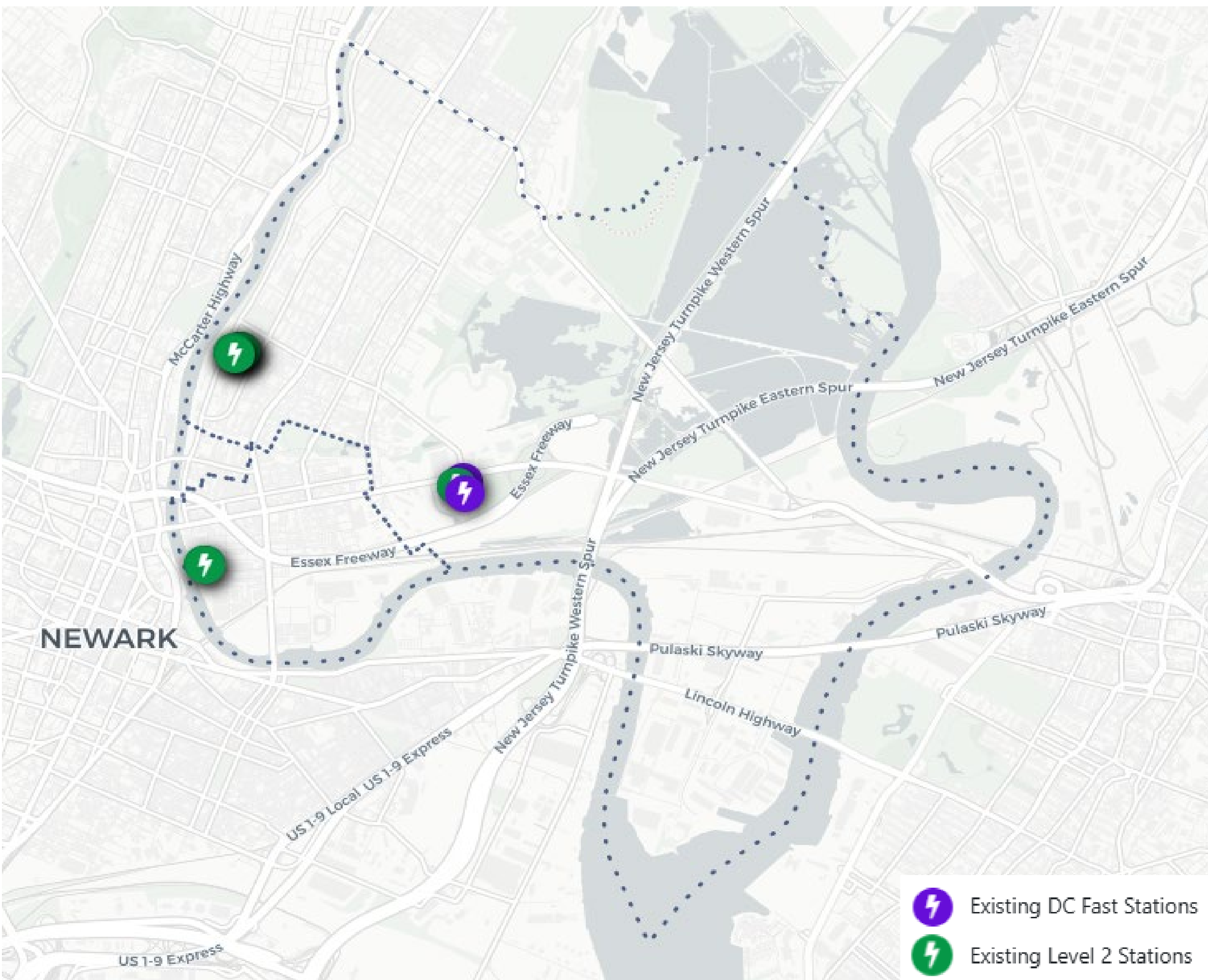


Figure 41 - Existing Locations of Public Charging Stations

7.2 EV Growth

As of June 2024, there are 8,911[12] electric vehicles[13] registered within Hudson County, with 712 of those registered within the West Hudson area.[14] These 712 vehicles amount to eight percent of the EVs registered within Hudson County, and two percent of all light-duty vehicles (LDVs) registered within Hudson County. While two percent seems low, it's anticipated that EVs will be a more significant portion of LDV registration numbers over the next 15 years, as the goal set forth by the state in P.L. 2019, c. 362 (S-2252[15]) – that 85 percent of all vehicles sold/leased in New Jersey shall be plug-in EVs by 2040 – approaches. Compared to 486[16] registered EVs in June 2023, the number of EVs registered within West Hudson increased 47 percent over the last year. Before trying to estimate what the EV landscape within the region could look like over the next few years, it's important to establish where things are trending at the state level, as understanding the impact of initiatives such as S-2252 and funding programs like the New Jersey Zero Emission Incentive Program (NJ ZIP) and the New Jersey Zero Emission Vehicle Financing Program (NJ ZEV) will help contextualize growth rates. Per New Jersey's National Electric Vehicle Infrastructure Deployment Plan,[17] the statewide growth rate is 56 percent, and going into Q4 of 2024, New Jersey ranked fifth in terms of number of EVs registered.

While prohibitive factors such as tariffs, high MSRPs on the cost of new and used vehicles, and fluctuating or reduced federal funding may negatively impact EV adoption, few factors are more important than supporting widespread, appropriate, and reliable public charging infrastructure. A 2021 study[18] found that 18 percent of BEV and 20 percent of PHEV owners in California were switching back to conventional ICE vehicles due to their dissatisfaction with vehicle charging; of these owners, 70 percent lacked at-home Level 2 charging (i.e., either had no home charging or solely relied on Level 1 charging).

Based on the local (47 percent) and state (56 percent) growth rates, two projection scenarios were developed to estimate EV growth in the study area through a five-year period to 2029, a low growth and a high growth scenario.

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[12] NJ Electric Vehicle Data. New Jersey Electric Vehicle Data, New Jersey Department of Environmental Protection, dep.nj.gov/drivegreen/nj-ev-data/.
[13] Note: Includes battery electric vehicles (BEVs) and Plug-in Hybrid Electric Vehicles (PHEVs).
[14] Note: Based on the number of electric vehicle registrations within the 07032 and 07029 zip codes.
[15] *P.L. 2019, c.362 (S2252 SCS)*, pub.njleg.gov/bills/2018/PL19/362_.HTM.
[16] *Data About EVs In the NJTPA Region*, North Jersey Transportation Planning Authority, ev-resources-njtpa.hub.arcgis.com/pages/data-about-evs.
[17] New Jersey Department of Environmental Protection (2022, August 1). New Jersey National Electrical Vehicle Infrastructure (NEVI) Deployment Plan. https://www.nj.gov/dep/drivegreen/pdf/nevi.pdf
[18] Hardman, S., Tal, G. Understanding discontinuance among California's electric vehicle owners. Nat Energy 6, 538–545 (2021). https://doi.org/10.1038/s41560-021-00814-9

1. Low Growth: 47 percent year-over-year growth
2. High Growth: 56 percent year-over-year growth

The low growth scenario of 47% assumes the current growth rate, as this reflects a population beginning to adopt this new vehicle technology despite higher-than-average MSRPs, a still evolving build-out of county-wide public charging infrastructure, and fluctuating availability of EV tax credits. The statewide growth rate of 56% is used as our higher growth rate scenario, as it reflects a growth rate that's moving more aggressively towards the state's 2040 goals and is inclusive of growth that's happening as a result of private and public infrastructure deployment across the state. The results of these projection scenarios are summarized in the table below. The scenarios estimate between 4,805 and 6,579 registered EVs in the study area by 2029. Based on the current number of total registered vehicles[19] in the study area, the projections represent EV adoption between 14 percent and 19 percent.

Table 15 – EV Growth Projection Scenarios

Scenario	Year 2029
Low Growth	4,805
High Growth	6,579

7.3 EV Infrastructure Needs

According to National Renewable Energy Laboratory (NREL) research,[20] there will be a need for 28 million EV charging ports for 33 million EVs in the United States in 2030. That is almost a 1:1 ratio of cars to ports. The total number of ports includes private, at-home charging. However, according to the California Energy Commission's (CEC's) EV charging infrastructure assessment,[21] there is a need for one publicly-accessible port for every seven vehicles. The International Energy Agency (IEA),[22] citing European Union targets, recommends one public charging port for every ten vehicles, which is an appropriate target for the West Hudson study area, given its dense urban environment and the presence of key local and regional roadways. A public charging port refers to ports at locations that are accessible to the general public, such as libraries, municipal parking lots, or retail locations.

[19] This number includes both traditional internal combustion engine vehicles and alternative fuel vehicles.
[20] "FOTW #1334, March 18, 2024: By 2030, the US Will Need 28 Million EV Charging Ports to Support 33 Million Evs." U.S. Department of Energy, 18 Mar. 2024, www.energy.gov/eere/vehicles/articles/fotw-1334-march-18-2024-2030-us-will-need-28-million-ev-charging-ports.
[21] "Second Assembly Bill (AB) 2127 Electric Vehicle Charging Infrastructure Assessment: Assessing Charging Needs to Support Zero-Emission Vehicles in 2030 and 2035." California Energy Commission, California Energy Commission, www.energy.ca.gov/publications/2023/second-assembly-bill-ab-2127-electric-vehicle-charging-infrastructure-assessment.
[22] "Trends in Charging Infrastructure – Global EV Outlook 2022 – Analysis." IEA, www.iea.org/reports/global-ev-outlook-2022/trends-in-charging-infrastructure.

As of the date of the analysis (February 2025) 12 new Tesla Supercharging ports have been installed but are not yet operational at the Harrison Plaza Shopping Center (Bergen Street between Frank E. Rodgers Boulevard and S. 5th Street) and are included as planned in Table 13. With these new ports, the existing EV to charging port ratio will be 12 to one.

Establishing the IEA ratio of ten EVs for every one port, West Hudson should have 481 to 658 publicly-available ports in 2029 to support the Low and High Growth scenarios, respectively. Rounding up from a baseline Low Growth scenario (since that scenario was established using EV growth for the study area), approximately 500 publicly-accessible charging ports are recommended for the West Hudson study area in 2029 to support projected demand. With 49 existing ports, 439 will need to be constructed over the next five years.

Table 16 – Recommended Number of EV Charging Ports for West Hudson

Recommended Ports	Existing Ports	Known Planned Ports	Remaining Ports Needed
500	43	12	445

7.4 Suitability Analysis

Michael Baker's EV-RIDE^{SM} tool was used to evaluate the feasibility of various areas for the deployment of EV charging infrastructure. EV-RIDE^{SM} is a GIS-based tool that utilizes a "hexbin" style suitability analysis to divide the study area into equally-sized hexagons for the purpose of assessing these areas based on parameters from a range of data sets such as power availability, employment density, EV registration rates, census data, and more. The process begins with selecting and applying relevant GIS data layers such as existing land use, municipal boundaries, zoning, and vehicle registration data. The tool then performs a geospatial intersection analysis within the hexbins based on the characteristics of the GIS data layers. A customizable algorithm scores the hexbins and assigns and removes points on a scale based on specific preferences, with more favorable characteristics earning more points and less desired factors earning fewer points. For example, areas with high trip values score high, while areas with minimal electrical capacity score lower.

To ensure consistency and comparability in the review of these areas, the raw scores are then refined using data normalization methods such as Min-Max Normalization and Quintiles to convert this raw number into an overall score that fits into a 0.0-5.0 range based on the combination of GIS layers within each hexbin. The resulting overall score that each hexbin receives after this analysis is the location's site suitability score. Higher scores (i.e., 2.5 or higher) indicate that the location contains characteristics that are more favorable to the deployment of this infrastructure, with lower scores (i.e., 2.4 or lower) suggesting the opposite.

7.4.1 Siting Methodology

To support the site suitability analysis, model inputs were collected from a variety of sources and assigned scoring ranges based on priority for the program. The table below summarizes the datasets used.

Table 17 – EV Site Suitability Analysis Datasets

Dataset	Parameters/Units	Justification	Source
Total Trips	Trips	The higher the number of trips to an area, the higher number of EVs that will be visiting that area and the greater potential opportunity for a site to support charging.	Replica
EV trips	Total EV Trips	Understanding existing EV trips helps to identify areas where charging locations may be needed.	U.S. Department of Energy, Alternative Fuels Data Center "Electric Vehicle Charging Station Locations"
Retail Employees	Number of Workers employed in retail	The presence of retail workers can indicate opportunities for electrification in retail parking lots in addition to or in place of home charging.	U.S. Census Bureau, Center for Economic Studies, LEHD "On the Map"
Total Employees	Total number of workers	The presence of workers in general can indicate opportunities for electrification at places of employment in addition to or in place of home charging.	U.S. Census Bureau, Center for Economic Studies, LEHD "On the Map"
Disadvantaged Communities	Climate and Economic Justice Screening Tool	Many funding sources come with equity/EJ requirements. These areas are likely the last to see charging deployed, so proactively prioritizing these communities supports EV charging.	White House Council on Environmental Quality, "Climate and Economic Justice Screening Tool v. 2.0"
Renter-occupied Housing and Retail Space	Apartment and Retail Acreage	Renters are less likely to install home charging and may therefore be more reliant on nearby public charging locations.	County of Hudson GIS Mapping Hub, "Hudson County Tax Parcel Viewer"
Utility EV Hosting Capacity	Available Electrical Capacity	Leveraging sites with available electrical infrastructure capacity can facilitate installation while limiting implementation costs.	PSE&G, "EV Hosting Capacity Map"

7.5 Priority Areas

Following the EV-RIDE℠ analysis, the suitability scores for the 264 different hexbins were ranked to identify localized zones within the study area that could feasibly support public charging infrastructure. Of these 264 hexbins, 71 of these scored a 1 or more, and only 24 hexbins scored 2 or more. While these scoring numbers sound small, the hexbin analysis is inclusive of the entire study area, including infeasible parcels such as ones located on I-95 and within the Hackensack River; examples of these types of hexbins can be seen in grey in Figure 41. With the main goal of this assessment being providing public charging, the scoring criteria focused on factors that such as high numbers of total trips to and from a parcel, high availability of electrical hosting capacity, and commercial land uses with high numbers of renter-occupied housing space and retail employees, where charging can potentially serve employees and multi-family residents as well. In the interest of providing a diverse, yet focused final list of potential charging areas, the 9 hexbins that scored between a 2.0 and a 2.24 were eliminated, leaving 15 final locations. These top scoring locations (hexbins) are summarized in the table below and shown in the following map.

Table 18 – Summary of Top Scoring Locations

Rank	Suitability Score	Rank	Suitability Score	Rank	Suitability Score
1	4.46	6	2.81	11	2.37
2	3.24	7	2.63	12	2.37
3	3.22	8	2.43	13	2.34
4	3.02	9	2.41	14	2.25
5	3.02	10	2.41	15	2.25

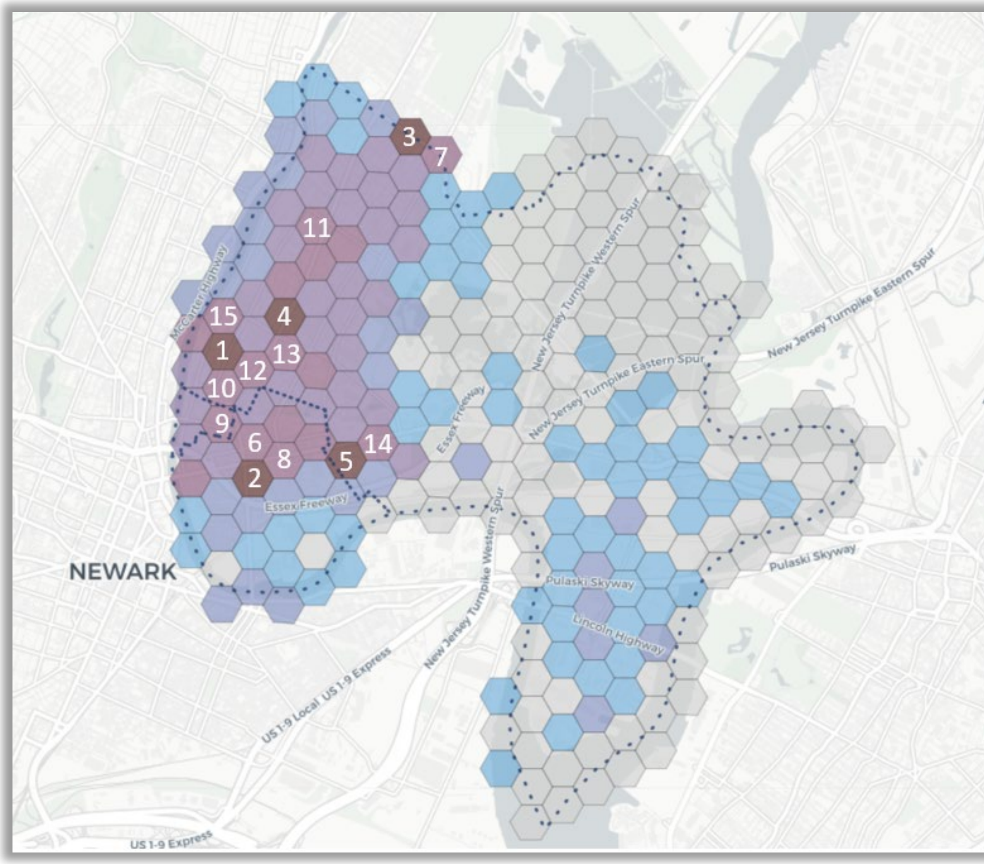

Figure 42 – Locations of Highest Scoring Potential Public Charging Sites

The top scoring hexbins are shown in purple shades, while lower scoring hexbins are shown in blue or gray. The highest scoring locations are generally concentrated where the borders of the three study area municipalities meet and in north Kearny. As shown, the highest scoring areas are located within or near residential and mixed-use areas. These locations would provide residents, shoppers, workers, and visitors with opportunities to use public charging sites. These areas should be prioritized when planning EV charging infrastructure.

8. Conclusion

8.1 Summary of Key Takeaways

The data analyses summarized herein reveal much about circulation and connectivity within the West Hudson study area. Major takeaways include:

Travel Patterns:

- The study area's roadways are currently at or near capacity and often very congested during AM and PM peak periods. Congestion at or on key bridges or roadways can impact congestion elsewhere. Congestion is expected to increase in the future.
- A plurality (39 percent) of trips originate and terminate within the study area. Converting these trips from vehicular modes to alternative modes could help alleviate car dependency and congestion throughout the study area.

Transit:

- The study area is served by transit at the Harrison PATH Station and by five NJ TRANSIT Bus routes. Significant rail transit investment in and around the study area will improve regional connectivity, but improved *local* connections to/from transit will benefit study area residents, particularly those who rely on transit for mobility. Increased transit use will also help to alleviate car dependency and roadway congestion.

Active Transportation:

- The study area's street grid supports walking, provides multiple route options, and helps to distribute trips. Currently most local trip attractors in the study area are located within a convenient five-to-ten-minute walk of many parts of the study area. The main exception is the Harrison PATH station which is located thirty or more minutes away from the northern part of the Kearny. Improved bike accommodations may be able to alleviate these distance issues.
- Most local roadways in the study area have an LBC of 3, while wider streets have an LBC of 4. On these roadways, dedicated bike facilities such as bike lanes would be best suited to accommodate safe travel via bicycle. The NJTPA's Active Transportation Plan identifies corridors (not necessarily specific streets) that would be appropriate for bike use. New or improved active transportation facilities in these corridors would help to alleviate car dependency and roadway congestion.

Roadway Safety:

- Hudson County's High Injury Network includes portions of the following study area roadways: Newark-Jersey City Turnpike (CR 508); Belleville Turnpike/NJ Route 7; Frank E. Rodgers Boulevard (CR 697); and Bergen Avenue. Future improvements along these roadways will benefit the safety of local and regional travelers, provide opportunities for new or improved active transportation connections, and limit congestion impacts related to crash responses.

Stormwater Management:

- Opportunities exist throughout the study area for drainage improvements and green infrastructure that could improve stormwater capture and treatment and mitigate flooding that can impact roadways and overall circulation within and through the study area.

Electric Vehicles:

- Using the IEA's recommended ratio of ten EVs per charging port, the West Hudson study area will require 439 public charging ports by 2029 (five-year horizon), primarily within the western (residential) section of the study area.

8.2 Next Steps

Recommendations

Informed by data analyses, the project team will focus on identifying connectivity and circulation recommendations for the West Hudson study area. These recommendations will address multiple transportation modes and likely include both hard (infrastructure) and soft (programmatic or policy) strategies intended to holistically address issues identified to date.

Prioritization Methodology

With recommendations developed, projects will be prioritized based on various factors that may include, but are not limited to:

- Order of magnitude costs
- Implementation timeframe
- Community Impacts
- Safety benefits
- Benefits to vulnerable roadway users (VRUs)
- Right-of-way impacts

Final Reporting

Once recommendations are developed and prioritized, the project team will draft a Final Report. A project presentation will then be developed and given to Hudson County staff, project stakeholders, and the public for final input and refinement of recommendations. This effort will be complete in June 2024.

Appendix A - Stormwater Management Maps

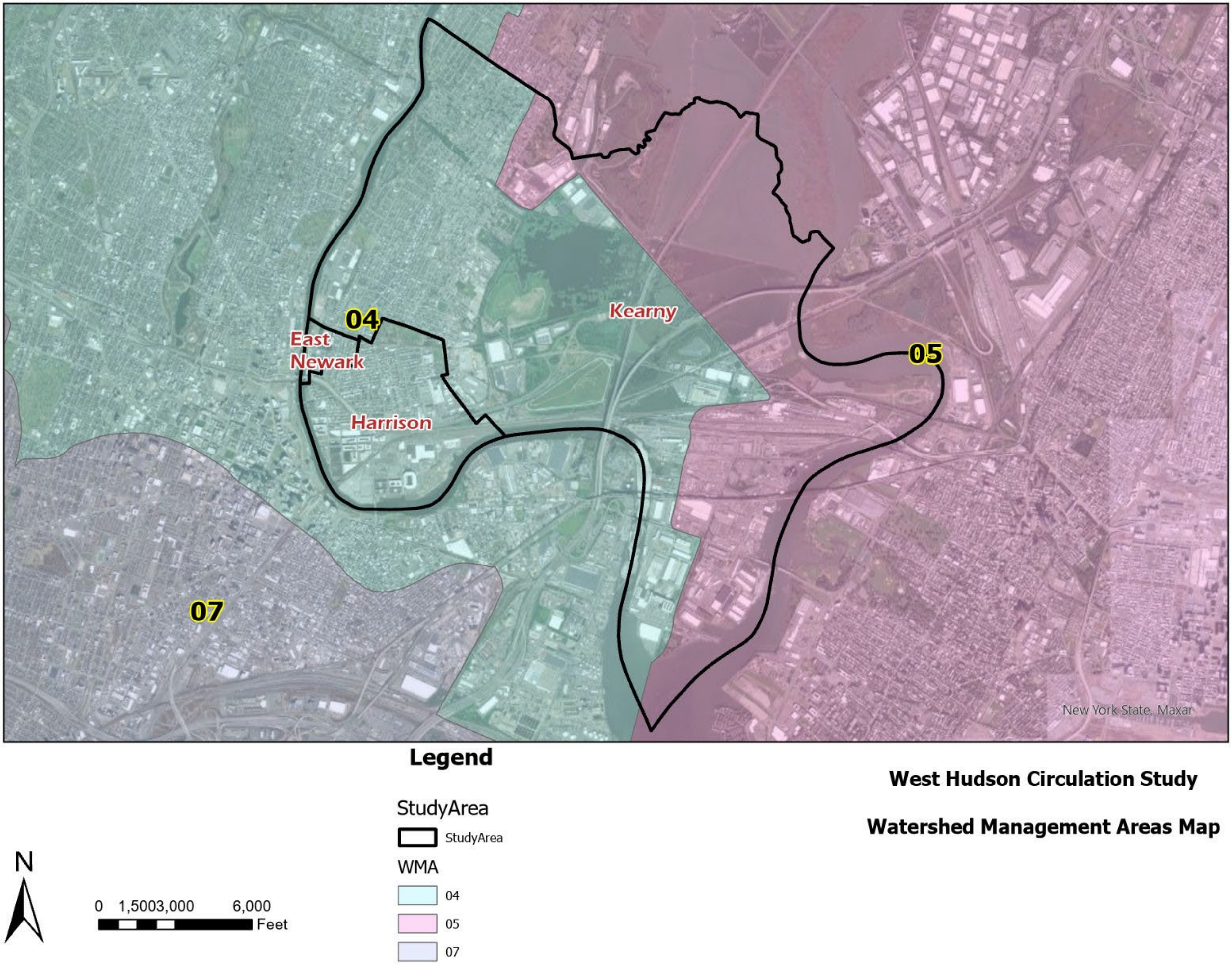

Figure 43 - Watershed Management Areas Map

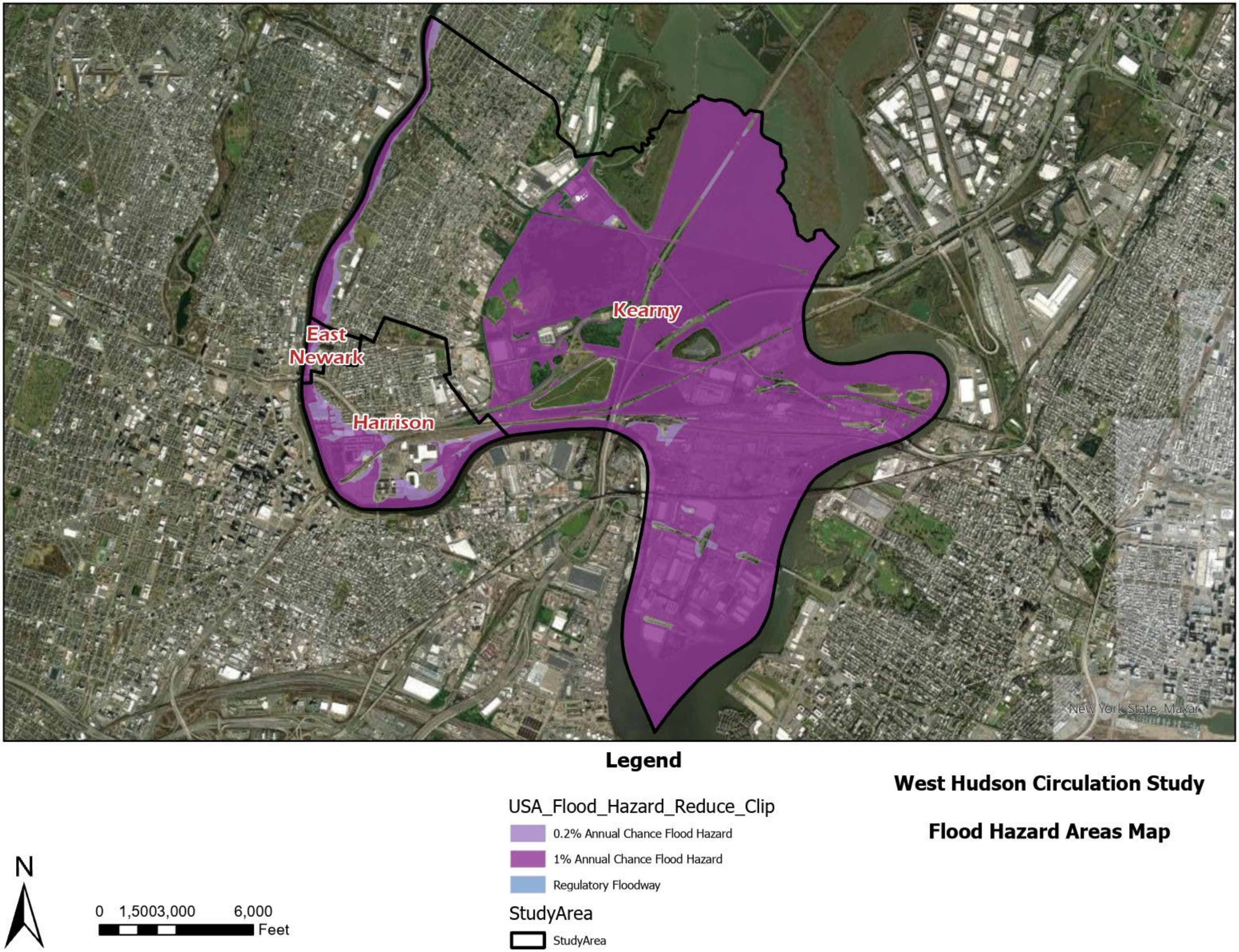

Figure 44 - Flood Hazard Areas Map

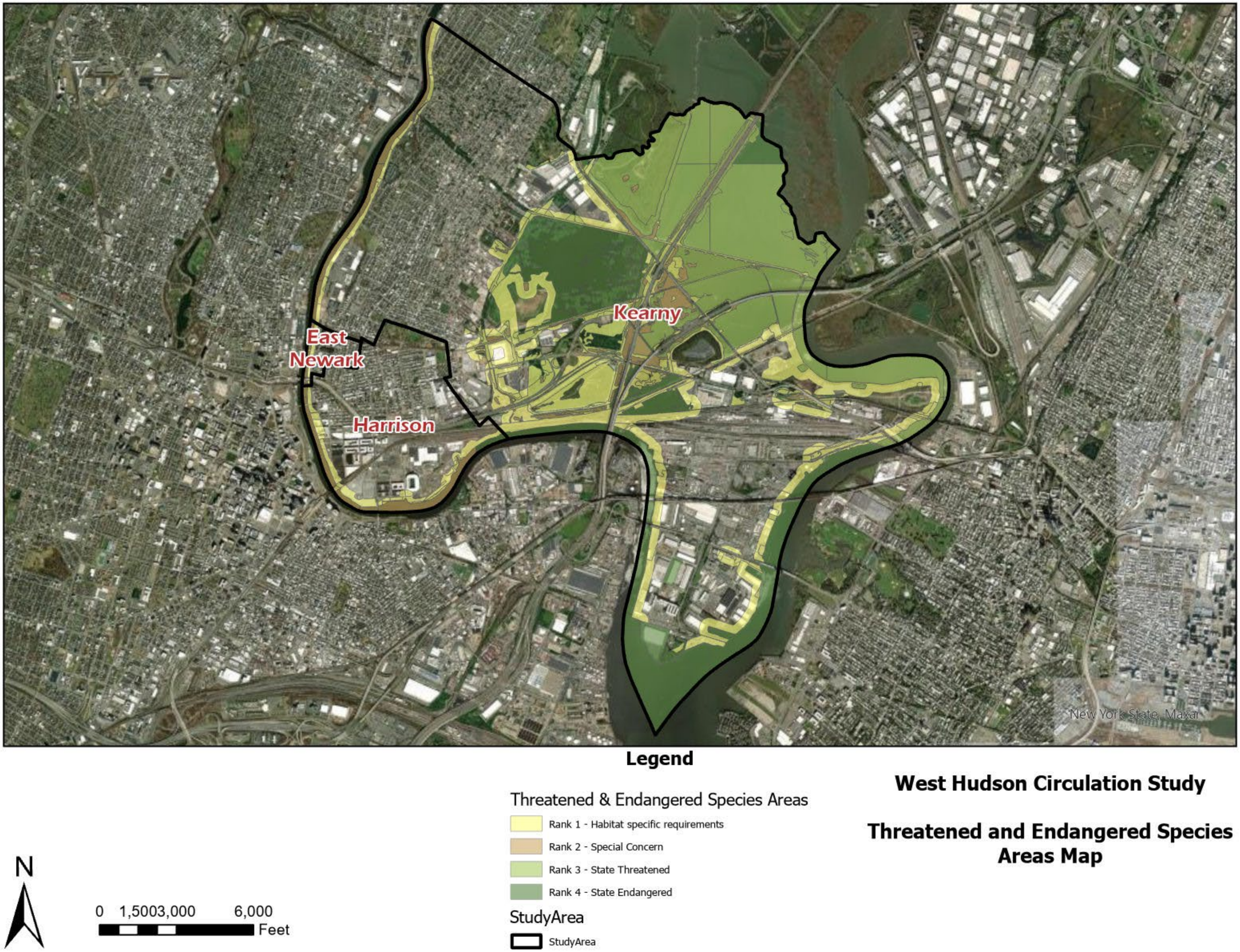

Figure 45 - Threatened and Endangered Species Areas Map

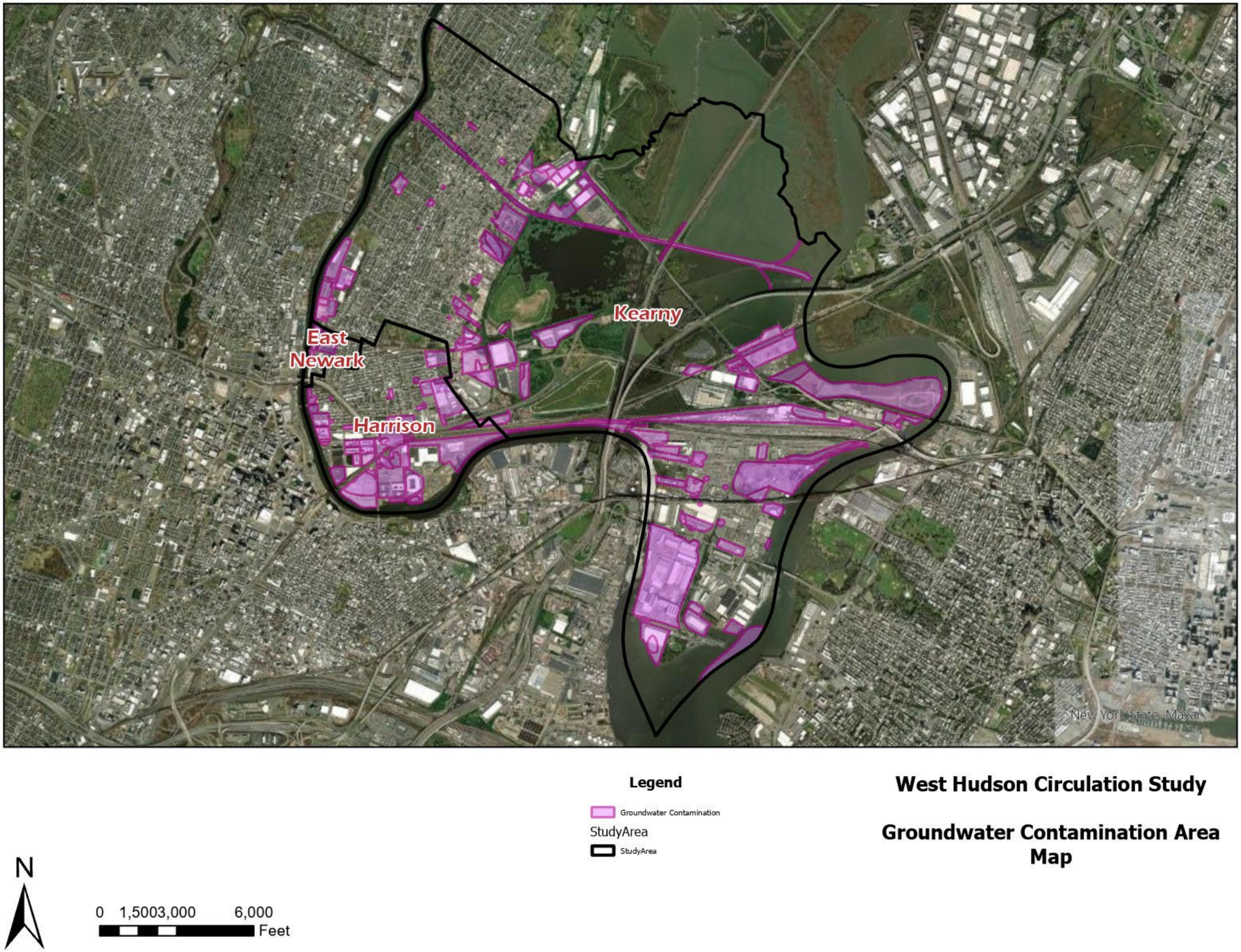

Figure 46 - Groundwater Contamination Area Map

Legend

Desktop Analysis Notes

StudyArea

StudyArea

N

0 1,5003,000 6,000 Feet

West Hudson Circulation Study

Google Streetview Survey

Figure 47 - Google Streetview Survey

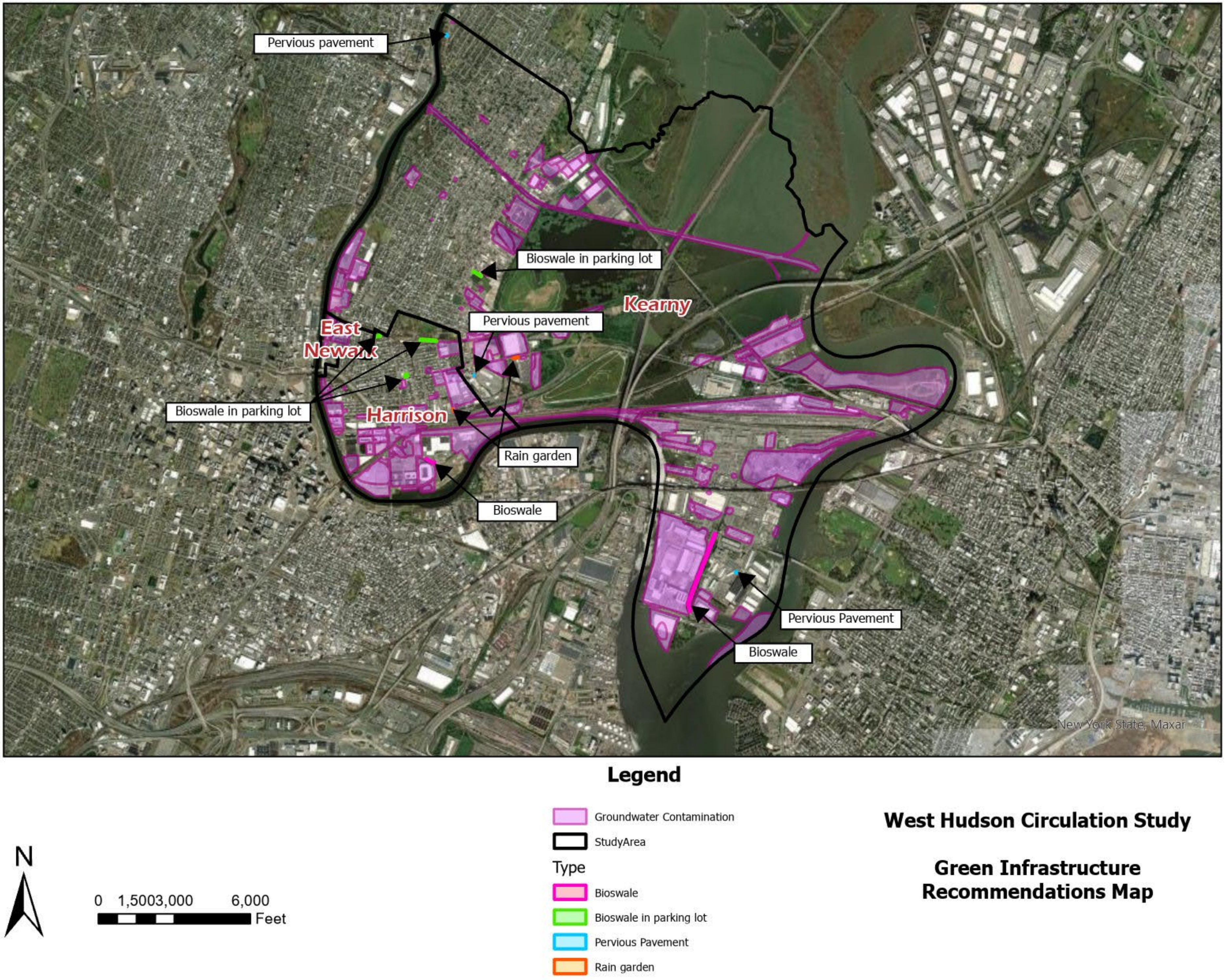

Figure 48 - Green Infrastructure Recommendations Map