

**Issues Summary**

Moving forward, the county must consider these circulation-related issues and problems:

- Increased roadway congestion
- Roadway safety
- Unlicensed jitneys and vans
- Gaps and reliability in transit service
- First/Last-mile connections
- Barriers to bicycling
- Damage from storm events
- Connectivity between destinations
- Aging infrastructure

Harrison, NJ, NE Corridor from Harrison Station

**Introduction**

The Hudson County Circulation Element examines previous circulation goals and objectives, issues identified in the 2002 Master Plan and the 2008 Re-examination Report, and analyzes whether those issues have been reduced or increased to date. The Circulation Element also establishes a new set of goals and objectives based on current patterns and potential future trends, including the introduction of new Street Typologies to replace the Functional Classification. Finally, the element includes recommendations to address the current issues, and improve the safety, mobility, and accessibility of the county's transportation system.

percentage of commutes of thirty minutes or more (59.56%) than that of New Jersey workers (45.50%), and only 14% of county workers commute less than 15 minutes. The average travel time to work for Hudson County workers is 32.6 minutes, about 3 more minutes than the statewide average. One

**Travel Time to Work**



Source: U.S. Census Bureau, 2014 5-Year Estimates

**Movement of People  
Journey to Work**

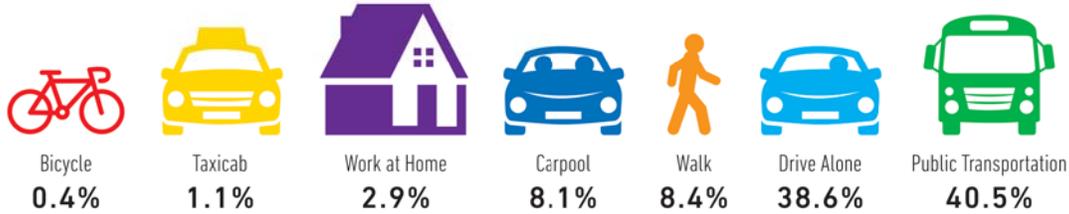
Nearly 70% of Hudson County residents work in New Jersey, while 43.8% of all workers work within the county. At 30.70%, the county has the greatest percentage of workers who work outside the state compared to other New Jersey counties. 25% work in Manhattan, according to 2009-2013 ACS 5-year Estimates. Despite its geographic proximity to New York City, this large commuting population may result in longer average commute times. Hudson County workers have a greater

reason is the high rate of commuting by public transportation. The average commute for Hudson County commuters who use public transportation is 44.3 minutes versus 29.4 minutes for commuters who drive their automobile.

**Mode Choice**

The 2014 ACS 5-year Estimates indicates that 40.5% of workers in Hudson County use public transportation for commuting, compared to just over 10% statewide. 8.8% of workers either walk or bicycle to work. This information, combined with the fact that nearly one-third of households do not

## Transportation to Work by Mode



Source: U.S. Census Bureau, 2014 5-Year Estimates

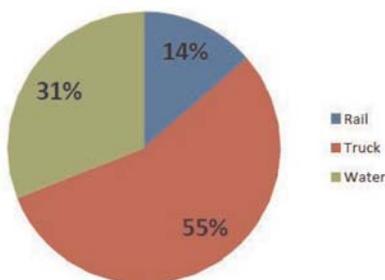
own a vehicle, and another 45.56% have access to only one car, indicate the continued need for an efficient transportation system that provides mobility and accessibility for residents who travel by means other than the automobile.

### Movement of Goods

Due to the large regional market, the close proximity of several Hudson River crossings into New York City and the availability of port, rail and distribution infrastructure, freight is a major user of the transportation network through Hudson County. In fact, Hudson County is home to 765 warehousing/distribution buildings, 194 manufacturing buildings, and about 72.7 million tons of domestic freight is shipped or received annually, according to NJTPA's data.<sup>24</sup> Hudson County is home to the Port Jersey Port Authority Marine Terminal, and Croxton, South Kearny and North Bergen rail yards, 14% of domestic freight travels by rail and 31% by water. These percentages are higher than the NJTPA region as a whole, whose percentages of tonnage moved by rail and water is 6.5% and 12.7%, respectively. These larger modal splits are due to two key factors – for

### Mode Split, Domestic O-D Tonnage, 2007

Source: IHS Global Insight



Source: NJTPA Hudson County Freight Profile

rail, the Northern Secondary Branch/River Line is one of the busiest rail networks in the state, and for waterborne cargo, the location of industry along major waterways, particularly in Bayonne, supports goods movement by barges and tankers. However, according to NJTPA's "2040 Freight

Industry Level Forecasts", trucks carry most (55%) of the domestic freight into, out of, and within the county. 55% of freight currently travels by truck. Hudson County is a "through-county"; only 27.8% of truck trips in Hudson County are made to or from Hudson County. Truck as the predominant mode of freight transportation in Hudson County is forecasted to continue to 2040. Truck transportation will maintain 55% of the mode split, while water cargo is expected to decline slightly (30% in 2040) and rail is forecasted to increase (15% in 2040).

### Regional Current and Future Projects

As part of the larger New York City region, Hudson County must be aware of potential projects that could have lasting impacts on the county. Therefore, the county should ensure that its voice is heard during any public participation proceedings for the following projects, and other projects that may not be listed here.

### Port Authority Bus Terminal Renovation

A recent 2015 report revealed the South Wing bus level floor slabs inside the Port Authority of New York and New Jersey (PANYNJ) Bus Terminal would need to be replaced within the next 25 years. Replacing these slabs would be extremely disruptive to current service, according to the report. In addition, a projection of bus demand for 2040 shows an increase in ridership. Bus and passenger capacity is already severely affected by the limitations of the current building, specifically inadequate bus parking, staging or circulation space and structural concerns regarding the accommodation of modern buses. Given the current building's end of useful life is fast approaching, the PANYNJ initiated the Port Authority Bus Terminal Midtown Bus Master Plan as a solution. After a year and a half, five concepts were presented to the Authority by a consultant team in March 2015. However, due to the high cost

of the proposed solutions, the concepts ranging from \$4 billion to upwards of \$15 billion were rejected. The Port Authority continues to explore potential options to replace the bus terminal, even potentially moving into New Jersey.

### The Gateway Program

After the Access to the Region's Core (ARC) project was canceled, a new project rose to the forefront which would provide the additional Trans-Hudson rail capacity that is needed. Unlike ARC, which only provided additional capacity for New Jersey TRANSIT trains, the Gateway Program is sponsored by Amtrak and would increase rail capacity for both Amtrak and New Jersey TRANSIT into New York City. As of January 2016, the project cost is estimated at \$23.9 billion<sup>25</sup> with a construction start date of 2019 or 2020. If and when the project picks up momentum, significant changes would occur in Hudson County. Such improvements would include repairing and upgrading the Portal Bridge over the Hackensack River between Kearny and Secaucus, also known as the "Achilles' heel of the Northeast Corridor," and would include laying additional rail along the five-mile route from Secaucus into New York City. Additionally, the project would include the "Secaucus Loop" which would create a one-seat ride for additional riders by bypassing Secaucus Junction. Currently, Amtrak and New Jersey TRANSIT is preparing an Environmental Impact Statement (EIS) to evaluate the environmental impacts under the requirements of the National Environmental Policy Act (NEPA).<sup>26</sup>

### Bayonne Bridge

As global trade increases, ocean carriers are responding by constructing larger vessels that are capable of shipping greater amounts of commodities in one trip. These ships, known as Post-Panamax ships carry 12,000 TEUs (twenty-foot equivalent units, or one twenty-foot shipping container). By comparison, Panamax ships, which typically deliver goods to the ports in Hudson County and the rest of the Port Authority complex, transport about 4,500-5,000 TEUs per load. This change has necessitated two major infrastructure changes in North America. The first is the Panama



Bayonne, NJ, Navigational Clearance Project

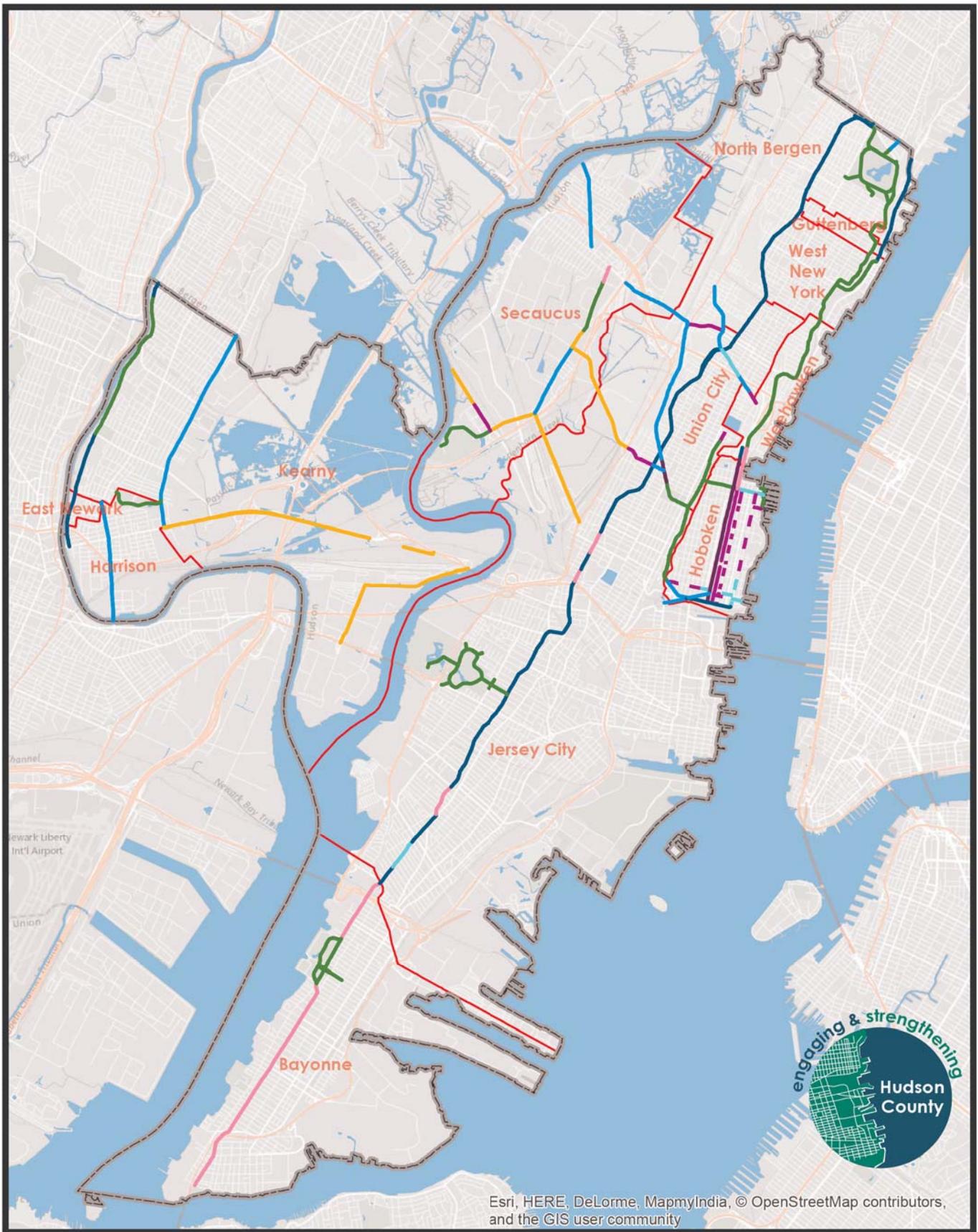
Canal expansion, which is the construction of a new ship canal to accommodate the increased width and depth of these larger vessels. The second project, taking place in Hudson County is the Bayonne Bridge Navigational Clearance Project. The project, being undertaken by the Port Authority, entails raising the road deck from 151-foot clearance above the Kill Van Kull to 215 feet. This is being done to allow access by these larger ships through the Kill Van Kull to access the port facilities in Newark, Elizabeth and Staten Island. The project is expected to be completed in late 2017 and will allow the region to remain competitive with other seaports along the east coast.

### Pulaski Skyway Rehabilitation

The Pulaski Skyway, constructed in 1932, is undergoing a major rehabilitation of the bridge. In 2009, the 84-year old structure that connects Hudson County to Essex County via US-1&9 over the Passaic and Hackensack Rivers was deemed structurally deficient. Roadway repairs began in 2014 by NJDOT who is phasing work by reconstructing two lanes at a time through the use of alternate lane closures. The total project cost is estimated at \$1.2 to \$1.5 billion with an expected completion date of 2020.<sup>27</sup>

### Wittpenn Bridge Replacement

The Wittpenn Bridge, which connects Kearny and Jersey City via US-7 over the Hackensack River is undergoing a replacement. The project will replace the existing structurally deficient, 86-year old vertical lift bridge, meet current roadway design standards and increase the vertical clearance over the river. Construction of the bridge is underway with an estimated cost of \$650 to \$700 million and anticipated completion by 2021.<sup>28</sup>



## Street Typology

- |   |   |   |
|---|---|---|
|  Downtown Avenue           |  Main Street           |  Neighborhood Street           |
|  Downtown Avenue (One-Way) |  Mixed Urban Boulevard |  Neighborhood Street (One-Way) |
|  Industrial Avenue         |  Mixed-Use Avenue      |  Residential Boulevard         |
|   |  Scenic Boulevard      |   |



The 2008 Re-examination Report published the following goals and objectives for the Circulation Element.

## 2008 Goals and Objectives

### 2008 Goals

1. To provide a safe and efficient transportation system.
2. To provide transportation improvements which support economic development.
3. To expand the Hudson Bergen Light Rail system areas to promote transit and use of the county not served by mass transit.
4. To promote alternate transportation modes including bicycling, tele-commuting, transit and walking.
5. To coordinate land use activities with the transportation network.
6. To support system coordination, efficiency and safety.
7. To reduce traffic and mitigate congestion on local roads and highways and improve air quality.
8. To protect and improve quality of life.
9. To reduce "green house gas" emissions from mobile sources.
10. To promote a pedestrian-first approach in Downtown areas.
11. To provide pedestrian and bicycle access along all roadways, particularly those roads that leads residents to job centers.
12. To promote the design and re-design of public roadways to comply with ADA standards.

## 2008 Objectives

1. Provide cost effective transportation systems that support business by providing for the efficient movement of goods and people.
2. Plan transit and roadway infrastructure system improvements to support existing economic activity centers and promote development of new activity centers along transit corridors and at transit hubs.
3. Maintain the efficient movement of goods with planning for safe and efficient truck travel and promotion of the transport of freight by rail and barge.
4. Encourage the siting and expansion of inter-modal facilities at locations where existing infrastructure can accommodate the movement of freight.
5. Promote the timely construction and expansion of the Hudson Bergen Light Rail Transit (HBLRT) system.
6. Encourage the expansion of rail systems to serve major residential and commercial developments at the Peninsula at Bayonne Harbor, Bergen Point, Westside-Newark Bay, the Bergen Arches, West Hudson, the Secaucus Transfer Station and the Meadowlands.
7. Consider the County as an extension of the New York City system and work to coordinate even greater investment in the public transportation system through partnerships with NJTRANSIT, Port Authority and the MTA.
8. Consider the PATH system as an integral part of the Hudson County system and pursue expansion opportunities with PANYNJ.
9. Coordinate local bus and shuttle service, pedestrian ways and parking with transit stations, residential and commercial locations.
10. Coordinate public and private bus service, information on service, transfers, fares and bus passes.
11. Improve the ease and speed of modal change by creating multi-modal transit centers, with parking at outlying transit locations, improved signage both to the center and within it, and separate pedestrian connectors where volumes warrant.
12. Promote the expansion of existing ferry service and integration of transit (including HBLRT) lines feeding ferry terminals.
13. Encourage pedestrian/bike traffic by providing appropriate, safe and attractive facilities between population and employment centers.
14. Provide scenic walkways and bikeways along the County's Waterfront(s).
15. Complete missing links in the Hudson River Waterfront Walkway along the water's edge from the Bergen County border to the Bayonne Bridge and between major attractions.
16. Complete the Hackensack River Greenway along the water's edge from the Bayonne Bridge to the Cromack Creek.
17. Complete the Passaic River Walkway from the Bergen County border to the Jackson St. Bridge.
18. Complete the East Coast Greenway via off-road trails linking Newark with the Hudson River Waterfront.
19. Complete the Hudson County portion of the Liberty-Watergap trail linking Liberty State Park with the Delaware Watergap.
20. Coordinate the development and design of comprehensive and continuous walkway and bikeway facilities among the communities.

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21. Promote public access to the Hudson River Waterfront and pedestrian open space and circulation opportunities.
  22. Improve on-street and off-street parking by establishing parking management practices, providing additional signage and increasing capacity, where appropriate.
  23. Reduce Vehicle Miles Traveled (VMT) by County residents and commuters.
  24. Reduce Vehicle Hours Traveled (VHT) by County residents and commuters.
  25. Reduce traffic congestion and improve the Level of Service (LOS) along local roads and intersections.
  26. Improve local air quality and reduce air pollution and green house emissions by encouraging alternative modes of transportation and commutation.
  27. Reduce stormwater run-off and non-point source pollution from roadways through implementation of Best Management Practices (BMPs).
  28. Introduce "Intercept Parking" Facilities near major rail and road corridors.
  29. Develop addition bridge route at the Passaic River in South Kearny.
  30. Improve handicapped accessibility to public streets by implementing ADA design standards for sidewalks, ramps, and parking.



## Functional Class

- |  |   |   |
|--|---|---|
|  Urban Local              |  Urban Minor Collector |  Urban Minor Arterial               |
|  Urban Principal Arterial |  Urban Major Collector |  Urban Minor Arterial / Urban Local |



## 2002 & 2008 Issues

The County's major land development problems have been drawn from the 2002 Master Plan and 2008 Re-examination Report Land Use Elements as well as the 2008 Land Use Goals and Objectives.

### Roadway Congestion

**The Issue:** The 2002 Master Plan identified congestion as an ongoing issue, particular on local arterials, stating that, "traffic congestion and delays are a fact of life in Hudson County." It did, however, also recognize the negative impact of congestion on quality of life, goods movement, and the business community. The plan did identify some major projects that would promote the use of transportation by other modes, especially the HBLRT, which the plan noted would improve mobility along highly utilized north-south corridors and decrease congestion at the Hudson River crossings.

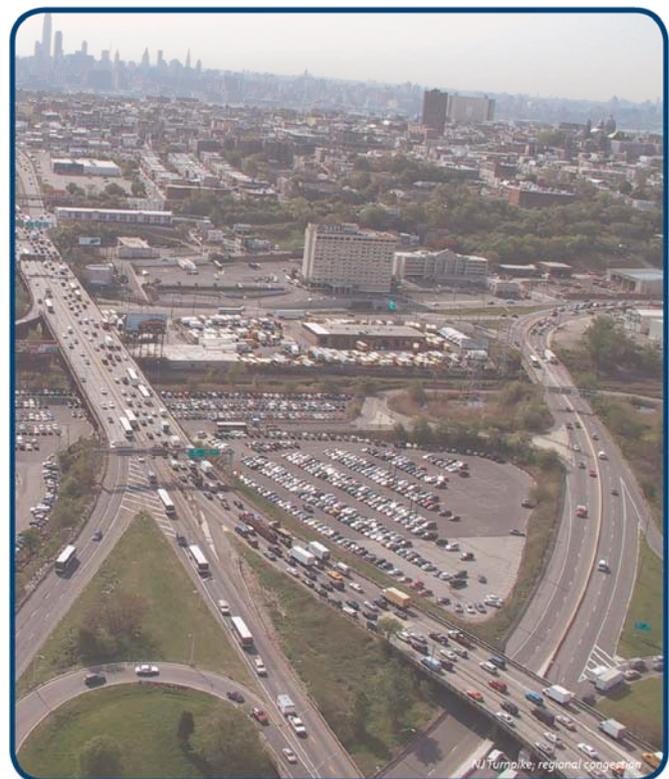
The 2008 Re-examination Report identified an increased demand on roads as a result of changing commuting patterns. Previously, while most residents in the county also worked in the county, that had changed by the 2008 re-examination. By 2008, more residents were traveling outside of the county into places like Manhattan, Essex and Bergen counties for work, and more commuters from other NJ counties were traveling into Hudson County.

**What Has Changed:** Traffic congestion is an ongoing issue for roads in Hudson County, consistent with the fact that important roadways in northern New Jersey are typically congested during peak commuting hours. One indicator of congestion on Hudson County roadways is vehicle miles traveled (VMT), which is the number of miles that are driven on Hudson County roads over the course of one year. In 2002, there were 5.75 million vehicle miles traveled. By 2007, that number had grown to 6.34 million. The 2008 economic recession resulted in a prolonged decline in VMT (the low was 6.01 million miles traveled in 2009) due most likely to the loss of jobs or cutting of employment hours, but VMT has steadily climbed

again. In 2014, the VMT was estimated at 6.15 million miles traveled, even as improvements to public transportation in the county have taken place since the 2002 and 2008 plans, such as the expansion of the Hudson Bergen Light Rail Transit (HBLRT). Although the county is generally built-out, leaving little ability to build new roads or add capacity to existing ones, improvements have been made to the Tonelle Circle and 495/Lincoln Tunnel Helix, the Pulaski Skyway, Route 139, and Turnpike Exit 14A (in progress). However, increased VMT and few roadway improvements are an indication that as people are driving again, increased roadway congestion is the result.

### Roadway Safety

**The Issue:** The 2002 plan identified key areas of high crash locations using data collected from 1993. Most of the high crash locations were located on the New Jersey Turnpike (I-95) or federal and state roads, which included US-1&9 (listed only as US-1), US-1&9T, NJ 139, and NJ 495. Paterson Plank Road (CR-681) and JFK Boulevard (CR-690) were the only county routes to exceed 20 crashes in a single year at 52 and 23, respectively. These



NJ Turnpike, regional congestion

high crash locations also tended to be consistent with roadways with high volumes.

**What Has Changed:** Crashes in Hudson County between 2002 and 2014 declined by about 20 percent, a higher drop than the drop in crashes statewide (-9.3%). However, since 2008, the decline in crashes has generally leveled off. There were 19,846 in 2008 and 19,595 in 2014, a reduction of just over one (1) percent. Part of this may be due to the overall increase in crashes related to cell phone use. While the number of crashes where cell phone use was a contributing factor was very low in 2002 (20 crashes in Hudson County), it had increased to 412 by 2008, and by 2014, the number had grown to 629. The overall increase in crashes is consistent with an overall increase in cell phone ownership from 2002. However, the gains in safety from other means (physical roadway improvements, increased education, vehicle technology) are being offset with their widespread use while driving.

### Regional Connectivity

**The Issue:** In the 2002 Master Plan, it was noted that Hudson County's geography can challenge access between areas of the county. For instance, the Hackensack River separates Kearny, Harrison and East Newark from the rest of eastern Hudson County. As a result, there are limited routes of access from these municipalities to the county's population, businesses and cultural centers; they are limited to US 1&9, US-1&9T, Newark-Jersey City Turnpike (NJ 7), the NJ Turnpike (I-95) and NJ 3 via Bergen County for roads, and the PATH and NJ TRANSIT by rail. Additionally, the Palisades traversing Hudson County limit east/west links to the waterfront, especially for safe bicycle and pedestrian connectivity. The highways themselves can also act as a barrier between communities, notably US 1&9, NJ 3 and NJ 495.

**What Has Changed:** Hudson County continues to explore ways to improve regional connectivity. It is critical to support improved connections as they help increase access to employment, education, and recreational opportunities between low-income residents and job clusters, high-performing schools, and parks - a regional

challenge and focus area identified by the Together North Jersey Plan. The 2009 *River Road/Hudson Waterfront Circulation Study* identified potential pedestrian connections between the uplands and the River Road/Port Imperial Boulevard study area, including recommendations for new sidewalks and a funicular (cable railway). In addition, the County supports East Coast Greenway efforts to improve mobility throughout the county and region by bicycle.

### ADA Compliance

**The Issue:** Conformity to the 1990 Americans with Disability Act (ADA) requirements was an issue identified in the 2002 plan. The plan discussed the need to provide mobility via dial-a-rides and accessibility to transit service through barrier free facilities.<sup>29</sup> The plan did not address the requirement for curb ramps, however. In 2008, a goal was added to the re-examination report, which states, "*To promote the design and re-design of public roadways to comply with ADA standards*" and an added objective to, "*Improve handicapped accessibility to public streets by implementing ADA design standards for sidewalks, ramps, and parking.*"

**What Has Changed:** Hudson County continues to comply with ADA regulations and seeks new opportunities to enhance accessibility options for residents with limited mobility. The 2016 LDR update addresses ADA standards for County roadways through accessible waterfront walkways, curb ramps, pedestrian signals, sidewalks, temporary sidewalk extensions (i.e. parklets), and parking design standards.

### Goods Movement

**The Issue:** The 2002 Master Plan noted that the goods movement industry was a major user of the Hudson County transportation network. Truck traffic, which moved most of the freight tonnage into, out of, and through the county, experienced accessibility issues to intermodal facilities located within Hudson County. Specifically, inadequate design geometry for large trucks at intersections, jughandles and Tonelle Circle made access to intermodal terminals extremely difficult in

the Tonnelle Circle section of Hudson County. Addressing issues of shared tracks between freight and passenger rail service was also identified as a goods movement need in the county.

**What Has Changed:** Goods movement continues to play an important role for Hudson County. In particular, the expansion of the Panama Canal to accommodate larger shipping vessels from Asia to the ports on the East Coast, is having a very direct impact for Hudson County. In order to allow for these larger ships (called New or Post-Panamax ships, which have cargo capacity up to 13,000 TEUs (twenty-foot equivalent units) to reach Port Authority of New York and New Jersey port terminals through the Kill Van Kull, there was a need to raise the Bayonne Bridge from its previous clearance height of 151 feet above the water to a new height of 210 feet. The project began in 2013 and navigational clearance is expected by 2017, with full project completion in 2019. This project will continue to make the port facilities in the region the prime destination along the east coast, supporting local industry and jobs in Hudson County.

Truck access to large intermodal facilities is vital to the state and regional economy. Croxton Yard, an intermodal facility located in Jersey City and Secaucus is accessed by rail and trucks via US Route 1/9 and County Road or via NJ Turnpike Exit 15X, New County Road and County Road. The North Bergen intermodal facility is located on Tonnelle Avenue accessed by rail and truck via Tonnelle Avenue (Routes 1/9) and NJ Turnpike Exit 17. The South Kearny terminal is located along Old Fish House Road in Kearny accessed by rail and truck



Hoboken, NJ, Hudson Bike Share

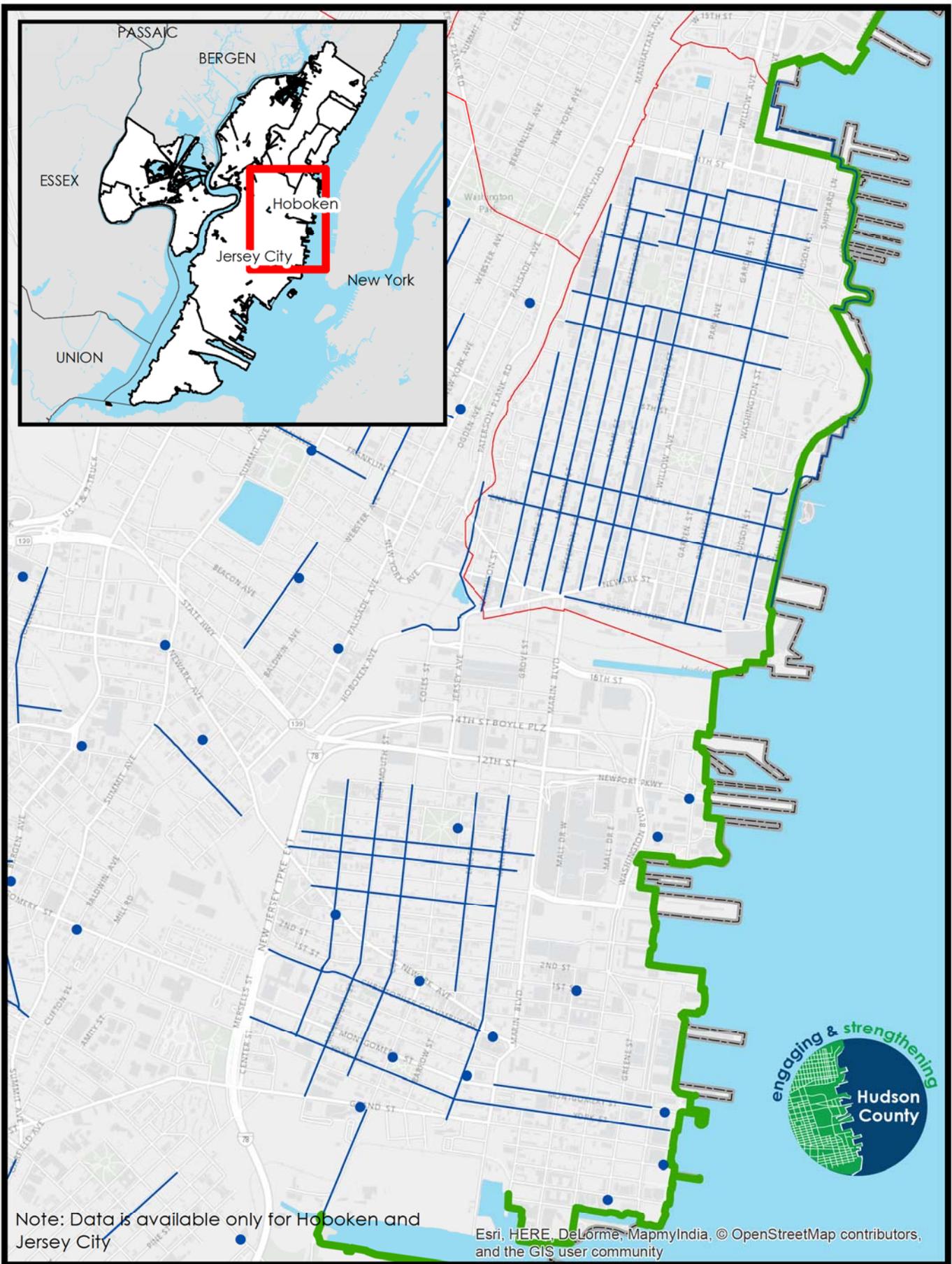
via Route 1&9 Truck to Central Avenue, from Route 7 and from NJ Turnpike 15E to Route 1/9 Truck.<sup>30</sup> Various improvements have been made to several of these access roads within recent years.

### Physical Barriers to Bicycling

**The Issue:** Identified in the 2002 Master Plan, there were several physical barriers to bicycling throughout the county, including congested or narrow roadways, blocked routes, lack of storage areas and other issues including concerns for safety, a lack of connections for bicyclists to other modes, and an overall lack of acceptance of bicyclists on the roadway. Three walkable community workshops were held in 2006 (in North Bergen, West New York, and Union City) that included a number of general recommendations that could be applied countywide. They included traffic calming techniques, improved pedestrian infrastructure and bicycle accommodations, and streetscape amenities, among others. The 2008 re-examination identified several bicycle and pedestrian studies that recommended improvements to support pedestrian and bicycling activity.



**What Has Changed:** As cycling has become more popular in Hudson County, physical and policy improvements have taken place to encourage greater use of bicycles. The County adopted a countywide Complete Streets Policy in 2012 and new roadway design guidelines that incorporate the safe use of bicycling, which were included in the 2016 update to the Hudson County Land Development Regulations (LDR). Section H of the LDR provides guidance on bike



## Bicycle Infrastructure

- CitiBike Stations
- Bicycle lane/sharrows
- Hudson River Waterfront Walkway

0 0.125 0.25 0.5 Miles



facilities on County roads and requires that a bikeway be provided consistent with the zoning, subdivision, site planning, or other ordinance of the municipality or County Master Plan. The County has also been supportive of municipal initiatives to increase accessibility to bicycling such as bike share programs (in which the County studied the potential for bike share programs and potential station locations) and has funded walkway improvements through its Open Space, Recreation, and Historic Preservation Trust Fund.

### Unlicensed Jitneys and Vans

**The Issue:** The prevalence of unlicensed jitneys and vans was identified as a major circulation problem in the 2002 Master Plan. A jitney is an informal, unlicensed, or illegal taxicab operation that



follows existing bus routes to pick up passengers at designated bus stops, usually charging a lower fare. These jitneys resulted in increased congestion at bus stops, safety problems, and undermined NJ TRANSIT's bus service. The plan further posed a licensing program as a potential solution to the problem.

In 2001, Hudson County and NJTPA produced the *Hudson County Jitney Study* which identified the following issues:

- Excessive competition between operators on certain routes leading to potential safety concern and roadway congestion
- Inadequate vehicle maintenance and repeated inspection failures
- Inadequate frequency of vehicle and operator inspections
- Lack of compliance with ADA requirements
- Lack of public information for services

- Imbalanced service (oversupply in some corridors, lack of service in others)

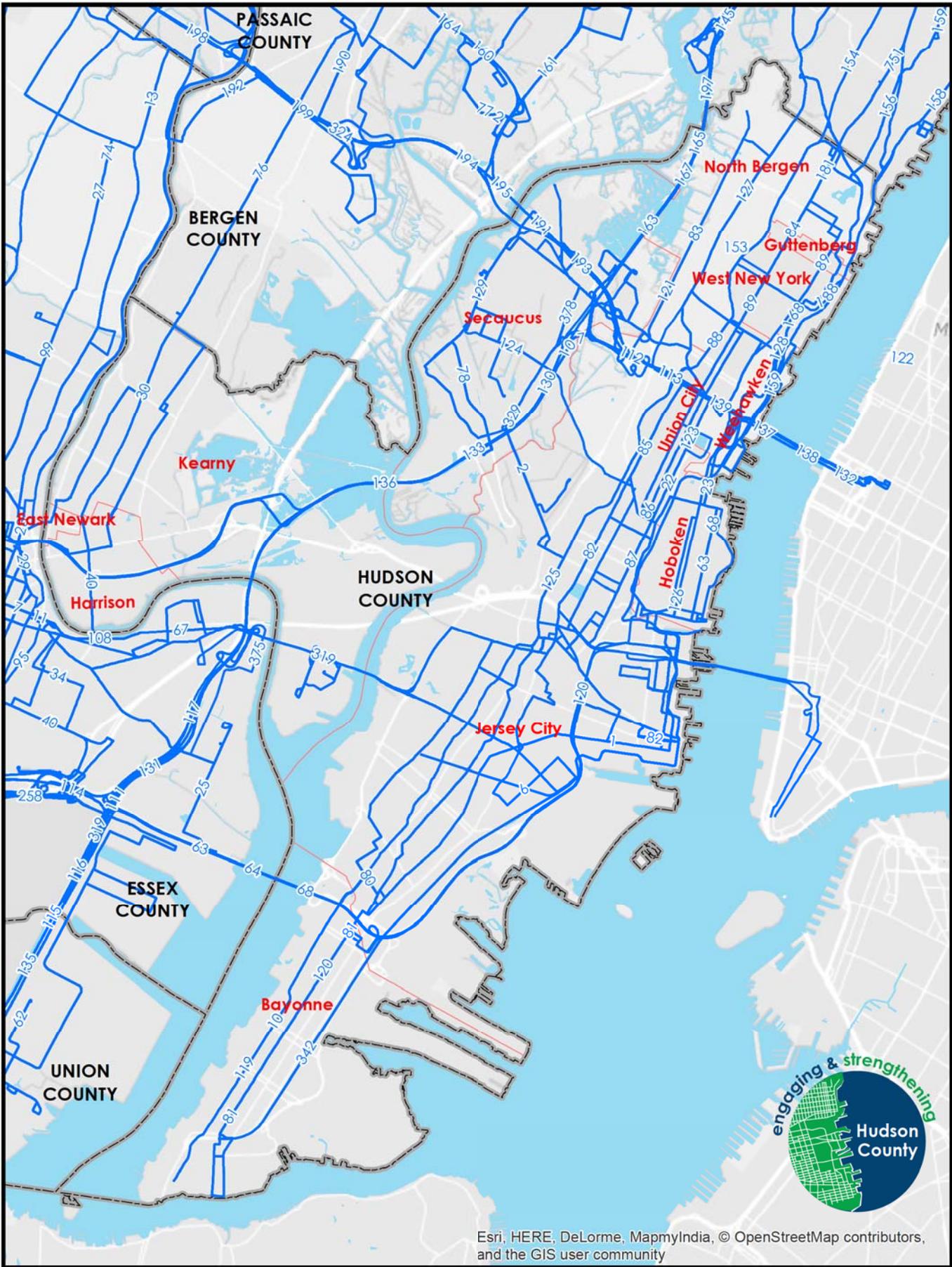
### What Has Changed:

The major recommendation of the jitney study included creating a "revenue neutral" jitney medallion program (similar to that used by taxicabs and jitneys in Atlantic City) and inter-municipal coordination as well as proposing Hudson TMA become a repository for transit operator information.<sup>31</sup> Since the study, unofficial maps have surfaced and no regulations have been put in place, although New Jersey's MVC (Motor Vehicle Commission) has started requiring annual emissions and safety inspections. Unlicensed jitneys and vans continue to cause issues throughout the county.

### Transit Connectivity

**The Issue:** The 2002 Master Plan listed several issues with bus service, particularly including a lack of bus service providing east-west connections from East Newark, Kearny, Harrison, the Meadowlands, and Secaucus, and a slow adaptation of bus service to newly developed Jersey City waterfront developments. Another issue was a lack of coordination between public and private bus operators. Both schedules were noted as being erratic and limited and having no unified fare system between bus and rail.

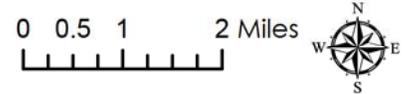
**What Has Changed:** Hudson County enjoys excellent public transportation that has been further enhanced since the 2002 Master Plan with the Hudson Bergen Light Rail Transit (HBLRT). The recently launched bike share systems also increase transit system connectivity by providing the "last mile" to several existing transit stations in Hoboken and Jersey City. However, the gaps in east-west service that were identified continue to be a pressing concern, one that was raised by the public during the development of this plan. Additionally, due to funding gaps in NJ TRANSIT's operating budget, there have been several fare increases in the last ten years, which has created affordability issues for riders with limited incomes. The most recent fare increase took place in 2015 where the price of bus and rail tickets rose by an average of 9%. These budget cuts have also led to the discontinuation of several bus lines throughout the County, limiting residents' transit options.



## Bus Route Map

— Bus Route

\* Please visit NJ Transit's website for more detailed route information.



## 2008 Recommendations - Now

### General

***"Create a definition for circulation/traffic in the County Site Plan & Subdivision Ordinance to amend and expand to encompass a more holistic view of traffic and circulation as well as Waterfront walkways. Impacts that affect county roads, but not necessary on county roads should also be considered for review as well."***

As noted in the Land Use recommendations, the definition for circulation has been updated in the Hudson County Land Development Regulations (LDR) to include pedestrian and bicycle circulation as well as waterfront walkways. However, the connection between circulation and building design is not established. The County does review proposed developments that may impact county roads or circulation assets.

***"Adopt innovative design approaches to the county's transportation network that work to positively impact CO<sub>2</sub> emissions outside of traditional transportation related implementation strategies. Such approaches should employ a multi-year effect by including a "green" streetscape design that couples pedestrian friendly design with innovative storm water control measures. Additionally, street trees should be considered an integral part of the county's infrastructure as they not only are aesthetic enhancements, but cool paved surfaces and expand longevity, enhance pedestrian safety, and aid in traffic calming."***

The 2016 LDR update incorporates "green" streetscape designs, pedestrian friendly designs, and innovative stormwater control measures through the classification of county roadways as Street Typologies and through the requirement of development applications to provide Green Stormwater Infrastructure (GSI) techniques. Street trees are also incorporated into the regulations as an integral component of complete streets and the county drainage system. The LDR states, "Street trees shall be provided along all roadways.

*The following design guidelines are standard to trees planted in all development projects requiring County approvals and/or along or near a County Road right of-way such that by their proximity are reasonably expected to impact the County road right-of-way or infrastructure after reaching maturity." The County has also established the Hudson County Shade Tree Fund that applicants can pay into if their site poses a hardship to plant a tree along their right-of-way. The County uses these funds to plant trees along other County roads. Municipal efforts to lower CO<sub>2</sub> emissions include Washington Street and Observer Highway in Hoboken since both streets implement Complete Streets designs and will have sustainable design features.*

***"Review and enact standards for applications for development that mandate level of service D or better before review."***

The 2016 Hudson County LDR notes, "Any development that causes a location on a roadway to operate in excess of capacity Level E for vehicles is discouraged. However, vehicular level of service should not be the only metric used to determine the traffic impact. For instance, if a development reduces the motor vehicle level of service, but improves conditions for pedestrians, transit, and/or bicyclists, a motor vehicle level of service in excess of capacity Level E may be acceptable, at the discretion of the Planning Board and the County Engineer. If there are no improvements for other modes to offset the impact to the motor vehicle level of service, a developer may address traffic problems resulting from the development by incorporating design modification or by contributing to the cost of off-site traffic improvements."

***"Ensure that traffic reports need to identify not only vehicle trips but also identify trips generated by public transportation, pedestrian and bicycle."***

The 2016 LDR update introduces a requirement for a Multi-Modal Impact Report (MMIR), as part of a Traffic Impact Report. A Multi-Modal Impact Report measures the movement of people and other modes rather than vehicles and is required "for all sites located within areas studied by a Road Safety Audit, areas within ¼ mile of a PATH stop,

*light rail stop, Journal Square Bus Terminal and other possible bus depots/hubs at the County's discretion. The goal of the study is to determine the locations of increased pedestrian circulation and the associated likelihood of increased vehicular/pedestrian collisions."*

***"Provide internal site circulation of large sites which will expand the idea of street-grid where applicable through an integrated land use and circulation approach."***

The 2016 LDR update states in the General Conditions of the Circulation and Roadways Design Standards Section that, *"the proposed streets and walkways interior to the development shall be designed to provide optimal, well-balanced pedestrian, bicycle, and vehicular circulation for the development for any existing streets, roads, and walkways, which may adjoin the development or may be constructed in the future."*

***"Provide adequate information in the form of legible street signs, wayfinding signs and information kiosks."***



The 2016 LDR update states that developers must provide all required signage under municipal, County, and NJDOT requirements and in accordance with the Manual on Uniform Traffic Control Devices (MUTCD). Further, signs that are pedestrian oriented are encouraged. Specifically, county roadways classified as a Downtown Avenue often serve many users not from the neighborhood, so clear and comprehensive pedestrian and vehicular wayfinding is essential. The LDR also states that *"bicycle wayfinding signage should be used on all thoroughfares where bicycling is expected or encouraged. At a minimum, it should be provided where bicycle lanes, cycle tracks, or shared lane markings are used."*

***"Require applicants contribute to their share of roadway improvements that address all transportation modes, and include environmental and aesthetic standards."***

Through the 2016 LDR update, Hudson County applicants are now required to provide the existing and reasonably anticipated future multi-modal peak hour flows for off-tract improvements and are required to pay a proportionate share towards those improvements. Improvements may include street improvements, alignment, channelization, barriers, new or improved traffic signalization, signs, curbs, sidewalks, trees, or other improvements.

***"Review the Cyber-District Study and determine how tele-commuting can be utilized as a means to reduce auto congestion."***

Published in 2002, the Hudson County Cyber District Feasibility Study defines a cyber district as *"a spatial area in which digital networks play a strategic role in its physical and economic development."* The recommendations for the study were based on the opportunity and need to dramatically improve the level of network utilization by institutions, business and individuals throughout the county. Little development has occurred with the Cyber-District

study and there has been no sign of a countywide effort to encourage telecommuting. Globally, however, network utilization has evolved through innovations such as smartphones, tablets, and other technological advances. According to 2016 data, approximately 20-25% of the workforce teleworks at some frequency. As a result, U.S. telecommuting has grown since 2013.<sup>32</sup>

***"Review and consider major infrastructure improvement projects that assist communities of the County create and enhance parks and pedestrian environments such as the decking of I-495 in Union City."***

The potential for decking I-495 in Union City continues to be explored. Highway decking (or capping) has been successfully used across the country to create vibrant parks and safe pedestrian environments. In addition, spaces underneath viaducts, like the Hoboken 14th St.

Viaduct Park have been converted into urban parks that serve the local communities. Other infrastructure improvement projects that integrate enhanced recreational facilities include 1600 Park and Southwest Park in Hoboken.

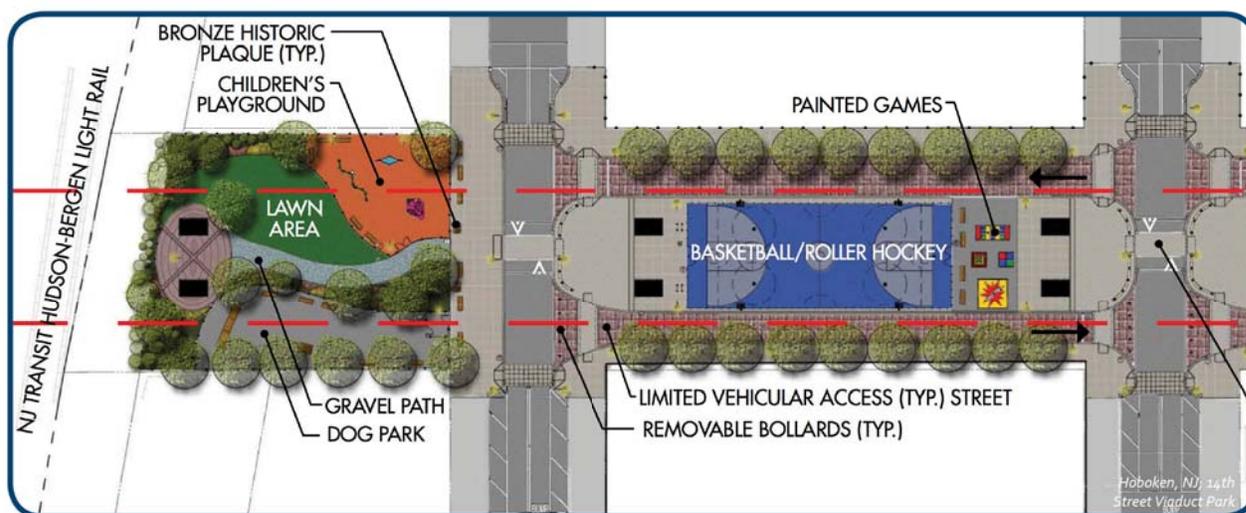
***"Consider the circulation needs of the Port."***

The needs of the port are vital to the state economy. Many of the intermodal facilities in Hudson County serve the port and utilize freight rail. According to NJTPA data, Hudson County received the second greatest proportion of inbound intermodal freight and the greatest proportion of outbound rail freight in the state, so improving rail access to Port Jersey is vital to the rail-supported portion of the state economy. Local serving yards in Hudson County include Bayonne, Greenville (Jersey City), and North Bergen. Greenville Yards serves Global Marine Terminal making it a critical node in the rail system. PANYNJ is redesigning the facility to handle an anticipated increase in traffic (Greenville Yard Express Rail Project).

According to New Jersey's 2015 State Rail Plan, port related proposed improvements in Hudson County include the construction of the Northbound Connector at Greenville Yards to the National Docks Secondary and the rehabilitation of Dock Bridge (Newark-Harrison) over the Passaic River (PATH, NJ TRANSIT, and Amtrak all run over this bridge, which is owned by Amtrak). The Bayonne Bridge is also being raised to allow navigational clearance of large container ships to Port Newark



Hoboken, NJ; 14th Street Viaduct Park



Hoboken, NJ; 14th Street Viaduct Park

and the Elizabeth-Port Authority Marine Terminal. Additionally, PANYNJ is undertaking a \$600 million rail program to improve access to NJ's ports and involves dedicating rail facilities for each of the major container terminals and six inter-regional rail facilities that connect to the ports.<sup>33</sup>

### **Bicycle and Pedestrian**

***"A county-wide bicycle and pedestrian study should be undertaken to identify bicycle and pedestrian improvements throughout the county."***

In 2009, the River Road/Hudson Waterfront Circulation Study was published in cooperation with Bergen County and the NJTPA. Several sidewalk gaps were identified. In 2012, the Hudson County Division of Planning, in partnership with the Hudson Transportation Management Association (TMA), conducted a preliminary bike share feasibility study and was expanded on in 2015 by the *"Exploration of a Public Bike Share Program in Hudson County."*<sup>34</sup> However, a full county bicycle and pedestrian study is still needed.

***"Create and encourage provisions to provide secure bicycle racks at major employment centers and development nodes. Consideration should also be given to provide secure and/or indoor storage as well and shower and changing facilities for commercial and institutional uses."***

Jersey City (Citi Bike) and Hoboken (Hudson Bike Share) have created bike share systems that rely on residential density transit stops/systems among other factors for station placement. The systems also have the potential to expand to other municipalities. The county has also embraced bicycle storage for the purpose of both accommodating and encouraging bicycle use within the county. The LDR states, "bicycle parking racks shall be provided for multi-family, non-residential and mixed-use development projects. The racks shall accommodate bicycle at a ratio of one (1) bicycle rack for every ten (10) vehicular parking spaces provided." Additionally, "Street furniture for bicyclists such as bike racks and bike shelters, is encouraged in areas of high

bicycle use, and may be required at the discretion of the County Engineer." Public transit stops may also include bicycle racks. Neighborhood Streets (one of the Street Typologies) should also provide pedestrian and bicycle access to neighbors, school and convenience retail. And, to encourage bicycling as a commuting option, the 2016 LDR Update recommends that on County roadways classified as an Industrial Boulevard, bicycle parking should be provided at key locations for commuters. According to the regulations, bike racks shall comply with the latest edition of the National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guidelines.

***"Provide complete pedestrian and bicycle circulation throughout the site design and take into consideration of off-site generators of pedestrians and bicyclists."***

The 2016 LDR update states in the General Conditions of the Circulation and Roadways Design Standards Section that, *"the proposed streets and walkways interior to the development shall be designed to provide optimal, well-balanced pedestrian, bicycle, and vehicular circulation for the development for any existing streets, roads, and walkways, which may adjoin the development or may be constructed in the future."*

According to the 2016 LDR update, applicants are required to submit a Multi-Modal Impact Report (MMIR) as part of a Traffic Impact Report if the site is *"located within areas studied by a Road Safety Audit, areas within ¼ mile of a PATH stop, light rail stop, Journal Square Bus Terminal and other possible bus depots/hubs."* The goal of the MMIR is to determine the location of increased pedestrian circulation and associated likelihood of increased vehicular/pedestrian collisions paired with the appropriate mitigation measures, if required.

***"Increase pedestrian visibility through lighting, improving sight lines, etc."***

There are several methods for increasing pedestrian visibility on the street including lighting crosswalks and curb radii. According to the 2016