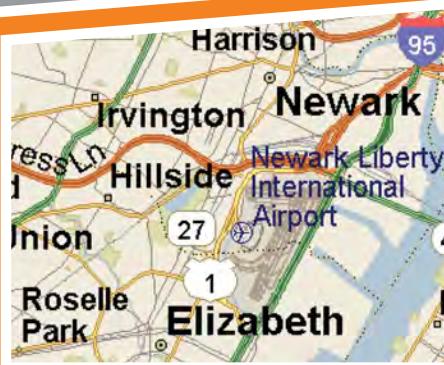




# GREATER NEWARK BUS SYSTEM STUDY

## Final Report

July 2011



**Gannett Fleming**  
Abrams-Cherwony Group

*in association with*



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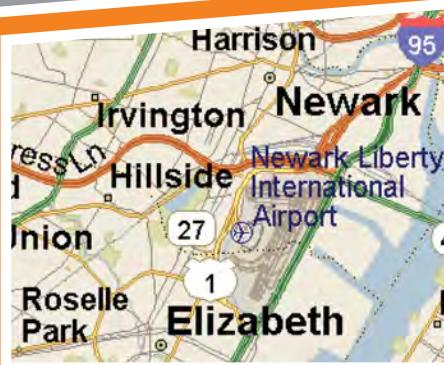
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# GREATER NEWARK BUS SYSTEM STUDY

## Executive Summary

July 2011



**Gannett Fleming**  
Abrams-Cherwony Group

*in association with*



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## INTRODUCTION

The local bus transit network in the greater Newark-Elizabeth area consists of approximately 50 bus routes operated by NJ TRANSIT and COACH USA. These routes provide approximately 5,200 one-way bus trips each weekday through 6,300 revenue hours of service and requiring 475 vehicles during the peak service period. On any given weekday, these routes transport approximately 240,000 passengers. Taken alone, this network of bus routes would be the 20<sup>th</sup> largest bus system in the country based on the number of peak vehicles in operation for the motorbus mode, as reported to the National Transit Database (NTD) for Report Year 2008. Among the NJ TRANSIT bus services, NJ TRANSIT's local bus routes in the Newark-Elizabeth area account for approximately 25% of weekday bus revenue hours but carry more than 35% of the total average weekday passengers.

Taken alone, the local bus route network that operates in the Newark-Elizabeth area would be the 20<sup>th</sup> largest bus system in the country.

Given these facts, this system of bus routes is the cornerstone of NJ TRANSIT's intrastate bus market, representing an important element of New Jersey's public transportation network. This network of bus routes has not been analyzed in a comprehensive manner since the early 1980's, shortly after the inception of NJ TRANSIT. However, since 1970, the share of transit trips as a percentage of journey-to-work trips in this portion of the state has declined by half. In the interim, the geographic area served has undergone significant change in terms of demographics and development patterns. Most notably, residential development has greatly increased the population in the suburban areas north and west of the older urban cores, which, historically have not received a high level of local bus service. In addition, more employment has shifted away from the traditional urban centers to suburban areas and changes in the medical industry have dramatically shifted the location of available medical services more towards suburban locales. Newark Liberty International Airport and the Ports of Newark & Elizabeth have emerged in recent years as significant regional employers. "Big Box" retailers have been drawn to the area in locations such as in nearby Harrison in Hudson County and along the US Route 22 Corridor in Union & Springfield Townships.

In recognition of the numerous factors listed above, NJ TRANSIT decided to undertake a comprehensive review of the bus network in the greater Newark, Essex, Union and Western Hudson County areas rather than focusing on specific narrow issue such as improving interfaces or truncating services with the Newark light rail extension at the Broad Street Station. Each of the geographic study phases included a service planning effort building upon the data collection results. The study was conducted over a three-year time frame beginning in Spring 2007 and finishing in Spring 2010. Additional funding for the study was provided by NJTPA

Other national trends have greatly affected mobility needs in the study area. The decline of the manufacturing sector has increased the importance of post-secondary education for the local labor force; especially those seeking basic and advanced job skills and educational degrees received through community and technical colleges. Access to these institutions has become a vital component of economic development efforts throughout the study area.

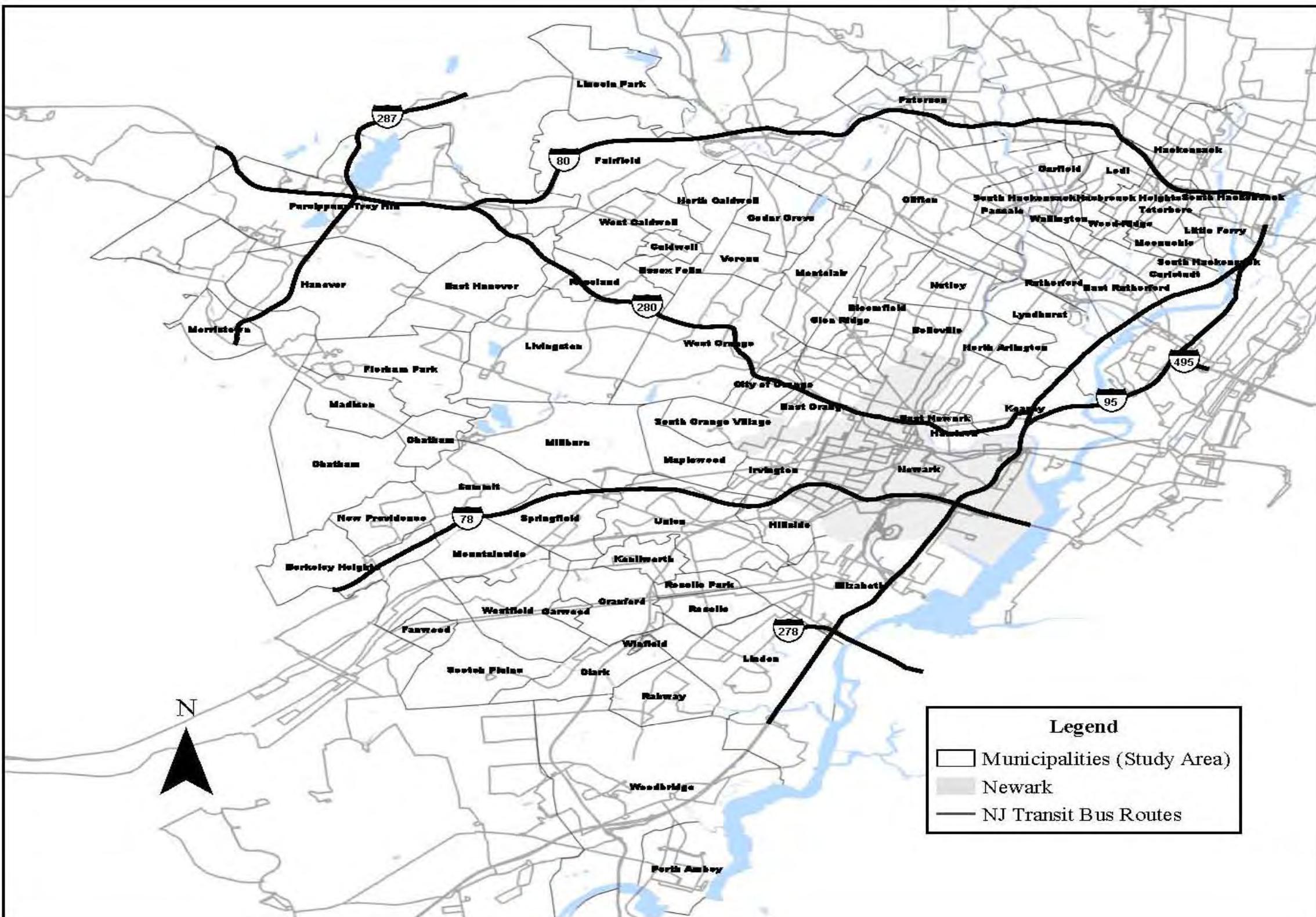
As these trends changed the nature of the study area, NJ TRANSIT continues to address the emerging transportation needs with a very limited and finite set of resources that must be shared over the entire transit network. As a result, select routes have become complicated with some having numerous operating variations designed to address the unique transit needs of different groups of riders in the most economical way possible.

In 2006, NJ TRANSIT recognized the need to turn the tide of the ridership decline and instead grow the transit market shares in this region because of its importance to the residents and workers in this area and it is essential to the growth of the economy in this area of the state. Coupled with the expansion of the Newark light rail between Newark's Penn Station and Broad Street Station, NJ TRANSIT began to conceptualize how the Newark area bus routes should be restructured to take advantage of the newly created intermodal opportunities both within the City of Newark and the surrounding areas. Ultimately, the targeted goal should be to grow total transit usage by three to five percent annually, beginning in FY2012, with bus transit assuming a sizable portion of this burden. Obviously, for this goal to be achieved, the economy of the region will need to recover from the economic recession.

The Greater Newark Bus System Study (GNBSS) came to include more than 50 area bus routes as listed in Table 1 of the Appendix. The study was initially organized into four phases of analysis of NJ TRANSIT routes based upon geography and function. A subsequent phase that examined the COACH USA route structure was added at the study inception. Each study phase included an extensive on-board ride check and passenger origin-destination and opinion survey effort. An additional phase which included the surveying of the Newark light rail passengers was later included in the study effort. The study area is shown in the figure on the following page.

This document provides a summary of the study process, overall goals of the service improvement proposals and identifies priority recommendations from among the extensive list of proposed changes. The proposals create a much needed foundation for action and further planning, and should be viewed as a blueprint for action in the immediate and longer range future. Additional analysis is necessary concerning future financial and capital needs and opportunities that cover a longer time period, which will fall to the responsibility of NJ TRANSIT staff as it proceeds with implementation.

Study Area



## PLANNING INPUTS

The GNBSS process included extensive data collection along with community, rider and stakeholder input. This supported various quantitative and qualitative analyses. Each analysis played a part in identifying potential service improvements and prioritizing those improvements. Planning inputs included:

- **Socioeconomic and Demographic Analysis** – The study area consisting of Essex, Union and Western Hudson Counties was analyzed to determine where the greatest needs for transit exists based on the size and density of a series of population indicators, including overall population, senior citizen population, low income households, zero-car households, youth population and the number of persons with disabilities.
- **Inventory of Major Trip Generators** – An inventory of destinations which typically attract transit trips was assembled for the study area. This included a list of locations such as major employers, colleges/universities, hospitals, large retail-commercial-industrial centers and government centers.
- **Rider Origin-Destination and Opinion Survey** – As noted earlier, each phase of the GNBSS included a rider origin-destination and opinion survey effort. The survey collected information concerning the riding and travel patterns of current riders along with their opinion of current services and their most important improvement suggestions. Throughout the study, over 20,000 surveys were returned and processed representing an overall 5.7% return rate.

The study included a rider origin-destination and opinion survey. Over 20,000 survey cards were processed throughout the study.
- **On-Board Ride Checks** – While conducting the origin-destination and opinion survey, survey workers also performed on-board passenger activity and time checks in which the passenger activity (i.e., boards and alights) were recorded at each bus stop along the bus routes. In addition, the arrival time of the bus at key stops was noted. This allowed for the identification of poorly performing route segments, instances of overcrowding as well as routes experiencing on-time performance problems.
- **Route Diagnostics Analysis** – A detailed quantitative analysis was performed for the routes included in the study to determine which routes are placing a disproportionate financial or resource burden on the system overall given current ridership performance. Conversely, the analysis allowed for the identification of routes which perform better than would be expected given the current resource investment.
- **Focus Groups** – NJ TRANSIT conducted a series of focus groups with members of the public at the outset of the study process. The groups included a mix of bus riders and non-bus riders. The sessions focused on the participants' opinions of the current bus services and their suggestions for improvement.

- **Community Outreach** – The study process also included group sessions with individuals and stakeholders along with municipal and county officials from throughout the study area who have a stake in the design and delivery of bus service in the Newark-Elizabeth study area. This group included a mix of representatives from both the public and private sectors. Similar to the focus groups, the sessions provided information on the participants' opinions of current services and improvement suggestions. In addition to these groups, the study included specific outreach meetings with the planning and development communities throughout the study area. These meetings focused on identifying the broad development or redevelopment plans of the communities in the study area and how the local bus system could support those plans.
- **Bus Operator Outreach Meetings** – A series of meetings were held with the bus operators at each of the garages from which the routes included in the study operate. This included both NJ TRANSIT and COACH USA facilities. Operators were asked for their input regarding issues with the current services and their suggestions on how service could be improved.

Outreach efforts included meetings with municipal and county officials to identify development and redevelopment priorities.

Participating in the local community's priority projects presents opportunities for partnering with public and private sector entities.

## OVERALL PLANNING GOALS

Taken together, the various qualitative and quantitative planning inputs described above helped determine the broad goals that should be addressed as part of the service improvement planning process. For the GNBSS study area, these goals include:

- **Improve Access to CBD/Non CBD Employment, Education and Medical Services** – This, in essence, is the definition of mobility. Improved access to these vital locations not only improves the quality of life of area residents but also promotes economic development efforts in both the urban core and outlying areas. Journey-to-work trips have to be the first focus, but that is not where the effort must end.
- **Simplify the Route Structure** – As noted earlier, attempting to address divergent mobility needs with finite resources over a period of three decades has resulted in some bus routes with numerous operating variations. Therefore, every attempt was made to revise the existing route structure and develop a new user-friendly route structure with limited routing variations to work, shop, medical, personal business and myriad other daily travel needs.
- **Rationalize Existing Service** – The detailed ride check and running time data

collected through the study effort allows for the identification of poorly performing routes and route segments. These route segments were further examined for potential elimination or service reduction allowing the resources saved to be redirected to route segments on which overcrowding was identified. In addition, the running time data allows for the re-timing of current routes which can greatly improve the on-time performance of the route thereby enhancing the quality of service from the rider's perspective. The primary finding is that the core bus network is on streets and corridors where it should be; however, opportunities for improvement continue to exist.

- **Improve Existing and Create New Multimodal Connection Opportunities** – Given the breadth of the transit system in the study area, service planning efforts must view these bus routes as one element of a complete multimodal public transit network. That is, plans to address particular travel patterns should, to the greatest extent possible, incorporate all modes available for all or part of the trip. Coupled with fare policy changes across multiple modes and carriers, this will allow for a more efficient use of current resources and reduces duplication of services. Further exploration of developing a joint fare structure between the various transit options and operators will encourage a greater level of transferring between modes.
- **Develop a BRT System for Newark & Surrounds** – Starting with some of the largest passenger volume bus corridors in the existing system, develop an incremental plan for the implementation of Bus Rapid Transit (BRT) that uses elements such as special bus priority treatments on local streets and at intersections coupled with other supportive actions to create a new overlay rapid bus network that is highly visible, faster, more reliable and higher quality. NJ TRANSIT is clearly on the proper path as this incremental approach has been endorsed in the recently released study of the Mineta Transportation Institute, titled “From Buses to BRT: Case Studies of Incremental BRT Projects in North America.”
- **Support Local Development/Redevelopment Plans** – Transit can play an important role in the success of development and redevelopment plans of the communities in the study area such as in Newark, Elizabeth and the Meadowlands. The goals of these communities were considered when developing service improvement proposals in the affected areas. In addition, participating in these identified development and redevelopment priorities earlier rather than later presents opportunities for partnering with local communities or private sector entities to improve or add new access via public transit.
- **Engage Local Partners** – Work with local transportation partners such as NJDOT, counties and municipal governments to make improvements in the transportation infrastructure to insure that the NJ TRANSIT and private bus networks can travel at the posted speed limit 24 hours a day, 7 days a week.

## SERVICE PLAN SUMMARY

As noted earlier, taken alone, the local bus route network in the greater Newark-Elizabeth area would be the 20<sup>th</sup> largest bus system in the country. The more than 50 bus routes included in the study serve varying purposes and geographical areas. For that reason, the routes and the resulting service improvement proposals have been organized into the following categories:

- Orange-Newark-Elizabeth (O-N-E) Central Core Services;
- GO Bus (Bus Rapid Transit) Services;
- Crosstown Services;
- Newark Liberty International Airport/Ports Newark & Elizabeth Services;
- Union County Services;
- Suburban Essex, West Hudson & Bergen Counties Services;
- Coach USA Services;
- New York Based Services.

Given the breadth of the study and the extensive number of resulting service recommendations, the priority order of proposals within each of the above categories was identified. Comprehensive descriptions of all proposals generated by the study have been documented in the *Greater Newark Bus System Study Technical Service Plan* and the *Final Report*, which have been submitted under separate cover. For the purposes of this Executive Summary, the early action items and the top ten priority recommendations from among all of the proposals are described below.

## PRIORITY RECOMMENDATIONS

A collaborative process involving the consultant team, as well as Bus Service Planning and Capital Planning staffs at NJ TRANSIT was followed to identify the early action recommendations and the top ten priority recommendations from among the dozens of proposals resulting from the GNBSS study process. The early action items and ten priority recommendations were identified in consideration of:

- The degree to which the proposal addressed one or more of the overall planning goals described earlier;
- The feasibility of early implementation; and
- Likely availability of operating and capital funding to implement

The feasibility of early implementation and opportunities for partnering were considered when identifying priority proposals.

The resulting list of four early action items and ten priority recommendations is summarized below. More detailed information for each recommendation is

included in the Technical Service Plan found in the appendix to this report:

### **Early Action Recommendations Implemented During the Study**

1. **Expansion of Route 62 service to address overcrowding** - During the early outreach process to Newark Liberty International Airport employers, it was quickly determined that insufficient capacity existed on Route 62 between downtown Newark and Newark Liberty International Airport to support the present travel needs of the airport workforce during the early afternoons and later evening hours. In late 2006 additional weekday and weekend service was added to the Route 62 schedule to address immediate needs of airport employees.
2. **Implementation of early phases of BRT - GO Bus 25 on Springfield Avenue and GO Bus 28 on Bloomfield Avenue** – Based on the recommendations of a separate analysis which reviewed the potential for initial BRT services within Newark – in late 2008 limited weekday peak hour service with BRT elements (enhanced station stops and unique branding) was implemented along the Springfield Avenue corridor (Go Bus 25) between the Irvington Bus Terminal and Newark Penn Station. In 2009, Go Bus 25 expanded to offer peak hour service both inbound and outbound.

This was followed in the fall of 2009, with a second, more robust GO Bus corridor along the Bloomfield Avenue-Broad Street corridor (GO Bus 28) operating daily between the Bloomfield RR Station and Newark Liberty International Airport via Newark's Innovation Zone and University Heights. This route provides direct 24 hour service to the airport, which employs over 24,000 workers and serves over 90,000 passengers per day. Additional BRT elements included with this corridor were: headway based operations, the use of new uniquely branded buses, the use of Transit Signal Prioritization (TSP) at 14 intersections along Bloomfield Avenue within Newark and the demonstration of real time service information at the Bloomfield Avenue Light Station stop.

Go Bus vehicles and station stops were partially funded by Liberty Corridor and ARRA. This organizations, along with Essex County helped fund the Bloomfield Avenue TSP.

3. **Rationalization of Route 39 – Creation of new Route 30** – An analysis of the busy Irvington-Newark-Harrison-Kearny corridor was undertaken early in the study process with the goal of achieving some early service efficiencies due to declining demand for service along the northerly portion of the route. After a detailed ridership analysis was completed, a recommendation was put forth and implemented in mid 2009 to split the existing Route 39 into two unique

**Bus Route No. 39**  
IRVINGTON - NEWARK PENN STATION  
Effective June 27, 2009

Locations Served:  
Chancellor Avenue  
Stuyvesant Avenue  
Valley Fair  
Maple Avenue  
Lyons Avenue  
Bergen Street  
W. Bigelow Street  
Elizabeth Avenue  
Clinton Avenue  
Lincoln Park  
Broad Street  
Raymond Boulevard  
Newark Penn Station

**Bus Route No. 30**  
N. ARLINGTON - KEARNY - NEWARK  
Effective June 27, 2009

Locations Served:  
North Arlington Loop  
Ridge Road  
Kearny Avenue  
Harrison Avenue  
Broad Street  
Park Place\*  
Newark Penn Station\*  
Lincoln Park\*

\* Select trips only. See timetable.

**Need more info?**  
visit [njtransit.com](http://njtransit.com)  
or call (973) 275-5555

## Bus 39 Service Changes Effective June 27, 2009

### New Bus Route 30 serving North Arlington Harrison, Kearny & Newark



#### New Service Pattern

#### More Service to Penn Station

#### Improved Reliability

## A Service Change Arrives June 27, 2009

On June 27, 2009, the No. 39 Bus will be split into two routes to provide more service for customers traveling to/from Newark Penn Station, and to improve reliability. The new No. 39 will operate between Irvington and Newark Penn Station, serving all of the same stops as before. Beginning June 27, No. 39 buses will no longer serve points north of Raymond Blvd. in Newark, Harrison, Kearny or North Arlington. Most No. 39 buses will begin and end their trips at Newark Penn Station. Certain trips, known as "39X" (EXPRESS), will continue to operate to/from Washington Park in Newark.

For customers in North Arlington, Kearny and Harrison, a new bus route will be introduced: the No. 30. This route will serve bus stops previously served by No. 39 buses in North Arlington, Kearny, and Harrison, as well as selected stops along Broad Street in Newark. On weekdays until 6 p.m., buses will operate from North Arlington to Lincoln Park in Newark. Starting with the 6:20 p.m. departure from North Arlington on weekdays and all day on weekends, No. 30 buses will begin/end their trips at Newark Penn Station. (On weekdays the first trip from Newark Penn Station to North Arlington departs at 7:05 p.m.)

#### How does this affect my trip?

All customers will continue to have bus service from their regular bus stop to downtown Newark. Customers along the new No. 39 route will benefit from more direct service to Newark Penn Station, making it easier to make connections. In addition, by shortening the length of the route, buses will operate more reliably for all customers. Customers who travel through downtown Newark (e.g. from Irvington through to North Arlington) will now have to transfer between the two routes on Broad Street or at Newark Penn Station.

#### Are fares impacted?

The one-zone fare will continue to be \$1.35, and the zone boundary for the new No. 39 will continue to be the border of Newark and Irvington, so most customers will not have to pay more than they do today. Customers who transfer between the new No. 39 and the No. 30 will need a 65¢ transfer (just like any other bus transfer). However, customers who travel one zone on the new No. 39 to connect to the No. 30 can pay less than they do today by purchasing a one-zone bus card.

#### Why are these changes being made?

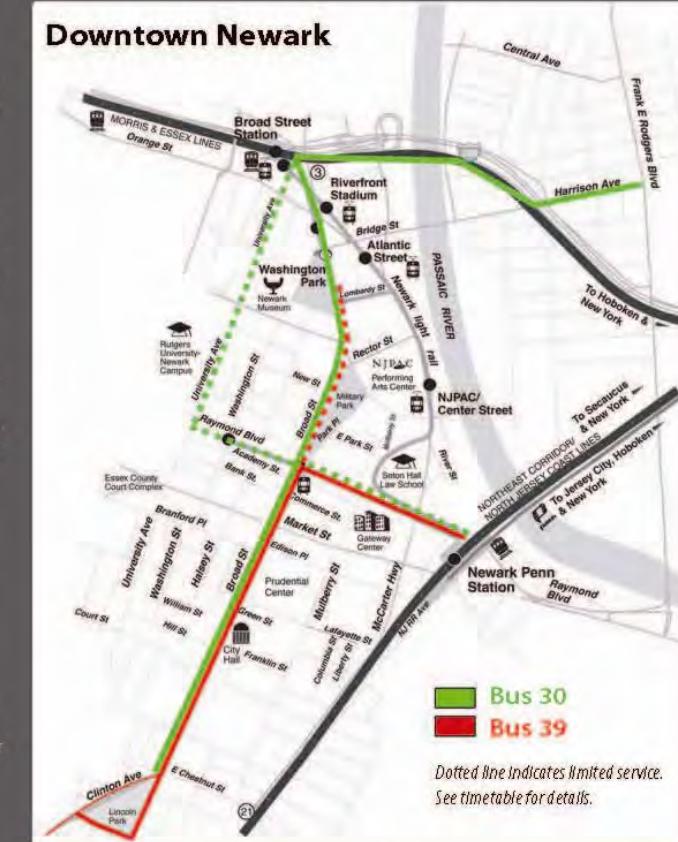
For several reasons. We want to improve reliability for customers along the existing No. 39 route. One way to do this is to shorten the distance that buses travel. This is also part of a broader effort to put seats where they're needed most. Please carefully check bus schedules dated June 27, 2009, as many departure times have changed.

#### Where can I find my bus at Newark Penn Station?

No. 39 buses to Irvington will continue to board from Bus Lane 1A at Newark Penn Station. No. 30 buses to North Arlington will board from Bus Lane 3B until 10:00 p.m. After 10:01 p.m., No. 30 buses will board at Bus Lane 1B. (On weekdays, the first departure from Newark Penn Station is 7:05 p.m.)

#### What will the destination sign say?

Traveling from Irvington to Newark Penn Station: **39 NEWARK PENN STATION**  
Traveling from Irvington to Washington Park (express): **39X EXPRESS / WASH PARK**  
Traveling from Newark Penn Station to Irvington: **39 IRVINGTON**  
Traveling from Washington Park to Irvington (express): **39X EXPRESS / IRVINGTON**  
Traveling from Newark to North Arlington: **30 KEARNY / N ARLINGTON**  
Traveling from North Arlington to Newark: **30 NEWARK / (LINCOLN PARK or PENN STATION)**



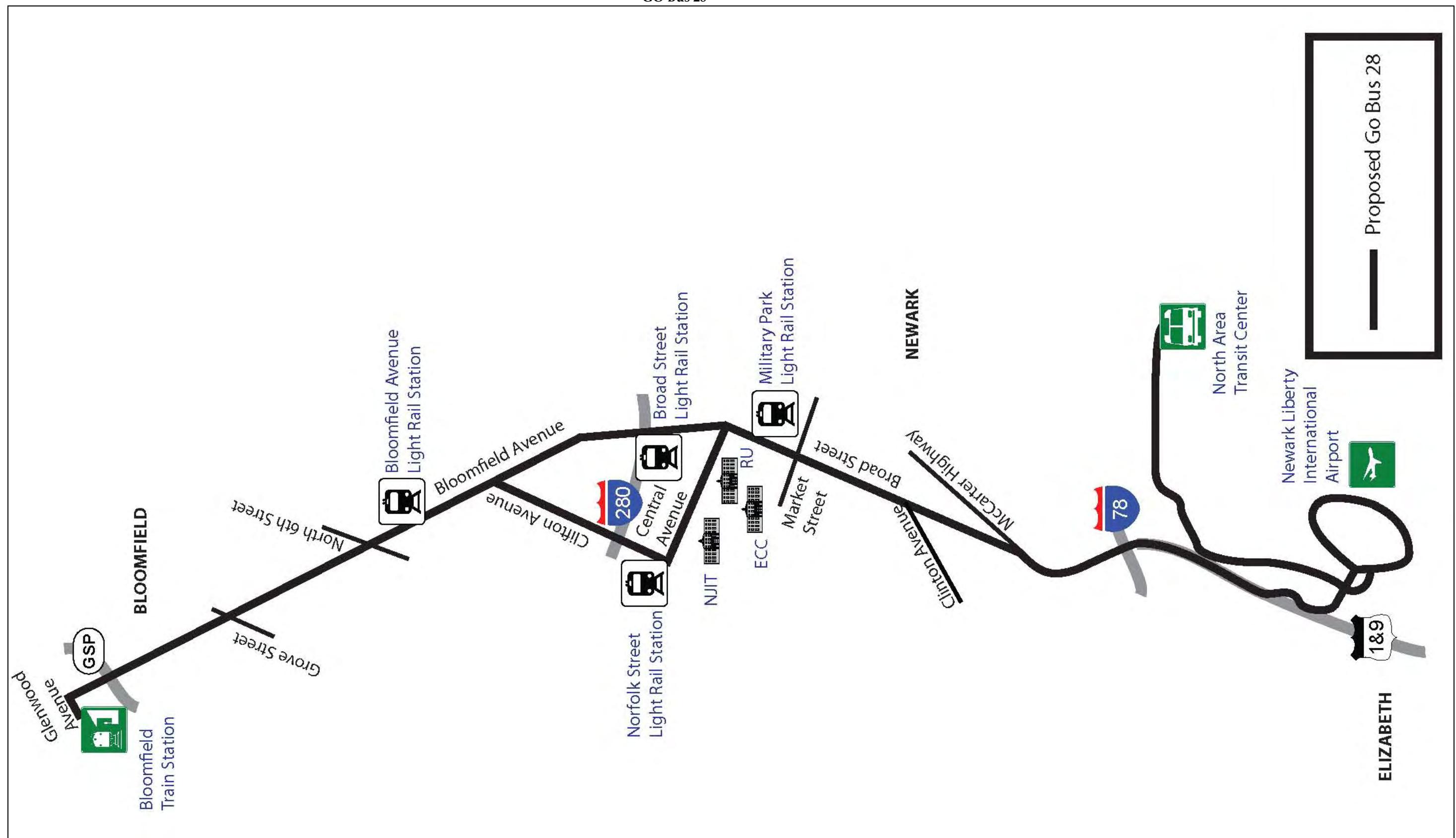
routes. Today, the Route 39 operates only between Irvington and the Newark CBD, originating and terminating at Newark-Penn Station. The northerly portion of the Route 39 to Harrison and Kearny became the basis of the new route known today as the 30. Route 30 service levels in both the peak and off-peak periods are reduced compared to the original Route 39 and are based upon the demonstrated demand for service in this market. The map for this service is presented on the following page.

4. **Implementation of the weekday PM peak Raymond Boulevard bus lane –** Based upon the recommendations of a previous analysis for the implementation of a bus only priority lane within the Newark CBD, the weekday PM peak hour Raymond Boulevard bus only lane was implemented in 2008 between Newark-Penn Station and the intersection of Raymond Boulevard and NJ Route 21. This facility allows for buses exiting the Penn Station bus lanes to have both traffic and signal queue jump of a few minutes along the normally congested Raymond Boulevard corridor.

### Top Ten Priority Recommendations

1. **Expand GO 28 – Rationalize Route 28** – The new GO 28 is a Bus Rapid Transit (BRT) type route that was implemented between the Bloomfield Train Station and the *Newark Liberty International Airport's North Area Transit Center via the Central Terminals Area* as part of the Liberty Corridor improvements in the Fall of 2009. GO 28 operates on two variations with one serving the University Heights/Newark Innovation Zone area of Newark, thereby providing a convenient link between University Heights community and the Airport which can *support the development of the area as a major research center*.

Proposals call for a multi-phased expansion of the GO 28 service to the *Montclair State University and Montclair State University Station* on the northern end and to Jersey Gardens Mall – Newark Liberty International Airport – South Area in Elizabeth on the southern end. As GO 28 is fully implemented, service on Route 28 should only operate between the Wayne Transit Center and the Bloomfield Avenue Newark Light Rail Station, with additional *resources directed to other more effective uses*.

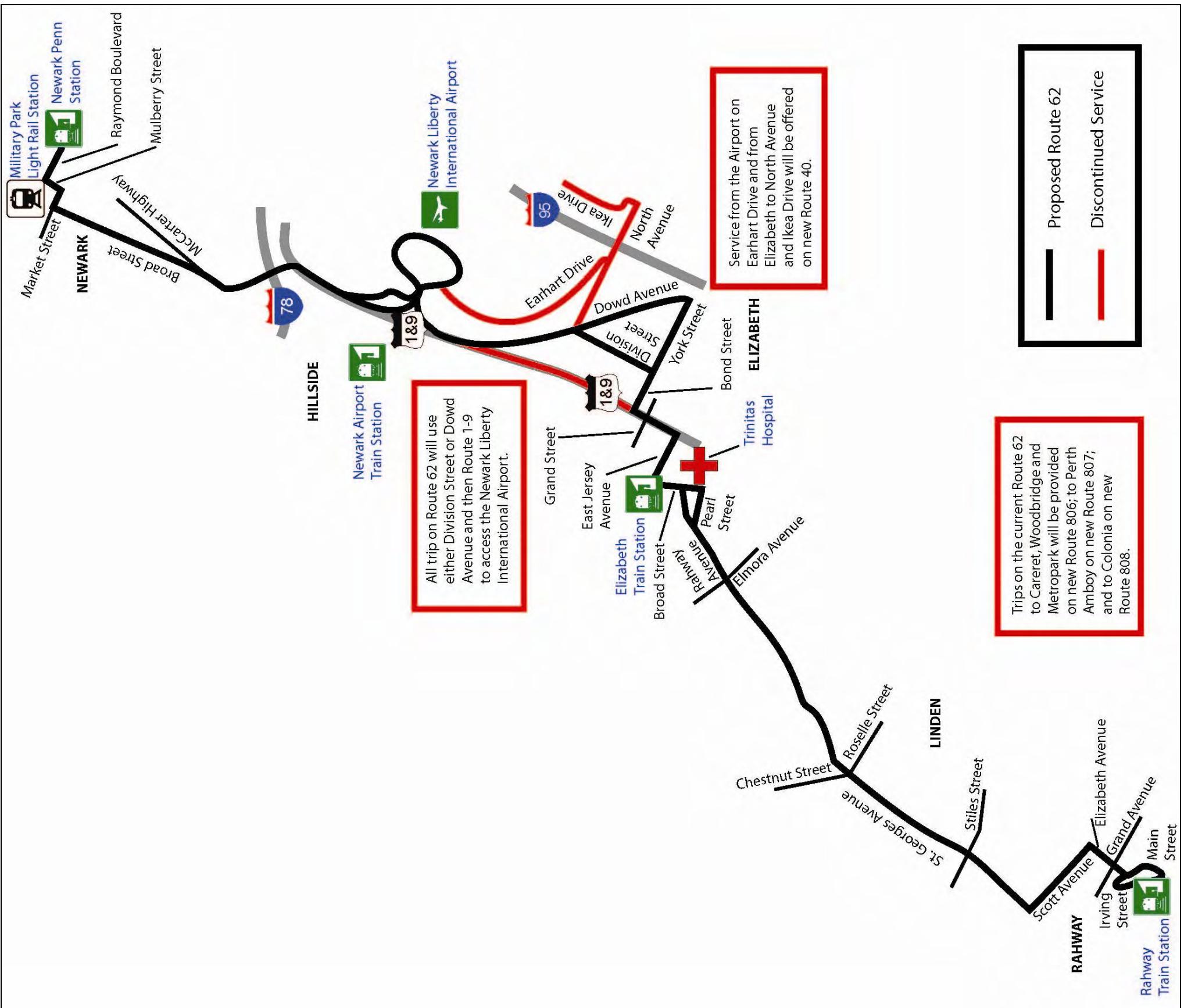


2. **Route 62 Rationalization – Creation of up to three new Routes 806/807/808** – To simplify operation of Route 62 - which currently acts as the long spine route for the key Perth Amboy-Woodbridge-Rahway-Elizabeth-Newark Liberty International Airport-Newark corridor - the service would be re-designed to *offer a simpler, shorter and more frequent service along this corridor between Rahway, the Airport and downtown Newark*. It would be tied to the creation of up to three new connecting feeder bus routes at a potential transit center at the Rahway Station. Successful implementation of a Rahway hub would require a search for, and procurement of a location in proximity to the Rahway Station capable of supporting the spine and feeder routes. The recommendation not only simplifies current service, but also presents an opportunity for NJ TRANSIT to *make greater use of private service contractors* to operate the newly designed system of feeder routes, when additional funding becomes available.
3. **Union County Busway** (*a component of the Union County Sustainability Corridor*) – A central piece of the GNBSS's vision for bus services in Union County is the creation of a new Busway emanating from a new intermodal transit center at the Elizabeth Station and following the abandoned right-of-way of the Central of New Jersey Railroad to Cranford. The potential also exists to extend the Busway operation via the local street network eastward from the Elizabeth Station area to the Newark Liberty International Airport via Elizabethport and Jersey Gardens and from Cranford Station westward to Garwood Station. Extensions westward to Garwood and possibly further westward to Plainfield *would support proposed redevelopment plans* for the station area, and foster development on the entire corridor by *presenting public-private partnership development opportunities*.

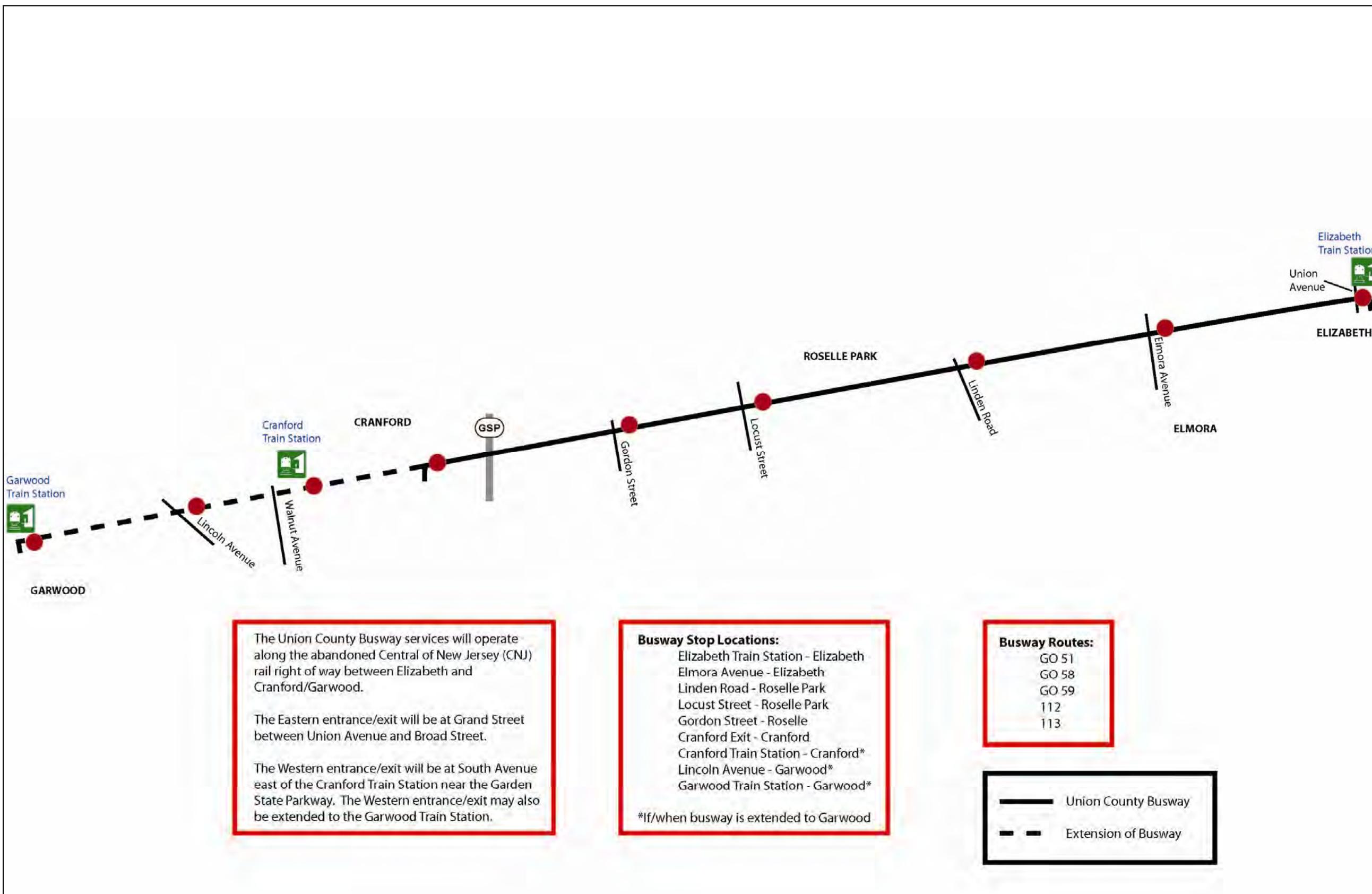
A phased implementation of the busway service is planned with the eventual implementation of a network of local cross-county services that provide express service options to destinations such as the *Union County College - Cranford Campus, the Newark Liberty International Airport (Central Terminal Area, North/South Areas) and to Jersey Gardens Mall*. It is also envisioned that a few New York based commuter services such as Routes 112 or 113 from southwestern Union County could utilize the Busway if travel time can be reduced.

This BRT corridor is undergoing further analysis by NJT in the *Union County Sustainable Transit Corridor Site Planning and Transit Analysis* effort.

Route 62

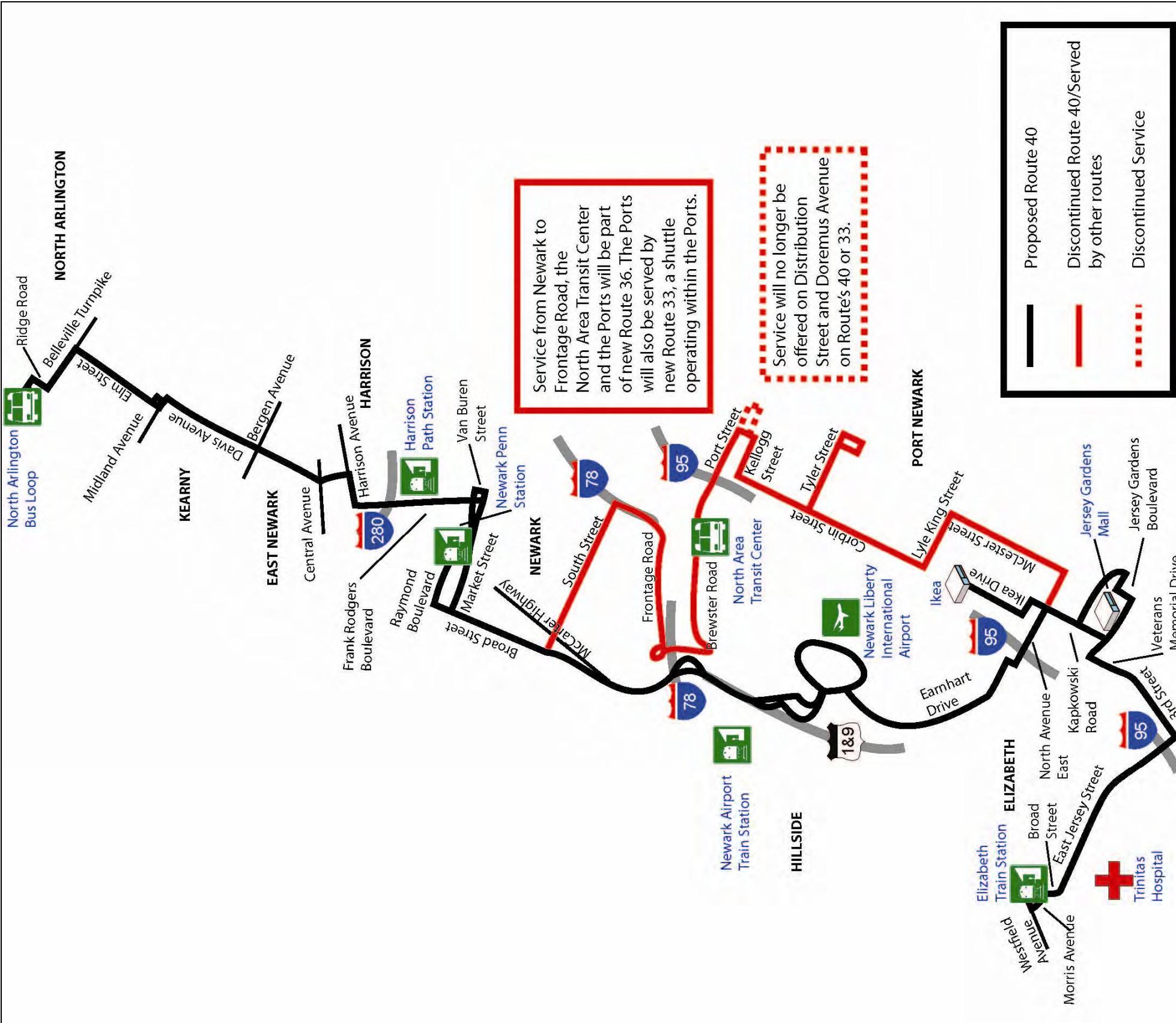


## Union County Busway

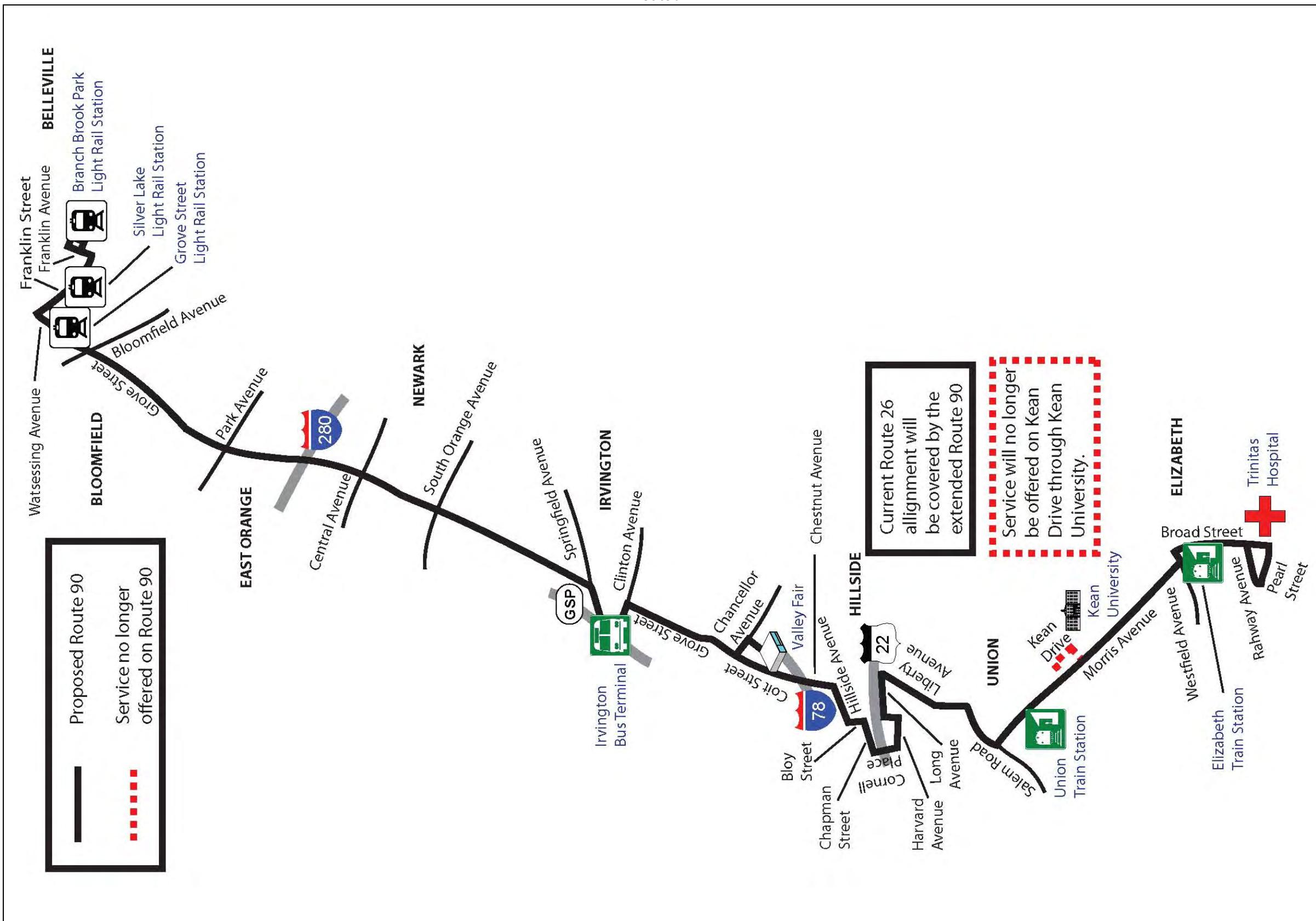


4. **Route 40 Restructuring – Creation of new Routes 18 & 33** – This group of new or redesigned current routes *would improve access to the airport* from the North Arlington-Kearny-Harrison corridor and from the Ironbound section of Newark. In addition, this package of routes would improve access to the Airport from Southern Hudson County (Bayonne/Jersey City) through the creation of a new Route 18. Additionally, this group of proposals would introduce a new Route 33 Port Shuttle, which will allow for more flexible service in the ports area with small vehicles providing closer and more flexible access to port employers. The introduction of the Route 33 Ports Shuttle also *presents an opportunity for partnerships with the Port Authority of New York and New Jersey (PANYNJ)*.
5. **Elimination of Routes 42/93/96/97** – These routes have all been identified as poor performers and have been recommended for elimination. Eliminating these routes will allow these *resources to be reinvested in the existing system to address running time and other operational performance issues*.
6. **Route 94 Restructuring – Creation of new Route 50** – This proposal would improve *access to employment and shopping opportunities* along the US 22 commercial/retail corridor in Union County from the western suburbs of Newark, East Orange, Irvington and Union Center by providing more consistent and frequent service along the present Route 94 - US 22 branch of the route. *The route would also be simplified* by creating the new Route 50 which would replace the current Route 94 service between the Irvington Bus Terminal and Linden.
7. **Expansion of Route 99** – Route 99, the Clifton Avenue Crosstown in the City of Newark, would be extended on both its northern and southern ends. On the northern segment, the route would extend to the Branch Brook Park Station on the Newark light rail to *create intermodal connection opportunities* on the route. Subsequently, Route 99 could be extended south to the Union Train Station on the Raritan Valley Line and Kean University to *create intermodal connections* and *improve access to an institution of higher education*.

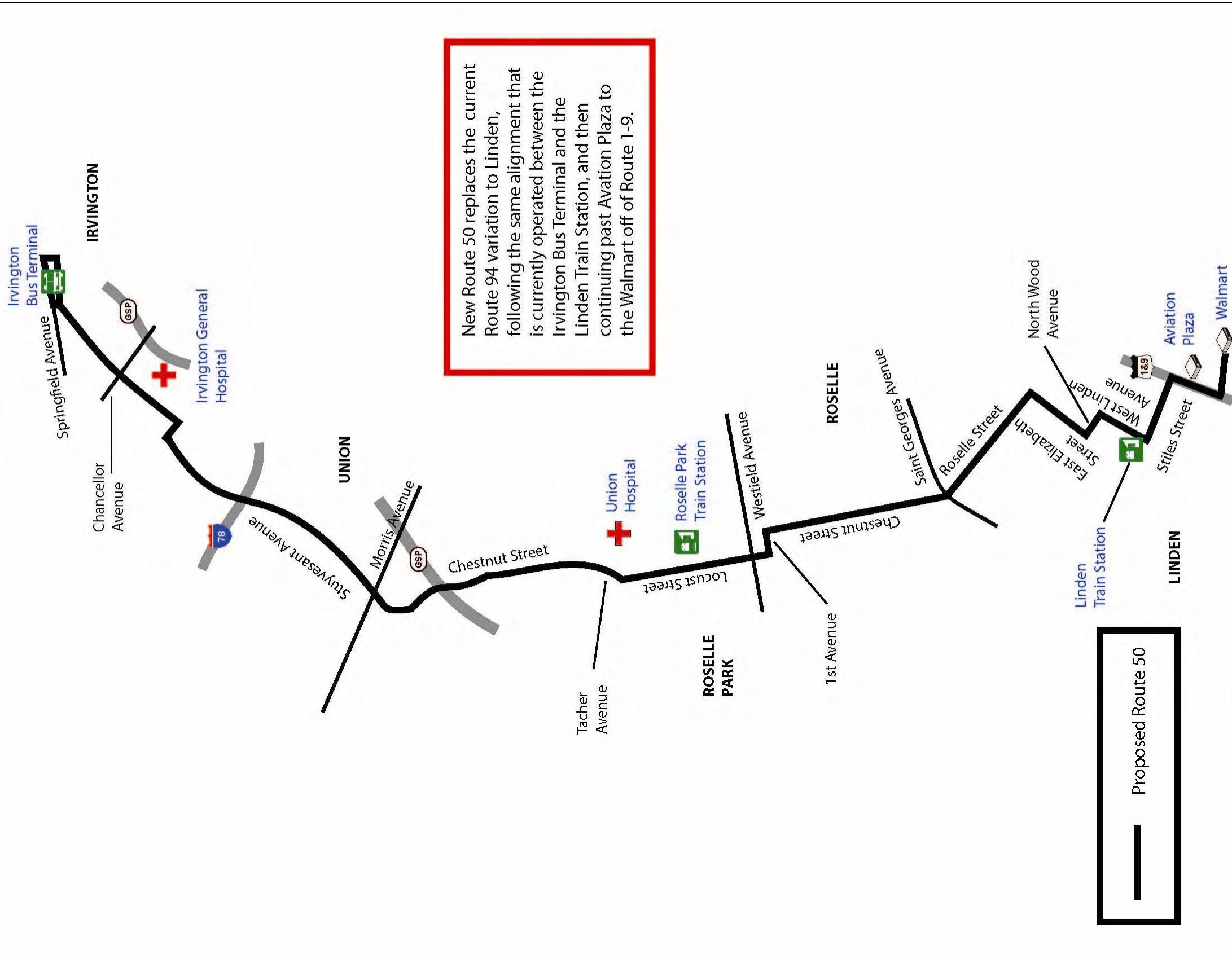
### Route 40



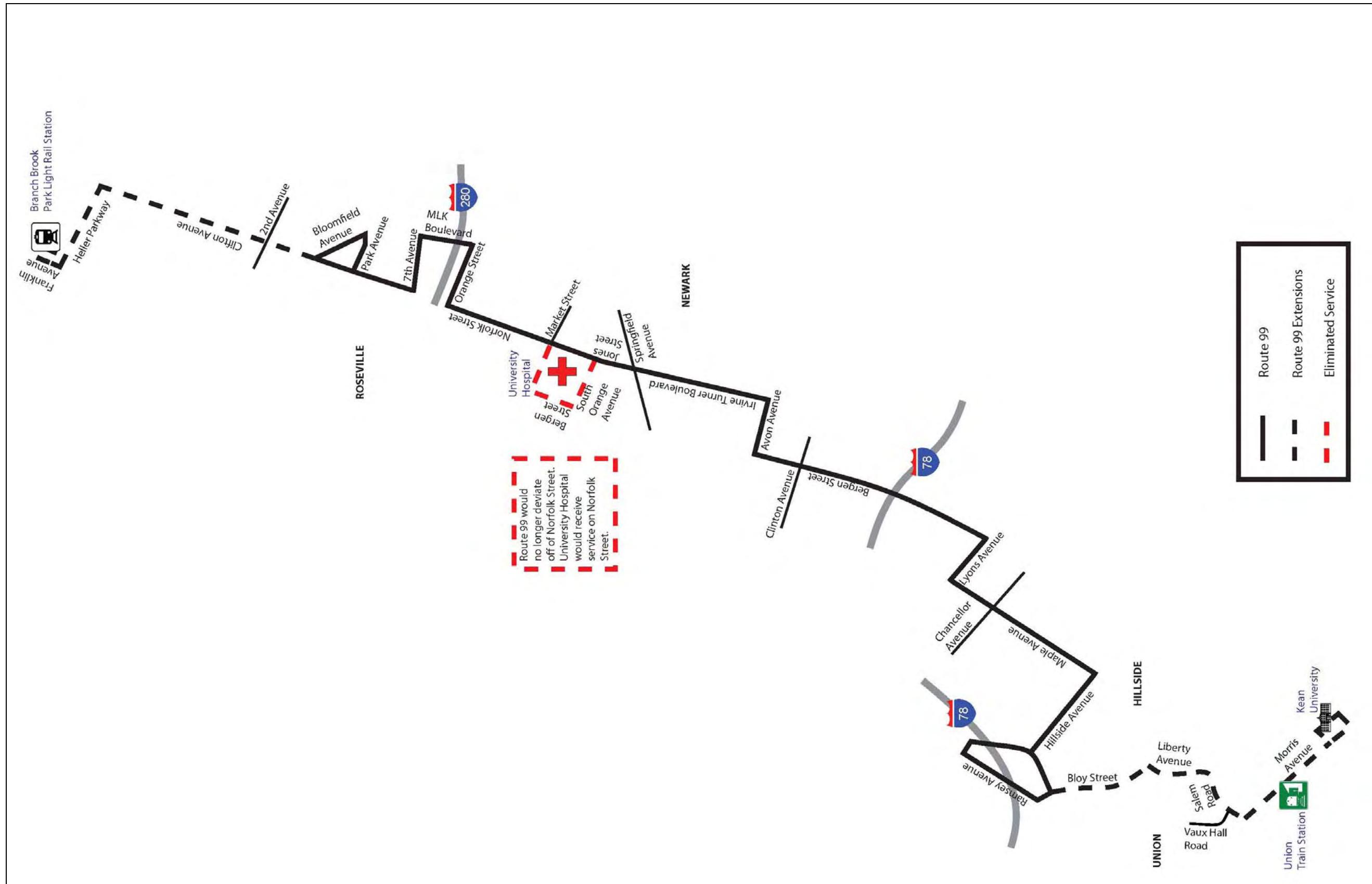
Route 94



Route 50

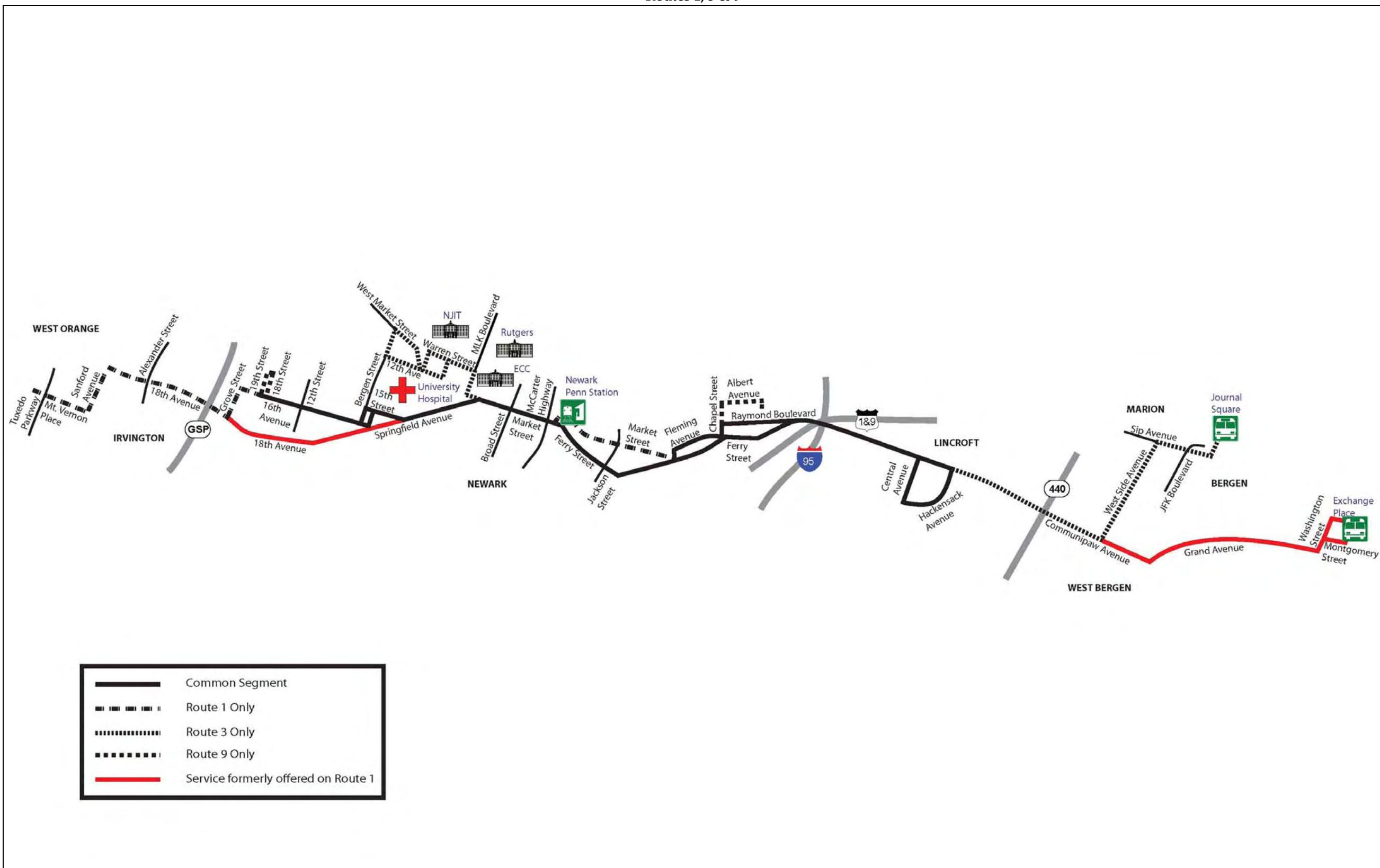


### Route 99

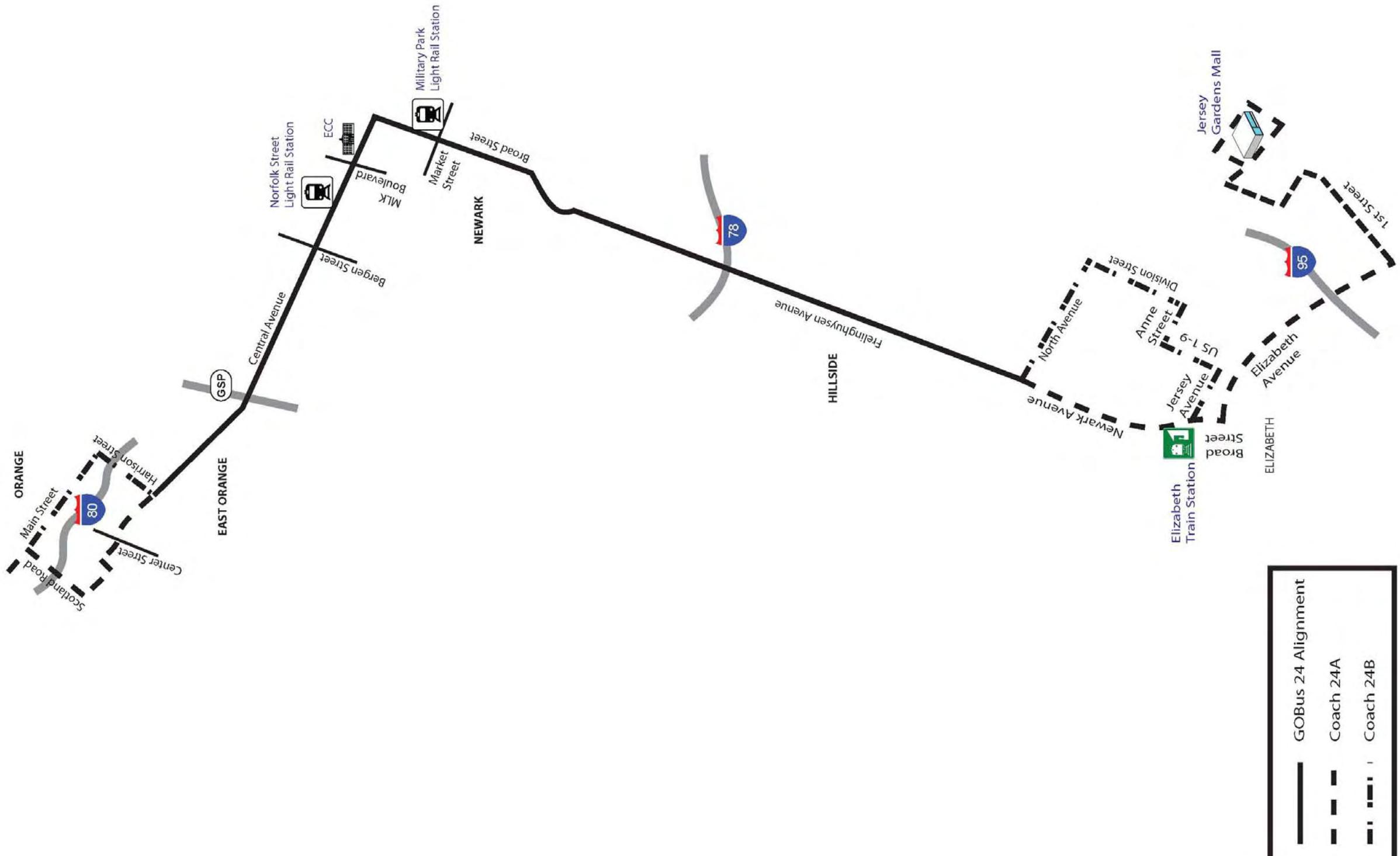


8. **Restructure Route 1 – creation of new Routes GO1, 3 & 9** – Route 1 is currently one of the most important, but most complex bus routes in the Newark-Elizabeth area. In addition, Route 1 *is subject to occasional delays* since the current alignment traverses two lift bridges between Newark and Kearny. This package of service improvement proposals would create up to three new separate routes that would not only *simplify the service and improve reliability*, but would also *improve connections to the University Heights area of Newark* from Penn Station, the Journal Square Transportation Center and portions of western Hudson County. Future phases of the Route 1 restructuring include the possible introduction of a new GO 1 BRT style route between Penn Station and Ivy Hill. The recently completed Jersey City Bus Study also offered alternate designs of Route 1 service. These two differing recommendations need to be reconciled for efficiency and effectiveness.
9. **Restructure COACH USA Route 24 – creation of new GO24 BRT** – COACH USA's Route 24 would maintain its current route structure, but will include some minor service revisions in the Elizabethport area – however service will still be offered to the area – and the introduction of a new GO 24 BRT variation along the major Central Avenue and Frelinghuysen Avenue Corridors in Newark. This Go Bus route would be operated by COACH USA, and the service *will support the City of Newark's redevelopment vision* for these key corridors.
10. **Restructuring of Routes 37 & 107** – These two routes would be redesigned in a way that better reflects the purpose of the two routes. Route 37 would continue to operate as a core local route between Newark- Ivy Hill – Irvington – Newark Liberty International Airport. With a new extension of service from the Airport to the Hudson-Bergen light rail station on Bergenline Avenue in Union City in central Hudson County, for first the time northern and central Hudson County residents would have a direct and frequent one seat ride to the Newark Liberty International Airport, replacing a multi-trip, multi-mode journey. Job access and leisure travel options would be significantly *improved for Hudson County residents*. Route 107 would be redesigned to become more of a commuter oriented service with both local and express service options. These improvements would *support redevelopment efforts planned for Irvington Center and present an opportunity for a public-private development opportunity* if a planned commercial development and parking garage adjacent to the Irvington Bus Terminal moves forward.

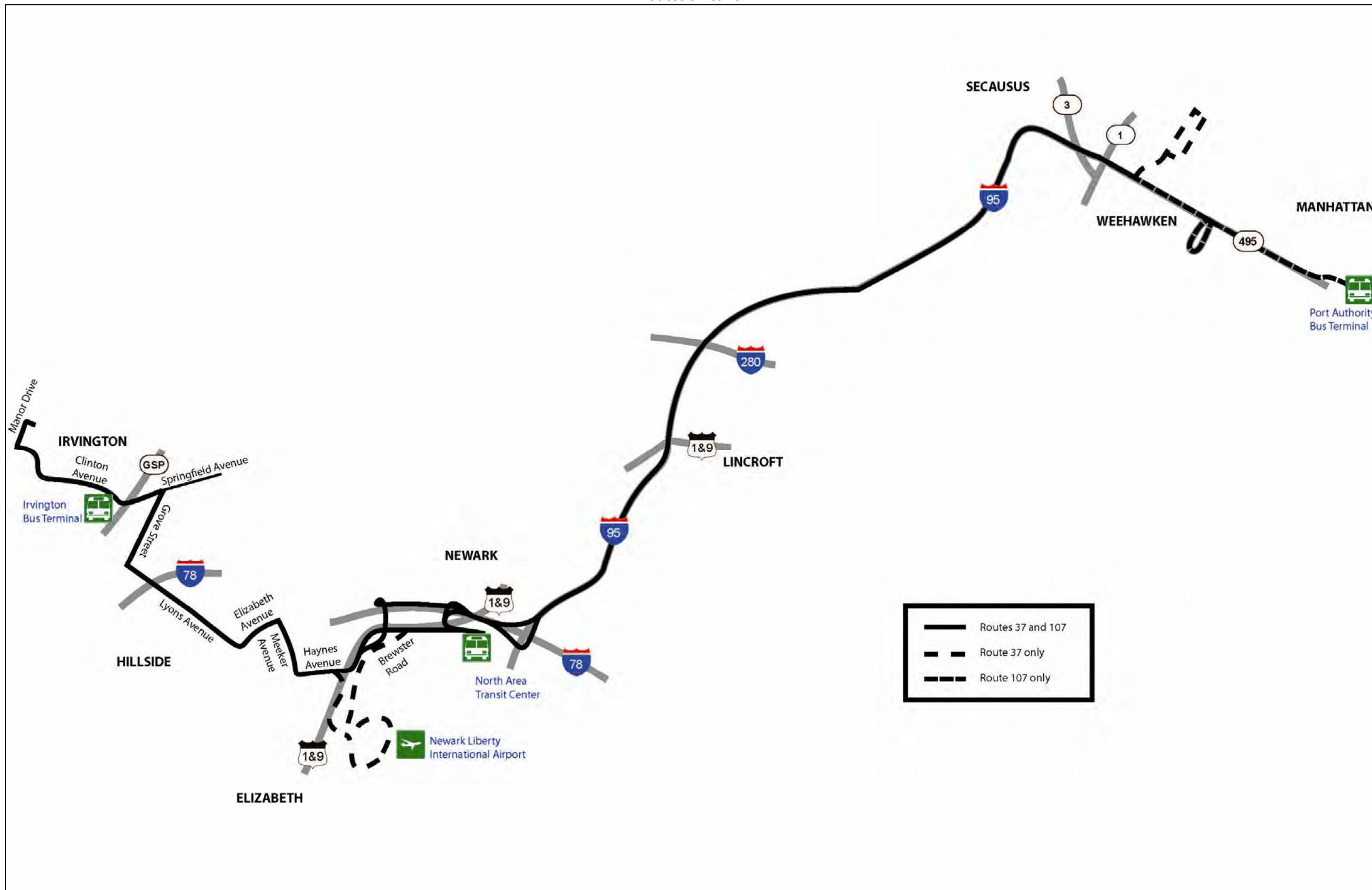
Routes 1, 3 & 9



Coach USA GO Bus 24 & Coach USA Route 24



Routes 37 & 107



The above paragraphs highlighted the initial four early actions items and the ten priority service improvement recommendations resulting from the GNBSS. As noted, each of these proposals plays a role in improving access to major employers, institutions of higher learning and medical facilities; creating intermodal connection opportunities; or improving or rationalizing current operations. It should be recognized that the service improvement plan includes numerous other changes to the network of bus routes serving the study area.

The proposal profiles included in the appendix provide information regarding the resource impact of the priority recommendations described above. It is envisioned that other proposals developed as part of the planning process will be implemented as resources are available or as demand warrants.

## CAPITAL NEEDS AND SUPPORTING POLICIES

It is important to recognize that several other components are involved in the feasibility and success of any service improvement plan. This section provides an overview of the capital needs and supporting policies which would be needed to support the implementation of proposals recommended in the GNBSS.

### Capital Needs

- **Revenue Vehicles** – The implementation of the proposals included in the GNBSS would require a significant increase in the number of vehicles needed to operate scheduled services and additional maintenance facilities to manage the expanded fleet. NJ TRANSIT will not only need to ensure a sufficient fleet size, but will also need to examine the most appropriate vehicle fleet mix. With the expansion of services in the suburban areas, the incorporation of additional smaller transit buses (i.e., 30' length) should be investigated (if passenger loads permit), given that these vehicles tend to be more acceptable to suburban communities. In addition, vehicle design, such as low-floor configurations, can assist in operating efficiency by helping to speed the boarding process.
- **Maintenance Facilities** – Related to the revenue fleet is the issue of bus maintenance and support facilities. Three out of the four NJ TRANSIT bus maintenance facilities that presently support service in the greater Newark-Elizabeth area are currently at or near capacity. An increase in the fleet size would require expansion of current maintenance facilities and/or the possible addition of new maintenance facilities to address capacity issues. Based upon the service recommendations prepared for this study, it is anticipated one additional maintenance facility could be required.

NJ TRANSIT will need to ensure a sufficiently sized fleet, an appropriate fleet mix and adequate maintenance and possibly additional facilities for the implementation of GNBSS.

- **BRT Features** – As NJ TRANSIT continues to incrementally implement its Bus Rapid Transit (BRT) program, GO BUS, it will be necessary to procure and install various technologies and passenger amenities along designated routes. These include distinctive shelters, security lighting, posted and electronic service information, off-board ticketing options, transit signal priority, etc. Bus transit improvements, specifically those associated with creating and sustaining BRT services can truly become an enabler of economic development, as has been proven in other parts of the United States.
- **Transit Centers** – The GNBSS envisions increased focus on certain existing transit centers as well as the need for new major hub locations and local neighborhood locations. New or expanded major transit hubs are envisioned initially for these key locations: Newark – Orange Street Light Rail Station, Elizabeth Station and Rahway Station. Along with actual physical engineering at some of these locations, hubs should also be equipped with various amenities including:
  - Sheltered/protected waiting;
  - Security (lighting, cameras, etc.).
  - Posted information;
  - Technology (real time information, etc.);
  - Fare media purchase options;
  - Way finding signage;
  - Parking (where applicable);
  - Vending/retail presence

## Other Supporting Policies and Factors

- **Technology** – There are various technology tools available to the transit industry that can not only improve passengers experience with the transit system, but can also allow NJ TRANSIT to operate more efficiently. NJ TRANSIT should develop an organization wide plan for the use of technology in such areas as bus and facility security, off-board fare collection, public information, operations improvements (such as Traffic Signal Prioritization) and on-board data collection (such as Automated Passenger Counters and Automated Vehicle Locator technology).
- **Public Information** – As noted in the previous point, technology tools can be used to provide the public with information about service. NJ TRANSIT should pursue the most modern methods of reaching its customers. However, it must be considered that transit users continue to rely on traditional printed and posted sources for service information. NJ TRANSIT should strive to continuously balance and improve the presentation, availability and timeliness

NJ TRANSIT should develop an organization wide plan for the use of technology in various aspects of bus service delivery.

of its service information.

- **Fare Policy** – Several of the recommendations included in the GNBSS created more opportunities for NJ TRANSIT and COACH USA riders to transfer between rail, light rail, rapid transit and bus modes. However, NJ TRANSIT's and COACH USA's and other regional transit providers current fare structures do not promote those types of connections. NJ TRANSIT in conjunction with COACH USA and the PANYNJ should continue pursuing an integrated fare structure that allows riders from one system to use the services of another system without paying multiple fares.
- **Liberty Corridor** – An initiative sponsored by Senator Robert Menendez – the Liberty Corridor was an initial source of funds to support development of the GO 28 BRT program. Funds from this initiative could be used to support operational recommendations and capital investments in service focused around the Ports of Newark & Elizabeth, Newark Liberty International Airport and their support zones across Essex and Union Counties.

NJ TRANSIT along with Coach USA and the PANYNJ should continue pursuing an integrated fare structure that allows bus riders to use multiple transit networks without barriers.

## OTHER INFLUENCING FACTORS

While a priority implementation order has been identified for the proposals within each of the categories listed above, there are various factors internal and external to NJ TRANSIT that could affect future decisions on which proposals should be implemented and when. Among other issues, these may include:

- **Current and future funding for existing and expanded operations is uncertain** – The current economic recession has essentially curtailed any type of planned service expansions for the Greater Newark area and throughout the state as a whole. In these trying economic times, NJ TRANSIT must be efficient in using the funds made available from the State and paid to it in fares to provide a customer responsive service that offers sufficient value.
- **Employment Rebound at the Airport/Ports and support areas** – As the economy recovers, employment may increase quickly at the Newark Liberty International Airport, at the Ports of Newark & Elizabeth and their respective support areas. This may change the priority status of some of the proposals designed to improve access to the Airport/Ports area from various locations throughout the study area.
- **Potential Curtailment/Abandonment of service by COACH USA** – At any time COACH USA may choose to abandon current services or be in a position where they are unable to continue operating certain services. In the GNBSS study area this could have a major impact on mobility since private carriers cover core critical major corridors such as Central Avenue, Elizabeth-

Frelinghuysen Avenues and South Orange Avenue. If the private carrier could no longer serve selected core corridors of the study area, NJ TRANSIT would need to direct resources to maintain service in those corridors.

## SUMMARY

This Executive Summary provides an overview of the study process for an extensive network of bus routes that are vital to the economic health of the Greater Newark area. It has included a detailed and comprehensive description of the existing transit system, its users, and the setting in which it operates. In addition to those qualitative inputs, comments were sought from stakeholders and the public. Based on their information, an extensive program of transit improvements have been identified for the near term and longer horizon periods. The study recommendations provide a detailed blueprint of bus system changes that will shape transit decisions.

## Introduction

More than two decades have passed since routes serving the City of Newark and the surrounding area have been subjected to a comprehensive review. In the interim, the geographic area served has undergone significant change in terms of demographics and development patterns. Most notably, residential development has greatly increased the population in the suburban areas north and west of the older urban cores. These areas, historically, have not received a high level of local bus service. Additionally, while the urban cores still present the largest pool for employment opportunities, suburban employment campuses have exploded in growth. Changes in the medical industry have also dramatically shifted the location of available medical services more towards suburban locations.

Mobility has also been affected by other national trends, such as the decline of the manufacturing sector – which has increased the importance of post-secondary education for the local labor force. Access to institutes of higher learning has become a vital component of economic development efforts throughout the Greater Newark area.

While changes have been made to the bus route network, they typically have been in response to specific requests for service or problems that have been identified. Additionally, any proposed change would affect the entire network of routes, as only a limited and finite set of transit resources were available. As a result, routes have become complicated, with some having numerous operating variations designed to address the unique transit needs of different groups of riders in the most economical way possible. The impact of monetary limitations has affected NJ Transit's ability to perform a recent comprehensive planning effort, which has limited the agency's ability to scrutinize current route alignments. This need is underscored by the number of bus riders that depend on public transportation for mobility and the revitalization of Newark, which continues in terms of residences, employment and cultural activities.

In response to these needs, NJ TRANSIT has undertaken the Greater Newark Bus System Study (GNBSS) to develop a comprehensive set of service proposals that remedy perceived deficiencies and exploit opportunities for the future. The study area includes the Greater Newark area, which encompasses the City of Newark and surrounding communities in Essex, Union, Hudson, Bergen, Passaic, Middlesex and Morris Counties. A total of 50 bus routes had been identified for analysis, including some of the most heavily utilized bus lines in the state. These routes provide approximately 5,200 one-way trips each weekday through 6,300 revenue hours of service and requiring 473 vehicles during the peak service period. On any given weekday, these routes transport approximately 240,000 passengers. Reflecting the magnitude of the assignment, the routes were divided into several phases which were analyzed in a sequential fashion over the course of the study timeline.

Taken alone, the local bus route network that operates in the Newark-Elizabeth area would be the 20<sup>th</sup> largest in the country, according to the data from the National Transit Database (report year 2008) in terms of peak vehicles in operation.

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The GNBSS consisted of several interrelated tasks which were organized into four phases of analysis of NJ TRANSIT routes based upon geography and function. Another phase examined the Coach USA route structure which also comprises a significant transit system. The assigned tasks included an extensive program of data collection, such as rider surveys and focus groups, along with an analysis of information routinely compiled by NJ TRANSIT. The study also sought out the views of Newark stakeholders, civic groups and the general public regarding mobility and desired improvements for the bus system. Input was sought from NJ TRANSIT and Coach USA operating personnel, since these employees interact with bus riders on a regular basis.

Based on this input and various analysis tools, alternatives were formulated for both near term and longer range horizon periods by phase. Based on subsequent discussions with study participants and interested parties, the proposals were evaluated and a recommended plan delineated for implementation, which is presented here. Ultimately, the targeted goal should be to grow total transit usage by three to five percent per year, beginning in fiscal year 2012, with bus transit shouldering a sizable portion of this burden.

During the course of the three year study, the various tasks were completed and the results and findings documented in interim reports and memorandums. These reports were then used to solicit review and comments at key milestones of the project. This Final Report provides a summary of the study process, the planning inputs, and the overall goals of the service improvement plan and identifies priority recommendations from among the extensive list of proposed changes. The proposals create a much needed foundation for action and further planning, and should be viewed as a blueprint for action in the immediate and longer range future. Additional analysis will be required concerning future financial and capital needs and opportunities that cover a longer time period, which will be the responsibility of NJ TRANSIT staff.

## **Study Process**

The study process involved several sequential tasks, including a description of the NJ TRANSIT system of buses in the Greater Newark area, an in depth survey effort which included ride-checks and an origin and destination analysis, an evaluation of the system and a series of alternative recommendations which were then evaluated.

The study began with a kick off meeting and quickly moved into task one, the description of the current bus system (NJ TRANSIT and Coach USA). In an effort to compile an accurate, comprehensive and up-to-date picture of the current public transportation system, a summary of existing transit services was created, an inventory of existing facilities was established and previous plans and future expansions were examined. This information provided the basis for the survey design.

The second task, a comprehensive transit survey effort (i.e., ride checks and passenger surveys), established a database of passenger activity by route and stop location, as well as provided detailed origin-destination information. The ride-check effort called for a 100 percent sample of weekday peak bus trips, a 50 percent sample of off-peak weekday trips, and a 25 percent sample of all weekend trips. These surveys allowed for an examination of the utilization,

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productivity and loads of the currently operated services, as well as detailing the running time information and schedule adherence. The detailed information that was collected was geared towards fine-tuning the current bus system. Additionally, an origin-destination survey was conducted at the same time as the passenger ride-check effort; although these surveys were only performed in one direction since most riders make a round trip. Travel itinerary, rider characteristics, and passenger attitudes and perceptions were collected through this effort. The origin-destination surveys were the only source of information on linked trips and customer usage.

A description of the transportation setting of the Greater Newark Area followed, which gathered the quantitative information on the service area that describes need and propensity to use public transportation. This task assisted the project team to understand where service is required, the level needed and what travel patterns should be served. This portion of the study included an analysis of the socioeconomic and demographic setting of the study area, an inventory of the area generators and the land uses, and a study of the available journey to work data which helped outline specific travel patterns. A transit needs assessment was also performed, which detailed the overall supply and demand of bus service and presented a residential scoring based on aggregate and rate measures of need.

A system evaluation was then performed, utilizing various techniques to identify system needs and opportunities at sub-route, route and system-wide levels. An analysis of the survey data was performed, looking specifically at the productivity, loading and on-time performance of the routes serving the study area. Service standards were then created to serve as guidelines pertaining to service coverage, patron convenience, the fiscal condition and passenger comfort. The current services were then compared to these set service standards in an effort to determine the system's adequacy. A route diagnostic analysis was also performed, which employed a variety of techniques to assess each individual bus route, including a cost center analysis, ordinal ranking, strategic planning method and a supply and demand analysis. Finally, driver and staff meetings were initiated in order to obtain valuable and specific data from drivers, dispatchers and customer service representatives.

Service alternatives were created in response to the quantitative and qualitative inputs. The alternatives incorporated both short and long term proposals and included tactical proposals, which remedy existing deficiencies; strategic proposals that focus on new services and service expansion opportunities; intermodal connections and the integration of bus with other modes of public transportation (i.e., rail and ferry); bus preferential strategies in an effort to improve speeds and reliability (e.g., Bus Rapid Transit); desirable passenger facilities and amenities, as well as operational facilities; and potential public-private partnerships. The tactical and strategic proposals offered operating strategies (e.g., headways, alignments, new routes, extensions), schedule adjustments (e.g., span, running time, schedule coordination), and system changes and new service types (e.g., new hubs, cross-town routes, reverse commute). The alternatives were evaluated by their operating statistics and costs, how they addressed challenges and constraints, and by their mobility benefit.

The study effort also included a public outreach program to address the qualitative input to the service development process. This part of the study helped to identify ongoing problems, and detailed key issues and concerns, while also offering suggested improvements. The effort

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sought to engage current riders, non-riders and community leaders through stakeholder meetings and open houses.

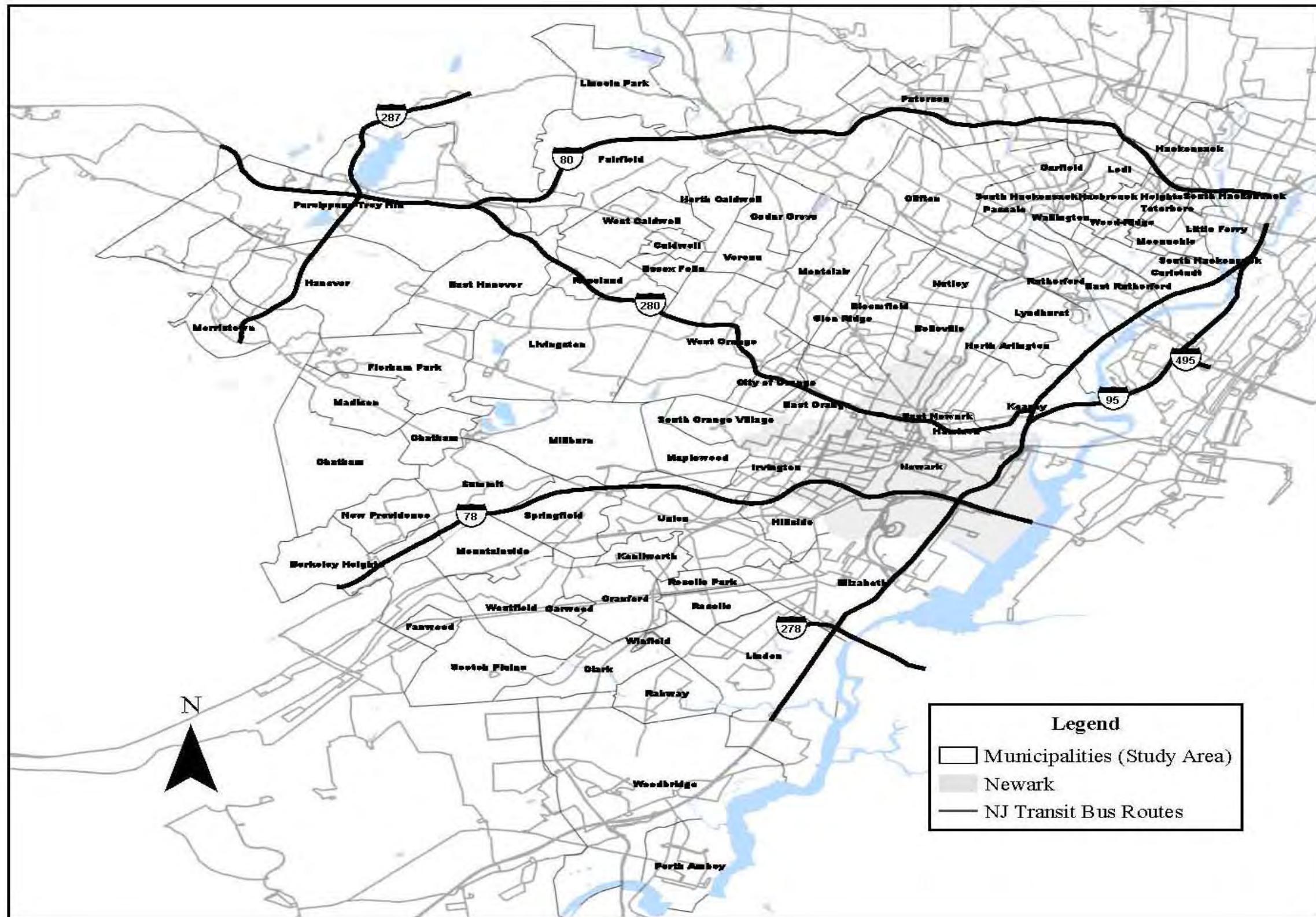
## **Service Area**

The study area is located in northeastern New Jersey and includes all or portions of Bergen, Essex, Hudson, Middlesex, Morris, Passaic, and Union Counties. The dimensions of the area reflect the commuter shed and area of influence for bus routes in the study area. This study area for purposes of this analysis has been broadly defined, but the primary focus of analysis was the Newark-Elizabeth area and the adjacent communities. There are 76 municipalities located in the study area with an estimated population of 2.2 million (2005 U.S. Census estimate).

The eastern half of the study area is comprised of a dense urban corridor of older municipalities. The City of Newark is located in the center of the corridor and is the largest city in the study area and the state. The study area is also comprised of several dense older municipalities including the Cities of Elizabeth and Paterson. The northern and western portions of the study area include mostly suburban communities which are characterized by lower densities and dispersed development patterns.

In addition to the NJ TRANSIT and Coach USA fixed route bus services, the study area is served by a comprehensive regional, national, and global transportation network, including the Newark Liberty International Airport; Ports of Newark & Elizabeth; Amtrak; NJ TRANSIT commuter rail and light rail; PATH commuter rail service; Interstates 78, 80, 95, and 280, and numerous rail freight operations. Figure 1 presents the study area and shows the location of NJ TRANSIT bus routes which operate within this service area, for purposes of this analysis.

**Figure 1 – Study A**



## Planning Inputs

Several different inputs went into the planning process, including the information accumulated in the socioeconomic and demographic report, such as population and density, journey to work data and employment. Other information that proved useful for the planning of the route alternatives includes an inventory of the Greater Newark area's major trip generators, the rider origin-destination and opinion survey, an on-board ride-check, a route diagnostic analysis, and qualitative information gathered from focus groups, a community outreach effort and input from the bus operators.

### Population Distribution and Characteristics

The socioeconomic setting of the Greater Newark area was analyzed for this study to identify the communities which currently rely on NJ TRANSIT service and also to locate any area's which may be underserved. Data provided by the 1990 and 2000 U.S. Census and North Jersey Transportation Planning Authority (NJTPA) were the basis of this analysis. The data was analyzed on a few different levels: study area, county and census tract. The detailed information for this planning input can be found in Appendix A.

The population of the GNBSS study area, as reported in the 2000 U.S. Census, was 2,014,600, an increase of 5.4 percent from the 1990 U.S. Census. In 2005 the area was estimated to have 2,164,000 residents, a 7.4 percent increase since 2000.

Between 2000 and 2020, the Greater Newark area's population is expected to increase by 8.9%. Middlesex County will experience the largest growth in terms of population, with an increase of 18.0%, while Bergen County is expected to increase the least, at 5.7%.

Essex County has the highest population when considering only the counties within the study area, with 792,300 residents. Union County was the second most populated county with a population of 474,700. The City of Newark has the highest population among the municipalities in the study area, with 272,500 people, followed by Paterson (149,220 residents) and Elizabeth (120,600 residents).

There are several target groups within this population which indicate a need for transit services in an area, including senior citizens, youths, the disabled and persons living in poverty. These groups were identified and their populations accounted for in terms of aggregate population, population density and percent of the total population. Other identified groups which indicate a need for transit were median household income and zero-car households. This analysis indicated a strong need for transit in and around the cities of Newark, Elizabeth Passaic and Paterson, which was expected as these locations have the largest and most diverse populations.

### Employment

High concentrations of employment within an area indicate common destinations for transit use. With this in mind, the employment level throughout the GNBSS study area was analyzed to assure that all employment areas were provided the appropriate level of transit

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service. Employment was analyzed in terms of aggregate jobs, job densities and the rate of employment growth. This analysis can be found in Appendix B.

In 2000, the study area had over 1.1 million jobs. Of those, Essex County had the largest number of jobs, with nearly 400,000. The City of Newark had the largest number of jobs at the municipal level, with greater than 160,000. According the NJTPA, the number of jobs in the study area is projected to increase by almost 17 percent, with Middlesex County, a peripheral portion of the study area, expected to incur the largest growth (39 percent).

## **Journey to Work**

The 2000 U.S. Census provides journey to work information, which provides a view of the mode split (e.g., auto, bus, rail, walk, etc.) of all commuters. According to the 2000 U.S. Census, transit accounts for approximately 13 percent of all work trips within the study area. Essex County had the highest percent of transit use among the counties, with 19 percent of the employed persons using some form of transit to meet their commuting needs. This is not surprising as Essex County is well served by public transportation. Travel patterns also provided in the journey to work data, were where residents are traveling to for work trips. In the GNBSS area, approximately 52 percent travel within their county of residence, while 38 percent travel outside of their county, but within New Jersey. An additional 10 percent travel outside of New Jersey for employment. This analysis is presented in Appendix C.

## **Major Trip Generators**

Major trip generators include major employers, multi-family housing and apartment locations, hospitals and other medical facilities, government buildings, shopping centers and malls, and colleges and universities. Essex County had the highest number of generators, with many locations in and around the City of Newark. The list of the major generators in the Greater Newark area is provided in Appendix D.

## **Needs Assessment**

This needs assessment presents an overview of the likelihood of transit use and a composite measure of transit need. An assessment of transit need was performed to identify those areas with the greatest need and potential demand for public transportation. Nearly two dozen variables were used to rate each census tract in terms of transit potential and include both rate and aggregate measures of transit need. Rates, such as percentage of seniors in total population and density of senior citizens are useful in understanding the composition of an area. Aggregate measures, such as total population, indicate the absolute potential for travel in general, and transit trip-making in particular.

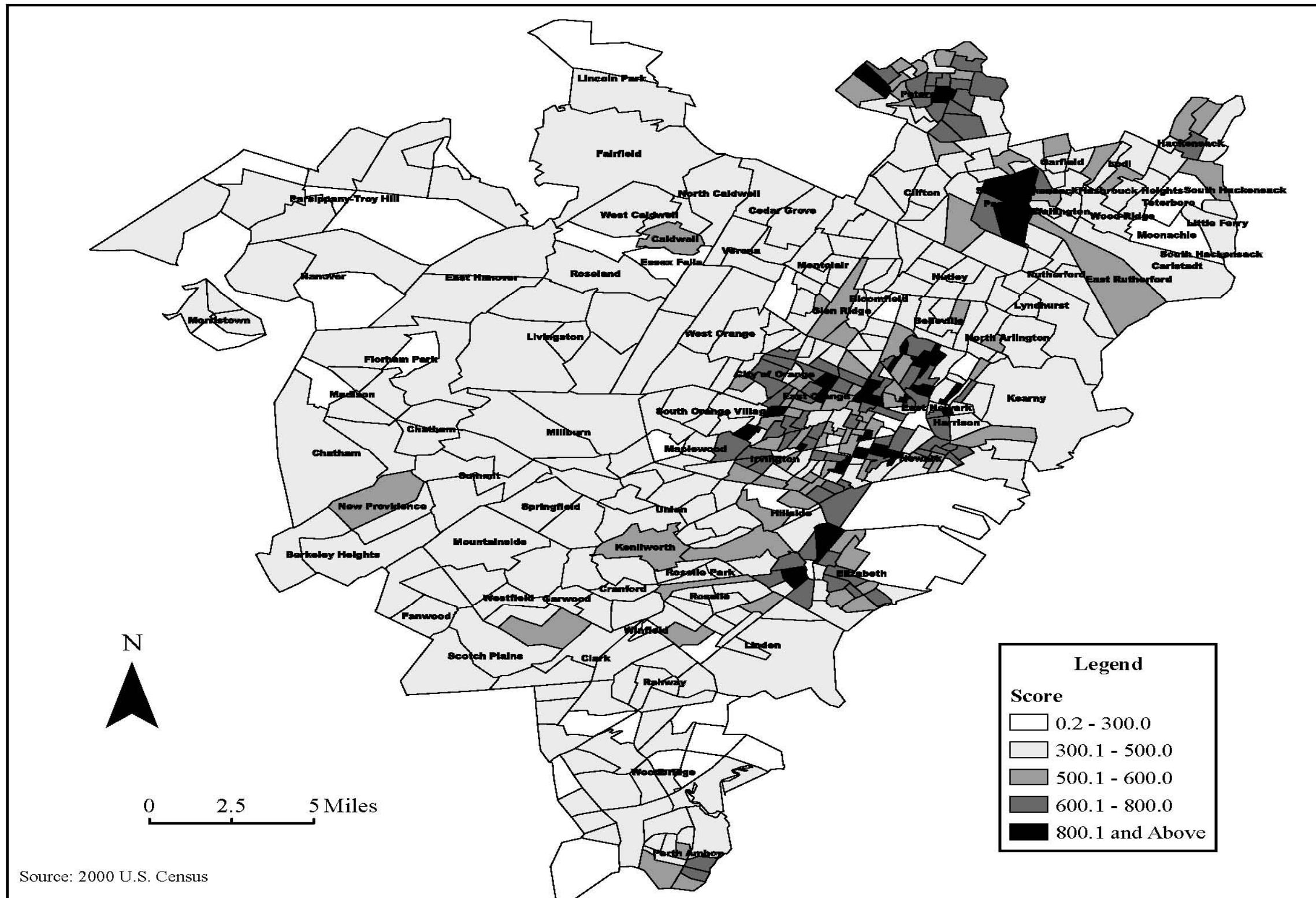
The variables used to analyze transit need for the study area are: population, population density, senior population (over 65) in terms of number, percent and density, youth population (under 18) in terms of number, percent and density, zero car households in terms of number, percent and density, low income population in terms of number, percentage and density, disabled population in terms of number, percentage and density, percentage of trips by transit, total number of work trips, and employment in terms of number and density.

For all of the variables, higher values are indicative of greater need and likelihood of transit use. For example, a census tract with high population density or a high number of zero car households exhibits greater mobility need and propensity for transit use. In the current analysis, a standardized score has been used to combine the different variables. With this approach for each variable, the census tract with the lowest value is assigned a score of zero while the census tract with the highest value is assigned a value of 100. The other areas are computed by interpolating between the maximum and minimum values. These scores can then be added for 21 variables.

Figure 2 presents the Transit Needs Score by census tract for the study area, and illustrates that the areas attaining the highest scores (more than 800) are located in and around the major cities in the study area including Elizabeth, Newark, Paterson, and Passaic. These results reflect the combined impact of various measures and both aggregate and rate indices. The NJ TRANSIT fixed route bus system serves all of the areas that exhibit the greatest transit need.

The locations with the highest needs score are in proximity to the larger cities within the study area. The location with the highest needs score was a census tract in Paterson City. The other high needs scores occurred in the City of Newark and in East Orange.

Figure 2 – Transit Needs Score



## Rider Origin-Destination and Opinion Survey

A rider origin-destination study and opinion survey effort examined the NJ TRANSIT and Coach USA routes within the GNBSS study area. The information derived from this portion of the study allowed for an analysis of the persons who rely on NJ TRANSIT (i.e., current riders). Appendix E provides the detailed information from this effort and includes analyses of the passenger demographics, trip purposes, access and egress patterns, the employed fare media, the transit dependency of the responding population and a qualitative look at the services that the passengers are using. Throughout the study, over 20,000 surveys were returned and processed, representing a 5.7% return rate.

Response results were similar for both carriers for most of the questions. "Home" and "work" were the most cited trip origin and destination locations. A majority of the surveyed passengers mentioned that they walked to and from the bus, but a significant number of passengers indicated that they transferred to another bus to complete their trip. Passengers indicated that they use transit either five, six or seven days per week, with very few passengers saying that they ride less than that. Most of the suggested improvements for both systems were to increase the frequency of service, to improve the on-time performance of the existing routes, and to improve the customer service experience.

## On-Board Ride Checks

Ongoing with the rider origin-destination survey was an on-board ride check effort to collect data on passenger activity (on's, off's and times). The data allowed for an analysis of each route's passenger load per trip, as well as each route's on time performance. This provides information on the efficiency and effectiveness of each route by each trip. This information also assisted with the planning of the route proposals by showing heavily utilized segments and those areas where there was little to no ridership. This information is provided in Appendix F.

The passenger loads of each trip were analyzed, looking for instances where ridership exceeded 55 passengers (85 passengers on articulated vehicles) at any given time, which is known as the "crush" load. This occurred on many of the GNBSS routes, most notably on Coach USA's routes 12 and 24, with 50 instances of the "crush" load being exceeded. The NJ TRANSIT routes with "crush" load being exceeded most frequently are routes 21 (17 instances), 62 (17 instances) and Coach USA Route 31 (14 instances) (Route 31 is a Coach USA route, should this be listed above or are the numbers transposed and this really Route 13?). There were several routes that did not experience a single "crush" load.

A running time analysis was also performed, comparing the average observed time versus the actual scheduled time by time period for each route variation. Differences between actual and scheduled times greater than five minutes were noted. Most of the routes experience at least one instance where a scheduled time was not met by the vehicle in service; however, the routes that had many instances where the scheduled time was not met include NJ TRANSIT routes 62 (38 instances), 13 (32 instances), 1 (30 instances), 25 (28 instances), 40 (25 instances) and 73 (22 instances), and Coach USA's routes 12 and 24 (24 instances). In addition to supporting the

current transit analysis, the on-board surveys provide a wealth of information that will be used by staff on a continuing basis.

## Route Diagnostic Analysis

A detailed quantitative analysis was performed, using 2007 fiscal year data, for the routes included in the study to determine which routes are placing a disproportionate financial or resource burden on the system overall given current ridership levels. The focus of this analysis was to delineate the characteristics of the NJ TRANSIT bus routes utilizing several analytical techniques. With this approach, each bus route is treated as an individual operating entity. The performance characteristics of each bus route are compared to the other bus routes as well as to the overall system average. The analysis details which routes are operating effectively and efficiently, and those that are not. Conversely, the analysis allowed for the identification of routes which perform better than would be expected given the current resource investment. The detailed route diagnostic analysis is provided in Appendix G.

The results from the Route Diagnostic Analysis were helpful to determine which routes required limited changes, which needed major overhauls, and those which should be eliminated. However, all inputs were successfully employed in this effort.

The routes that comprise the GNBSS study had a farebox recovery rate of 39.71 percent. The best performing routes in terms of farebox recovery were routes 21 (51.08 percent), 112 (50.85 percent) and 13 (48.75 percent), while the worst performing were routes 93 (8.95 percent), 42 (11.48 percent) and 56 (18.38 percent). There were nine bus routes that contribute less to the overall system deficit, but have a higher market share value (routes 1, 13, 21, 25, 27, 34, 39, 59 and 94), while 22 routes contribute more to the deficit than the average yet have a lower market share value.

Productivity per route was analyzed by calculating a combined productivity score using passengers per vehicle mile, per vehicle hour and per vehicle day (i.e., per peak vehicle). The services which exhibit the highest productivity were routes 13, 21, 25, 27 and 90, while those experiencing the lowest productivity were routes 78, 65, 93, 43 and 42. Similarly, deficit was measured against the same three operating statistics, as well as against the ridership of each route, to create a combined deficit score. The best performing routes in terms of deficit per route were routes 94, 13, 59, 41 and 21, while those services with the highest deficit score were routes 5, 56, 96, 97 and 99.

## Focus Groups

NJ TRANSIT conducted a series of focus groups with members of the public at the outset of the study process. The groups each included a mix of bus riders and non-bus riders. The sessions focused on the participants' opinions of the current bus services and their suggestions for improvement. The focus group for the educational facilities within the GNBSS study area was attended by Rutgers Newark, Bloomfield College, UMDNJ, Montclair State University,

A more user friendly system with better maps and more visible stops, as well as the desire for more reliable service were two items that were cited as desired transit improvements.

NJIT and Seton Hall Law School. The results of this focus group effort are presented in Appendix H.

A focus group of the businesses and organizations located in and around the Newark Liberty International Airport and Ports of Newark & Elizabeth was also conducted. Attendees of this focus group included the Port Authority of New York and New Jersey (PANYNJ), Newark Liberty International Airport, Port Authority Traffic Engineering Division, Newark International Airport Cargo Committee, EWR Council for Airport Opportunities, Continental Airlines, Continental Air Cargo, Federal Express, Gateway Security, HMS Host Services, Worldwide Flight Services (WFS), Meadowlink, US Customs and Border Protection, US Transportation Security Administration, Ports of Newark & Elizabeth, New England Motor Freight, East Coast Warehouse, the Port Users Group at Ports of Newark & Elizabeth and Seaman's Church Institute. The results of this focus group effort are presented in Appendix I.

## Community Outreach

The GNBSS study process also included stakeholder group sessions with individuals from throughout the study area who have a stake in the design and delivery of bus service in the Newark-Elizabeth area. This group included a mix of representatives from the public and private sector. Similar to the focus groups, these community outreach sessions focused on the participants' opinions of current services and improvement suggestions. In addition to these groups, the study included specific outreach meetings with planning and development communities throughout the study area. These meetings focused on identifying the broad development or redevelopment plans of the communities in the study area and how the local bus system could support those plans. The results from these stakeholder group meetings are presented in Appendix J.

Outreach efforts included meetings with Municipal and County officials, in an effort to identify new development and redevelopment priorities.

Participating in the local community's priority projects presents opportunities for partnering with public and private sector entities.

## Bus Operator Outreach Meetings

A series of meetings were held with the bus operators at each of the GNBSS study area garages. This included meetings at both NJ TRANSIT and Coach USA facilities. Operators were asked for their input regarding the current services and their suggestions on how service could be improved. Each bus operator's input was important since they observe the system on a daily basis and also talk with customers.

Comments received from the bus operator meetings were categorized by garage and then by either route or one of the following sub-categories: general operating; fares; public information; Newark Liberty International Airport; New York City; destination; big ideas; or other input. The bus garages where the meetings took place were: Hilton Garage and Orange Garage on October 5, 2007; Big Tree Garage on October 4, 2007; and Ironbound Garage and Coach USA Elizabeth Garage on November 1, 2007. The comments collected from the bus operator outreach effort are available in Appendix K.

## Overall Planning Goals

When reviewing all of the collected quantitative and qualitative data, several broad planning goals become apparent, all which need to be addressed, in some fashion, by the GNBSS service improvement program. These goals include: improving access to CBD/non-CBD employment, education and medical services; simplifying the route structure; rationalizing existing services; improve existing and create new multimodal connection opportunities; develop a BRT system for Newark and its surrounding areas; support local development and redevelopment plans; and engage local partners. One common theme that resonates through all of these planning goals is the need to eliminate service barriers.

### **Improve Access to CBD/Non-CBD Employment, Education and Medical Services**

This, in essence, is the definition of mobility. Improved access to these vital locations not only improves the quality of life of area residents, but also promotes economic development efforts in both the urban core and outlying areas. Journey-to-work trips have to be the first focus, but that is not where the effort must end.

### **Simplify the Route Structure**

Attempting to address divergent mobility needs with finite resources over a period of three decades has resulted in some bus routes with numerous operating variations. Therefore, every attempt was made to revise the existing route structure and develop a new route structure with limited routing variations to better serve the populations' need to travel to work, shop, obtain medical care and satisfy a myriad of other daily travel needs. Generally, in the effort to create a more simplified system of bus routes, the service improvement proposals have been kept to under three variations per route, a far more user friendly approach to transit service.

### **Rationalize Existing Service**

The detailed ride check and running time data collected through the study effort allows for the identification of poorly performing routes and route segments. These route segments were further examined for potential elimination or service reduction allowing the resources saved to be redirected to route segments on which overcrowding was identified. In addition, the running time data allows for the re-timing of current routes which can greatly improve the on-time performance of the route thereby enhancing the quality of service from the rider's perspective. The primary finding is that the core bus network is on streets and corridors where it should be; however, opportunities for improvement continue to exist.

### **Improve Existing and Create New Multimodal Connection Opportunities**

Given the breadth of the transit system in the study area, service planning efforts must view these bus routes as one element of a complete multimodal public transit network. That is, plans to address particular travel patterns should, to the greatest extent possible, incorporate all

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modes available for all or part of the trip. Coupled with fare policy changes across multiple modes and carriers, this will allow for a more efficient use of current resources and reduce duplication of services. Further exploration of developing a joint fare structure between the various transit options and operators will encourage a greater level of transferring between modes.

### **Develop a Bus Rapid Transit (BRT) System for Newark and Surrounds**

Starting with some of the largest passenger volume bus corridors in the existing system, develop an incremental plan for the implementation of Bus Rapid Transit (BRT) that uses elements such as special bus priority treatments on local streets and at intersections coupled with other supportive actions to create a new overlay rapid bus network that is highly visible, faster, more reliable and higher quality. NJ TRANSIT is clearly on the proper path as this incremental approach has been endorsed in the recently released study of the Mineta Transportation Institute, titled “From Buses to BRT: Case Studies of Incremental BRT Projects in North America.”

### **Support Local Development/Redevelopment Plans**

Transit can play an important role in the success of development and redevelopment plans of the communities in the study area such as in Newark, Elizabeth and the Meadowlands. The goals of these communities were considered when developing service improvement proposals in the affected areas. In addition, participating in these identified development and redevelopment priorities earlier rather than later presents opportunities for partnering with local communities or private sector entities to improve or add new access via public transit.

### **Engage Local Partners**

Work with local transportation partners such as NJDOT, counties and municipal governments to make improvements in the transportation infrastructure to insure that the NJ TRANSIT and private bus networks can travel at the posted speed limit 24 hours a day, 7 days a week. Participating in the local community’s priority projects presents opportunities for partnering with both public and private sector entities.

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## Service Plan Summary

### Recommended Route Proposals

The service recommendations have been organized into eight categories depending on the area in which the route will operate. This section details the categories and the recommended services per each category; however a more detailed look at each route proposal, including a route map, is provided in Appendix L. There are a number of route proposals that have been listed more than once, depending on where they are located and which other routes the service changes affect. Additionally, routes have been grouped within each category as some of the proposals affect more than one route.

Given the breadth of the study and the extensive number of resulting service recommendations, the priority order of proposals within each of the categories was identified. The recommended route proposals are listed by priority under each category heading.

#### **Orange-Newark-Elizabeth (ONE) Central Core**

1. Rationalize Route 1 – Create Routes 3 & 9
2. Eliminate Route 42
3. Rationalize Route 40 – Create Routes 35, 34 & 36
4. Rationalize Routes 25 & 70
5. Rationalize Route 5 – Create Route 91
6. Rationalize Route 13 – Create Route 15
7. Rationalize Route 27
8. Rationalize Route 21
9. Rationalize Route 41
10. Rationalize Route 43

#### **Bus Rapid Transit (BRT)**

1. Create GO Bus 28 & Rationalize Route 28
2. Create GO Bus 24
3. Create GO Bus 59 & GO Bus 51 (Union County Busway)
4. Create GO Bus 25 – Rationalize Routes 25 & 70
5. Create GO Bus 1
6. Create GO Bus 21
7. Create GO Bus 44 & GO Bus 31 (Coach USA)

#### **Crosstown Services**

1. Rationalize Route 94 – Create Route 50
2. Eliminate Routes 93, 96 & 97
3. Rationalize Route 99
4. Rationalize Routes 90 & 26
5. Rationalize Route 92
6. Create Routes 95 & 98
7. Create Route 19

### **Newark Liberty International Airport - Ports of Newark & Elizabeth**

1. Rationalize Route 62 – Create Routes 806, 807 & 808
2. Rationalize Routes 40 – Create Routes 18 & 33
3. Rationalize Routes 37 & 107
4. Create Route 17
5. Create Route 38

### **Union County Services**

1. Implement Union County Busway - Create GO Bus 59
2. Rationalize Route 62 - Create 806, 807 & 808
3. Rationalize Routes 90 & 26
4. Create Route 50
5. Rationalize Route 112 – Create Route 54
6. Rationalize Route 66 – Create Route 69
7. Rationalize Routes 56 & 57
8. Rationalize Route 52
9. Create Route 53

### **Suburban Essex County Services**

1. Create GO Bus 28 – Rationalize Route 28
2. Rationalize Routes 71 & 73 – Create Routes 45 & 46
3. Rationalize Route 11
4. Rationalize Route 76 – Create Route 16
5. Rationalize Routes 29 & 79
6. Rationalize Route 65 – Create Route 820
7. Rationalize Route 72
8. Create Routes 812 & 816
9. Create Routes 47X (LCX1) & 48X (LCX2)

### **Coach USA Services**

1. Rationalize Route 24 - GO Bus 24
2. Eliminate Route 12
3. Create GO Bus 31 & Route 31
4. Create GO Bus 44 - Rationalize Route 44

### **New York Based Services**

1. Rationalize Routes 37 & 107
2. Rationalize Route 108
3. Create Route 101

## Overall Priority Recommendations

Given the breadth of the study and the extensive number of resulting service recommendations, the priority order of proposals within each of the categories was identified. A collaborative process involving the consultant team, as well as Bus Service Planning and Capital Planning staffs at NJ TRANSIT, was followed to identify these early action items and the top ten priority recommendations from among the dozens of proposals resulting from the GNBSS study process. The resulting list of four early action items and ten priority recommendations is summarized below.

Early action items and priority recommendations were identified in consideration of the degree to which the proposal addresses one of more of the overall planning goals, the feasibility of early implementation and the likely availability of operating and capital funding to implement.

### **Early Action Recommendations**

1. **Expansion of Route 62 service to address overcrowding** - During the early outreach process to Newark Liberty International Airport employers, it was quickly determined that insufficient capacity existed on Route 62 between downtown Newark and Newark Liberty International Airport to support the present travel needs of the airport workforce during the early afternoons and later evening hours. In late 2006 additional weekday and weekend service was added to the Route 62 schedule to address immediate needs of airport employees.
2. **Implementation of early phases of BRT - GO 25 on Springfield Avenue and GO 28 on Bloomfield Avenue** – Based on the recommendations of a separate analysis which reviewed the potential for initial BRT services within Newark – in the Fall of 2008 limited weekday peak hour service with BRT elements (enhanced station stops and unique branding) was implemented along the Springfield Avenue corridor between the Irvington Bus Terminal and Newark Penn Station. This was followed in the Fall of 2009, with a second, more robust GO BUS corridor along the Bloomfield Avenue-Broad Street corridor operating daily between the Bloomfield RR Station and Newark Liberty International Airport via Newark's Innovation Zone and University Heights. Additional BRT elements included with this corridor were: headway based operations, the use of new uniquely branded buses, the use of TSP (transit signal priority) at 14 intersections along Bloomfield Avenue within Newark and the demonstration of real time service information at the Bloomfield Avenue Light Station stop.
3. **Rationalization of Route 39 – Creation of new Route 30** – An analysis of the busy Irvington-Newark-Harrison-Kearny corridor was undertaken early in the study process with the goal of achieving some early service efficiencies due to declining demand for service along the northerly portion of the route. After a detailed ridership analysis was completed, a recommendation was put forth and implemented in mid-2009 to split the existing Route 39 into two unique routes. Today, the Route 39 operates only between Irvington and the Newark CBD, originating and terminating at Newark-Penn Station. The northerly portion of the Route 39 to Harrison and Kearny became the basis of the new route known today as the 30. Route 30 service levels in

both the peak and off-peak periods are reduced compared to the original Route 39 and are based upon the demonstrated demand for service in this market.

4. **Implementation of the weekday PM peak Raymond Boulevard bus lane** – Based upon the recommendations of a previous analysis for the implementation of a bus only priority lane within the Newark CBD, the weekday PM peak hour Raymond Boulevard bus only lane was implemented in 2008 between Newark-Penn Station and the intersection of Raymond Boulevard and NJ Route 21. This facility allows for buses exiting the Penn Station bus lanes to have both traffic and signal queue jump of a few minutes along the normally congested Raymond Boulevard corridor.

### **Top Ten Priority Recommendations**

1. **Expand GO 28 – Rationalize Route 28** – The new GO 28 is a Bus Rapid Transit (BRT) type route that was implemented between the Bloomfield Train Station and the Newark Liberty International Airport’s North Area Transit Center via the Central Terminals Area as part of the Liberty Corridor improvements in the Fall of 2009. GO 28 operates on two variations with one serving the University Heights/Newark Innovation Zone area of Newark, thereby providing a convenient link between University Heights community and the Airport which can support the development of the area as a major research center.

Proposals call for a multi-phased expansion of the GO 28 service to the Montclair State University and Montclair State University Station on the northern end and to Jersey Gardens Mall – Newark Liberty International Airport – South Area in Elizabeth on the southern end. As GO 28 is fully implemented, service on Route 28 should be rationalized to direct resources to their most effective use.

2. **Rationalize Route 62 – Creation of up to three new Routes 806/807/808** – To simplify operation of Route 62 - which currently acts as the long spine route for the key Perth Amboy-Woodbridge-Rahway-Elizabeth-Newark Liberty International Airport-Newark corridor - the service would be re-designed to offer a simpler, shorter and more frequent service along this corridor between Rahway, the Airport and downtown Newark. It would be tied to the creation of up to three new connecting feeder bus routes at a potential transit center at the Rahway Station. Successful implementation of a Rahway hub would require a search for, and procurement of a location in proximity to the Rahway Station capable of supporting the spine and feeder routes. The recommendation not only simplifies current service, but also presents an opportunity for NJ TRANSIT to make greater use of private service contractors to operate the newly designed system of feeder routes, when additional funding becomes available.
3. **Union County Busway** (a component of the Union County Sustainability Corridor) – A central piece of the GNBSS’s vision for bus services in Union County is the creation of a new Busway emanating from a new intermodal transit center at the Elizabeth Station and following the abandoned right-of-way of the Central of New Jersey Railroad to Cranford. The potential also exists to extend the Busway operation

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via the local street network eastward from the Elizabeth Station area to the Newark Liberty International Airport via Elizabethport and Jersey Gardens and from Cranford Station westward to Garwood Station. Extensions westward to Garwood and possibly further westward to Plainfield would support proposed redevelopment plans for the station area, and foster development on the entire corridor by presenting public-private partnership development opportunities.

A phased implementation of the Busway service is planned with the eventual implementation of a network of local cross-county services that provide express service options to destinations such as the Union County College - Cranford Campus, the Newark Liberty International Airport (Central Terminal Area, North/South Areas) and to Jersey Gardens Mall. It is also envisioned that a few New York based commuter services such as Routes 112 or 113 from southwestern Union County could utilize the Busway if travel time can be reduced.

- 4. Restructure Route 40 – Creation of new Routes 18 & 33** – This group of new or redesigned current routes would improve access to the airport from the North Arlington-Kearny-Harrison corridor and from the Ironbound section of Newark. In addition, this package of routes would improve access to the Airport from Southern Hudson County (Bayonne/Jersey City) through the creation of a new Route 18. Additionally, this group of proposals would introduce a new Route 33 Port Shuttle, which will allow for more flexible service in the ports area with small vehicles providing closer and more flexible access to port employers. The introduction of the Route 33 Ports Shuttle also presents an opportunity for partnerships with the Port Authority of New York and New Jersey (PANYNJ).
- 5. Elimination of Routes 42/93/96/97** – These routes have all been identified as poor performers and have been recommended for elimination. Eliminating these routes will allow these resources to be reinvested in the existing system to address running time and other operational performance issues.
- 6. Restructure Route 94 – Creation of new Route 50** – This proposal would improve access to employment and shopping opportunities along the US 22 commercial/retail corridor in Union County from the western suburbs of Newark, East Orange, Irvington and Union Center by providing more consistent and frequent service along the present Route 94 - US 22 branch of the route. The route would also be simplified by creating the new Route 50 which would replace the current Route 94 service between the Irvington Bus Terminal and Linden.
- 7. Expansion of Route 99** – Route 99, the Clifton Avenue Crosstown in the City of Newark, would be extended on both its northern and southern ends. On the northern segment, the route would extend to the Branch Brook Park Station on the Newark light rail to create intermodal connection opportunities on the route. Subsequently, Route 99 could be extended south to the Union Train Station on the Raritan Valley Line and Kean University to create intermodal connections and improve access to an institution of higher education.

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8. **Restructure Route 1 – creation of new Routes GO1, 3 & 9** – Route 1 is currently one of the most important, but most complex bus routes in the Newark-Elizabeth area. In addition, Route 1 is subject to occasional delays since the current alignment traverses two lift bridges between Newark and Kearny. This package of service improvement proposals would create up to three new separate routes that would not only simplify the service and improve reliability, but would also improve connections to the University Heights area of Newark from Penn Station, the Journal Square Transportation Center and portions of western Hudson County. Future phases of the Route 1 restructuring include the possible introduction of a new GO 1 BRT style route between Penn Station and Ivy Hill. The recently completed Jersey City Bus Study also offered alternate designs of Route 1 service. These two differing recommendations need to be reconciled for efficiency and effectiveness.
  9. **Restructure Coach USA Route 24 – creation of new GO24 BRT** – Coach USA's Route 24 would maintain its current route structure, but will include some minor service rationalizations in the Elizabethport area and the introduction of a new GO 24 BRT variation along the major Central Avenue and Frelinghuysen Avenue Corridors in Newark. This will support the City of Newark's redevelopment vision for these key corridors.
  10. **Restructure Routes 37 & 107** – These two routes would be redesigned in a way that better reflects the purpose of the two routes. Route 37 would continue to operate as a core local route between Newark- Ivy Hill – Irvington – Newark Liberty International Airport. With a new extension of service from the Airport to the Hudson-Bergen light rail station on Bergenline Avenue in Union City in central Hudson County, for first the time northern and central Hudson County residents would have a direct and frequent one seat ride to the Newark Liberty International Airport, replacing a multi-trip, multi-mode journey. Job access and leisure travel options would be significantly improved for Hudson County residents. Route 107 would be redesigned to become more of a commuter oriented service with both local and express service options. These improvements would support redevelopment efforts planned for Irvington Center and present an opportunity for a public-private development opportunity if a planned commercial development and parking garage adjacent to the Irvington Bus Terminal moves forward.

The above paragraphs highlighted the initial four early actions items and the ten priority service improvement recommendations resulting from the GNBSS. As noted, each of these proposals plays a role in improving access to major employers, institutions of higher learning and medical facilities; creating intermodal connection opportunities; or improving or rationalizing current operations. It should be recognized that the service improvement plan includes numerous other changes to the network of bus routes serving the study area.

## Capital Needs

### Revenue Vehicles

The implementation of the proposals included in the GNBSS would require a significant increase in the number of vehicles needed to operate scheduled services and additional maintenance facilities to manage the expanded fleet. NJ TRANSIT will not only need to ensure a sufficient fleet size, but will also need to examine the most appropriate vehicle fleet mix. With the expansion of services in the suburban areas, the incorporation of additional smaller transit buses (i.e., 30' length) should be investigated (if passenger loads permit), given that these vehicles tend to be more acceptable to suburban communities. In addition, vehicle design, such as low-floor configurations, can assist in operating efficiency by helping to speed the boarding process.

The top five priorities call for an over 40 new buses, which will require an additional \$13 million in capital funding.

### Maintenance and Garage Facilities

Related to the revenue fleet is the issue of bus maintenance, garage and support facilities. Three out of the four NJ TRANSIT bus maintenance facilities that presently support service in the greater Newark-Elizabeth area are currently at or near capacity. An increase in the fleet size would require expansion of current maintenance facilities and/or the possible addition of new maintenance facilities to address capacity issues.

NJ Transit should investigate the opportunity to acquire and retrofit the remaining portion of the NBC facility as an expansion of the Ironbound Garage. This investment would add to the capacity of the facility by approximately 100 buses. An additional facility should be considered within the GNBSS study area that would house and maintain approximately 150 buses. Such an investment would cost upwards of \$70 million.

NJ TRANSIT will require a sufficiently sized fleet, an appropriate fleet mix and the availability of adequate maintenance and garage facilities for the implementation of the GNBSS to be a success. It is possible that additional facilities will be needed prior to implementation.

### Transit Centers

The GNBSS envisions increased focus on certain existing transit centers as well as the need for new major hub locations and local neighborhood locations. New or expanded major transit hubs are envisioned initially for these key locations: Newark Penn Station (at capacity), Irvington Bus Terminal (at capacity), Orange Street Station Transit Center (new), Elizabeth Station Transit Center (new) and Rahway Station Transit Center (modified). Along with actual physical engineering at some of these locations, hubs should also be equipped with various amenities including:

- Sheltered/protected waiting;

- Security (lighting, cameras, etc.).
- Posted information;
- Technology (real time information, etc.);
- Fare media purchase options;
- Way finding signage;
- Parking (where applicable);
- Vending/retail presence.

Additional transit centers and secondary hubs are proposed throughout the study area at these locations:

#### **Central Locations**

- Broad Street Station
- North Area Transit Center at Newark Liberty International Airport
- South Area Transit Center at Newark Liberty International Airport
- Jersey Gardens
- Orange - Erie Loop
- Branch Brook Park Light Rail Station
- South Orange Station
- Orange Station
- Linden Station
- Union County College-Cranford Campus

All transit centers and transit hubs, both primary and secondary, should exhibit the NJ TRANSIT branding and have standardized amenities in order to create familiarity with the passengers.

#### **Eastern Locations**

- Jersey City - Exchange Place
- Jersey City - Journal Square
- Meadowlands - American Dream - Meadowlands

#### **Southwestern Locations**

- Plainfield Station
- Metropark Station
- New Brunswick Station

#### **Western Locations**

- Willowbrook Mall
- Wayne Transit Center
- Livingston Mall
- Summit Station
- Morristown Station
- Montclair State University Station

#### **BRT Features**

As NJ TRANSIT continues to incrementally implement its Bus Rapid Transit (BRT) program, GO Bus, it will be necessary to procure and install various technologies and passenger

amenities along designated routes. These include distinctive shelters, security lighting, posted and electronic service information, off-board ticketing options, transit signal priority, etc. Bus transit improvements, specifically those associated with creating and sustaining BRT services can truly become an enabler of economic development, as has been proven in other parts of the United States. BRT routes are proposed along the following corridors:

### **Central Corridors**

- Springfield
- Bloomfield/Broad/ Newark Liberty International Airport
- Central
- South Orange
- 16<sup>th</sup> Avenue
- Main/West Main
- Broadway
- Frelinghuysen

Implementation of additional GO Bus routes should occur when demand is sufficient and as funding becomes available.

### **Southwestern Corridors**

- Union County Busway/Newark Liberty International Airport
- Union County Busway/Jersey Gardens
- South Avenue/Route 28
- Elizabeth – Union County College
- Morris (Elizabeth – Summit)

## **Other Supporting Policies and Factors**

### **Technology**

There are various technology tools available to the transit industry that can not only improve the passenger experience with the transit system, but can also allow NJ TRANSIT to operate more efficiently. NJ TRANSIT should develop an organization wide plan for the use of technology in such areas as bus and facility security, off-board fare collection, public information, operations improvements, such as Traffic Signal Prioritization, and on-board data collection (e.g., Automated Passenger Counters and Automated Vehicle Locator technology).

### **Public Information**

Many passengers and non-riders expressed the desire for easier to understand route information and the need for an easier payment system.

As noted in the previous point, technology tools can be used to provide the public with information about service. NJ TRANSIT should pursue the most modern methods of reaching its customers. However, it must be considered that transit users continue to rely on traditional printed and posted sources for service information. NJ TRANSIT should strive to continuously balance and improve the presentation, availability and timeliness of its service information.

Most passengers get service information (e.g., trip times, route

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alignments, potential destinations, etc.) from the individual route brochures, which are readily available at many locations throughout the study area. NJ TRANSIT should consider revising the maps employed on the individual route brochures to more accurately display the actual route alignment. The current route maps are designed to fit in a limited area rather than detail actual bus movements. Passengers and operators alike have mentioned that this practice is confusing and that they would prefer route maps that are easier to understand.

With the increased ability for people to access the internet wherever they are to get information that they seek, either through a personal computer or through a mobile device, keeping information up-to-date is paramount. NJ TRANSIT should provide notifications on all service changes, small or large. Additionally, NJ TRANSIT should investigate the usefulness of web based technology which could allow passengers to view the current location of the bus or merely alert them to when the next bus will arrive.

### **Fare Policy**

Several of the recommendations included in the GNBSS created more opportunities for NJ TRANSIT and Coach USA riders to transfer between rail, light rail, rapid transit and bus modes. However, NJ TRANSIT's, Coach USA's and the other regional transit providers current fare structures do not promote those types of connections. NJ TRANSIT in conjunction with Coach USA and the Port Authority of New York and New Jersey (PANYNJ) should continue pursuing an integrated or seamless fare structure that allows riders from one system to use the network of services on another rather than having customers pay multiple fares.

Other considerations would include the potential to collapse fare zones one through three in order to create one flat rate, and the implementation of pre-paid media. Pre-paid media, in particular, would allow for off-board collection of fares for the GO Bus routes, ticket vending machines at all primary and secondary hub locations and the expansion of private ticket sales outlets.

### **Liberty Corridor**

An initiative sponsored by Senator Robert Menendez – the Liberty Corridor was an initial source of funds to support development of the GO 28 BRT program. Funds from this initiative could be used to support operational recommendations and capital investments in service focused around the Ports of Newark & Elizabeth, Newark Liberty International Airport and their support zones across Essex and Union Counties.

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## Other Influencing Factors

While a priority implementation order has been identified for the proposals within each of the categories listed above, there are various factors internal and external to NJ TRANSIT that could affect future decisions on which proposals should be implemented and when. Among other issues, these may include:

### **Current and future funding for existing and expanded operations is uncertain**

The current economic recession has essentially curtailed any type of planned service expansions for the Greater Newark area and throughout the state as a whole. In these trying economic times, NJ TRANSIT must be efficient in using the funds made available from the State and paid to it in fares to provide a customer responsive service that offers sufficient value.

### **Employment Rebound at the Airport/Ports and support areas**

As the economy recovers, employment may increase quickly at the Newark Liberty International Airport, at the Ports of Newark & Elizabeth and their respective support areas. This may change the priority status of some of the proposals designed to improve access to the Airport/Ports area from various locations throughout the study area.

### **Potential Curtailment/Abandonment of service by Coach USA**

At any time Coach USA may choose to abandon current services or be in a position where they are unable to continue operating certain services. In the GNBSS study area this could have a major impact on mobility since private carriers cover core critical major corridors such as Central Avenue, Elizabeth-Frelinghuysen Avenues and South Orange Avenue. If the private carrier could no longer serve selected core corridors of the study area, NJ TRANSIT would need to direct resources to maintain service in those corridors.

## **Summary**

This Final Report of the Greater Newark Bus System Study presents the findings from a three-year process which assimilated a wide range of data and various stakeholder input. Based on various analyses, as well as the desires of the community expressed during the planning process, an ambitious vision for enhanced and expanded public transportation in the study area was developed and presented. Priority recommendations were identified and presented in this document, as well as a description of the capital needs and other policy considerations that will be needed to support these recommended changes. The study process produced several dozen recommendations dealing with approximately 50 different currently operated NJ TRANSIT and Coach USA bus routes, as detailed in this report and outlined in Appendix L.

## Appendix A – Population Distribution and Characteristics

Population data for the study area is shown in Table 1. The 2000 U.S. Census reported that the population of the study area was 2,124,130, which represents a 5.4 percent increase from the 1990 population of 2,014,619. The 2005 estimated population of the study area was 2,164,000. Approximately 37 percent of the 2000 study area population, 792,300 persons, resides in Essex County. An additional 22.3 percent of the population, 474,710 persons, resides in Union County, while another 13.9 percent of the population resides in Passaic County. The remaining population is distributed relatively evenly throughout Bergen, Hudson, Middlesex, and Morris Counties, with populations of 210,450, 57,310, 144,500, and 148,720, respectively.

The City of Newark (Essex County) is the largest municipality in the study area, with a population of 272,540. Other large municipalities within the study area include Paterson (Passaic County), with a population of 149,220; Elizabeth (Union County), with a population of 120,570; and Woodbridge (Middlesex County), with a population of 97,200. Table 1 also indicates the projected population changes during the three decades from the last complete U.S. Census in 2000. While the focus of the current analysis is on near term changes, the long range forecasts provide a context for the expected growth in the study area. Most communities are expected to increase population, although the rate of change is consistent with a mature service area. Of particular interest is the expected gain in population for Newark which reflects the rejuvenation of this city.

The largest population increases are projected for Florham Park, Morris County (77.9%); Perth Amboy, Middlesex County (39.2%); and Lyndhurst, Bergen County (34.2%). The only projected population decreases occur in Chatham, Morris County (-21.7%); and North Caldwell, Essex County (-10.4%).

**Table 1 – Population and Population Projections**

| County | Municipality      | 1,000's     |             |             |             |             |             |             |             | 00-30<br>%<br>Change |
|--------|-------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------------|
|        |                   | 1990<br>Pop | 2000<br>Pop | 2005<br>Pop | 2010<br>Pop | 2015<br>Pop | 2020<br>Pop | 2025<br>Pop | 2030<br>Pop |                      |
| Bergen | Carlstadt         | 5.5         | 5.9         | 5.9         | 6.0         | 6.0         | 6.2         | 6.5         | 6.8         | 14.4                 |
|        | East Rutherford   | 7.9         | 8.7         | 8.7         | 8.8         | 8.8         | 8.8         | 9.2         | 9.2         | 5.5                  |
|        | Garfield          | 26.7        | 29.8        | 30.9        | 31.4        | 31.7        | 32.7        | 33.9        | 35.2        | 18.0                 |
|        | Hackensack        | 37.1        | 42.7        | 44.1        | 44.5        | 44.8        | 46.0        | 47.4        | 49.0        | 14.8                 |
|        | Hasbrouck Heights | 11.5        | 11.7        | 11.7        | 11.7        | 11.8        | 12.2        | 12.5        | 13.0        | 11.6                 |
|        | Little Ferry      | 10.0        | 10.8        | 11.0        | 11.1        | 11.2        | 11.5        | 11.7        | 12.1        | 12.1                 |
|        | Lodi              | 22.4        | 24.0        | 24.5        | 24.6        | 24.8        | 25.4        | 25.9        | 26.9        | 12.1                 |
|        | Lyndhurst         | 18.3        | 19.4        | 19.4        | 19.5        | 19.7        | 20.3        | 25.8        | 26.0        | 34.2                 |
|        | Moonachie         | 2.8         | 2.8         | 2.8         | 2.8         | 2.9         | 3.0         | 3.0         | 3.3         | 19.6                 |
|        | North Arlington   | 13.8        | 15.2        | 15.2        | 15.2        | 15.3        | 15.6        | 16.7        | 17.0        | 12.2                 |
|        | Rutherford        | 17.8        | 18.1        | 18.0        | 18.1        | 18.3        | 18.3        | 18.3        | 18.7        | 3.4                  |

| County            | Municipality         | 1,000's      |              |              |              |              |              |              |              | 00-30<br>%<br>Change |
|-------------------|----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------------|
|                   |                      | 1990<br>Pop  | 2000<br>Pop  | 2005<br>Pop  | 2010<br>Pop  | 2015<br>Pop  | 2020<br>Pop  | 2025<br>Pop  | 2030<br>Pop  |                      |
| Bergen<br>(cont.) | South Hackensack     | 2.1          | 2.3          | 2.3          | 2.3          | 2.4          | 2.4          | 2.4          | 2.4          | 8.4                  |
|                   | Teterboro            | .02          | .02          | .02          | .02          | .02          | .02          | .02          | .02          | 0.0                  |
|                   | Wallington           | 10.8         | 11.6         | 11.6         | 11.7         | 11.8         | 12.2         | 12.5         | 12.7         | 9.8                  |
|                   | Wood-Ridge           | 7.5          | 7.6          | 7.6          | 7.7          | 7.7          | 7.9          | 8.1          | 8.4          | 9.6                  |
|                   | <b>Totals</b>        | <b>194.1</b> | <b>210.5</b> | <b>213.9</b> | <b>215.4</b> | <b>217.1</b> | <b>222.4</b> | <b>233.9</b> | <b>240.6</b> | <b>14.4</b>          |
| Essex             | Belleville           | 34.2         | 35.9         | 36.1         | 36.3         | 36.5         | 37.1         | 37.9         | 38.5         | 7.2                  |
|                   | Bloomfield           | 45.1         | 47.7         | 48.4         | 49.0         | 49.3         | 50.5         | 52.0         | 53.3         | 11.9                 |
|                   | Caldwell             | 7.5          | 7.6          | 7.6          | 7.6          | 7.6          | 7.7          | 7.8          | 7.9          | 4.4                  |
|                   | Cedar Grove          | 12.1         | 12.3         | 12.5         | 12.5         | 12.6         | 12.8         | 13.1         | 13.3         | 8.3                  |
|                   | City of Orange       | 29.9         | 32.9         | 32.9         | 33.4         | 33.7         | 34.7         | 35.8         | 36.6         | 11.2                 |
|                   | East Orange          | 73.6         | 69.8         | 70.2         | 71.0         | 71.2         | 73.7         | 76.3         | 78.3         | 12.2                 |
|                   | Essex Fells          | 2.1          | 2.2          | 2.3          | 2.4          | 2.4          | 2.5          | 2.7          | 2.8          | 28.7                 |
|                   | Fairfield            | 7.6          | 7.1          | 7.2          | 7.2          | 7.2          | 7.4          | 7.6          | 7.7          | 9.5                  |
|                   | Glen Ridge           | 7.1          | 7.3          | 7.3          | 7.4          | 7.4          | 7.6          | 7.8          | 7.9          | 8.9                  |
|                   | Irvington            | 61.0         | 60.7         | 61.5         | 62.0         | 62.4         | 63.7         | 65.6         | 67.2         | 10.6                 |
|                   | Livingston           | 26.6         | 27.4         | 27.7         | 27.9         | 28.0         | 28.5         | 29.2         | 29.7         | 8.4                  |
|                   | Maplewood            | 21.7         | 23.9         | 24.3         | 24.6         | 24.7         | 25.0         | 25.0         | 25.0         | 4.8                  |
|                   | Millburn             | 18.6         | 19.8         | 20.0         | 20.2         | 20.3         | 20.8         | 21.3         | 21.7         | 9.9                  |
|                   | Montclair            | 37.7         | 38.7         | 39.4         | 40.0         | 40.4         | 41.6         | 43.3         | 44.7         | 15.5                 |
|                   | Newark               | 275.2        | 272.5        | 276.8        | 280.6        | 285.6        | 296.6        | 306.5        | 311.8        | 14.4                 |
|                   | North Caldwell       | 6.7          | 7.4          | 6.0          | 6.0          | 6.1          | 6.2          | 6.4          | 6.6          | -10.4                |
|                   | Nutley               | 27.1         | 27.4         | 27.5         | 27.6         | 27.7         | 28.2         | 28.9         | 29.5         | 8.0                  |
|                   | Roseland             | 4.9          | 5.3          | 5.3          | 5.3          | 5.3          | 5.4          | 5.6          | 5.7          | 7.0                  |
|                   | South Orange Village | 16.4         | 17.0         | 17.3         | 17,720       | 17.9         | 18.3         | 18.8         | 19.1         | 12.9                 |
|                   | Verona               | 13.6         | 13.5         | 13.7         | 13.8         | 13.8         | 14.2         | 14.7         | 15.1         | 11.6                 |
|                   | West Caldwell        | 10.4         | 11.2         | 11.7         | 12.0         | 12.1         | 12.4         | 12.9         | 13.2         | 17.7                 |
|                   | West Orange          | 39.1         | 44.9         | 45.6         | 46.0         | 46.3         | 47.2         | 48.5         | 49.7         | 10.5                 |
|                   | <b>Totals</b>        | <b>778.2</b> | <b>792.3</b> | <b>801.1</b> | <b>810.4</b> | <b>819.4</b> | <b>842.2</b> | <b>867.4</b> | <b>885.4</b> | <b>11.8</b>          |
| Hudson            | East Newark          | 2.,2         | 2.4          | 2.4          | 2.5          | 2.7          | 2.8          | 2.8          | 2.8          | 18.5                 |
|                   | Harrison             | 13.4         | 14.4         | 14.7         | 15.7         | 16.6         | 17.0         | 17.4         | 17.7         | 22.6                 |
|                   | Kearny               | 34.9         | 40.5         | 40.9         | 42.3         | 43.3         | 44.7         | 46.5         | 46.9         | 15.7                 |
|                   | <b>Totals</b>        | <b>50.5</b>  | <b>57.3</b>  | <b>56.0</b>  | <b>60.5</b>  | <b>62.6</b>  | <b>64.4</b>  | <b>66.7</b>  | <b>67.4</b>  | <b>17.6</b>          |
| Middlesex         | Perth Amboy          | 42.0         | 47.3         | 49.7         | 52.5         | 55.0         | 58.7         | 62.7         | 65.8         | 39.2                 |
|                   | Woodbridge           | 93.1         | 97.2         | 99.8         | 103.8        | 108.1        | 111.8        | 113.4        | 114.5        | 17.8                 |
|                   | <b>Totals</b>        | <b>135.1</b> | <b>144.5</b> | <b>149.5</b> | <b>156.3</b> | <b>163.1</b> | <b>170.5</b> | <b>176.1</b> | <b>180.3</b> | <b>24.8</b>          |
| Morris            | Chatham              | 8.0          | 10.1         | 10.1         | 10.2         | 10.1         | 10.0         | 9.9          | 10.2         | 1.4                  |
|                   | Chatham              | 9.4          | 8.5          | 6.9          | 6.9          | 6.8          | 6.7          | 6.6          | 6.6          | -21.7                |

| County              | Municipality            | 1,000's      |              |              |              |              |              |              |              | 00-30<br>%<br>Change |
|---------------------|-------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------------|
|                     |                         | 1990<br>Pop  | 2000<br>Pop  | 2005<br>Pop  | 2010<br>Pop  | 2015<br>Pop  | 2020<br>Pop  | 2025<br>Pop  | 2030<br>Pop  |                      |
| Morris<br>(cont.)   | East Hanover            | 9.9          | 11.4         | 11.5         | 11.5         | 11.5         | 11.4         | 11.3         | 11.6         | 1.9                  |
|                     | Florham Park            | 8.5          | 10.3         | 14.6         | 16.0         | 16.3         | 17.0         | 17.7         | 18.3         | 77.9                 |
|                     | Hanover                 | 11.5         | 12.9         | 13.4         | 13.5         | 13.7         | 13.5         | 13.3         | 13.8         | 7.2                  |
|                     | Lincoln Park            | 11.0         | 10.9         | 10.9         | 11.0         | 10.9         | 10.7         | 10.6         | 11.0         | 0.6                  |
|                     | Madison                 | 15.9         | 15.5         | 16.2         | 16.6         | 17.0         | 16.9         | 17.1         | 17.4         | 12.4                 |
|                     | Morristown              | 16.2         | 18.5         | 19.3         | 19.6         | 20.1         | 19.9         | 19.8         | 20.2         | 8.7                  |
|                     | Parsippany-Troy<br>Hill | 48.5         | 50.7         | 51.6         | 52.0         | 51.5         | 50.8         | 50.4         | 51.9         | 2.4                  |
|                     | <b>Totals</b>           | <b>138.8</b> | <b>148.7</b> | <b>154.4</b> | <b>157.3</b> | <b>157.8</b> | <b>156.7</b> | <b>156.6</b> | <b>161.0</b> | <b>8.3</b>           |
| Passaic             | Clifton                 | 71.7         | 79.1         | 81.5         | 82.9         | 84.7         | 88.1         | 92.2         | 95.4         | 20.7                 |
|                     | Passaic                 | 58.0         | 67.9         | 71.2         | 73.3         | 75.0         | 78.5         | 83.4         | 86.6         | 27.6                 |
|                     | Paterson                | 140.9        | 149.2        | 148.4        | 151.2        | 156.0        | 164.8        | 174.1        | 179.5        | 20.3                 |
|                     | <b>Totals</b>           | <b>270.6</b> | <b>296.2</b> | <b>301.1</b> | <b>307.4</b> | <b>31.7</b>  | <b>331.4</b> | <b>349.7</b> | <b>361.5</b> | <b>22.1</b>          |
| Union               | Berkeley<br>Heights     | 12.0         | 13.4         | 13.4         | 13.5         | 13.,8        | 14.3         | 14.8         | 15.2         | 13.6                 |
|                     | Clark                   | 14.6         | 14.6         | 14.6         | 14.7         | 15.0         | 15.4         | 15.9         | 16.3         | 11.9                 |
|                     | Cranford                | 22.6         | 22.6         | 22.5         | 22.7         | 23.2         | 24.2         | 25.0         | 25.5         | 13.1                 |
|                     | Elizabeth               | 110.0        | 120.6        | 128.3        | 133.0        | 137.3        | 143.9        | 149.5        | 152.1        | 26.2                 |
|                     | Fanwood                 | 7.1          | 7.2          | 7.2          | 7.2          | 7.3          | 7.7          | 7.8          | 7.8          | 8.8                  |
|                     | Garwood                 | 4.2          | 4.2          | 4.1          | 4.2          | 4.3          | 4.4          | 4.6          | 4.6          | 9.6                  |
|                     | Hillside                | 21.0         | 21.8         | 21.9         | 22.0         | 22.6         | 23.4         | 24.4         | 25.0         | 15.1                 |
|                     | Kenilworth              | 7.6          | 7.7          | 7.7          | 7.7          | 7.8          | 8.1          | 8.3          | 8.5          | 10.9                 |
|                     | Linden                  | 36.7         | 39.4         | 39.8         | 40.3         | 41.3         | 43.0         | 44.8         | 45.8         | 16.1                 |
|                     | Mountainside            | 6.7          | 6.6          | 6.6          | 6.6          | 6.7          | 6.9          | 7.1          | 7.3          | 10.0                 |
|                     | New Providence          | 11.4         | 11.9         | 12.0         | 12.0         | 12.3         | 12.7         | 13.2         | 13.6         | 14.0                 |
|                     | Rahway                  | 25.3         | 26.5         | 27.0         | 27.2         | 27.7         | 28.6         | 29.5         | 29.9         | 12.8                 |
|                     | Roselle                 | 20.3         | 21.3         | 21.7         | 22.1         | 22.6         | 23.4         | 24.4         | 25.1         | 18.0                 |
|                     | Roselle Park            | 12.8         | 13.3         | 13.4         | 13.5         | 13.8         | 14.4         | 14.9         | 14.9         | 12.0                 |
|                     | Scotch Plains           | 21.2         | 22.7         | 22.8         | 22.9         | 23.3         | 24.0         | 24.7         | 25.3         | 11.2                 |
|                     | Springfield             | 13.4         | 14.4         | 14.7         | 14.9         | 15.2         | 15.7         | 16.2         | 16.6         | 15.2                 |
|                     | Summit                  | 19.8         | 21.1         | 21.3         | 21.6         | 22.1         | 22.9         | 23.8         | 24.3         | 15.0                 |
|                     | Union                   | 50.0         | 54.4         | 55.7         | 56.6         | 57.8         | 59.9         | 61.9         | 63.0         | 15.9                 |
|                     | Westfield               | 28.9         | 29.6         | 29.9         | 30.2         | 30.7         | 31.8         | 32.9         | 33.6         | 13.3                 |
|                     | Winfield                | 1.6          | 1.5          | 1.5          | 1.5          | 1.6          | 1.7          | 1.7          | 1.7          | 13.9                 |
|                     | <b>Totals</b>           | <b>447.3</b> | <b>474.7</b> | <b>486.1</b> | <b>494.5</b> | <b>506.3</b> | <b>526.2</b> | <b>545.3</b> | <b>556.2</b> | <b>17.2</b>          |
| <b>GNBSS Totals</b> |                         | <b>2,015</b> | <b>2,124</b> | <b>2,164</b> | <b>2,202</b> | <b>2,242</b> | <b>2,314</b> | <b>2,396</b> | <b>2,453</b> | <b>15.5</b>          |

Source: NJ TRANSITPA

Figure 3 displays the study area's total population at the census tract level from the 2000 U.S. Census. When evaluating population, it is important to consider that the spatial sizes of census tracts vary widely. Many of the census tracts located in the study area exhibit higher population totals than those tracts located in the major cities of the study area such as Newark. This is more reflective of the area size, rather than concentration of population.

The highest population densities are primarily concentrated in, and adjacent to, the largest cities in the study area including Elizabeth, Newark, Passaic and Paterson, with densities in excess of 10,000 persons per square mile.

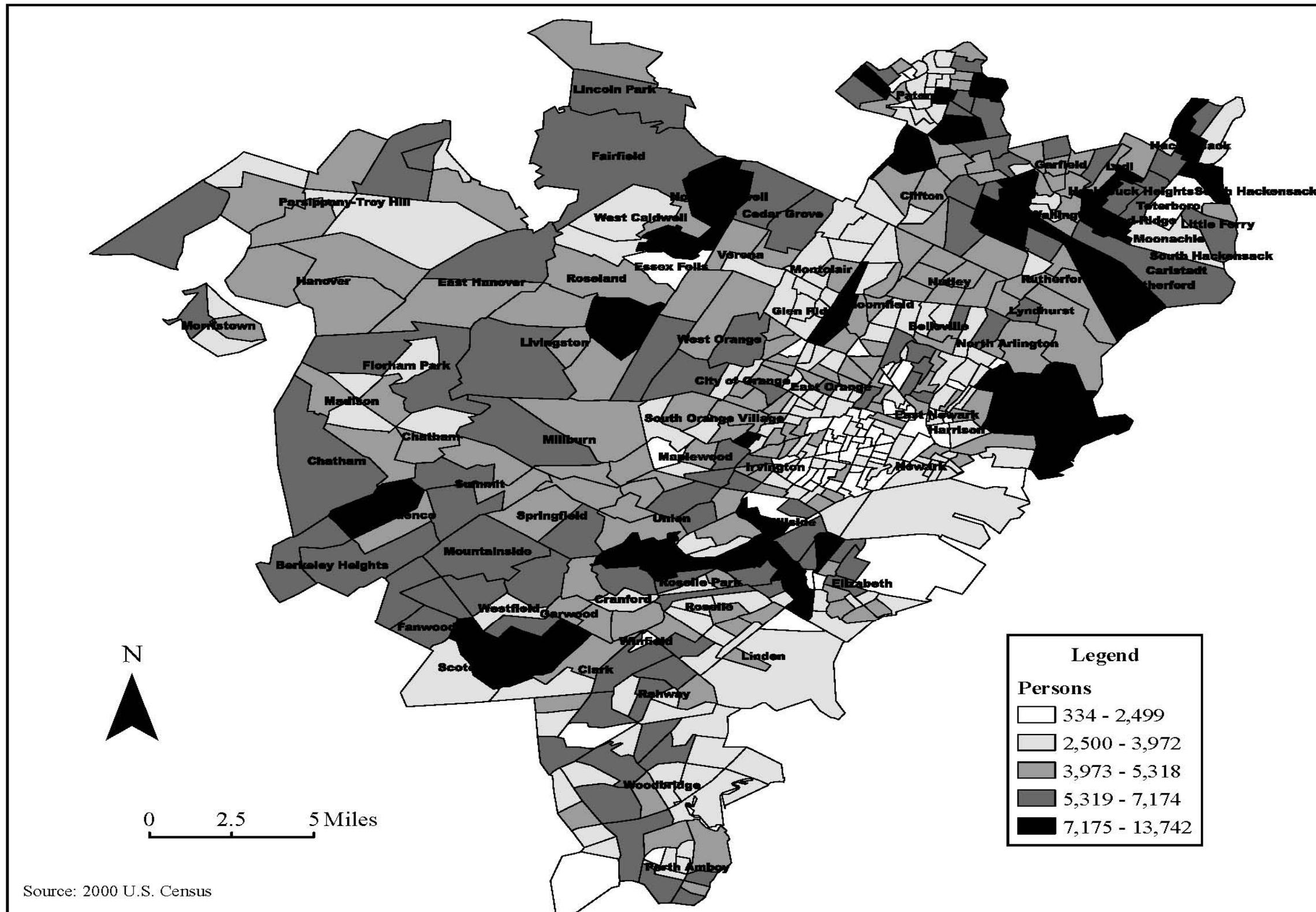
Figure 4 shows the population change by municipality between 1990 and 2000. The exhibit shows that most of the municipalities in the study area experienced population growth during this ten year period. The municipalities which experienced no population growth or a declining population are primarily located within Essex and Union Counties. The City of Newark's population declined by almost ten percent and was the largest city in the study area to lose population between the 1990 and 2000 census period.

Population density indicates how many people live within a one square mile area. Large areas of high population densities represent communities with existing or potential transit need. Based on the 2000 U.S. Census, the overall population density in the study area was 5,224, and was estimated to be slightly higher at 5,322 persons per square mile in 2005. Figure 5 shows the population density in the study area by census tract from the 2000 U.S. Census.

Some population density statistics are higher than the census tract's actual population. This is due to the fact that many census tracts in the areas with the highest population densities are smaller than one square mile. Although the population density statistics does not represent the number of people living in the census tract, it provides a valuable indicator of the character of the residential development in the tract. Not surprisingly, density typically declines with increasing distance from the urban centers along the eastern portion of the study area. These areas have population densities less than one thousand persons per square mile.

As noted previously, population projections for the study area indicate an overall increase of 15.5 percent between 2000 and 2030, with the populations of Newark and Elizabeth expected to increase by 14.4 percent and 26.2 percent, respectively during this period. Figure 6 graphically depicts the projected growth rates for the population within the study area.

**Figure 3 – Total Population (2000 U.S. Census)**



**Figure 4 – Population Change (1990-2000 U.S. Census)**

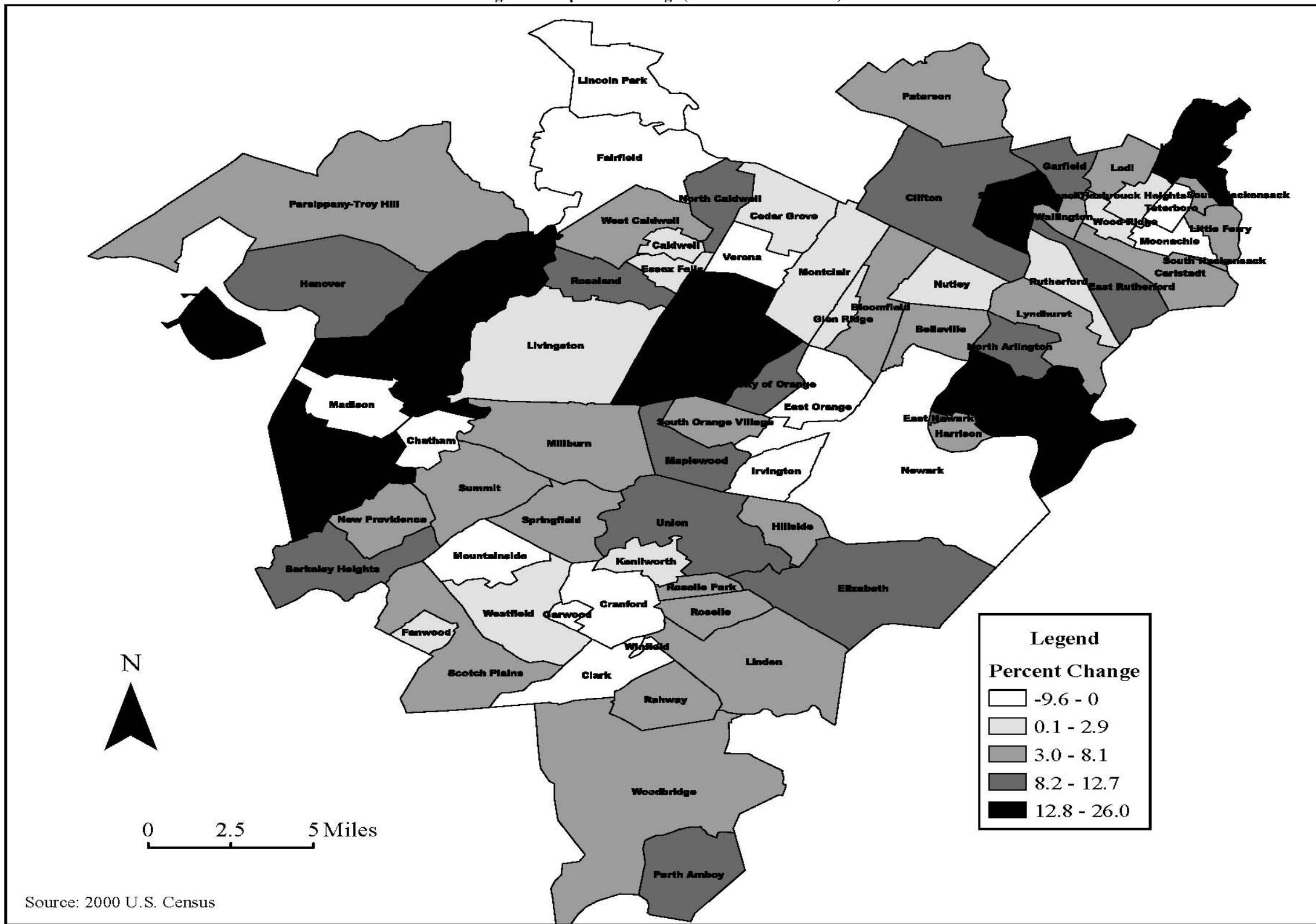


Figure 5 – Population Density (2000 U.S. Census)

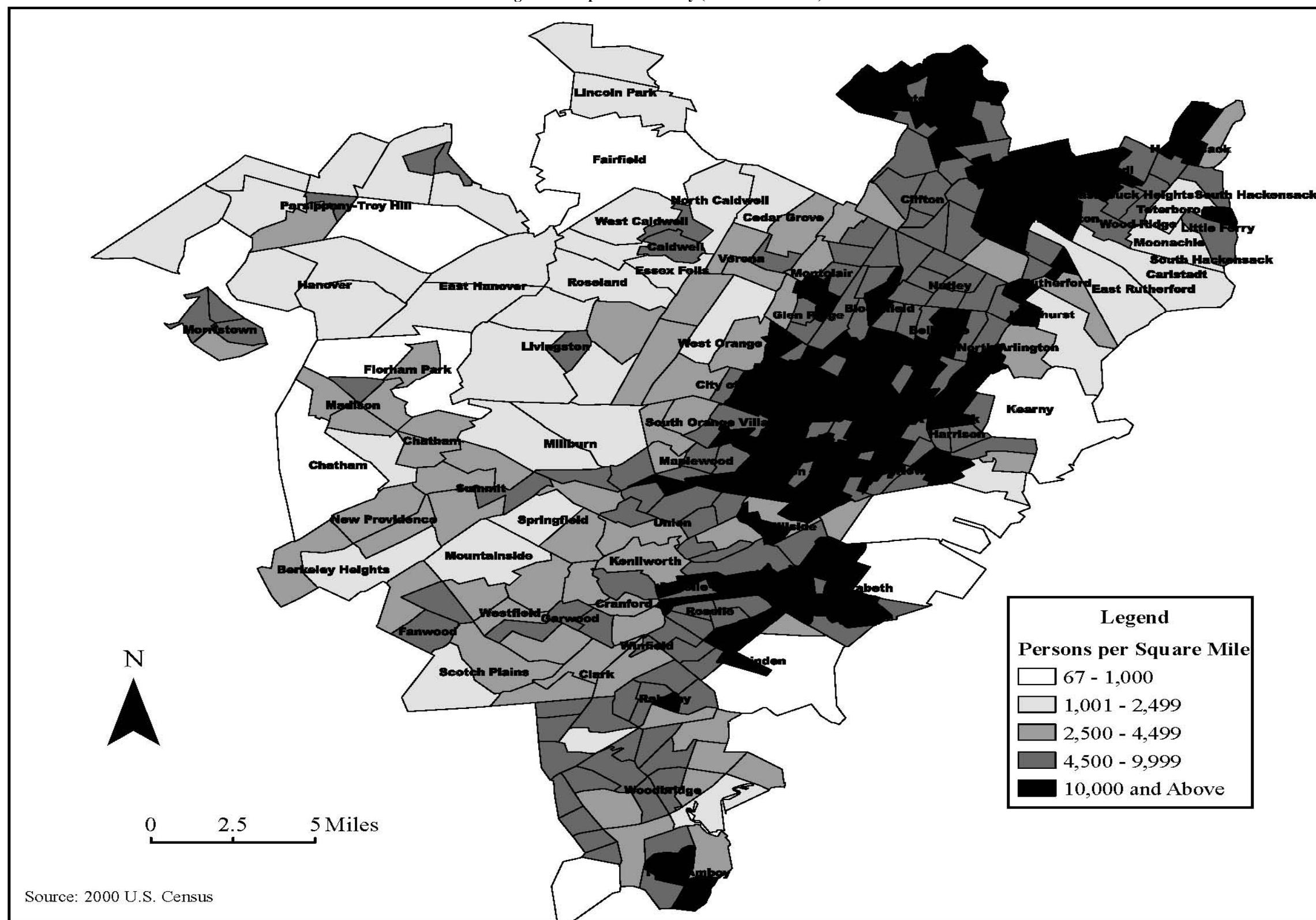
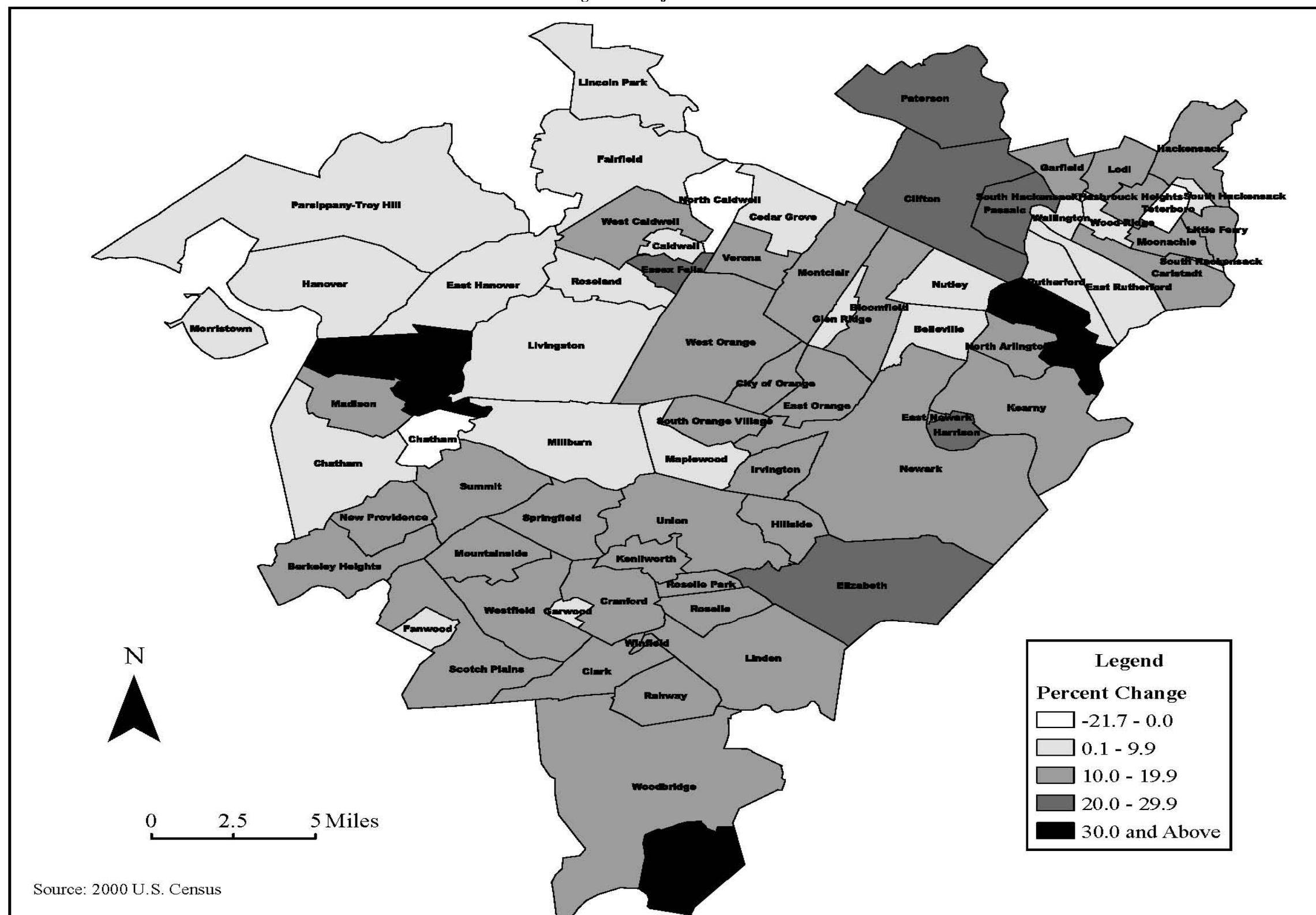


Figure 6 – Projected Growth



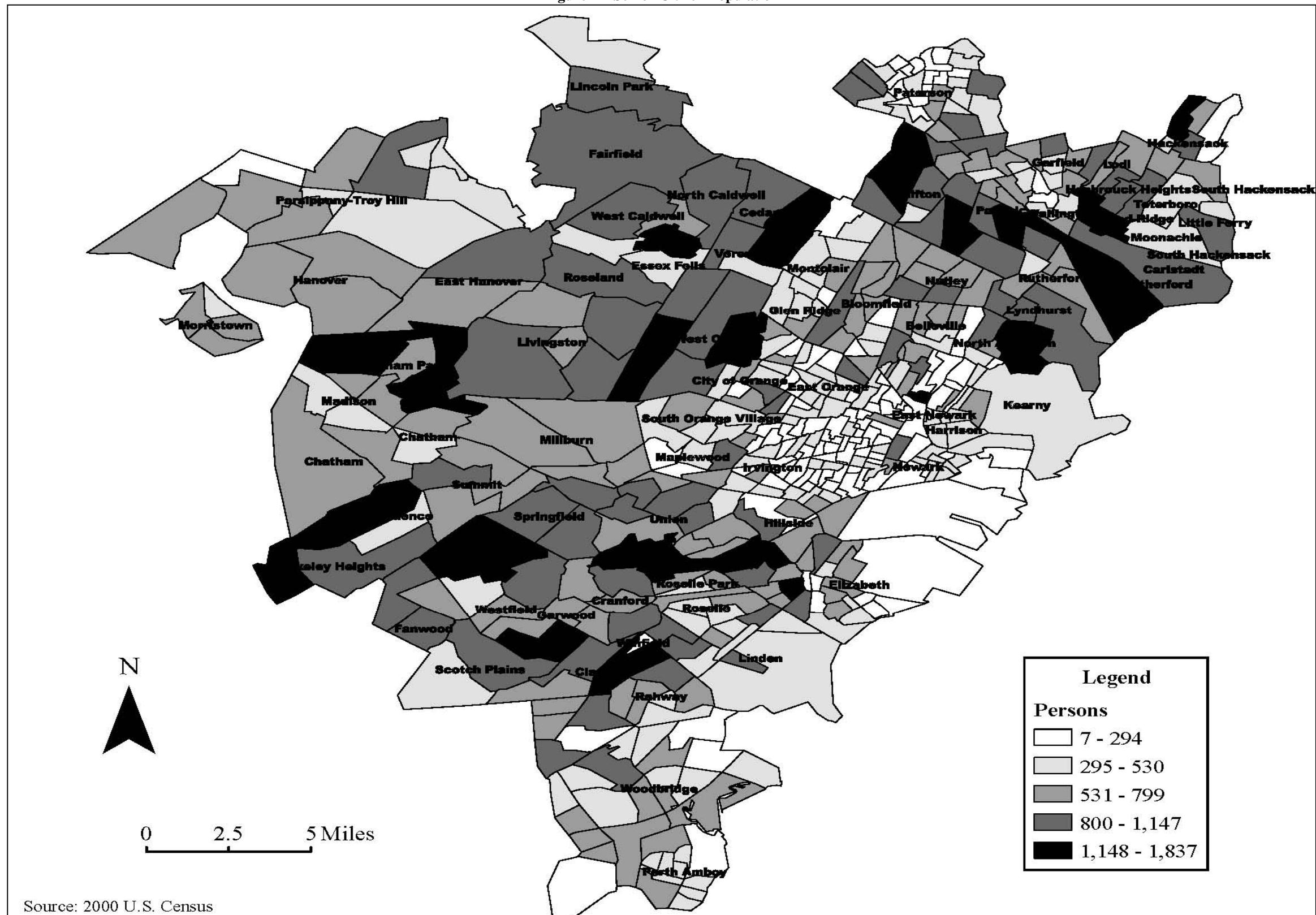
The remainder of this section presents characteristics of the population that are normally indicators of transit need and the propensity to use public transportation. Results are typically presented in three ways - aggregate values, percent of total and density. The first indicates the number of potential trips and the overall demand for mobility. The percent values attempt to indicate those areas where large portions of the population fall within a special needs group. Finally, density is important since transit works best where activity is concentrated. Many population groups are examined and the results reflect the diverse urban, suburban, and outlying portions of the study area.

The populations that rely on transit with the greatest frequency are senior citizens, youths, the disabled, persons living in poverty and persons without an available automobile.

- **Senior Citizens** – Persons over 65 years old typically comprise a group that relies on bus service. Often, these individuals have limited income and do not own an automobile. In some cases they may have some disability which limits their ability to operate an automobile. According to the 2000 U.S. Census, 12.7 percent of the population was ages 65 and over, which is 269,293 persons. Figure 7 shows the 2000 distribution of the senior citizen population in the study area.

Figure 8 shows the senior citizen population as a percent of total population. Figure 9 displays the on a density per square mile basis. The senior citizen population is concentrated in and around the major cities in the study area including Elizabeth, Newark, Passaic and Paterson. There are no areas where senior citizens make up a majority of the population.

**Figure 7 – Senior Citizen Population**



**Figure 8 – Senior Citizen Percentage of Total Population**

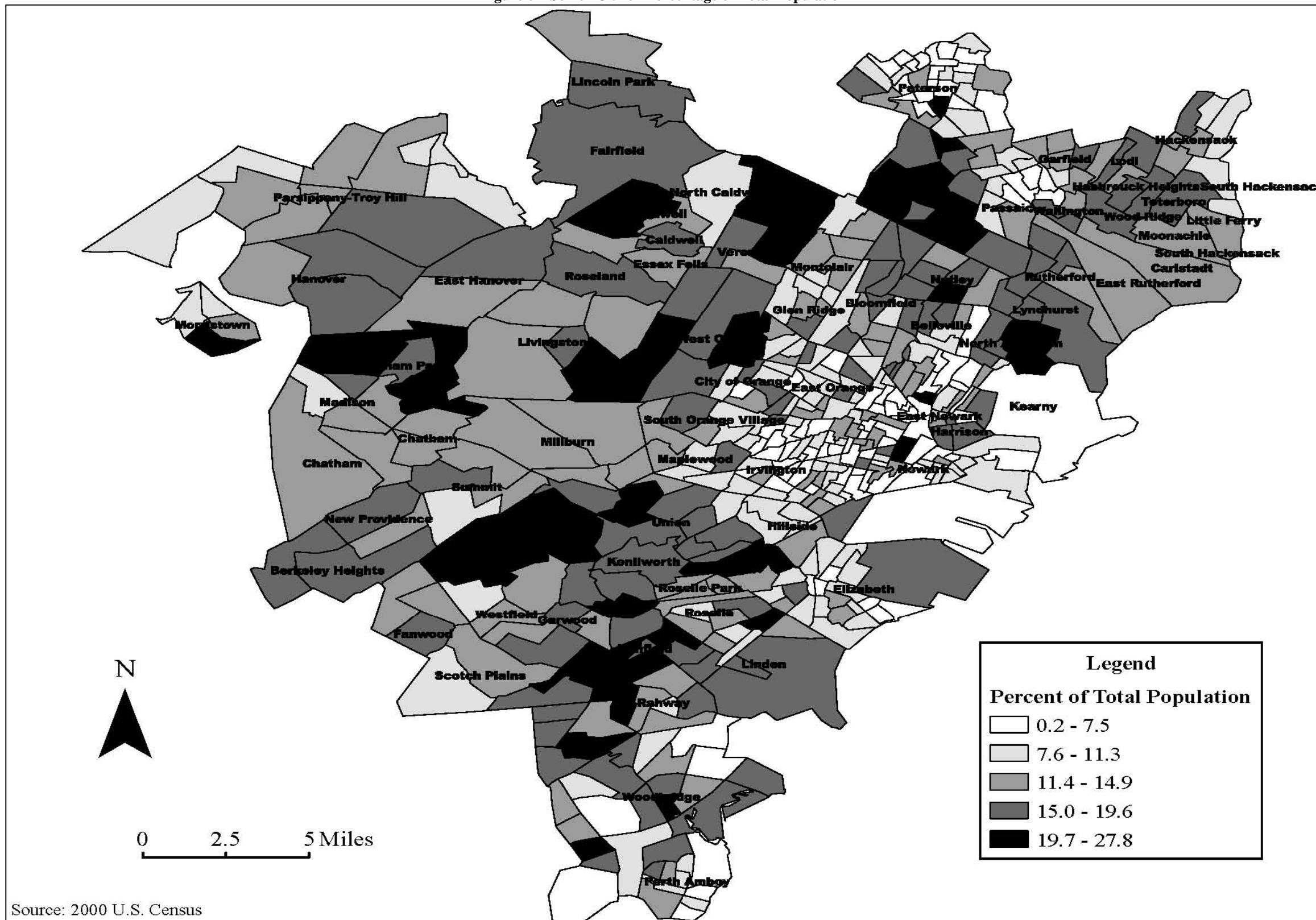
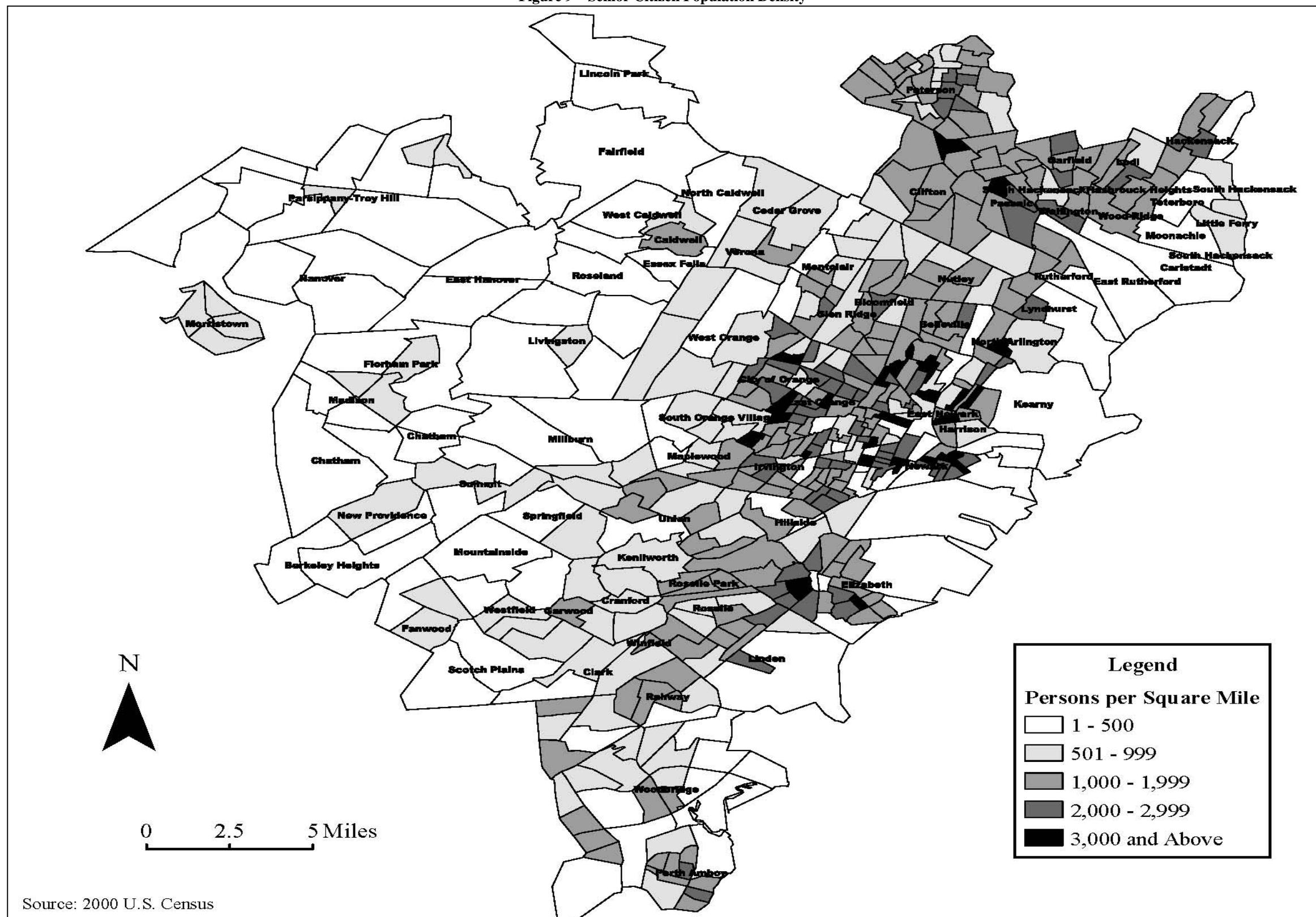


Figure 9 – Senior Citizen Population Density



- **Youths** – Younger New Jersey residents are not eligible to drive, making them dependent on public transportation, or on non-motorized modes, such as walking or biking, for their mobility. There is a multi-phase process for residents under the age of 21 to receive their license. Teens can begin the process at 16, but will not have a fully unrestricted driver's license until they reach the age of 21. Upon receiving a license, limited incomes often restrict their ability to own and maintain a vehicle. Youths for this section are considered to be any person under the age of 18. As of the 2000 U.S. Census, there were 525,548 persons under the age of 18 living in the study area. This age cohort represents 27.4 percent of the population. Figure 10 shows the 2000 distribution of the youth population in the study area. Figure 11 shows the youth population as a percent of the total population. Figure 12 shows the youth population per square mile.

The youth population in this study area is primarily concentrated in and around the major cities, including Elizabeth, Newark, Passaic and Paterson. However, youths do not comprise a majority of the population in any area.

**Figure 10 – Youth Population**

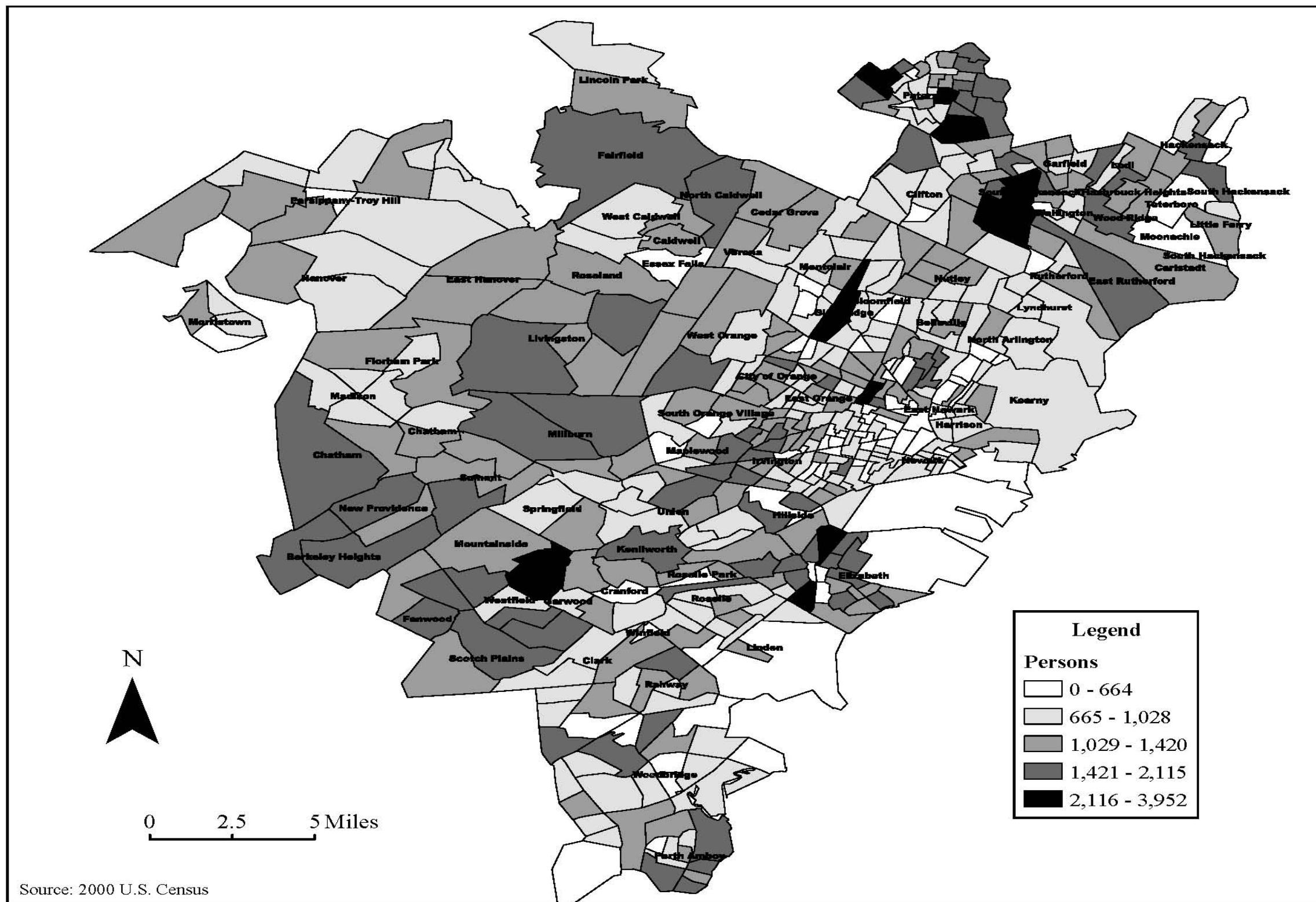


Figure 11 – Youth Percentage of Total Population

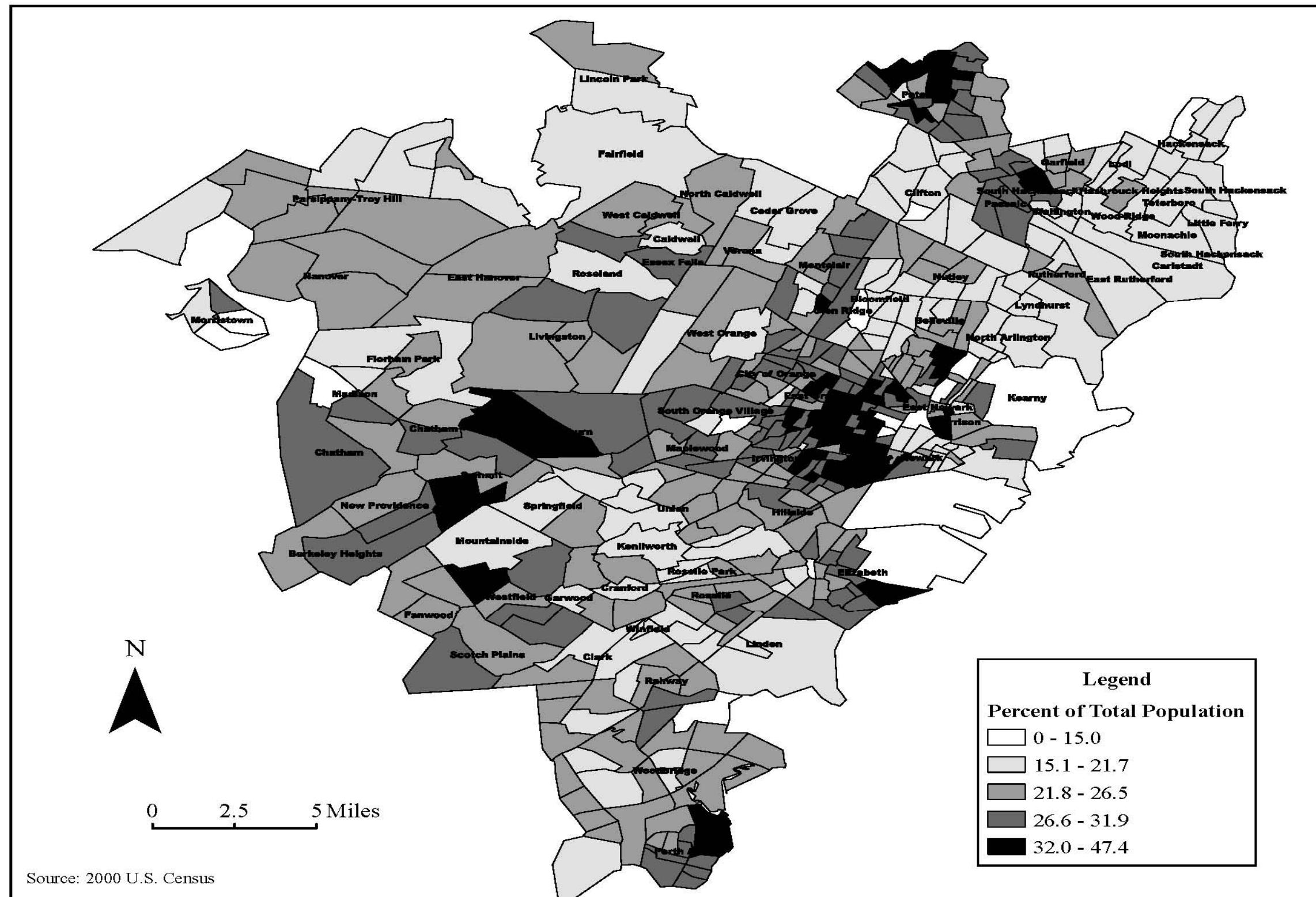
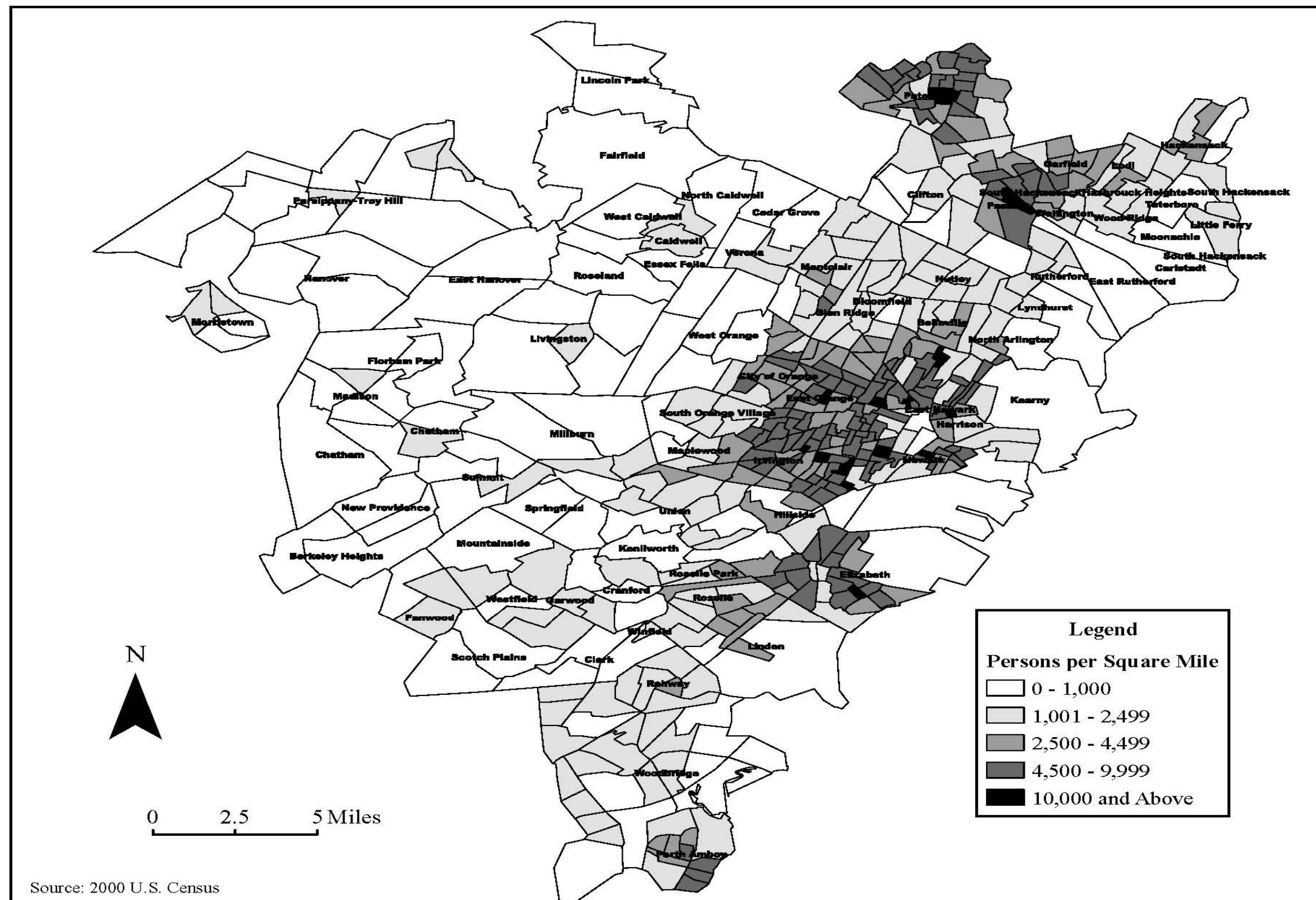


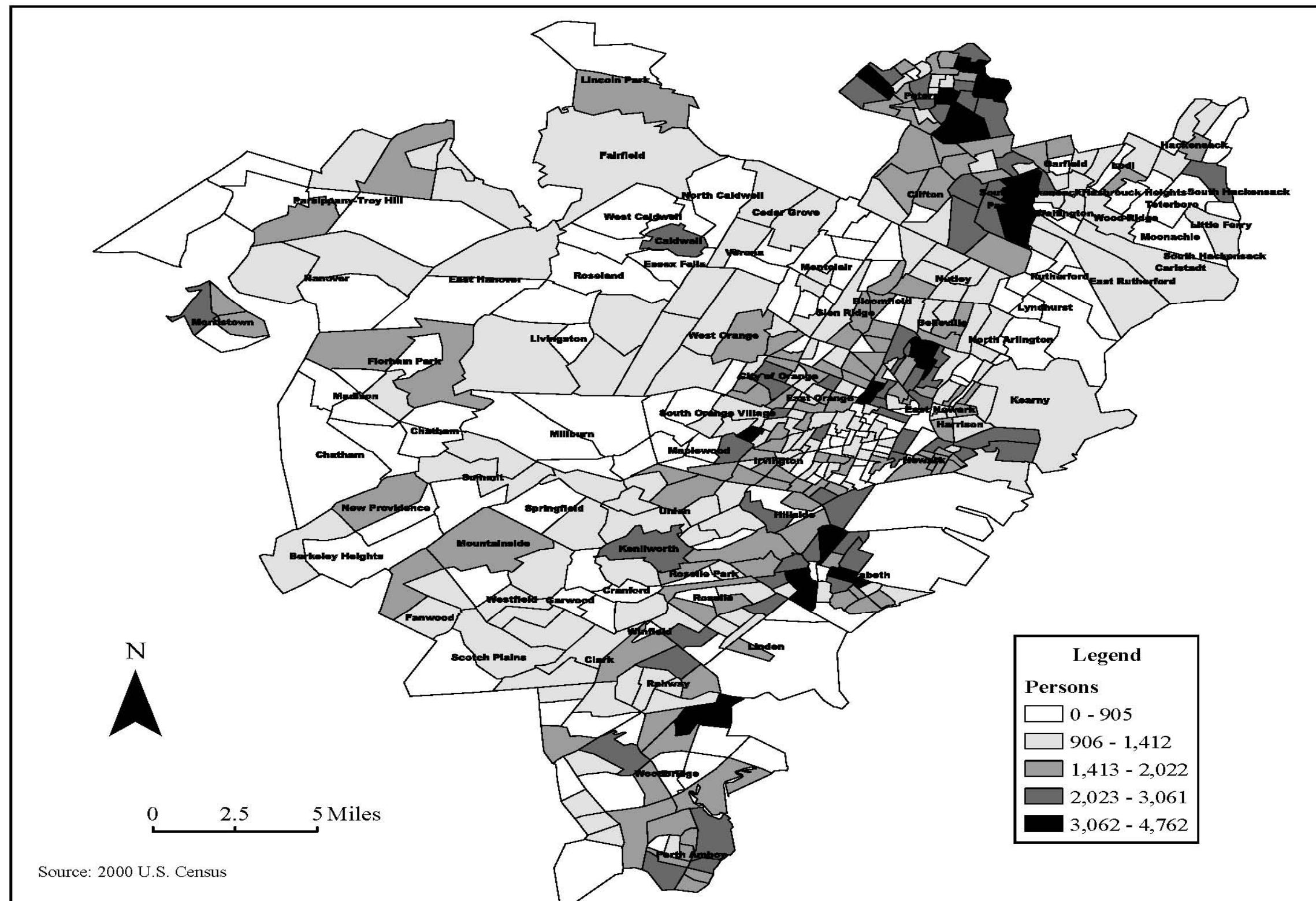
Figure 12 – Youth Population Density



- **Disabled** – This group represents another population that is typically more dependent on transit than the general public, since they often cannot drive. When discussing disabilities in this section, all disabilities are considered together. Based on the 2000 U.S. Census, there were 678,213 residents in the study area living with a disability, which is 31.9 percent of the total population. Figure 13 shows the 2000 distribution of the disabled population in the study area. Figure 14 shows the disabled population as a percent of total population. Figure 15 shows the disabled population per square mile. Persons with disabilities are heavily concentrated in and around the cities of Elizabeth, Newark, Passaic and Paterson, which is usually a reflection of the distance needed to travel to available medical facilities. Within these urban areas, there are several census tracts where persons with disabilities comprise the majority of the population.

Disabilities are far ranging in impact, from work-related disabilities to mental disabilities to mobility disabilities. There is no one type of disability that requires transportation more than any other, so all are considered needy and, thus, considered indiscriminately.

Figure 13 – Disabled Population



**Figure 14 – Disabled Percentage of Total Population**

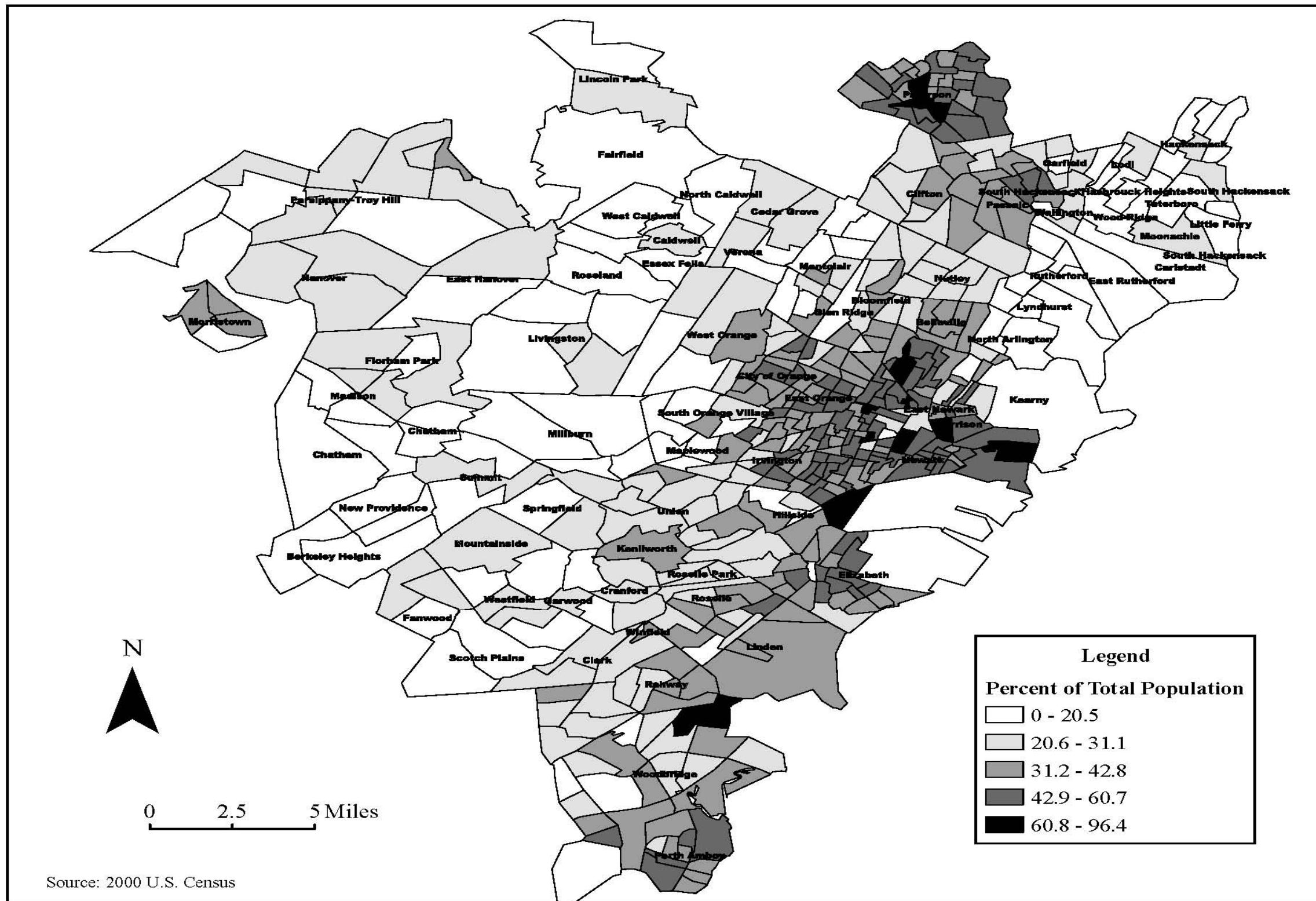
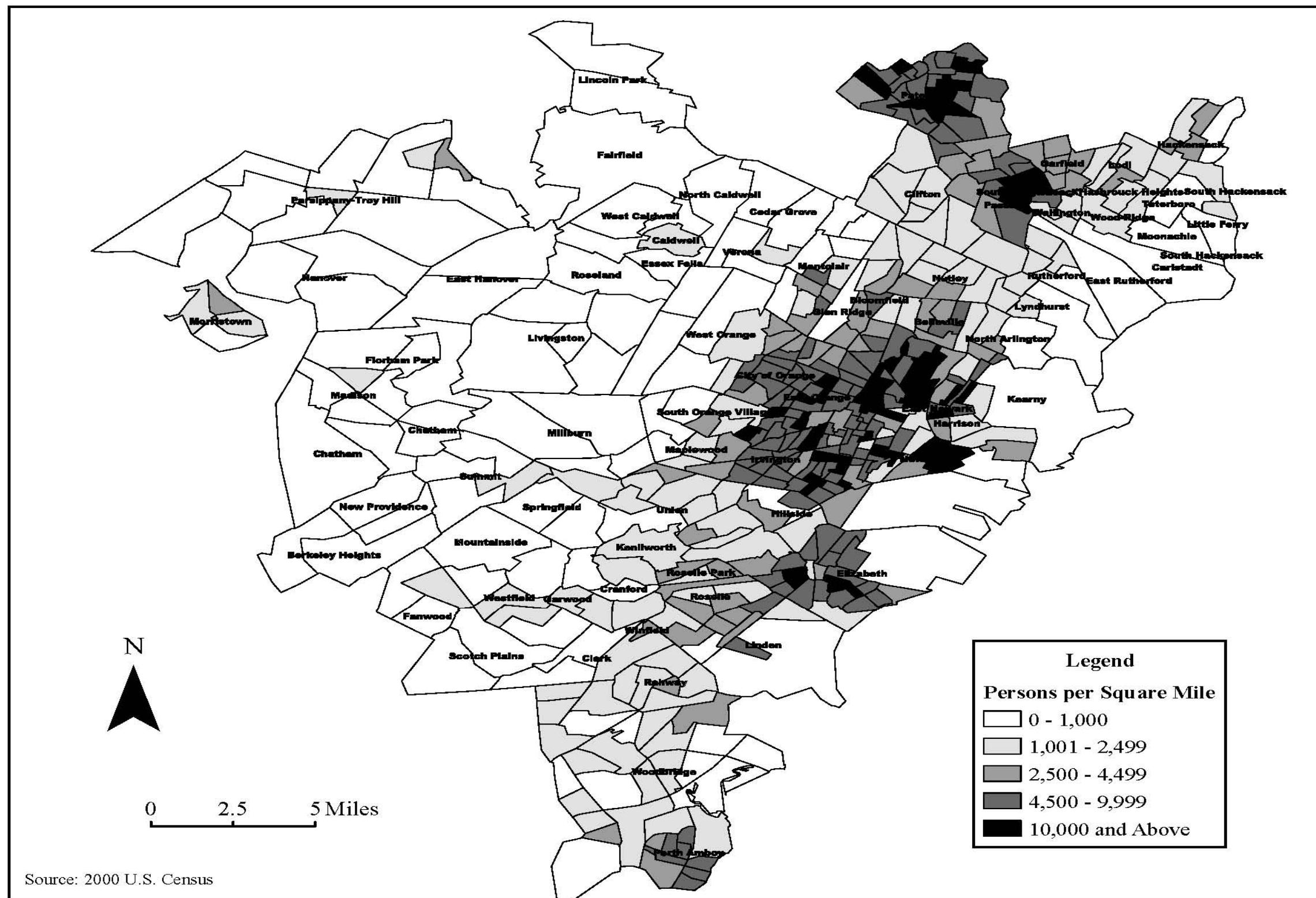


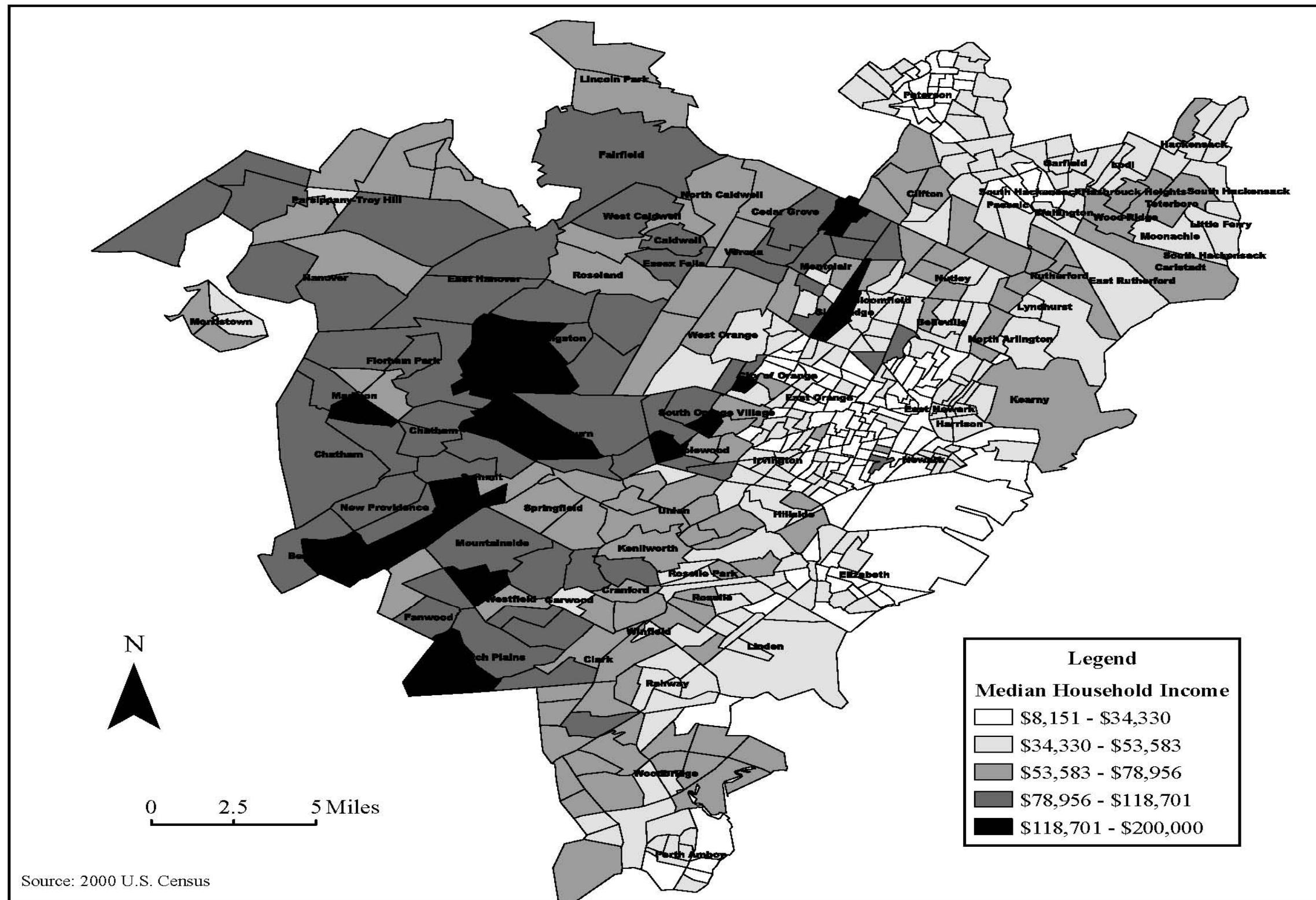
Figure 15 – Disabled Population Density



- **Median Household Income** – Income typically determines the type of transportation that people are able to use to get to work and travel for other purposes. People with lower incomes are more likely to be in need of public transportation options than people with higher incomes who can afford private transportation. Median household income describes the average income of households within the study area by census tract. In 2000, the median household income for the study area was \$51,876. Figure 16 shows the median income by census tract in the study area for 2000. Households with lower incomes are primarily concentrated in or adjacent to the cities of Elizabeth, Newark, Paterson and Passaic. Additionally, Perth Amboy which is in the far southern corner of the study area, also exhibits areas with low average median household incomes. Conversely, almost the entire western half of the study area exhibits median household incomes of at least \$53,583.

The median household income in the study area is lower than the New Jersey average median household income (\$61,672), but is higher compared to the average median household income of the United States (\$41,994).

Figure 16 – Median Household Income



- **Poverty** – Individuals with low incomes are not as likely to own automobiles and thus have fewer mobility options than people with higher incomes. The average income of an area's population is closely related to the potential transit demand in that area. Figure 17 indicates the number of persons living below the poverty level by census tract in 2000. Figure 18 shows the low income population as a percent of total population. Figure 19 shows the low income population per square mile. Overall, the low income population is most prevalent in and around the major cities in the study area including Elizabeth, Newark, Paterson, Passaic and Perth Amboy. In a similar situation as the with median household income population, the western half of the study area has very few low income residents.

Figure 17 – Poverty Population

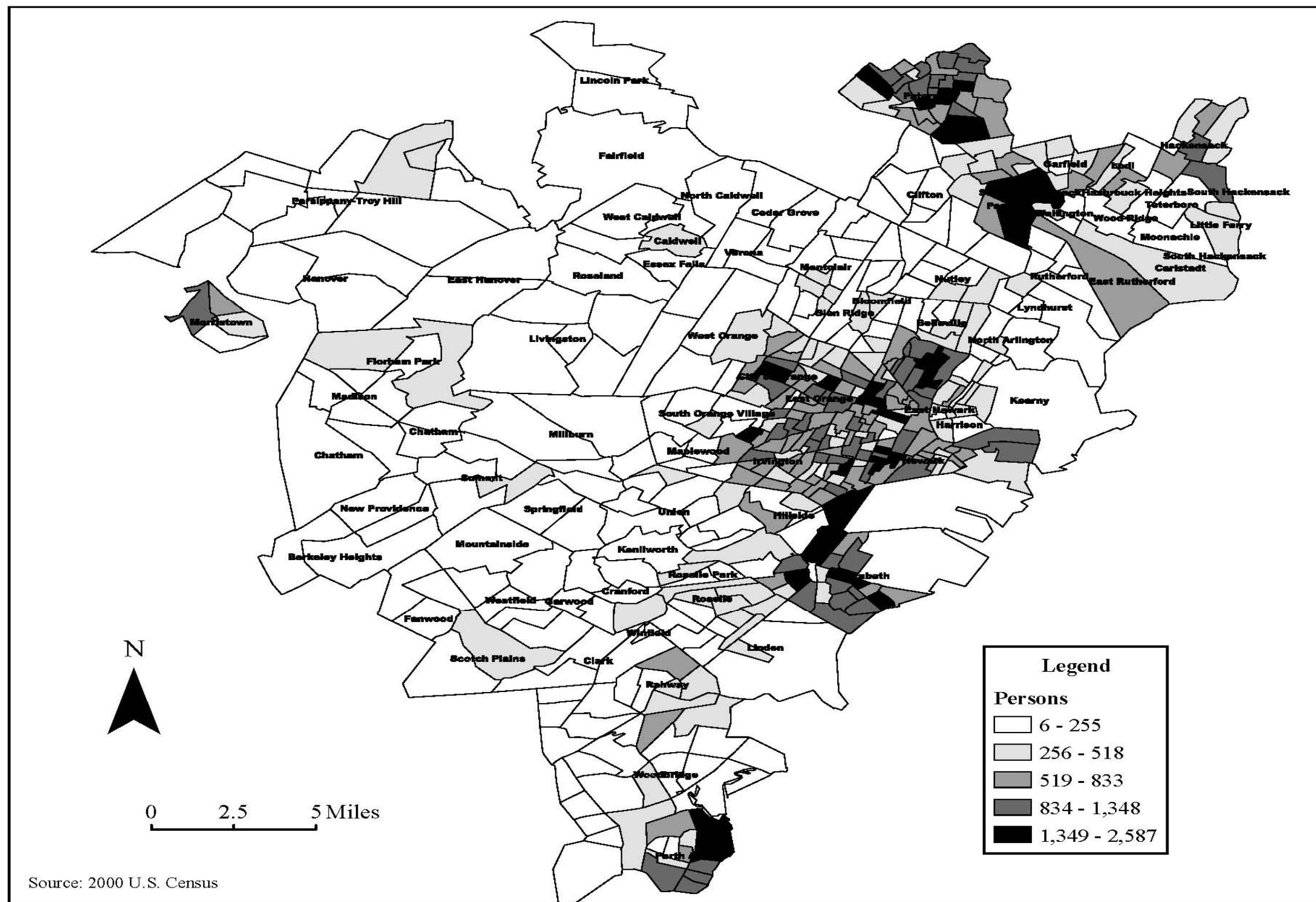


Figure 18 – Poverty Percentage of Total Population

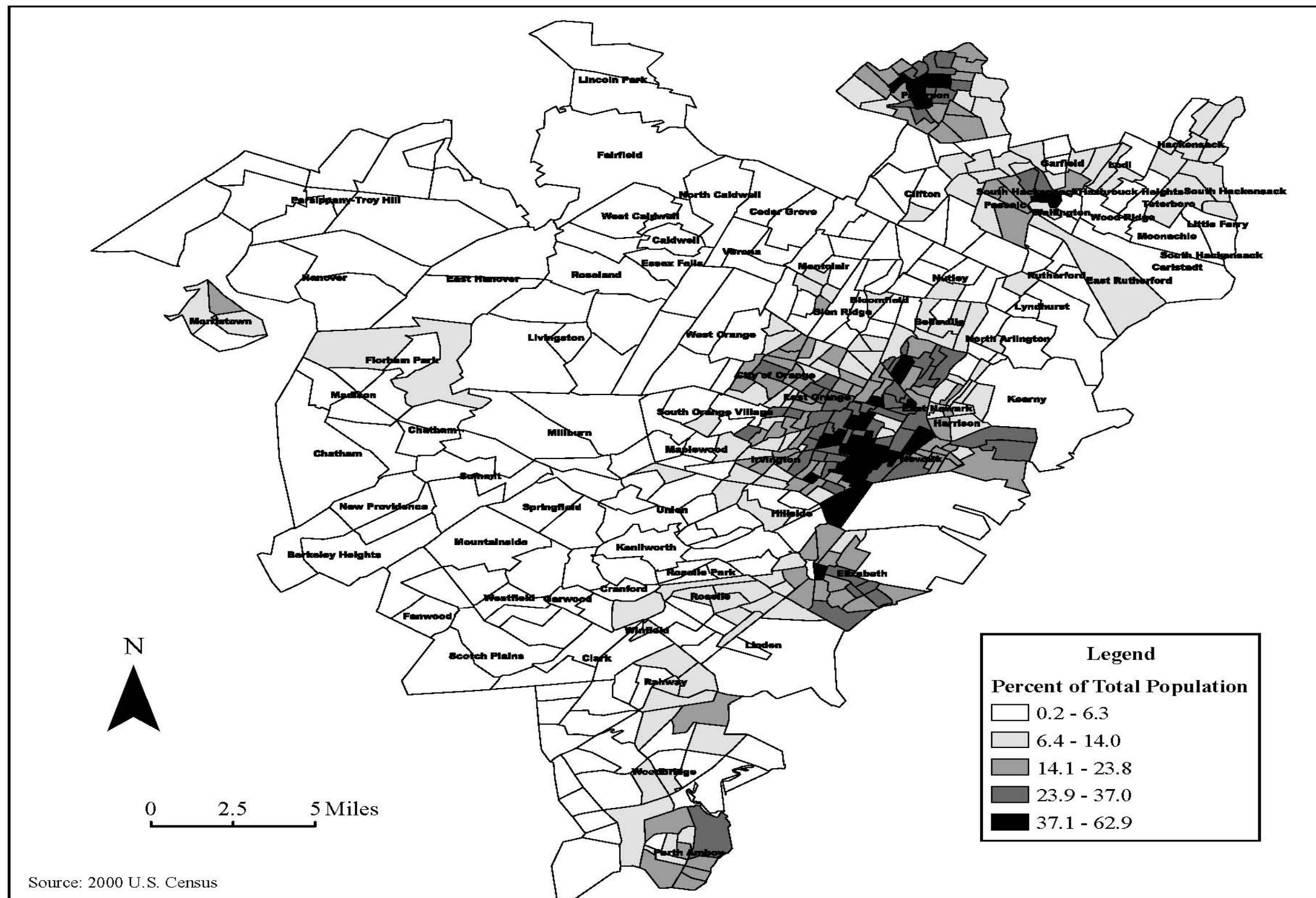
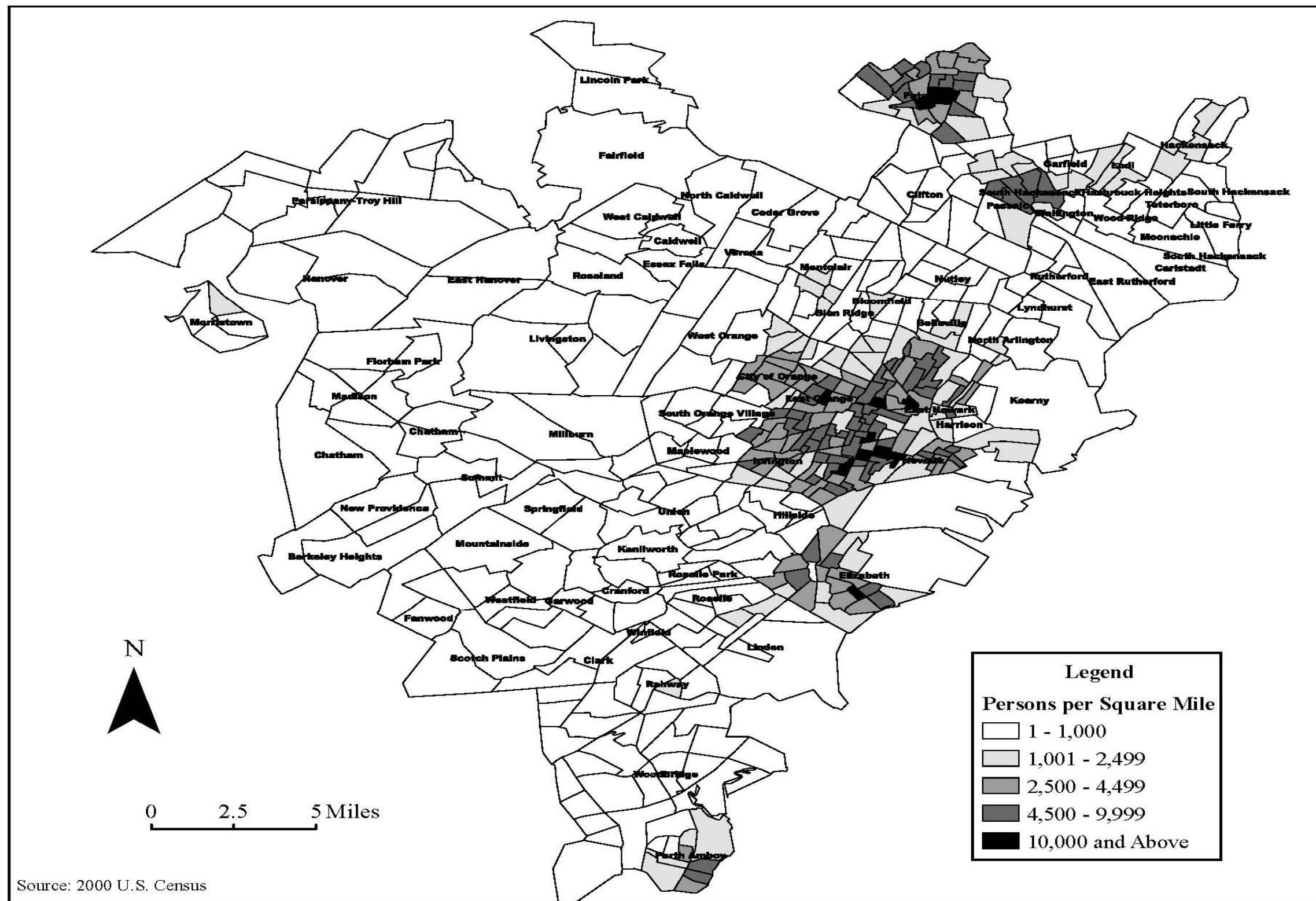


Figure 19 – Poverty Population Density



- **Zero Car Households** – Individuals with low incomes are not as likely to own automobiles and thus have fewer mobility options than people with higher incomes. The average income of an area's population is closely related to the potential transit demand in that area. Zero car households are considered to be dependent or captive to the transit system. However, it should not be overlooked that the study area possesses a large and comprehensive public transportation network that makes it possible to get around without owning an automobile. Thus, there is a strong likelihood that there are numerous individuals in higher income brackets who do not own an automobile out of choice. In 2000, there were 140,016 households in the study area with no vehicle available, which is 18.5 percent of the total households in the study area. This is a high percentage of zero car households compared to many other areas of the U.S.

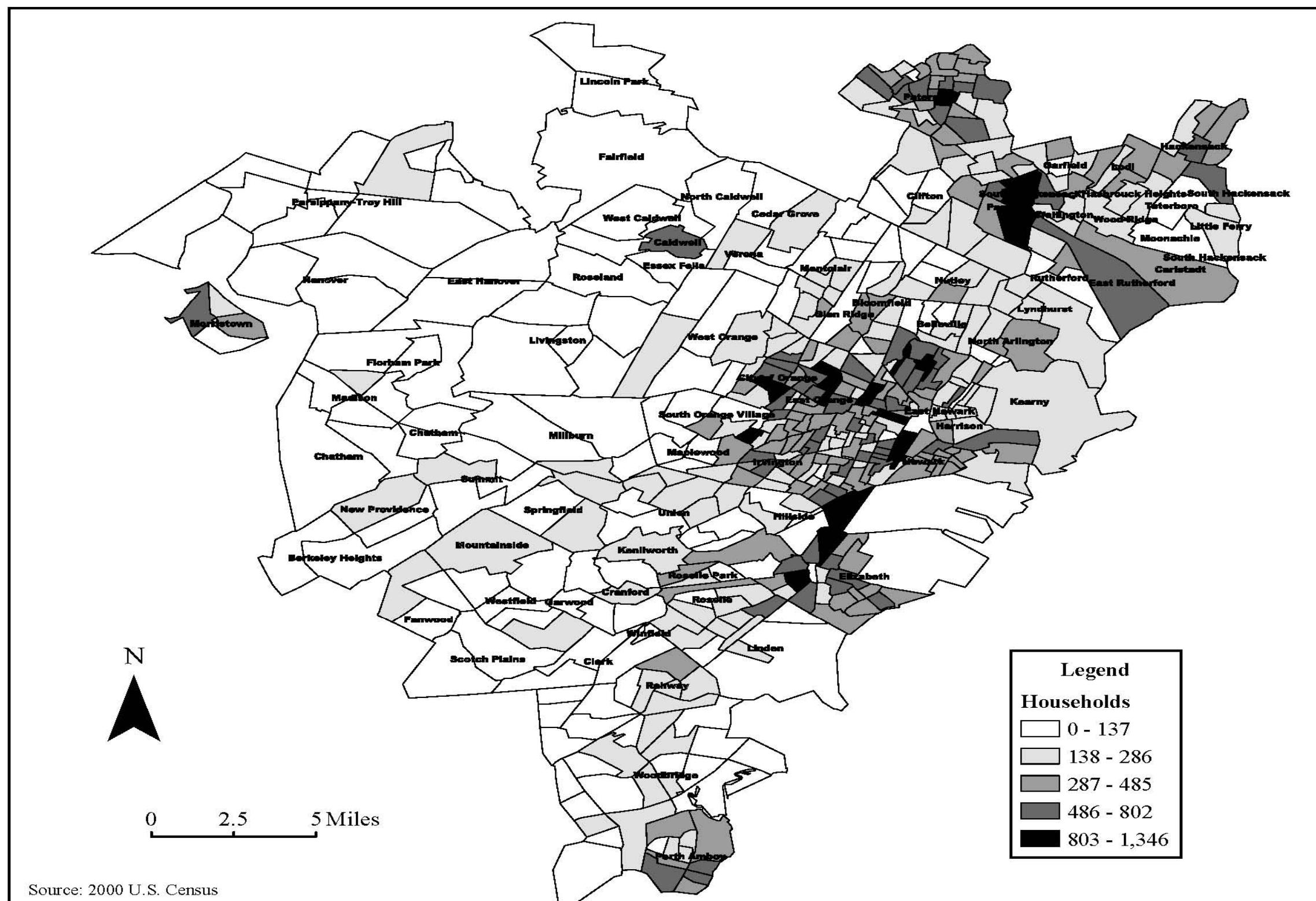
As with many of the other indicators of transit need in the GNBSS study area, the highest levels of zero car households are primarily located in and around the major cities, while the western half of the study area exhibits very low numbers of zero car households.

with no vehicle available, which is 18.5 percent of the total households in the study area. This is a high percentage of zero car households compared to many other areas of the U.S.

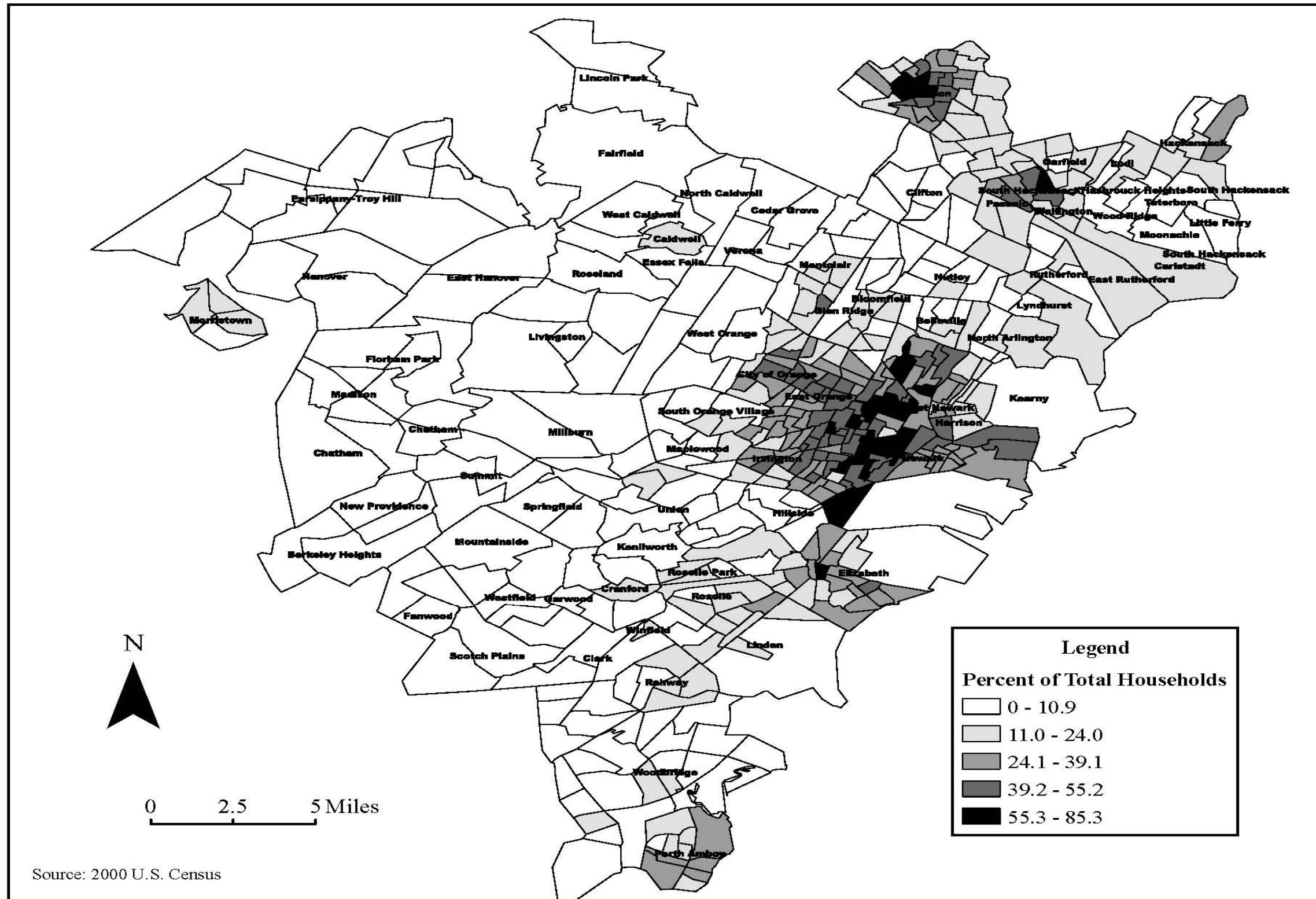
Figure 20 displays a map of the number of zero car households by census tract for 2000. Figure 21 shows the zero car households as a percent of total households. Figure 22 shows the number of zero car households per square mile.

Research has clearly demonstrated that the single most important determinant of transit usage is whether the individual has a vehicle

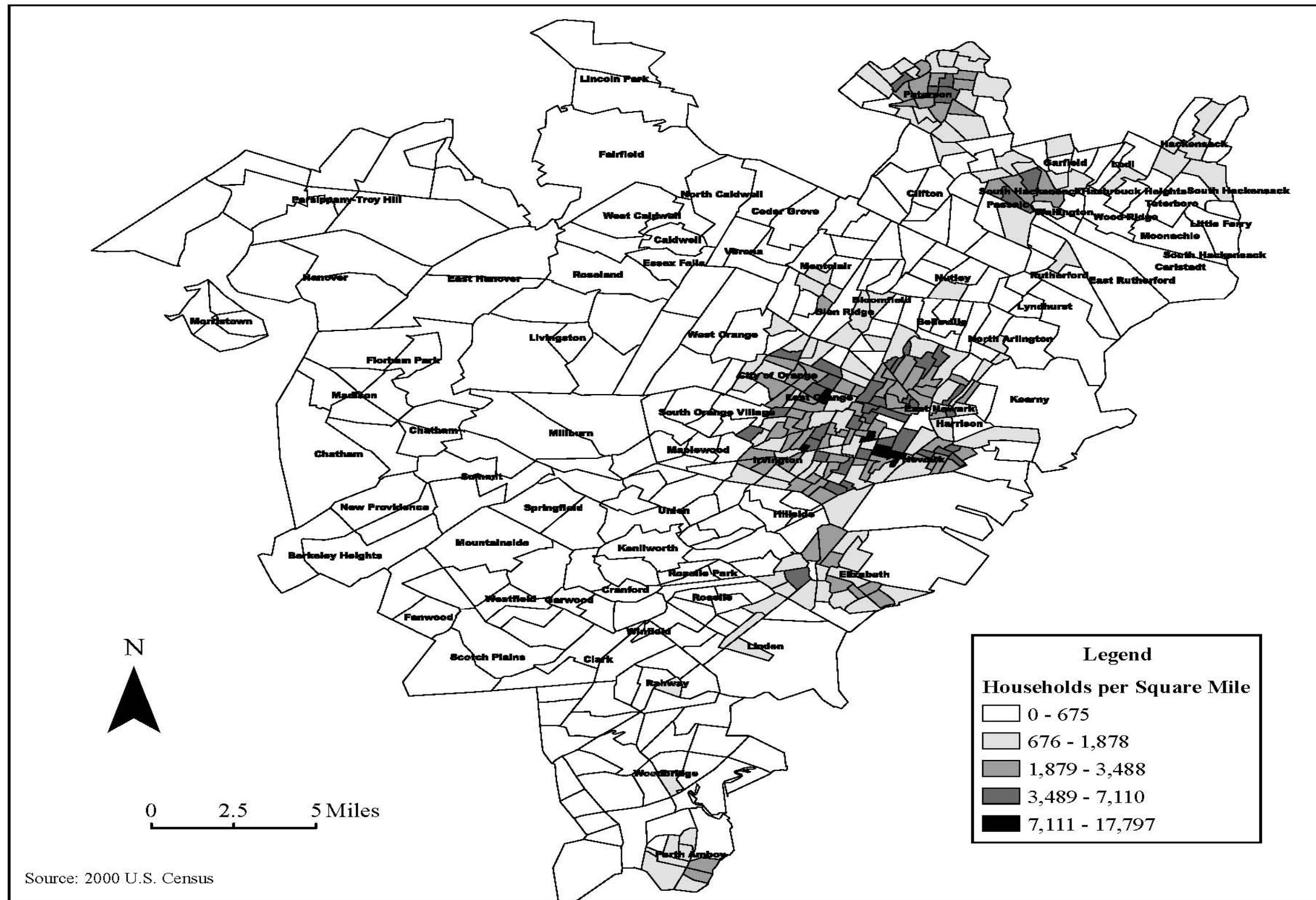
Figure 20 – Zero Car Households



**Figure 21 – Percentage of Zero Car Households**



**Figure 22 – Density of Zero Car Household**



## Appendix B – Employment

High concentrations of employment within an area indicate common destinations for transit use. Table 2 shows the distribution of employment within the study area and forecasts trends in employment between 2000 and 2030. At the time of the 2000 U.S. Census, Essex County had the largest employment base in the study area with a total of 396,180 jobs followed by Union County with 240,070 jobs and Bergen County with 145,510 jobs. Newark had the largest number of jobs for a municipality with 160,010. These statistics are consistent with the population densities and land uses within these areas.

**Table 2 – Employment Distribution**

| County | Municipality      | 1000's         |                |                |                |                |                |                | 00-30<br>%<br>Change |
|--------|-------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------------|
|        |                   | 2000<br>Employ | 2005<br>Employ | 2010<br>Employ | 2015<br>Employ | 2020<br>Employ | 2025<br>Employ | 2030<br>Employ |                      |
| Bergen | Carlstadt         | 16.2           | 16.6           | 16.8           | 16.9           | 17.2           | 17.2           | 17.6           | 8.5                  |
|        | East Rutherford   | 16.2           | 16.6           | 24.3           | 25.3           | 25.3           | 25.3           | 25.3           | 56.4                 |
|        | Garfield          | 9.2            | 9.4            | 9.6            | 9.8            | 10.3           | 10.3           | 11.1           | 21.4                 |
|        | Hackensack        | 35.3           | 36.3           | 36.8           | 37.4           | 38.4           | 38.4           | 39.8           | 12.5                 |
|        | Hasbrouck Heights | 5.5            | 5.7            | 5.8            | 5.9            | 6.1            | 6.1            | 6.5            | 18.9                 |
|        | Little Ferry      | 4.5            | 4.5            | 4.6            | 4.6            | 4.8            | 4.8            | 5.0            | 10.2                 |
|        | Lodi              | 8.6            | 8.8            | 9.0            | 9.2            | 9.6            | 9.6            | 10.2           | 18.1                 |
|        | Lyndhurst         | 10.3           | 11.0           | 11.3           | 11.6           | 12.3           | 12.3           | 13.9           | 34.7                 |
|        | Moonachie         | 6.0            | 6.2            | 6.4            | 6.5            | 6.7            | 6.7            | 6.9            | 13.9                 |
|        | North Arlington   | 3.8            | 4.0            | 4.0            | 4.1            | 4.4            | 4.4            | 4.7            | 24.8                 |
|        | Rutherford        | 7.3            | 7.7            | 7.8            | 8.0            | 8.5            | 8.5            | 9.0            | 22.9                 |
|        | South Hackensack  | 0.3            | 0.3            | 0.3            | 0.4            | 0.4            | 0.4            | 0.4            | 48.3                 |
|        | Teterboro         | 17.8           | 17.9           | 18.0           | 18.1           | 18.3           | 18.3           | 18.3           | 2.5                  |
|        | Wallington        | 2.1            | 2.3            | 2.4            | 2.5            | 2.8            | 2.8            | 3.0            | 40.2                 |
|        | Wood-Ridge        | 2.3            | 2.4            | 2.4            | 2.4            | 2.5            | 2.5            | 2.7            | 17.9                 |
| Essex  | <b>Total</b>      | <b>145.5</b>   | <b>149.6</b>   | <b>159.4</b>   | <b>162.7</b>   | <b>167.6</b>   | <b>167.7</b>   | <b>174.4</b>   | <b>19.8</b>          |
|        | Belleville        | 10.3           | 10.3           | 10.3           | 10.4           | 10.8           | 11.1           | 11.2           | 8.9                  |
|        | Bloomfield        | 14.6           | 14.7           | 14.8           | 15.0           | 15.8           | 16.7           | 16.8           | 15.0                 |
|        | Caldwell          | 2.7            | 2.9            | 3.1            | 3.2            | 3.4            | 3.9            | 4.0            | 47.4                 |
|        | Cedar Grove       | 6.2            | 6.2            | 6.2            | 6.3            | 6.5            | 6.7            | 6.7            | 8.1                  |
|        | City of Orange    | 8.3            | 8.3            | 8.3            | 8.6            | 9.1            | 9.7            | 9.8            | 18.0                 |
|        | East Orange       | 18.9           | 18.9           | 19.0           | 19.5           | 20.7           | 22.0           | 22.2           | 17.4                 |
|        | Essex Fells       | 0.7            | 0.7            | 0.7            | 0.7            | 0.7            | 0.8            | 0.8            | 14.5                 |
|        | Fairfield         | 28.9           | 28.9           | 29.0           | 29.1           | 29.4           | 29.7           | 29.8           | 3.1                  |

| County           | Municipality            | 1000's         |                |                |                |                |                |                | 00-30<br>%<br>Change |
|------------------|-------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------------|
|                  |                         | 2000<br>Employ | 2005<br>Employ | 2010<br>Employ | 2015<br>Employ | 2020<br>Employ | 2025<br>Employ | 2030<br>Employ |                      |
| Essex<br>(cont.) | Glen Ridge              | 1.5            | 1.5            | 1.5            | 1.5            | 1.6            | 1.6            | 1.7            | 12.9                 |
|                  | Irvington               | 11.0           | 11.0           | 11.1           | 11.3           | 12.0           | 12.8           | 12.9           | 17.9                 |
|                  | Livingston              | 28.7           | 28.8           | 28.8           | 29.0           | 29.3           | 29.7           | 29.8           | 4.0                  |
|                  | Maplewood               | 5.6            | 5.6            | 5.7            | 5.8            | 6.0            | 6.2            | 6.2            | 10.3                 |
|                  | Millburn                | 18.4           | 18.4           | 18.5           | 18.6           | 19.0           | 19.5           | 19.6           | 6.5                  |
|                  | Montclair               | 14.6           | 14.6           | 14.7           | 14.9           | 15.7           | 16.5           | 16.7           | 14.0                 |
|                  | Newark                  | 160.0          | 160.4          | 161.7          | 164.8          | 172.9          | 179.5          | 180.4          | 12.8                 |
|                  | North Caldwell          | 0.7            | 0.7            | 0.7            | 0.7            | 0.7            | 0.8            | 0.8            | 21.5                 |
|                  | Nutley                  | 12.1           | 12.1           | 12.1           | 12.3           | 12.6           | 13.0           | 13.1           | 8.4                  |
|                  | Roseland                | 14.1           | 14.1           | 14.1           | 14.2           | 14.3           | 14.4           | 14.4           | 2.3                  |
|                  | South Orange<br>Village | 5.4            | 5.4            | 5.4            | 5.5            | 5.8            | 6.0            | 6.1            | 13.0                 |
|                  | Verona                  | 4.7            | 4.7            | 4.9            | 5.0            | 5.2            | 5.7            | 5.8            | 24.6                 |
|                  | West Caldwell           | 10.3           | 10.3           | 10.3           | 10.4           | 10.5           | 10.8           | 10.8           | 5.4                  |
|                  | West Orange             | 18.8           | 19.3           | 19.4           | 19.6           | 20.2           | 20.9           | 21.0           | 12.2                 |
|                  | <b>Total</b>            | <b>396.2</b>   | <b>397.5</b>   | <b>400.1</b>   | <b>406.1</b>   | <b>422.2</b>   | <b>437.8</b>   | <b>440.5</b>   | <b>11.2</b>          |
| Hudson           | East Newark             | 1.0            | 1.1            | 1.4            | 1.5            | 1.7            | 1.7            | 1.7            | 74.7                 |
|                  | Harrison                | 5.0            | 5.1            | 5.6            | 6.1            | 6.6            | 6.8            | 6.8            | 37.7                 |
|                  | Kearny                  | 17.9           | 18.2           | 18.9           | 19.5           | 20.4           | 21.2           | 22.1           | 23.4                 |
|                  | <b>Total</b>            | <b>23.9</b>    | <b>24.4</b>    | <b>25.9</b>    | <b>27.1</b>    | <b>28.7</b>    | <b>29.7</b>    | <b>30.7</b>    | <b>28.5</b>          |
| Middlesex        | Perth Amboy             | 13.2           | 13.3           | 13.7           | 14.4           | 15.7           | 16.9           | 19.0           | 44.0                 |
|                  | Woodbridge              | 45.4           | 48.9           | 52.4           | 56.2           | 60.5           | 61.4           | 62.2           | 37.1                 |
|                  | <b>Total</b>            | <b>58.6</b>    | <b>62.2</b>    | <b>66.0</b>    | <b>70.6</b>    | <b>76.3</b>    | <b>78.3</b>    | <b>81.2</b>    | <b>38.7</b>          |
| Morris           | Chatham                 | 3.3            | 3.3            | 3.4            | 3.5            | 3.7            | 3.8            | 4.1            | 23.5                 |
|                  | Chatham                 | 4.1            | 4.1            | 4.1            | 4.2            | 4.4            | 4.5            | 4.5            | 10.9                 |
|                  | East Hanover            | 12.1           | 12.1           | 12.6           | 12.9           | 13.2           | 13.3           | 13.8           | 14.0                 |
|                  | Florham Park            | 13.0           | 13.1           | 14.4           | 15.2           | 15.9           | 16.1           | 17.0           | 31.3                 |
|                  | Hanover                 | 31.8           | 31.9           | 33.0           | 33.8           | 34.7           | 34.9           | 35.8           | 12.7                 |
|                  | Lincoln Park            | 3.8            | 3.8            | 3.9            | 4.0            | 4.2            | 4.3            | 4.6            | 20.7                 |
|                  | Madison                 | 6.0            | 6.0            | 6.3            | 6.6            | 7.0            | 7.1            | 7.3            | 21.9                 |
|                  | Morristown              | 17.3           | 17.4           | 17.8           | 18.3           | 19.0           | 19.2           | 19.8           | 14.0                 |
|                  | Parsippany-Troy Hill    | 52.0           | 52.2           | 56.0           | 58.5           | 60.8           | 61.5           | 64.4           | 24.0                 |
|                  | <b>Total</b>            | <b>143.3</b>   | <b>143.8</b>   | <b>151.5</b>   | <b>157.1</b>   | <b>162.9</b>   | <b>164.7</b>   | <b>171.3</b>   | <b>19.5</b>          |
| Passaic          | Clifton                 | 31.5           | 31.3           | 31.6           | 32.2           | 33.9           | 35.7           | 37.3           | 18.4                 |
|                  | Passaic                 | 17.9           | 17.8           | 17.9           | 18.3           | 19.3           | 20.4           | 21.5           | 20.2                 |
|                  | Paterson                | 43.5           | 43.4           | 43.7           | 44.9           | 48.3           | 51.3           | 53.5           | 22.9                 |

| County              | Municipality     | 1000's         |                |                |                |                |                |                | 00-30<br>% Change |
|---------------------|------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------------|
|                     |                  | 2000<br>Employ | 2005<br>Employ | 2010<br>Employ | 2015<br>Employ | 2020<br>Employ | 2025<br>Employ | 2030<br>Employ |                   |
| Passaic<br>(cont.)  | <b>Total</b>     | <b>92.9</b>    | <b>92.5</b>    | <b>93.2</b>    | <b>95.4</b>    | <b>101.5</b>   | <b>107.4</b>   | <b>112.3</b>   | <b>20.9</b>       |
| <b>Union</b>        | Berkeley Heights | 7.2            | 7.7            | 7.9            | 8.2            | 8.5            | 8.9            | 9.4            | 30.9              |
|                     | Clark            | 7.5            | 7.6            | 7.6            | 7.8            | 8.0            | 8.1            | 8.3            | 11.1              |
|                     | Cranford         | 13.7           | 14.1           | 14.3           | 14.8           | 15.2           | 15.7           | 16.3           | 18.3              |
|                     | Elizabeth        | 42.0           | 43.4           | 44.1           | 46.1           | 48.1           | 50.4           | 51.6           | 22.9              |
|                     | Fanwood          | 1.6            | 1.6            | 1.6            | 1.6            | 1.7            | 1.8            | 1.8            | 16.8              |
|                     | Garwood          | 2.7            | 2.7            | 2.7            | 2.8            | 2.9            | 3.0            | 3.0            | 8.8               |
|                     | Hillside         | 7.2            | 7.3            | 7.4            | 7.6            | 7.8            | 8.1            | 8.3            | 15.4              |
|                     | Kenilworth       | 15.3           | 15.4           | 15.5           | 15.7           | 15.8           | 16.0           | 16.2           | 5.9               |
|                     | Linden           | 30.0           | 30.5           | 30.7           | 31.5           | 32.2           | 33.1           | 33.7           | 12.2              |
|                     | Mountainside     | 7.2            | 7.2            | 7.3            | 7.4            | 7.5            | 7.6            | 7.7            | 7.0               |
|                     | New Providence   | 18.0           | 18.2           | 18.4           | 18.6           | 18.9           | 19.2           | 19.4           | 8.2               |
|                     | Rahway           | 17.1           | 17.6           | 17.7           | 18.0           | 18.3           | 18.8           | 19.0           | 11.0              |
|                     | Roselle          | 4.6            | 4.6            | 4.6            | 4.8            | 5.0            | 5.3            | 5.5            | 20.4              |
|                     | Roselle Park     | 2.8            | 2.8            | 2.8            | 3.0            | 3.2            | 3.4            | 3.4            | 21.9              |
|                     | Scotch Plains    | 5.5            | 5.5            | 5.5            | 5.7            | 5.8            | 6.0            | 6.2            | 12.9              |
|                     | Springfield      | 10.4           | 10.6           | 10.7           | 10.9           | 11.1           | 11.3           | 11.5           | 10.3              |
|                     | Summit           | 9.2            | 9.2            | 9.3            | 9.5            | 9.8            | 10.1           | 10.4           | 13.3              |
|                     | Union            | 29.6           | 29.8           | 30.0           | 30.6           | 31.3           | 32.0           | 32.6           | 10.2              |
|                     | Westfield        | 8.4            | 8.5            | 8.6            | 8.9            | 9.2            | 9.6            | 9.9            | 16.9              |
|                     | Winfield         | 0.2            | 0.2            | 0.2            | 0.2            | 0.2            | 0.3            | 0.3            | 64.7              |
|                     | <b>Total</b>     | <b>240.1</b>   | <b>244.3</b>   | <b>246.7</b>   | <b>253.5</b>   | <b>260.4</b>   | <b>268.4</b>   | <b>274.4</b>   | <b>14.3</b>       |
| <b>GNBSS Totals</b> |                  | <b>1,101.0</b> | <b>1,115.0</b> | <b>1,143.5</b> | <b>1,173.2</b> | <b>1,220.4</b> | <b>1,254.7</b> | <b>1,285.7</b> | <b>16.8</b>       |

Source: NJ TRANSITPA

Figure 23 is a map of the total number of jobs by census tract, while Figure 24 presents these results on the basis of density. Generally, the eastern half of the study area exhibits relatively high employment densities, with the highest concentrations of employment located in and around the cities of Elizabeth, Hackensack, Newark, Passaic, and Paterson. The census tracts with the highest number of total jobs are primarily located in the northern, northeastern, and southern portions of the study area.

The area's with the largest projected growth in terms of jobs in the GNBSS study area are East Newark, Hudson County (74.7%); East Rutherford, Bergen County (56.4%); South Hackensack, Bergen County (48.3%); Caldwell, Essex County (47.4%); Perth Amboy, Middlesex County (44.0%); and Wallington, Bergen County (40.2%).

Figure 23 – Jobs

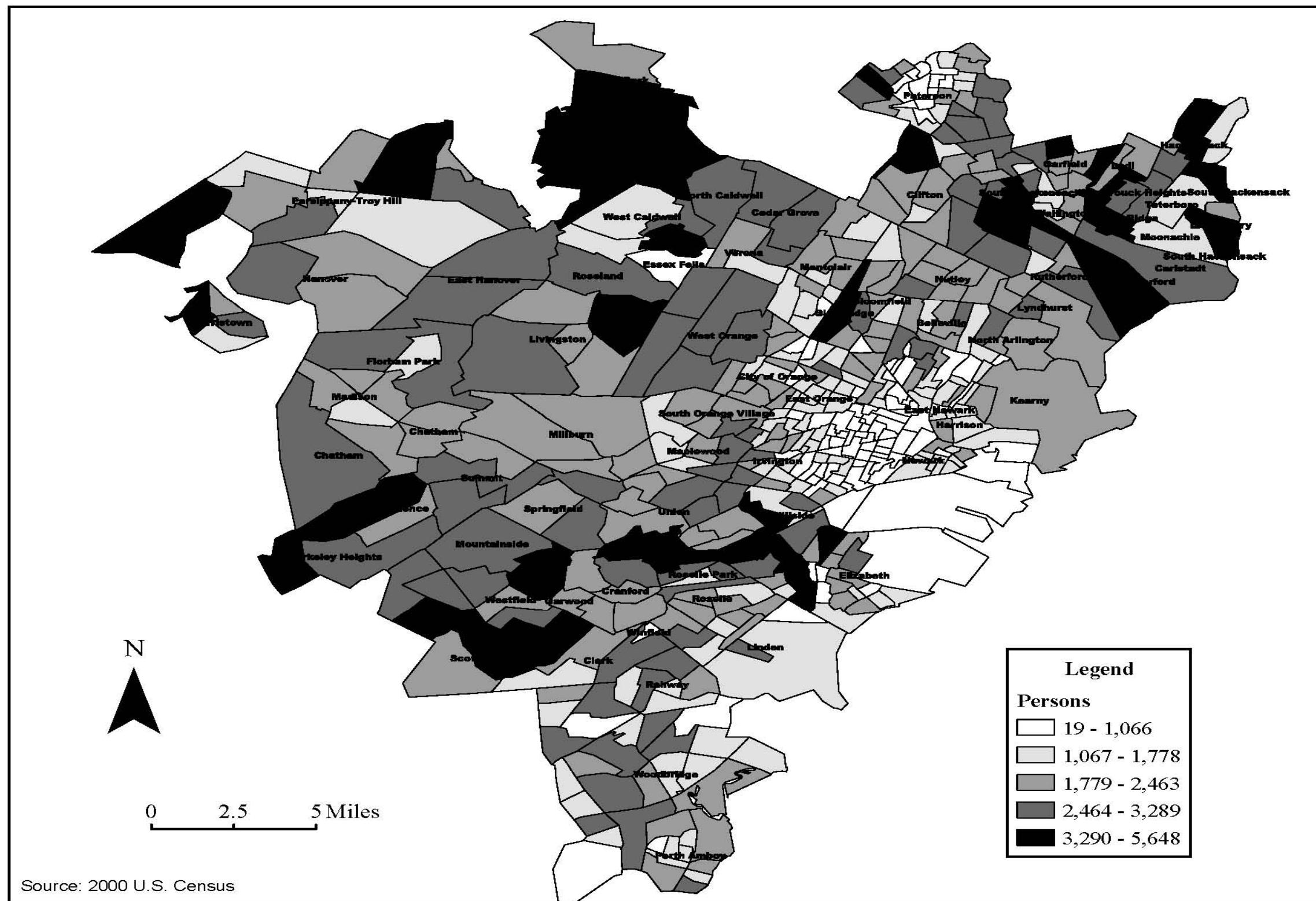
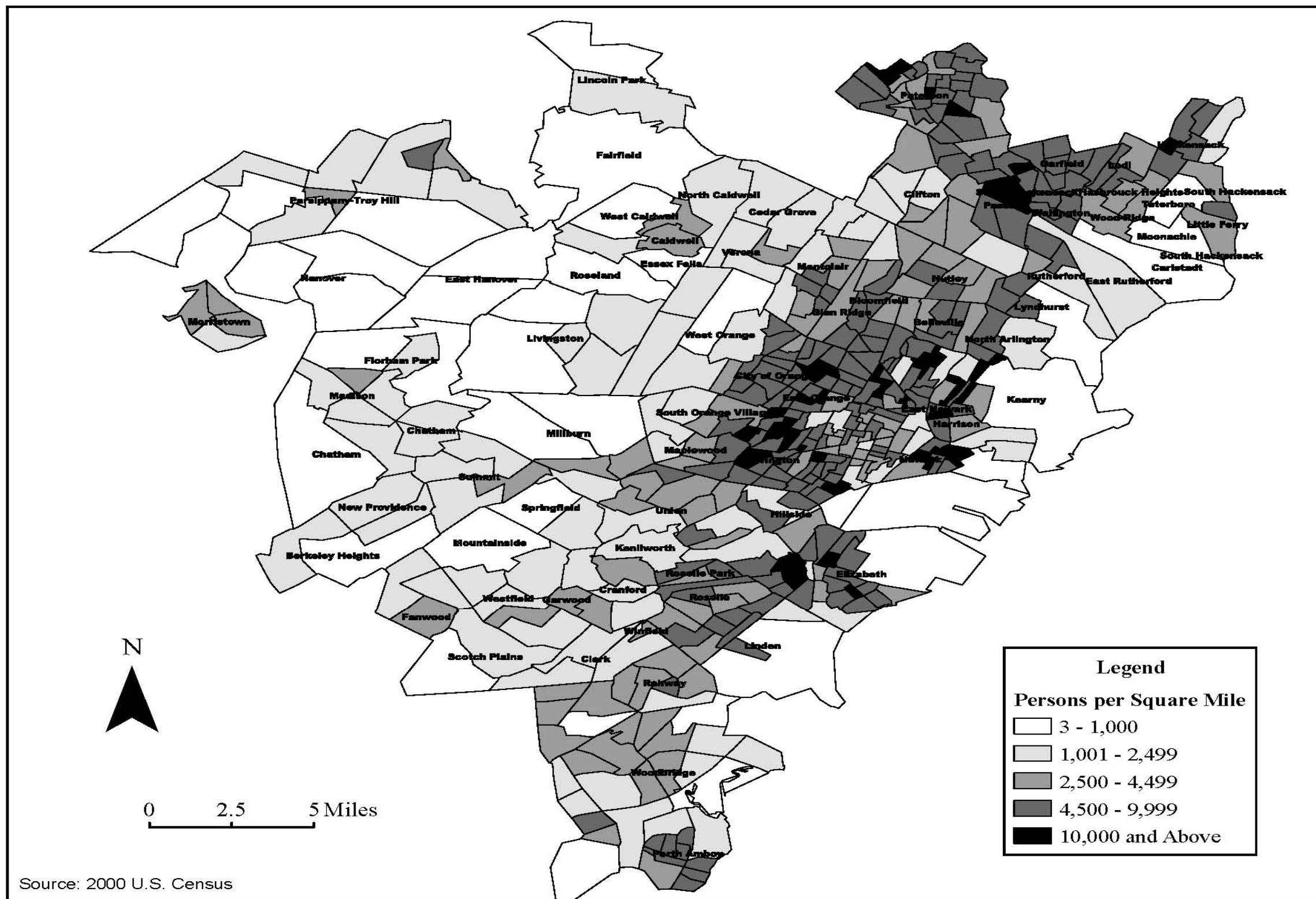


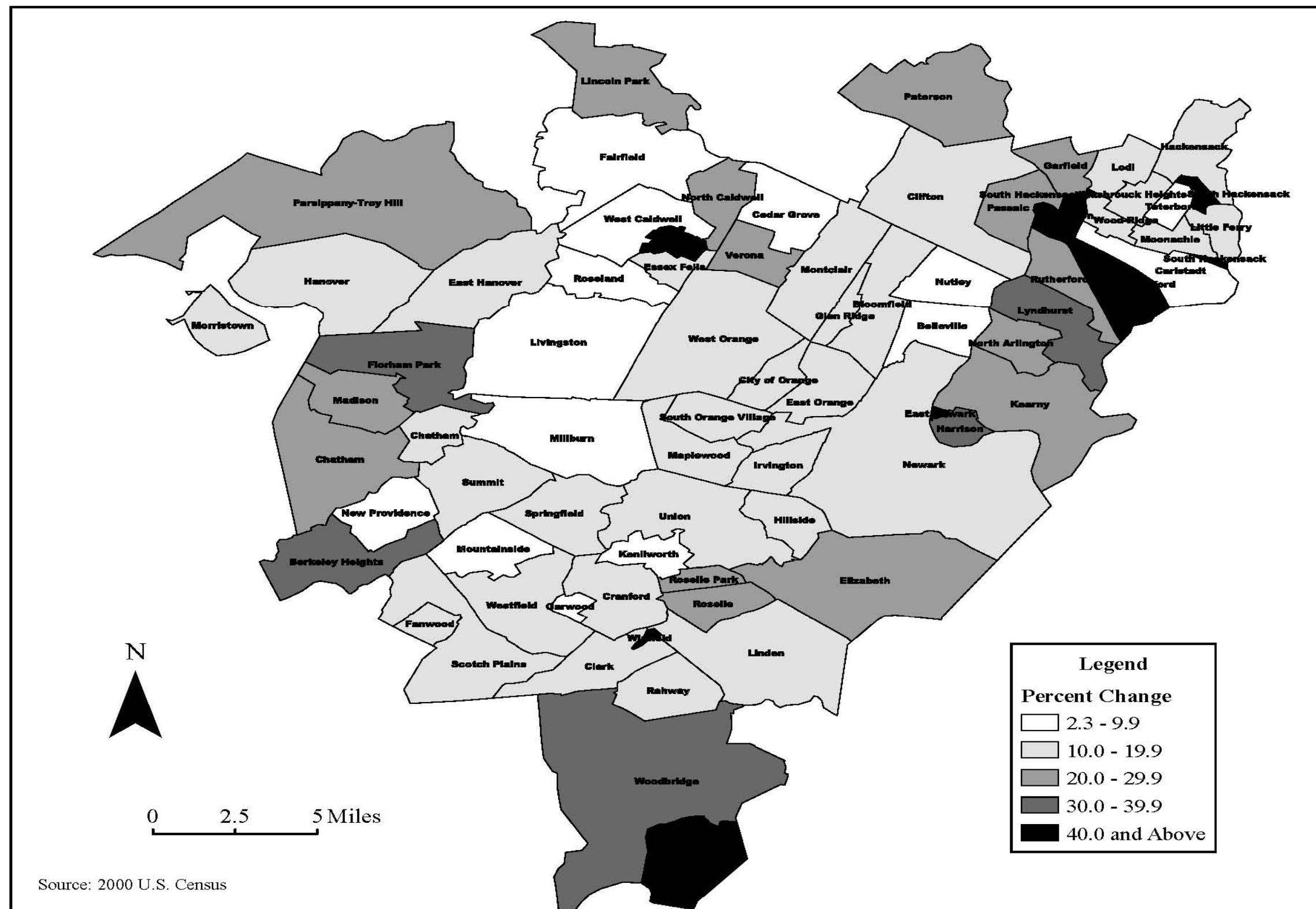
Figure 24 – Job Density



As previously detailed in Table 2, forecasts for the year 2030 indicate that the number of jobs in the study area is projected to increase by almost 17 percent. Figure 25 maps the forecasted rate of employment growth within the study area. As the exhibit shows, employment growth is expected to be fairly evenly distributed throughout the study area. The areas with the largest projected increases in employment are primarily located along the eastern, southern, and western edges of the study area. Overall, the rate of employment growth is similar to the rate of population growth over the same 30 year period.

The highest rate of employment growth is expected to occur in Middlesex County (39%) – a peripheral portion of the study area. Other areas that are projected to experience a high growth in employment include Hudson County (29%) and Passaic County (21%). No areas within the study area are projected to see a decline in employment.

Figure 25 – Rate of Employment Growth



## Appendix C – Journey to Work

The 2000 U.S. Census provides a considerable amount of information on journey to work, including persons who use public transportation. These statistics are important because people who use transit services for their work commutes are more likely to use the service for other purposes as well. Table 3 compares the modal split for journey to work trips made by residents in the GNBSS study area. The chart shows that the primary means of transportation throughout the study area during 2000 from the U.S. Census was by private auto. Drive alone accounted for about two-thirds of all commuting trips. Transit accounted for approximately 13 percent of all work trips of employed study area residents.

**Table 3 – Mode Split (Residents)**

| <b>Mode</b>                  | <b>Study Area</b> |                | <b>City of Newark</b> |                |
|------------------------------|-------------------|----------------|-----------------------|----------------|
|                              | <b>Trips</b>      | <b>Percent</b> | <b>Trips</b>          | <b>Percent</b> |
| Drove Alone                  | 624,133           | 67.3           | 39,768                | 45.4           |
| Carpooled                    | 111,676           | 12.0           | 15,468                | 17.6           |
| Public Transportation        | 122,218           | 13.2           | 23,227                | 26.5           |
| Bus                          | 75,291            | 8.1            | 18,685                | 21.3           |
| Streetcar or trolley car     | 491               | 0.1            | 122                   | 0.1            |
| Subway                       | 7,830             | 0.8            | 1,919                 | 2.2            |
| Railroad                     | 35,823            | 3.9            | 1,913                 | 2.2            |
| Other public transit         | 2,783             | 0.3            | 588                   | 0.7            |
| Bicycled or Walked           | 39,830            | 4.3            | 7,145                 | 8.1            |
| Motorcyclized or Other Means | 8,046             | 0.9            | 1,038                 | 1.2            |
| Worked at Home               | 21,422            | 2.3            | 1,074                 | 1.2            |
| <b>Total</b>                 | <b>927,325</b>    | <b>100.0</b>   | <b>87,720</b>         | <b>100.0</b>   |

Source: 2000 U.S. Census

Table 3 also shows the modal split for residents living in the City of Newark. The Newark data shows that almost half of the residents drove to work during the 2000 U.S. Census periods. Approximately 27 percent of residents used public transportation to commute to work, with most of these residents commuting by bus (21 percent of the total commuting population). Further, transit travel in the City of Newark is almost exclusively by bus, while the study area has a significant population of rail commuters.

When considering public transit commuters alone, the population using buses in the study area account for 62%, while rail commuters account for 29%. In the City of Newark, 80% of the public transit commuters use buses, while only 8% travel via rail.

Transit use among commuters reflects development patterns and other demographic characteristics which have an impact upon mode. Table 4 lists the mode split for the study area based on the 2000 U.S. Census. The table shows that Essex County had the highest percentage (19%) of transit commuters in the study area. Essex County is one of the most urbanized counties in the study area and includes the City of

Newark as well as several smaller municipalities that are well served by public transit. In fact, the municipalities with the highest percentage of transit commuters are located in Essex County and include East Orange (27.8%), Newark (26.5%), and Glen Ridge (23.7%). The lowest transit use rates are in Morris County.

**Table 4 – Mode Split (Location)**

| County | Municipality      | Drove Alone   | Carpool       | Public Transportation | Bicycle or Walk | Motorcycle or Other Means | Work at Home | Total          | % Transit    |
|--------|-------------------|---------------|---------------|-----------------------|-----------------|---------------------------|--------------|----------------|--------------|
| Bergen | Carlstadt         | 2,273         | 302           | 322                   | 146             | 0                         | 93           | 3,136          | 10.3%        |
|        | East Rutherford   | 3,007         | 345           | 715                   | 281             | 53                        | 55           | 4,456          | 16.0%        |
|        | Garfield          | 10,606        | 2,015         | 645                   | 530             | 115                       | 192          | 14,103         | 4.6%         |
|        | Hackensack        | 13,601        | 2,329         | 3,340                 | 1,733           | 119                       | 351          | 21,473         | 15.6%        |
|        | Hasbrouck Heights | 4,272         | 479           | 604                   | 129             | 6                         | 103          | 5,593          | 10.8%        |
|        | Little Ferry      | 4,250         | 655           | 479                   | 168             | 18                        | 55           | 5,625          | 8.5%         |
|        | Lodi              | 8,848         | 1,368         | 889                   | 302             | 57                        | 128          | 11,592         | 7.7%         |
|        | Lyndhurst         | 7,390         | 821           | 953                   | 313             | 41                        | 127          | 9,645          | 9.9%         |
|        | Moonachie         | 1,075         | 142           | 87                    | 39              | 5                         | 15           | 1,363          | 6.4%         |
|        | North Arlington   | 5,768         | 607           | 634                   | 252             | 39                        | 112          | 7,412          | 8.6%         |
|        | Rutherford        | 6,163         | 800           | 1,557                 | 394             | 15                        | 276          | 9,205          | 16.9%        |
|        | South Hackensack  | 876           | 103           | 16                    | 68              | 16                        | 17           | 1,096          | 1.5%         |
|        | Teterboro         | 6             | 7             | 0                     | 0               | 0                         | 0            | 13             | 0.0%         |
|        | Wallington        | 4,397         | 776           | 305                   | 172             | 80                        | 70           | 5,800          | 5.3%         |
|        | Wood-Ridge        | 3,270         | 322           | 224                   | 41              | 9                         | 28           | 3,894          | 5.8%         |
| Essex  | <b>Totals</b>     | <b>75,802</b> | <b>11,071</b> | <b>10,770</b>         | <b>4,568</b>    | <b>573</b>                | <b>1,622</b> | <b>104,406</b> | <b>10.3%</b> |
|        | Belleville        | 12,946        | 1,940         | 1,226                 | 452             | 101                       | 126          | 16,791         | 7.3%         |
|        | Bloomfield        | 17,548        | 2,550         | 2,849                 | 652             | 137                       | 459          | 24,195         | 11.8%        |
|        | Caldwell          | 3,401         | 302           | 195                   | 207             | 9                         | 133          | 4,247          | 4.6%         |
|        | Cedar Grove       | 4,799         | 314           | 427                   | 55              | 0                         | 214          | 5,809          | 7.4%         |
|        | City of Orange    | 7,033         | 2,224         | 3,140                 | 677             | 115                       | 185          | 13,374         | 23.5%        |
|        | East Orange       | 13,519        | 3,794         | 7,363                 | 1,123           | 206                       | 498          | 26,503         | 27.8%        |
|        | Essex Fells       | 733           | 38            | 84                    | 11              | 4                         | 62           | 932            | 9.0%         |
|        | Fairfield         | 2,995         | 261           | 107                   | 35              | 22                        | 88           | 3,508          | 3.1%         |
|        | Glen Ridge        | 2,214         | 167           | 806                   | 73              | 9                         | 139          | 3,408          | 23.7%        |
|        | Irvington         | 14,836        | 3,741         | 5,696                 | 676             | 170                       | 285          | 25,404         | 22.4%        |
|        | Livingston        | 10,382        | 860           | 1,076                 | 69              | 42                        | 781          | 13,210         | 8.1%         |
|        | Maplewood         | 7,714         | 831           | 2,586                 | 217             | 61                        | 693          | 12,102         | 21.4%        |
|        | Millburn          | 5,386         | 526           | 1,933                 | 265             | 30                        | 547          | 8,687          | 22.3%        |
|        | Montclair         | 11,743        | 1,514         | 4,401                 | 840             | 218                       | 1,261        | 19,977         | 22.0%        |

| County           | Municipality         | Drove Alone    | Carpool       | Public Transportation | Bicycle or Walk | Motorcycle or Other Means | Work at Home | Total          | % Transit    |
|------------------|----------------------|----------------|---------------|-----------------------|-----------------|---------------------------|--------------|----------------|--------------|
| Essex<br>(cont.) | Newark               | 39,768         | 15,468        | 23,227                | 7,145           | 1,038                     | 1,074        | 87,720         | 26.5%        |
|                  | North Caldwell       | 2,630          | 144           | 177                   | 0               | 0                         | 161          | 3,112          | 5.7%         |
|                  | Nutley               | 10,926         | 1,072         | 1,140                 | 367             | 37                        | 384          | 13,926         | 8.2%         |
|                  | Roseland             | 2,269          | 183           | 104                   | 6               | 16                        | 78           | 2,656          | 3.9%         |
|                  | South Orange Village | 4,723          | 625           | 1,865                 | 935             | 56                        | 601          | 8,805          | 21.2%        |
|                  | Verona               | 5,396          | 403           | 494                   | 133             | 25                        | 293          | 6,744          | 7.3%         |
|                  | West Caldwell        | 4,757          | 233           | 222                   | 73              | 15                        | 308          | 5,608          | 4.0%         |
|                  | West Orange          | 16,054         | 2,105         | 2,067                 | 409             | 125                       | 736          | 21,496         | 9.6%         |
|                  | <b>Totals</b>        | <b>201,772</b> | <b>39,295</b> | <b>61,185</b>         | <b>14,420</b>   | <b>2,436</b>              | <b>9,106</b> | <b>328,214</b> | <b>18.6%</b> |
| Hudson           | East Newark          | 535            | 181           | 118                   | 132             | 23                        | 32           | 1,021          | 11.6%        |
|                  | Harrison             | 3,142          | 1,093         | 1,208                 | 970             | 68                        | 69           | 6,550          | 18.4%        |
|                  | Kearny               | 11,314         | 2,205         | 2,418                 | 1,074           | 115                       | 170          | 17,296         | 14.0%        |
|                  | <b>Totals</b>        | <b>14,991</b>  | <b>3,479</b>  | <b>3,744</b>          | <b>2,176</b>    | <b>206</b>                | <b>271</b>   | <b>24,867</b>  | <b>15.1%</b> |
| Middlesex        | Perth Amboy          | 10,396         | 4,658         | 1,268                 | 1,263           | 410                       | 178          | 18,173         | 7.0%         |
|                  | Woodbridge           | 36,072         | 4,013         | 4,114                 | 1,027           | 292                       | 809          | 46,327         | 8.9%         |
|                  | <b>Totals</b>        | <b>46,468</b>  | <b>8,671</b>  | <b>5,382</b>          | <b>2,290</b>    | <b>702</b>                | <b>987</b>   | <b>64,500</b>  | <b>8.3%</b>  |
| Morris           | Chatham              | 2,835          | 196           | 738                   | 95              | 24                        | 173          | 4,061          | 18.2%        |
|                  | Chatham              | 3,630          | 216           | 725                   | 45              | 23                        | 274          | 4,913          | 14.8%        |
|                  | East Hanover         | 4,827          | 487           | 169                   | 32              | 0                         | 134          | 5,649          | 3.0%         |
|                  | Florham Park         | 3,435          | 167           | 251                   | 53              | 47                        | 190          | 4,143          | 6.1%         |
|                  | Hanover              | 5,672          | 550           | 159                   | 84              | 6                         | 191          | 6,662          | 2.4%         |
|                  | Lincoln Park         | 4,952          | 292           | 160                   | 40              | 81                        | 135          | 5,660          | 2.8%         |
|                  | Madison              | 5,424          | 565           | 732                   | 775             | 30                        | 397          | 7,923          | 9.2%         |
|                  | Morristown           | 6,629          | 1,520         | 648                   | 805             | 388                       | 219          | 10,209         | 6.3%         |
|                  | Parsippany-Troy Hill | 23,341         | 2,289         | 1,002                 | 491             | 94                        | 707          | 27,924         | 3.6%         |
|                  | <b>Totals</b>        | <b>60,745</b>  | <b>6,282</b>  | <b>4,584</b>          | <b>2,420</b>    | <b>693</b>                | <b>2,420</b> | <b>77,144</b>  | <b>5.9%</b>  |
| Passaic          | Clifton              | 28,286         | 4,096         | 2,396                 | 791             | 259                       | 740          | 36,568         | 6.6%         |
|                  | Passaic              | 11,214         | 5,242         | 4,632                 | 2,669           | 696                       | 353          | 24,806         | 18.7%        |
|                  | Paterson             | 29,344         | 10,616        | 6,192                 | 3,091           | 852                       | 524          | 50,619         | 12.2%        |
|                  | <b>Totals</b>        | <b>68,844</b>  | <b>19,954</b> | <b>13,220</b>         | <b>6,551</b>    | <b>1,807</b>              | <b>1,617</b> | <b>111,993</b> | <b>11.8%</b> |
| Union            | Berkeley Heights     | 4,676          | 240           | 630                   | 138             | 34                        | 348          | 6,066          | 10.4%        |
|                  | Clark                | 5,860          | 436           | 265                   | 30              | 5                         | 210          | 6,806          | 3.9%         |
|                  | Cranford             | 8,969          | 618           | 1,282                 | 176             | 19                        | 407          | 11,471         | 11.2%        |
|                  | Elizabeth            | 27,210         | 8,251         | 6,795                 | 2,511           | 798                       | 528          | 46,093         | 14.7%        |

| County              | Municipality   | Drove Alone    | Carpool        | Public Transportation | Bicycle or Walk | Motorcycle or Other Means | Work at Home  | Total          | % Transit    |
|---------------------|----------------|----------------|----------------|-----------------------|-----------------|---------------------------|---------------|----------------|--------------|
| Union<br>(cont.)    | Fanwood        | 2,786          | 166            | 392                   | 68              | 7                         | 133           | 3,552          | 11.0%        |
|                     | Garwood        | 1,846          | 115            | 161                   | 99              | 14                        | 13            | 2,248          | 7.2%         |
|                     | Hillside       | 7,316          | 1,361          | 1,102                 | 380             | 15                        | 148           | 10,322         | 10.7%        |
|                     | Kenilworth     | 3,176          | 314            | 102                   | 51              | 17                        | 56            | 3,716          | 2.7%         |
|                     | Linden         | 13,944         | 2,152          | 1,311                 | 684             | 121                       | 169           | 18,381         | 7.1%         |
|                     | Mountainside   | 2,281          | 149            | 174                   | 31              | 37                        | 141           | 2,813          | 6.2%         |
|                     | New Providence | 4,504          | 281            | 738                   | 129             | 23                        | 206           | 5,881          | 12.5%        |
|                     | Rahway         | 8,944          | 1,328          | 1,145                 | 494             | 65                        | 227           | 12,203         | 9.4%         |
|                     | Roselle        | 6,686          | 1,442          | 1,226                 | 318             | 121                       | 173           | 9,966          | 12.3%        |
|                     | Roselle Park   | 5,279          | 685            | 603                   | 378             | 17                        | 92            | 7,054          | 8.5%         |
|                     | Scotch Plains  | 8,551          | 798            | 1,359                 | 80              | 60                        | 471           | 11,319         | 12.0%        |
|                     | Springfield    | 6,046          | 424            | 587                   | 133             | 0                         | 272           | 7,462          | 7.9%         |
|                     | Summit         | 6,375          | 989            | 1,632                 | 424             | 34                        | 590           | 10,044         | 16.2%        |
|                     | Union          | 20,023         | 2,298          | 1,766                 | 960             | 152                       | 507           | 25,706         | 6.9%         |
|                     | Westfield      | 10,447         | 789            | 2,053                 | 295             | 85                        | 699           | 14,368         | 14.3%        |
|                     | Winfield       | 592            | 88             | 10                    | 26              | 5                         | 9             | 730            | 1.4%         |
| <b>Totals</b>       |                | <b>155,511</b> | <b>22,924</b>  | <b>23,333</b>         | <b>7,405</b>    | <b>1,629</b>              | <b>5,399</b>  | <b>216,201</b> | <b>10.8%</b> |
| <b>GNBSS Totals</b> |                | <b>624,133</b> | <b>111,676</b> | <b>122,218</b>        | <b>39,830</b>   | <b>8,046</b>              | <b>21,422</b> | <b>927,325</b> | <b>13.2%</b> |

Source: 2000 U.S. Census

To provide more detailed information on the 2000 U.S. Census journey to work data, travel information is presented by census tract. Figures 26 to 28 are maps of public transportation usage by study area residents. Figures 29 to 31 are maps showing bus transit usage by study area commuters. The illustrations present mode of travel data in terms of absolute trip, percent by transit mode and density of transit trips by census tract. The figures illustrate that the majority of residents who commute to work via public transportation live in or around the major urban centers in the study area, with the highest concentrations of transit usage in and around the City of Newark. Generally, areas with high numbers of commuters using public transit also exhibit population density levels in excess of 2,500 persons per square mile.

The commuting patterns of the study area labor force are shown in Table 5, which is based on the journey to work data from the 2000 U.S. Census. The table details the employment location of residence in terms of those working inside their county of residence (about 52%), outside their county of residence (38%) and outside New Jersey (10%).

Figure 26 – Transit Commuting by Resident

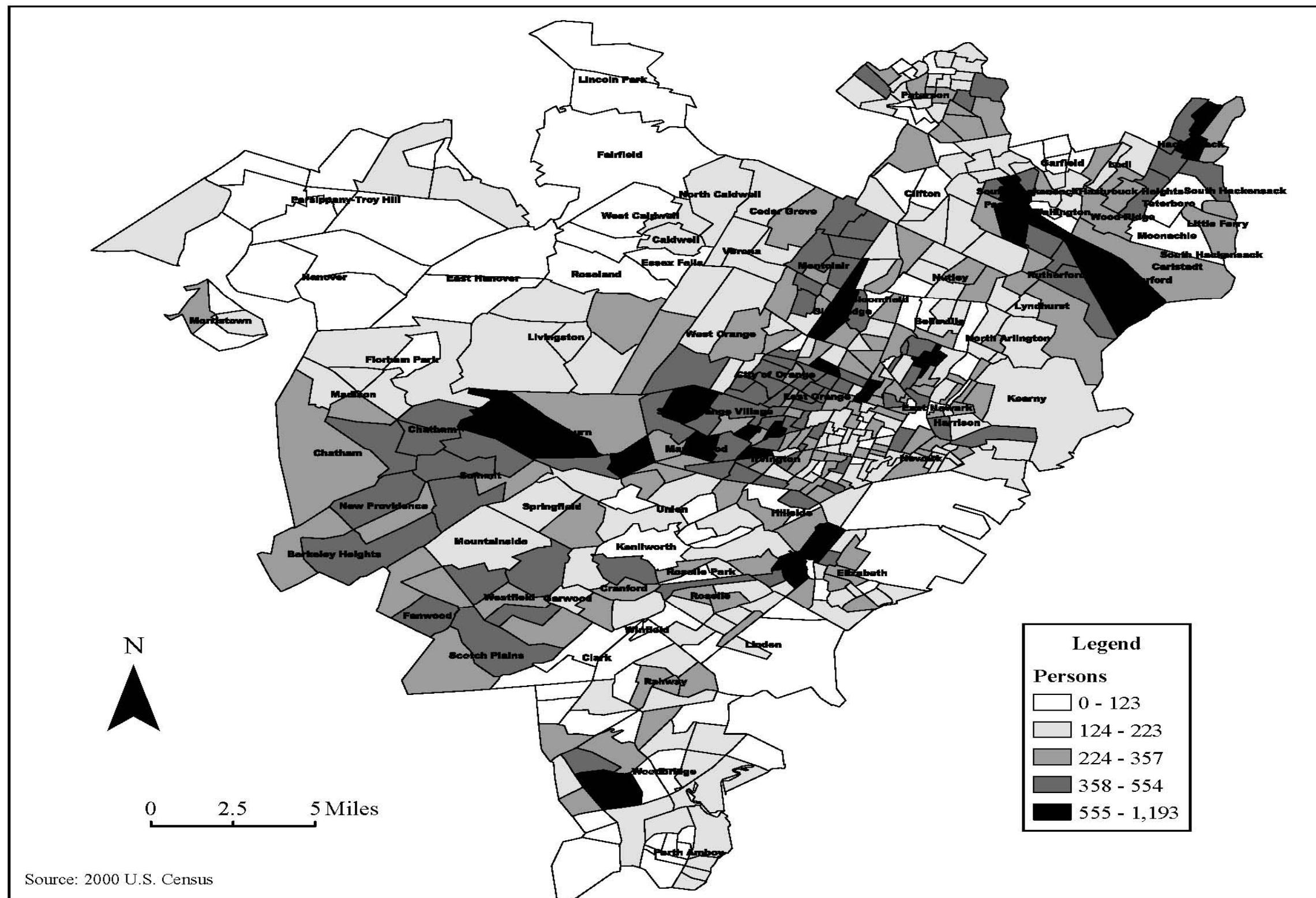


Figure 27 – Percent of Residents Commuting by Public Transportation

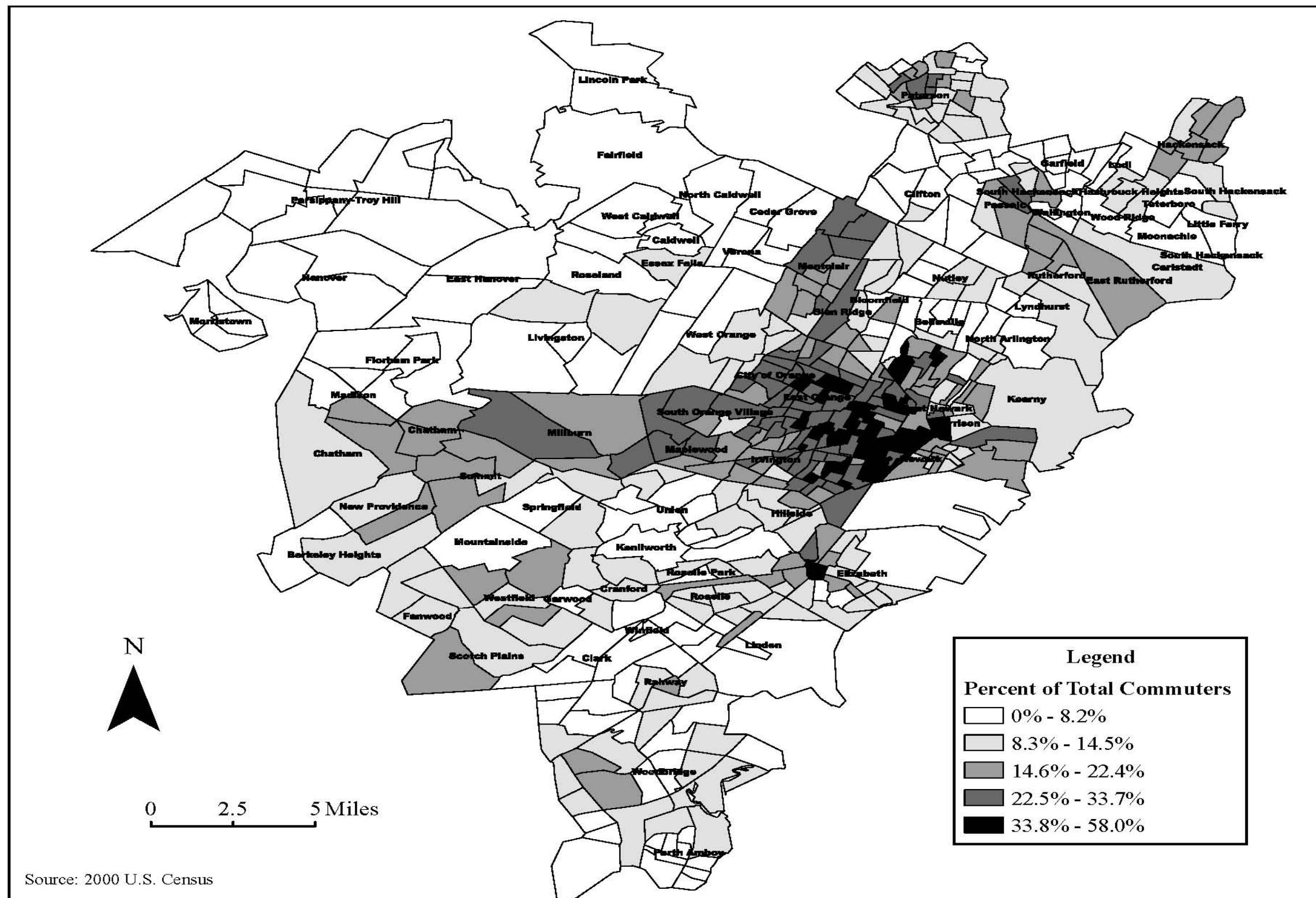


Figure 28 – Density of Public Transportation Commuters

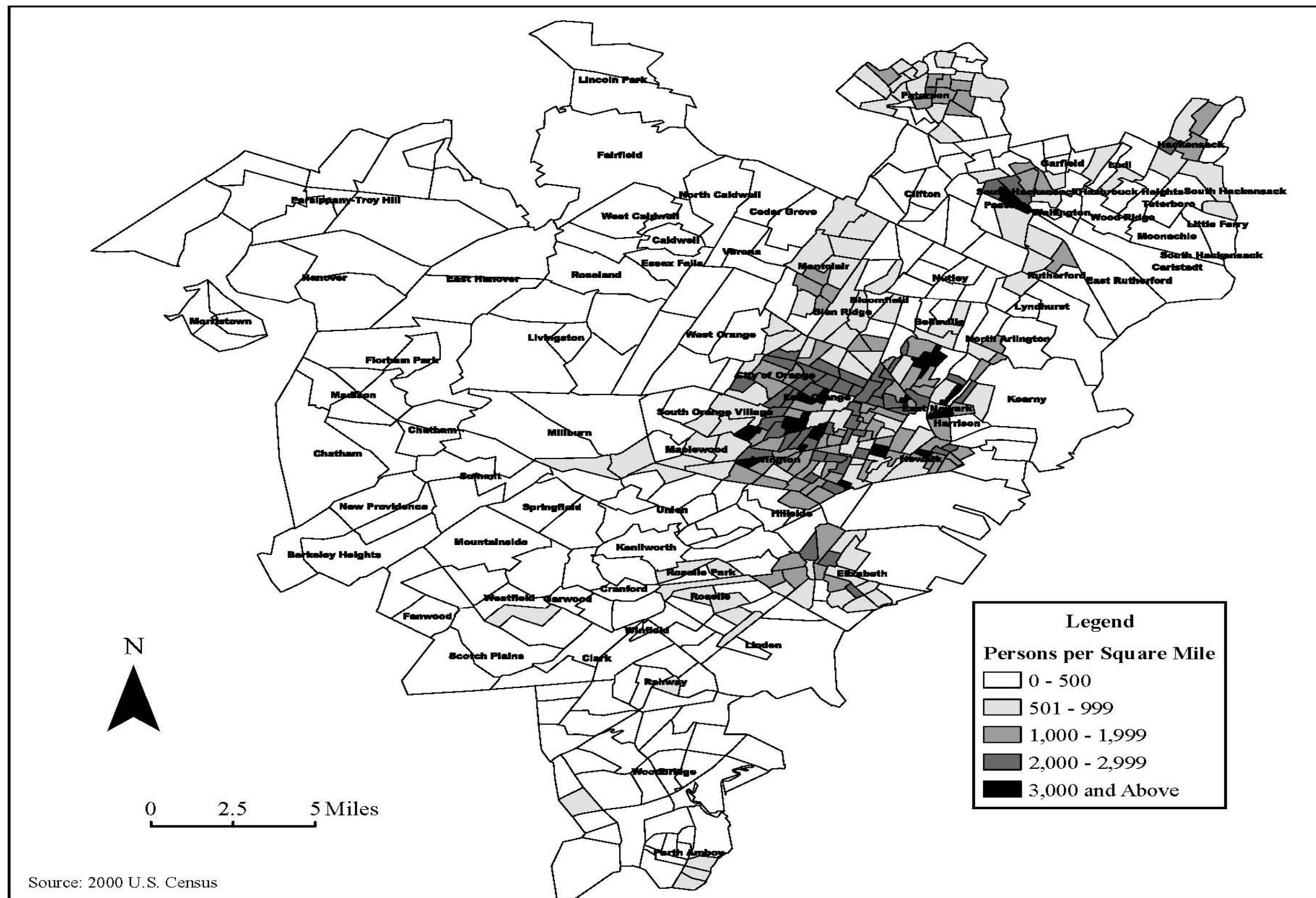


Figure 29 – Persons Commuting via Bus

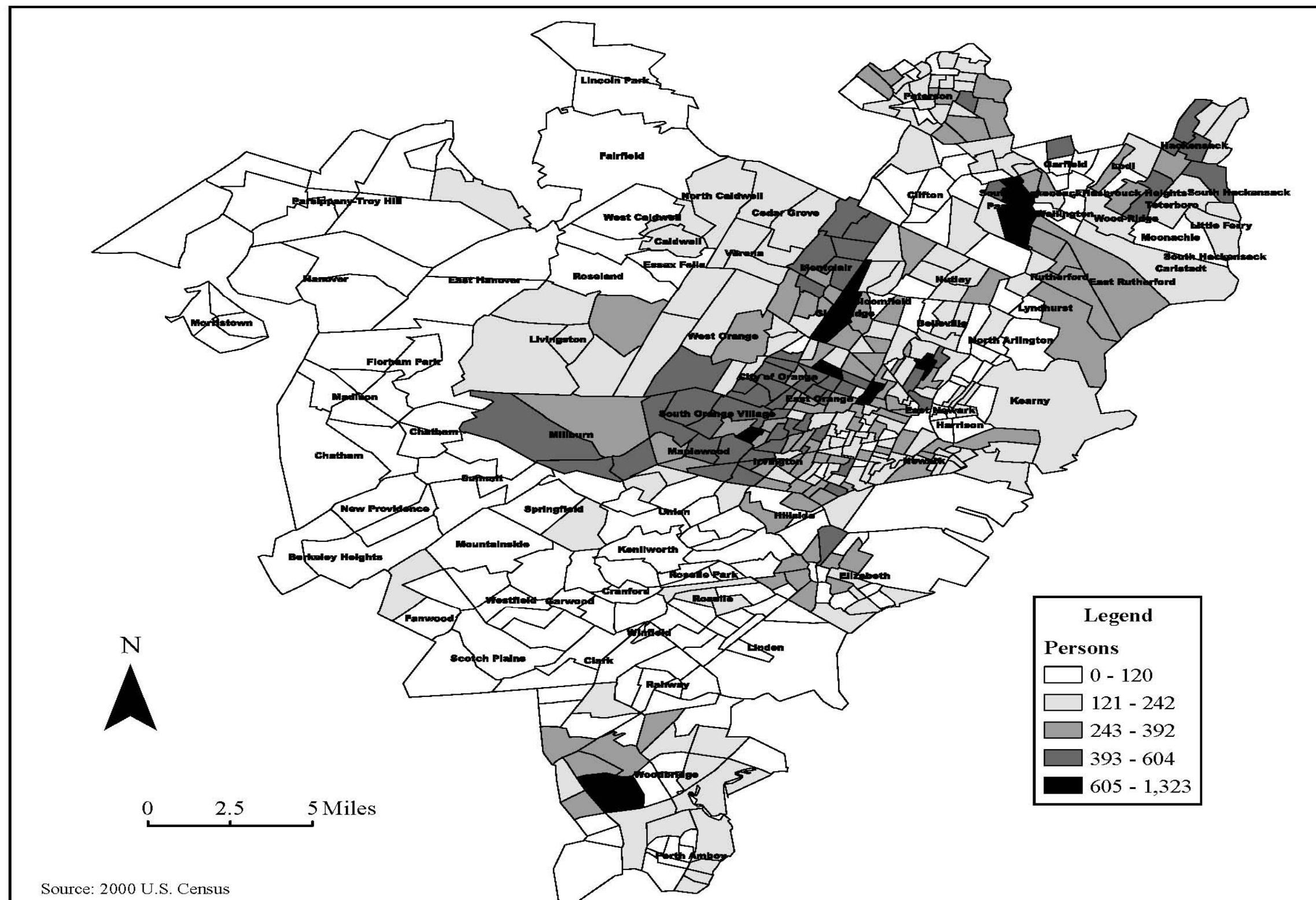


Figure 30 – Percent of Residents Commuting via Bus

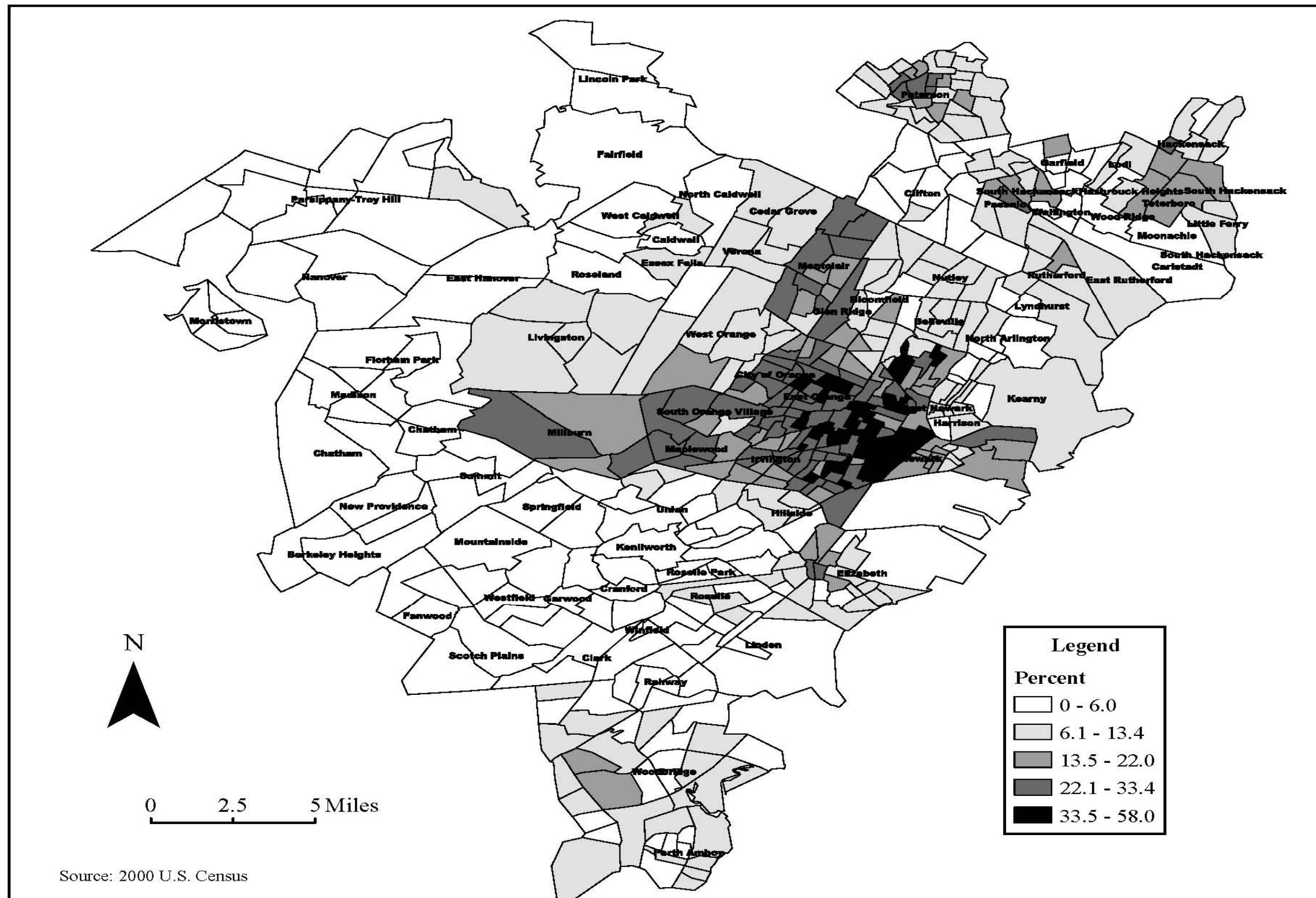
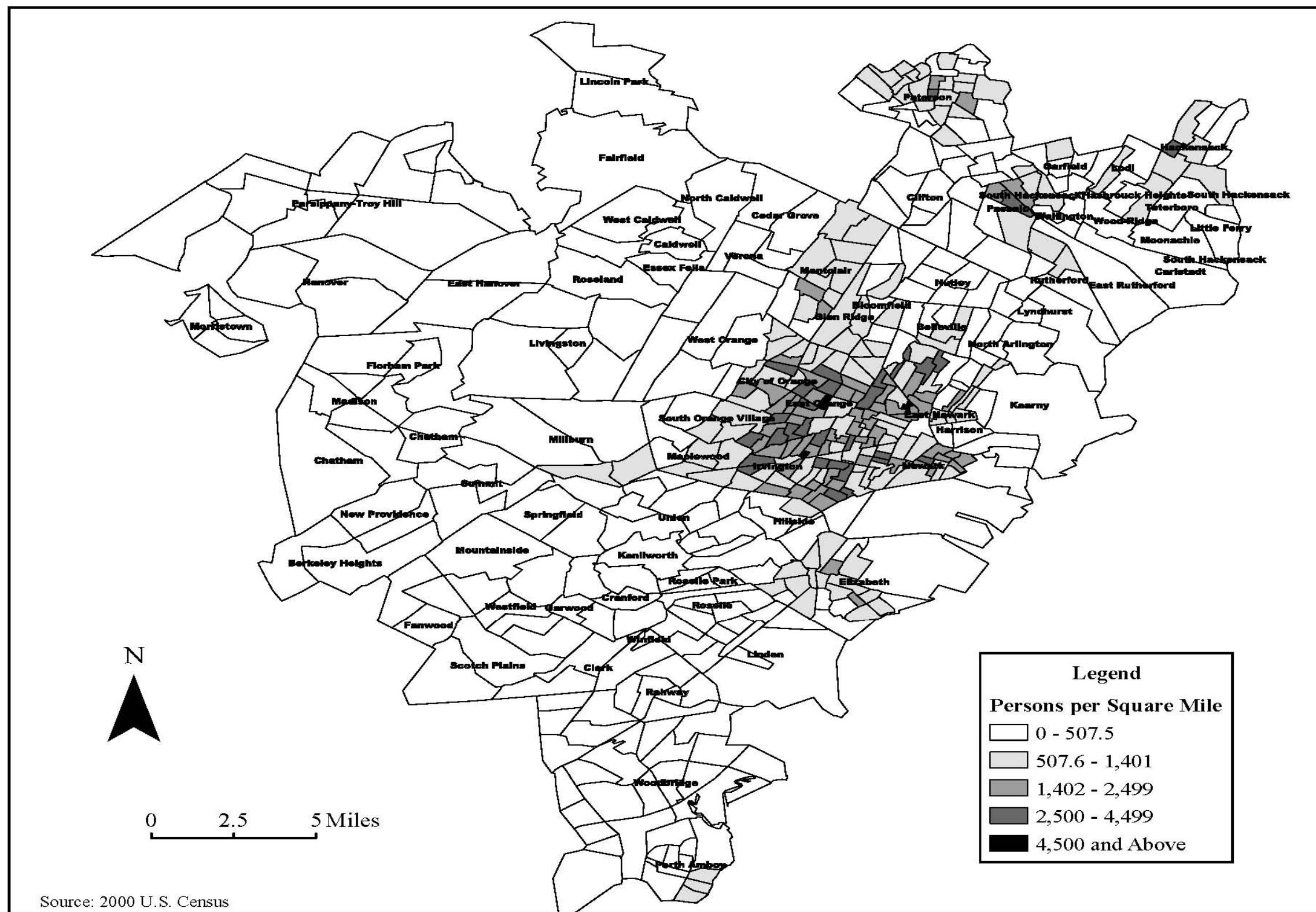


Figure 31 – Density of Bus Commuters



**Table 5 – Work Trips by Employee Location**

| <i>County</i> | <i>Municipality</i>  | <i>In County</i> | <i>Outside County</i> | <i>Outside State</i> |
|---------------|----------------------|------------------|-----------------------|----------------------|
| <b>Bergen</b> | Carlstadt            | 1,675            | 1,064                 | 397                  |
|               | East Rutherford      | 2,221            | 1,403                 | 832                  |
|               | Garfield             | 8,198            | 5,124                 | 781                  |
|               | Hackensack           | 14,602           | 3,409                 | 3,462                |
|               | Hasbrouck Heights    | 3,008            | 1,622                 | 963                  |
|               | Little Ferry         | 3,393            | 1,397                 | 835                  |
|               | Lodi                 | 7,250            | 3,286                 | 1,056                |
|               | Lyndhurst            | 4,293            | 4,208                 | 1,144                |
|               | Moonachie            | 855              | 394                   | 114                  |
|               | North Arlington      | 2,535            | 4,119                 | 758                  |
|               | Rutherford           | 4,294            | 2,958                 | 1,953                |
|               | South Hackensack     | 822              | 158                   | 116                  |
|               | Teterboro            | 5                | 2                     | 6                    |
|               | Wallington           | 2,912            | 2,409                 | 479                  |
|               | Wood-Ridge           | 2,269            | 1,209                 | 416                  |
|               | <b>Totals</b>        | <b>58,332</b>    | <b>32,762</b>         | <b>13,312</b>        |
| <b>Essex</b>  | Belleville           | 8,666            | 6,967                 | 1,158                |
|               | Bloomfield           | 12,005           | 9,576                 | 2,614                |
|               | Caldwell             | 2,076            | 1,920                 | 251                  |
|               | Cedar Grove          | 2,795            | 2,374                 | 640                  |
|               | City of Orange       | 8,075            | 4,248                 | 1,051                |
|               | East Orange          | 15,143           | 9,209                 | 2,151                |
|               | Essex Fells          | 507              | 259                   | 166                  |
|               | Fairfield            | 1,584            | 1,748                 | 176                  |
|               | Glen Ridge           | 1,236            | 1,085                 | 1,087                |
|               | Irvington            | 12,864           | 10,638                | 1,902                |
|               | Livingston           | 6,244            | 4,857                 | 2,109                |
|               | Maplewood            | 5,195            | 4,175                 | 2,732                |
|               | Millburn             | 3,142            | 2,984                 | 2,561                |
|               | Montclair            | 9,330            | 5,790                 | 4,857                |
|               | Newark               | 53,949           | 27,819                | 5,952                |
|               | North Caldwell       | 1,583            | 1,156                 | 373                  |
|               | Nutley               | 6,629            | 5,861                 | 1,436                |
|               | Roseland             | 1,449            | 958                   | 249                  |
|               | South Orange Village | 4,687            | 2,296                 | 1,822                |
|               | Verona               | 3,597            | 2,372                 | 775                  |
|               | West Caldwell        | 3,196            | 2,021                 | 391                  |
|               | West Orange          | 11,296           | 7,439                 | 2,761                |

|                  | <b>Totals</b>        | <b>175,248</b> | <b>115,752</b> | <b>37,214</b> |
|------------------|----------------------|----------------|----------------|---------------|
| <b>Hudson</b>    | East Newark          | 313            | 632            | 76            |
|                  | Harrison             | 2,482          | 3,195          | 873           |
|                  | Kearny               | 5,538          | 9,977          | 1,781         |
|                  | <b>Totals</b>        | <b>8,333</b>   | <b>13,804</b>  | <b>2,730</b>  |
| <b>Middlesex</b> | Perth Amboy          | 14,092         | 3,325          | 756           |
|                  | Woodbridge           | 23,865         | 17,394         | 5,068         |
|                  | <b>Totals</b>        | <b>37,957</b>  | <b>20,719</b>  | <b>5,824</b>  |
| <b>Morris</b>    | Chatham              | 1,615          | 1,495          | 951           |
|                  | Chatham              | 1,837          | 2,081          | 995           |
|                  | East Hanover         | 2,634          | 2,653          | 362           |
|                  | Florham Park         | 2,203          | 1,525          | 415           |
|                  | Hanover              | 3,963          | 2,354          | 347           |
|                  | Lincoln Park         | 2,059          | 3,250          | 351           |
|                  | Madison              | 4,546          | 2,354          | 1,023         |
|                  | Morristown           | 7,395          | 2,285          | 529           |
|                  | Parsippany-Troy Hill | 15,329         | 10,644         | 1,951         |
|                  | <b>Totals</b>        | <b>41,581</b>  | <b>28,641</b>  | <b>6,924</b>  |
| <b>Passaic</b>   | Clifton              | 15,557         | 18,257         | 2,754         |
|                  | Passaic              | 11,401         | 11,822         | 1,583         |
|                  | Paterson             | 27,472         | 21,421         | 1,726         |
|                  | <b>Totals</b>        | <b>54,430</b>  | <b>51,500</b>  | <b>6,063</b>  |
| <b>Union</b>     | Berkeley Heights     | 2,692          | 2,486          | 888           |
|                  | Clark                | 3,725          | 2,684          | 397           |
|                  | Cranford             | 5,636          | 4,464          | 1,371         |
|                  | Elizabeth            | 26,037         | 17,324         | 2,732         |
|                  | Fanwood              | 1,551          | 1,421          | 580           |
|                  | Garwood              | 1,354          | 694            | 200           |
|                  | Hillside             | 3,874          | 5,619          | 829           |
|                  | Kenilworth           | 2,022          | 1,484          | 210           |
|                  | Linden               | 10,544         | 6,888          | 949           |
|                  | Mountainside         | 1,322          | 1,207          | 284           |
|                  | New Providence       | 2,327          | 2,586          | 968           |
|                  | Rahway               | 5,949          | 5,433          | 821           |
|                  | Roselle              | 4,904          | 4,073          | 989           |
|                  | Roselle Park         | 3,958          | 2,539          | 557           |
|                  | Scotch Plains        | 4,870          | 4,750          | 1,699         |
|                  | Springfield          | 2,978          | 3,799          | 685           |
|                  | Summit               | 3,966          | 3,944          | 2,134         |
|                  | Union                | 11,161         | 12,630         | 1,915         |
|                  | Westfield            | 6,753          | 4,978          | 2,637         |

|  |                    |                |                |               |
|--|--------------------|----------------|----------------|---------------|
|  | Winfield           | 431            | 290            | 9             |
|  | <b>Totals</b>      | <b>106,054</b> | <b>89,293</b>  | <b>20,854</b> |
|  | <b>GNBSS Total</b> | <b>481,935</b> | <b>352,471</b> | <b>92,921</b> |

*Source: U.S. Census*

## Appendix D – Major Trip Generators

Major trip generators are locations frequented by a significant number of people, traveling by all modes, within the study area. Major trip generators include major employers, multi-family housing, hospitals and medical centers, government centers, shopping centers and malls, and colleges and universities. These generators must be considered when evaluating transit service for the study area as they comprise the majority of origins and destinations in a transportation network.

Table 6 lists the major employment trip generators within the study area. These include large employers with more than 500 employees. The City of Newark has the largest number of major employers within the study area. In addition, there are several major employers located in the municipalities surrounding the City. Outside of Newark, large numbers of employers can be found in the cities of Elizabeth, Morristown, New Providence, Parsippany, and Paterson. Overall, Essex County has the largest number of major employers in the study area.

**Table 6 – Major Employers**

| County | Employer                       | Municipality    | # of Employees |
|--------|--------------------------------|-----------------|----------------|
| Bergen | Continental Arena              | East Rutherford | 3,000          |
|        | Aramark                        | East Rutherford | 1,000          |
|        | America's Best Window Cleaners | Garfield        | 700            |
|        | Popular Club Plan              | Garfield        | 800            |
|        | SBM Svc Inc.                   | Hackensack      | 650            |
|        | Summit Bank                    | Hackensack      | 600            |
|        | North Jersey Media Group       | Hackensack      | 1,100          |
|        | Record                         | Hackensack      | 1,001          |
|        | Superior Court-Youth Services  | Hackensack      | 1,111          |
|        | Fuji Photo                     | Hackensack      | 500            |
|        | Polo Ralph Lauren              | Lyndhurst       | 500            |
|        | Nextel Communications          | Rutherford      | 1,100          |
|        | Harmann & Reimer Corp          | Teterboro       | 500            |
|        | Ford Motor Co                  | Teterboro       | 500            |
| Essex  | Honeywell                      | Teterboro       | 1,450          |
|        | Quest Diagnostics Inc.         | Teterboro       | 2,400          |
|        | Essex County Hospital          | Cedar Grove     | 690            |
|        | East Orange City Hall          | East Orange     | 500            |
|        | East Orange Personnel          | East Orange     | 1,400          |
|        | US Veterans Hospital           | East Orange     | 1,900          |

| County           | Employer                           | Municipality | # Of Employees |
|------------------|------------------------------------|--------------|----------------|
| Essex<br>(cont.) | Planned Building Svc               | Fairfield    | 500            |
|                  | Windmill Health Products           | Fairfield    | 500            |
|                  | Irvington Township                 | Irvington    | 750            |
|                  | CIT Group                          | Livingston   | 1,000          |
|                  | Formosa Plastics Corp              | Livingston   | 650            |
|                  | AM Topp Corp                       | Livingston   | 500            |
|                  | New Jersey Transit                 | Maplewood    | 500            |
|                  | Rapid Roofing                      | Montclair    | 1,239          |
|                  | New Community Foundation Corp      | Newark       | 1,200          |
|                  | Newark Housing Authority           | Newark       | 1,200          |
|                  | Kretchmer Elderly Tenants Assn.    | Newark       | 500            |
|                  | USF Red Star Inc.                  | Newark       | 500            |
|                  | Passaic Valley Sewerage            | Newark       | 600            |
|                  | New Jersey Transit Bus Operations  | Newark       | 600            |
|                  | Essex County Sheriff's Office      | Newark       | 550            |
|                  | Public Service Enterprise Grp      | Newark       | 3,000          |
|                  | PSE&G Nuclear Llc                  | Newark       | 3,000          |
|                  | PSE&G                              | Newark       | 850            |
|                  | Prudential Investments             | Newark       | 1,000          |
|                  | Prudential Insurance Co            | Newark       | 4,492          |
|                  | US Post Office                     | Newark       | 2,000          |
|                  | St Michael's Medical Center        | Newark       | 1,200          |
|                  | New Jersey Institute of Technology | Newark       | 1,200          |
|                  | Essex County College               | Newark       | 650            |
|                  | Star Ledger                        | Newark       | 900            |
|                  | Newark Morning Ledger              | Newark       | 800            |
|                  | New Community Assoc Corp           | Newark       | 600            |
|                  | University of Medicine/Dentistry   | Newark       | 8,000          |
|                  | Verizon New Jersey Inc.            | Newark       | 800            |
|                  | Seton Leather Co                   | Newark       | 600            |
|                  | Continental Airlines               | Newark       | 8,000          |
|                  | Newark International Airport       | Newark       | 1,000          |
|                  | Anheuser Busch Inc.                | Newark       | 875            |
|                  | Amr Svc                            | Newark       | 550            |
|                  | Corrections Department             | Newark       | 800            |
|                  | Hoffmann-La Roche Inc.             | Nutley       | 4,500          |
|                  | Orange Educational Assn. Inc.      | Orange       | 550            |

| County                         | Employer                       | Municipality | # Of Employees |
|--------------------------------|--------------------------------|--------------|----------------|
| <b>Essex</b><br><b>(cont.)</b> | New Jersey Orthopedic Hospital | Orange       | 800            |
|                                | Automatic Data Processing Inc. | Roseland     | 3,000          |
| <b>Hudson</b>                  | US Postal Service              | Kearny       | 600            |
|                                | Kearny School District         | Kearny       | 500            |
| <b>Middlesex</b>               | Amerada Hess Refining & Mktg   | Woodbridge   | 675            |
| <b>Morris</b>                  | NPA                            | East Hanover | 600            |
|                                | Planters Co                    | East Hanover | 575            |
|                                | Novartis Pharmaceuticals Corp  | East Hanover | 4,000          |
|                                | Automatic Switch Co            | Florham Park | 1,100          |
|                                | Price Water House Coopers      | Florham Park | 1,300          |
|                                | Accenture                      | Florham Park | 900            |
|                                | Lincoln Park Nursing Center    | Lincoln Park | 650            |
|                                | Lincoln Park Intermediate Care | Lincoln Park | 600            |
|                                | Maersk Inc.                    | Madison      | 500            |
|                                | Drew University                | Madison      | 500            |
|                                | Wyeth                          | Madison      | 1,000          |
|                                | Mennen Co                      | Morristown   | 800            |
|                                | Colgate Palmolive Co           | Morristown   | 1,000          |
|                                | Honeywell International Inc.   | Morristown   | 1,500          |
|                                | Telcordia Technologies         | Morristown   | 745            |
|                                | Morris View Nursing Home       | Morristown   | 600            |
|                                | National Guard Armories        | Morristown   | 600            |
|                                | Dendrite International Inc.    | Morristown   | 600            |
|                                | Golden Skillet                 | Morristown   | 1,023          |
|                                | Tyco Telecommunications        | Morristown   | 1,100          |
|                                | AT&T                           | Morristown   | 2,000          |
|                                | Rehabilitation Institute       | Morristown   | 500            |
|                                | AT&T Easy Commerce Service     | Parsippany   | 700            |
|                                | Roche Vitamin & Fine Chemicals | Parsippany   | 500            |
|                                | Parsippany Police Department   | Parsippany   | 500            |
|                                | Hyperion Solutions Corp        | Parsippany   | 1,000          |
|                                | Tiffany & Co                   | Parsippany   | 1,300          |
|                                | Business Marketing Svc         | Parsippany   | 750            |
|                                | Century 21                     | Parsippany   | 2,100          |
|                                | Cendant Corp                   | Parsippany   | 1,000          |
|                                | Avis Rent A Car System Inc.    | Parsippany   | 1,500          |
|                                | Merck-Medco Managed Care       | Parsippany   | 2,000          |

| County                    | Employer                        | Municipality   | # Of Employees |
|---------------------------|---------------------------------|----------------|----------------|
| <b>Morris<br/>(cont.)</b> | National Pharmacies Inc.        | Parsippany     | 1,000          |
|                           | Automatic Data Processing       | Parsippany     | 800            |
| <b>Passaic</b>            | Daughters Of Miriam Center-Aged | Clifton        | 500            |
|                           | Tri-Hospital Home Health        | Passaic        | 840            |
|                           | St Mary's Hospital              | Passaic        | 900            |
|                           | Melard Manufacturing Corp       | Passaic        | 500            |
|                           | Passaic County Superior Court   | Paterson       | 500            |
|                           | US Post Office                  | Paterson       | 1,200          |
|                           | Passaic County Jail             | Paterson       | 600            |
|                           | Paterson City Government        | Paterson       | 1,500          |
|                           | Passaic County Sheriff Office   | Paterson       | 573            |
|                           | Superior Court                  | Paterson       | 525            |
|                           | Passaic County Social Services  | Paterson       | 515            |
|                           | L'Oreal USA Inc.                | Clark          | 500            |
|                           | Tyco Telecommunications         | Clark          | 700            |
|                           | CBL Memorial Complex            | Cranford       | 2,644          |
|                           | Union County College            | Cranford       | 850            |
| <b>Union</b>              | Wakefern Food Corp              | Elizabeth      | 1,000          |
|                           | Elizabeth City Hall             | Elizabeth      | 1,455          |
|                           | Interbake Foods Inc.            | Elizabeth      | 800            |
|                           | Union County Court House        | Elizabeth      | 500            |
|                           | Elizabethtown Gas Co            | Elizabeth      | 500            |
|                           | Superior Court Of NJ            | Elizabeth      | 500            |
|                           | Schering-Plough Corp            | Kenilworth     | 4,000          |
|                           | Schering-Plough Pharmaceutical  | Kenilworth     | 4,000          |
|                           | H&D Linden Motors-Used Cars     | Linden         | 755            |
|                           | Exxon Chemical Co               | Linden         | 1,200          |
|                           | Phillips 66 Refining Co         | Linden         | 1,000          |
|                           | Weekends Holidays               | Linden         | 3,000          |
|                           | General Motors Corp C-P-C Grp   | Linden         | 2,700          |
|                           | Network Management Solutions    | Mountainside   | 2,000          |
|                           | BOC Group Inc.                  | New Providence | 1,400          |
|                           | BOC Gases                       | New Providence | 1,500          |
|                           | Lucent Technologies Inc.        | New Providence | 3,500          |
|                           | Direct Marketing Market Place   | New Providence | 850            |
|                           | Reed Elsevier                   | New Providence | 1,000          |
|                           | Martindale-Hubble Inc.          | New Providence | 900            |

| County           | Employer                     | Municipality   | # Of Employees |
|------------------|------------------------------|----------------|----------------|
| Union<br>(cont.) | National Register Publishing | New Providence | 900            |
|                  | RR Bowker                    | New Providence | 900            |
|                  | US Industrial Directory      | New Providence | 900            |
|                  | D&B Corp                     | New Providence | 550            |
|                  | Dun & Bradstreet Inc.        | New Providence | 500            |
|                  | Schneider National Bulk Inc. | Rahway         | 2,000          |
|                  | Merck Research Laboratories  | Rahway         | 6,000          |
|                  | Autoland Of New Jersey Inc.  | Springfield    | 600            |
|                  | Celanese Americas Corp       | Summit         | 500            |
|                  | Tuscan Dairy Farms Inc.      | Union          | 527            |
|                  | Kean University Book Store   | Union          | 1,000          |

Source: NJ TRANSITPA (Based On 2001 Estimated Employment)

Table 7 lists the other major trips generators in the study area. The largest numbers of major trip generators are located within Essex County, with the majority of these generators located within the City of Newark. In addition, Essex County has the highest number of hospitals and medical centers, shopping centers and malls, and colleges and universities in the study area. Union County has the second largest number of major trip generators in the study area. Overall, major trip generators are located throughout the study area and can be found in equal numbers in the major urban areas along the eastern and northeastern portions of the study area as well as the more suburban municipalities located in the western portion of the study area.

**Table 7 – Other Major Transit Generators**

| County                                       | Municipality | Generator                    |
|--|--------------|------------------------------|
| <b>Multi-Family Housing &amp; Apartments</b> |              |                              |
| Essex  | Irvington    | Marshall Street Apartments   |
|  | Newark       | Christopher Columbus Homes   |
|  | Newark       | Colonnade Apartments Complex |
|  | Newark       | Ivy Hill Apartments          |
|  | Newark       | Pavilion Apartments          |
|  | Newark       | Stephen Crane Village        |
| Hudson                                       | Union City   | Troy Towers                  |
|  | Union City   | Washington Park Towers       |
| Passaic                                      | Paterson     | Alex Hamilton Houses         |
|  | Paterson     | Colt Arms Apartments         |
|  | Paterson     | Gordon Canfield Apartments   |
|  | Paterson     | Gov. Paterson Towers         |
| <b>Hospitals &amp; Medical Centers</b>       |              |                              |
| Bergen                                       | Hackensack   | Hackensack Medical Center    |

| County                    | Municipality      | Generator                                |
|---------------------------|-------------------|--|
| <b>Bergen<br/>(cont.)</b> | Hasbrouck Heights | Hackensack Medical Center South Bergen   |
|                           | Ridgewood         | Ridgewood Hospital Assoc Valley Hospital |
|                           | Ridgewood         | Valley Hospital                          |
| <b>Essex</b>              | Belleville        | Clara Mass Memorial Hospital             |
|                           | Belleville Essex  | Essex County Geriatrics                  |
|                           | Belleville        | Garden State Cancer Center               |
|                           | Caldwell          | West Caldwell Care Center                |
|                           | Cedar Grove       | Cedar Grove Hospital                     |
|                           | Cedar Grove       | Essex County Hospital [Overlook]         |
|                           | East Orange       | East Orange General                      |
|                           | East Orange       | Kessler Institute Rehab                  |
|                           | East Orange       | Veterans Hospital                        |
|                           | Glen Ridge        | Glen Ridge Hospital                      |
|                           | Glen Ridge        | Mountainside Hospital                    |
|                           | Irvington         | Irvington General Hospital               |
|                           | Livingston        | St Barnabas Clinic                       |
|                           | Livingston        | St Barnabas Medical Center               |
|                           | Livingston        | West Essex General Hospital              |
|                           | Montclair         | Montclair Community Hospital             |
|                           | Montclair         | St Vincent's Hospital                    |
|                           | Newark            | Beth Israel Hospital                     |
|                           | Newark            | Children's Hospital                      |
|                           | Newark            | Columbus Hospital (closed)               |
|                           | Newark            | Crippled Children's Hospital             |
|                           | Newark            | Eye And Ear Institute Of NJ              |
|                           | Newark            | Mt Carmel Guild [Inpatient Pavilion]     |
|                           | Newark            | NJ State Hospital                        |
|                           | Newark            | Presbyterian Hospital                    |
|                           | Newark            | St James Hospital (closed)               |
|                           | Newark            | St Michael's Medical Center              |
|                           | Newark            | United Hospital Medical Center           |
|                           | Newark            | United Hospital Orthopedic Center        |
|                           | Newark            | University Hospital                      |
|                           | Nutley            | Industrial Hospital                      |
|                           | Orange            | NJ Orthopedic Hospital                   |

| County                         | Municipality      | Generator                                |
|--------------------------------|-------------------|--|
| <b>Essex</b><br><b>(cont.)</b> | Orange            | Orange Memorial [Hospital Center Orange] |
|                                | Orange            | St Mary's Hospital                       |
|                                | West Orange       | Kessler Institute Rehab                  |
|                                | West Orange       | Patient Care Inc.                        |
|                                | West Orange       | Personalize Home Care                    |
| <b>Hudson</b>                  | Kearny            | West Hudson Hospital                     |
| <b>Middlesex</b>               | Perth Amboy       | Raritan Bay Medical Center               |
| <b>Morris</b>                  | Morristown        | Morristown Memorial Hospital             |
| <b>Passaic</b>                 | Passaic           | Beth Israel Hospital (closed)            |
|                                | Passaic           | Passaic General Hospital (closed)        |
|                                | Passaic           | St Mary's Hospital                       |
|                                | Paterson          | Barnet Memorial Hospital (closed)        |
|                                | Paterson          | Graves Family Health Center              |
|                                | Paterson          | St Joseph's Medical Center               |
| <b>Union</b>                   | Berkeley Heights  | Berkeley Heights Hospital                |
|                                | Berkeley Heights  | Hospital Of Union County                 |
|                                | Clark             | Multi Care Health Center                 |
|                                | Elizabeth         | Trinitas Hospital                        |
|                                | Mountainside      | Children's Special Hospital              |
|                                | Rahway            | Rahway Hospital                          |
|                                | Summit            | Overlook Hospital                        |
|                                | Union             | Union Memorial General Hospital          |
| Government Facilities          |                   |  |
| <b>Bergen</b>                  | Carlstadt         | Boro Hall - Carlstadt                    |
|                                | Hasbrouck Heights | Boro Hall - Hasbrouck                    |
|                                | Carlstadt         | Municipal Building - Carlstadt           |
|                                | Garfield          | City Hall - Garfield                     |
|                                | Glen Rock         | Municipal Complex - Glen Rock            |
|                                | Hackensack        | City Hall - Hackensack                   |
|                                | Lodi              | Boro Hall - Lodi                         |
|                                | Wallington        | Boro Hall - Wallington                   |
|                                | Hackensack        | Bergen County Administration Bldg.       |
|                                | Ridgewood         | Municipal Building Village Hall          |
| <b>Essex</b>                   | Teterboro         | Municipal Building - Teterboro           |
|                                | Bloomfield        | Civic Center - Bloomfield                |
|                                | Bloomfield        | Municipal Hall [Bloomfield]              |

| County                         | Municipality | Generator                                |
|--------------------------------|--------------|--|
| <b>Essex</b><br><b>(cont.)</b> | East Orange  | Municipal Bldg. East Orange              |
|                                | Essex Fells  | Boro Hall - Essex Fells                  |
|                                | Fairfield    | Boro Hall - Fairfield                    |
|                                | Montclair    | Montclair Municipal Building             |
|                                | Newark       | City Hall - Newark                       |
|                                | Newark       | Essex County Court House                 |
|                                | Newark       | NJ TRANSIT Headquarters                  |
|                                | Newark       | One Penn Plaza [NJ TRANSIT Headquarters] |
|                                | Nutley       | Municipal Hall                           |
| <b>Hudson</b>                  | Roseland     | Municipal Building - Roseland            |
|                                | Harrison     | Town Hall                                |
|                                | Union City   | City Hall - Union City                   |
| <b>Middlesex</b>               | Union City   | Municipal Building - Union City          |
|                                | Perth Amboy  | City Hall - Perth Amboy                  |
| <b>Morris</b>                  | Lincoln Park | Municipal Building - Lincoln Park        |
|                                | Chatham      | Municipal Bldg. Chatham                  |
|                                | Parsippany   | Municipal Building - Parsippany          |
|                                | Parsippany   | Social Services Office Complex           |
|                                | Parsippany   | USPS Parsippany                          |
| <b>Passaic</b>                 | Clifton      | Municipal Complex/City Hall Clifton      |
|                                | Passaic      | City Hall - Passaic                      |
|                                | Paterson     | City Hall - Paterson                     |
|                                | Paterson     | Federal Building                         |
|                                | Paterson     | Hamilton Plaza Offices                   |
|                                | Paterson     | Passaic County Court Complex             |
|                                | Paterson     | Social Security Offices                  |
| <b>Union</b>                   | Clark        | Municipal Bldg. Clark Twp.               |
|                                | Cranford     | Municipal Bldg. Cranford                 |
|                                | Elizabeth    | City Hall - Elizabeth                    |
|                                | Elizabeth    | Court House - Elizabeth                  |
|                                | Fanwood      | Boro Hall - Fanwood                      |
|                                | Garwood      | Boro Hall - Garwood                      |
|                                | Garwood      | Municipal Bldg. - Garwood                |
|                                | Hillside     | Municipal Bldg. Hillside                 |
|                                | Kenilworth   | Boro Hall - Kenilworth                   |
|                                | Linden       | City Hall - Linden                       |

| County   | Municipality    | Generator                                    |
|--|-----------------|--|
| Union<br>(cont.)   | Mountainside    | Boro Hall - Mountainside                     |
|  | Rahway          | City Hall - Rahway                           |
|  | Roselle Park    | Boro Hall - Roselle Park                     |
|  | Roselle         | Boro Hall - Roselle                          |
|  | Summit          | City Hall - Summit                           |
|  | Linden          | Municipal Building - Winfield                |
|  | New Providence  | Municipal Center                             |
|  | Rahway          | Municipal Building - Rahway                  |
|  | Scotch Plains   | Municipal Building - Scotch Plains           |
|  | Springfield     | Municipal Building - Springfield             |
|  | Union           | Municipal Building - Union                   |
|  | Westfield       | Municipal Building - Westfield               |
| <b>Shopping Centers /Malls – Recreational/Athletic Centers</b> |                 |  |
| Bergen   | East Rutherford | IZOD Center                                  |
|  | Hackensack      | Shops at Riverside                           |
|  | Hackensack      | Sears  |
|  | Lyndhurst       | Station Square (Central Business District)   |
|  | Ridgewood       | Van Neste Square (Central Business District) |
|  | Ridgewood       | Wilsey Square (Western Business District)    |
| Essex  | Newark          | City Stadium                                 |
|  | Bloomfield      | Bloomfield Municipal Plaza [Center]          |
|  | Caldwell        | Essex Mall                                   |
|  | Irvington       | Irvington Center                             |
|  | Irvington       | Valley Fair                                  |
|  | Livingston      | Livingston Mall                              |
|  | Millburn        | Millburn Center                              |
|  | Millburn        | Millburn Mall                                |
|  | Montclair       | Montclair Center                             |
|  | Montclair       | Twelve Miles West Theatre Company            |
|  | Montclair       | Watchung Plaza                               |
|  | Nutley          | Central Business District                    |
|  | South Orange    | South Orange Center                          |
|  | West Orange     | Eagle Rock Shopping Center                   |
| Hudson   | West Orange     | Essex Green Shopping Center                  |
|  | Harrison        | Wal-Mart                                     |
|  | Kearny          | Wal-Mart                                     |

| County                  | Municipality  | Generator                                   |
|-------------------------|---------------|---|
| <b>Morris</b>           | East Hanover  | East Hanover Plaza                          |
|                         | Madison       | Madison Plaza                               |
|                         | Morristown    | Headquarter Plaza – Morristown Green        |
|                         | Parsippany    | Morris Hills Shopping Center                |
|                         | Parsippany    | Troy Hills Shopping Center                  |
| <b>Passaic</b>          | Clifton       | Allwood Plaza Shopping Center               |
|                         | Clifton       | Clifton Commons Mall                        |
|                         | Clifton       | Clifton Plaza Shopping Center               |
|                         | Clifton       | Richfield Shopping Center                   |
|                         | Clifton       | Styertowne Shopping Center                  |
|                         | Clifton       | Target                                      |
|                         | Passaic       | Sokol Square (central business district)    |
|                         | Paterson      | Dill Plaza (central business district)      |
| <b>Union</b>            | Elizabeth     | Elizabeth Center                            |
|                         | Elizabeth     | IKEA  |
|                         | Elizabeth     | Jersey Gardens Mall                         |
|                         | Linden        | Aviation Plaza                              |
|                         | Linden        | Linden Shopping Plaza                       |
|                         | Linden        | Wal-Mart                                    |
|                         | Mountainside  | Echo Plaza                                  |
|                         | Rahway        | Five Points Plaza                           |
|                         | Rahway        | Rahway Plaza                                |
|                         | Springfield   | Springfield Center                          |
|                         | Union         | Union Center                                |
|                         | Union         | Wal-Mart                                    |
|                         | Westfield     | Westfield Plaza (central business district) |
| Colleges & Universities |               |   |
| <b>Bergen</b>           | Hackensack    | Fairleigh Dickinson University              |
|                         | Lodi          | Felician College                            |
|                         | Rutherford    | Fairleigh Dickinson University              |
|                         | Rutherford    | Felician College                            |
| <b>Essex</b>            | Bloomfield    | Bloomfield College                          |
|                         | Caldwell      | Caldwell College                            |
|                         | West Caldwell | Essex County College                        |
|                         | East Orange   | Thomas Edison College                       |

| County                         | Municipality  | Generator                            |
|--------------------------------|---------------|--------------------------------------|
| <b>Essex</b><br><b>(cont.)</b> | Livingston    | Gibbs College                        |
|                                | Newark        | Essex County College                 |
|                                | Newark        | NJ Institute Of Technology           |
|                                | Newark        | Rutgers University                   |
|                                | Newark        | University Of Medicine And Dentistry |
|                                | South Orange  | Seton Hall University                |
| <b>Hudson</b>                  | Union City    | Hudson County Community College      |
| <b>Morris</b>                  | Madison       | Drew University                      |
|                                | Madison       | Fairleigh Dickinson University       |
|                                | Morristown    | Delbarton School                     |
|                                | Morris Twp.   | St. Elizabeth College                |
| <b>Passaic</b>                 | Paterson      | Passaic County College               |
|                                | Woodland Park | Berkeley College                     |
| <b>Union</b>                   | Cranford      | Union County College –               |
|                                | Elizabeth     | Union County College                 |
|                                | Union         | Kean University                      |

Source: NJ TRANSITPA

## Appendix E – Rider Origin-Destination and Opinion Survey

This section presents a number of the findings from the Greater Newark Bus System Study Origin-Destination Bus Survey effort. This survey effort examined the NJ TRANSIT and Coach USA routes in the Newark area for Phases A, B, C and D. The phased efforts took place during the spring of 2007 for Phase A, the fall of 2007 for Phase B and the fall of 2008 for Phases C and D. Included are brief analyses of the passenger demographics, trip purposes, access and egress patterns, the employed fare media, the transit dependency of the responding population and a qualitative look at the services that the passengers are using. The response rate by route has also been provided.

- **Passenger Demographics** – The following tables provide the demographic information for NJ TRANSIT and Coach USA for the Greater Newark area. These results were obtained through an origin-destination survey of transit riders. Table 8 provides information on the gender of each services passenger; Table 9 details the age group of the patrons; Table 10 illustrates the racial breakdown of the respective service; Table 11 provides information on whether or not the passenger is of Hispanic ethnicity; Table 12 details the passengers cited occupation; and Table 13 describes the annual household income of both services riding populations. As each table shows, the populations of passengers who utilize the NJ TRANSIT services and those provided by Coach USA are nearly identical across each of the measured demographics. Figure 32 graphically depicts the percentage of household with incomes below \$25,000 and above \$100,000 for both systems.

The rider origin-destination and opinion survey had over 20,000 survey cards which were processed throughout the study.

As Table 8 shows, a majority of the transit riders on both services were female, with nearly two-thirds of the riding population being women.

**Table 8 – Gender of Passengers (Percent)**

| Carrier      | Male        | Female      | Total        |
|--------------|-------------|-------------|--------------|
| NJ TRANSIT   | 38.2        | 61.8        | 100.0        |
| Coach USA    | 35.6        | 64.4        | 100.0        |
| <b>Total</b> | <b>37.8</b> | <b>62.2</b> | <b>100.0</b> |

Table 9 indicates that the majority of the passengers for both services are between the ages of 18 and 61, suggesting that a good portion of the riding populations use their respective service to get to and from their place of work.

**Table 9 – Age of Passengers (Percent)**

| Carrier      | Under 18   | 18-24 Years | 25-34 Years | 35-44 Years | 45-54 Years | 55-61 Years | 62 and Over | Total        |
|--------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| NJ TRANSIT   | 4.5        | 14.3        | 17.8        | 22.2        | 23.7        | 10.7        | 6.8         | 100.0        |
| Coach USA    | 3.2        | 12.3        | 15.6        | 21.9        | 27.5        | 12.3        | 7.3         | 100.0        |
| <b>Total</b> | <b>4.3</b> | <b>14.0</b> | <b>17.5</b> | <b>22.1</b> | <b>24.3</b> | <b>11.0</b> | <b>6.8</b>  | <b>100.0</b> |

Over two-thirds of the total riding population, and over three-fourths of Coach USA's passengers, indicated that they were black, as Table 10 details.

**Table 10 – Race of Passengers (Percent)**

| Carrier      | White       | Black       | Asian or Pacific Islander | American Indian, Eskimo or Aleut | Multi-Racial | Other       | Total        |
|--------------|-------------|-------------|---------------------------|----------------------------------|--------------|-------------|--------------|
| NJ TRANSIT   | 12.7        | 66.2        | 1.0                       | 3.1                              | 3.8          | 13.2        | 100.0        |
| Coach USA    | 6.5         | 77.4        | 0.9                       | 1.3                              | 3.6          | 10.3        | 100.0        |
| <b>Total</b> | <b>11.7</b> | <b>67.9</b> | <b>1.0</b>                | <b>2.8</b>                       | <b>3.7</b>   | <b>12.7</b> | <b>100.0</b> |

Fewer than 20 percent of the area's transit passengers reported that they were of Hispanic Ethnicity, as shown in Table 11.

**Table 11 – Hispanic Ethnicity of Passengers (Percent)**

| Carrier      | Yes         | No          | Total        |
|--------------|-------------|-------------|--------------|
| NJ TRANSIT   | 20.0        | 80.0        | 100.0        |
| Coach USA    | 17.3        | 82.7        | 100.0        |
| <b>Total</b> | <b>19.6</b> | <b>80.4</b> | <b>100.0</b> |

Table 12 indicates that the occupations of the transit passengers in the Greater Newark area varied greatly. No one job category stood out as having a majority of transit users, though nearly 13 percent mentioned that they were a student, just under 12 percent categorized their job as management or professional, and over nine percent mentioned that they worked in health care. Over 22 percent of the survey respondents said that their job fell into the "other" category.

**Table 12 – Occupation of Passengers (Percent)**

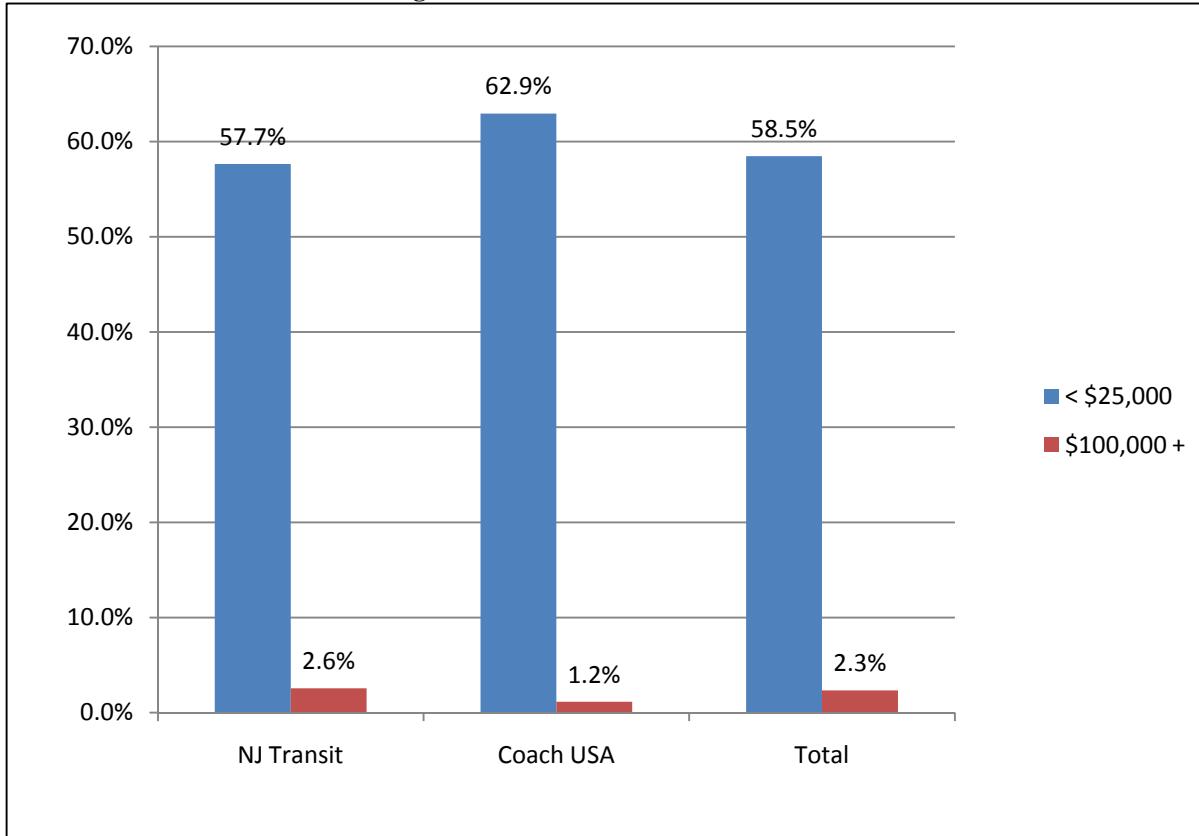
| Carrier      | Management/<br>Professional | Technical/<br>Skilled | Clerical   | Food Service | Retail     | Service    | Health Care | Student     | Homemaker  | Retired    | Domestic   | Other       | Total        |
|--------------|-----------------------------|-----------------------|------------|--------------|------------|------------|-------------|-------------|------------|------------|------------|-------------|--------------|
| NJ TRANSIT   | 12.2                        | 7.0                   | 7.6        | 8.6          | 5.9        | 4.5        | 8.9         | 13.0        | 3.3        | 4.5        | 2.0        | 22.6        | 100.0        |
| Coach USA    | 10.4                        | 6.4                   | 7.4        | 9.6          | 5.2        | 4.1        | 10.9        | 12.3        | 4.8        | 6.7        | 2.2        | 19.9        | 100.0        |
| <b>Total</b> | <b>11.9</b>                 | <b>6.9</b>            | <b>7.6</b> | <b>8.7</b>   | <b>5.8</b> | <b>4.4</b> | <b>9.2</b>  | <b>12.9</b> | <b>3.5</b> | <b>4.9</b> | <b>2.0</b> | <b>22.2</b> | <b>100.0</b> |

As Table 13 indicates, over two-thirds of the passengers reported that they earn under \$15,000 per year, while less than 12 percent earns \$50,000 or above. Figure 32 combines those earning less than \$15,000 per year with those earning between \$15,000 and \$24,999 and illustrates that nearly 60 percent of the survey responding population earns less than \$25,000 per year. Conversely, only a little more than two percent of the respondents suggested that they earn over \$100,000 per year.

**Table 13 – Annual Household Income (Percent)**

| Carrier      | < \$15,000  | \$15,000 -<br>\$24,999 | \$25,000 -<br>\$34,999 | \$35,000 -<br>\$49,999 | \$50,000 -<br>\$74,999 | \$75,000 -<br>\$99,999 | \$100,000 -<br>\$149,999 | \$150,000+ | Total        |
|--------------|-------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------------------|------------|--------------|
| NJ TRANSIT   | 36.0        | 21.7                   | 16.7                   | 13.1                   | 7.3                    | 2.7                    | 1.7                      | 0.8        | 100.0        |
| Coach USA    | 43.0        | 20.0                   | 16.4                   | 11.8                   | 6.0                    | 1.7                    | 0.6                      | 0.6        | 100.0        |
| <b>Total</b> | <b>37.1</b> | <b>21.4</b>            | <b>16.7</b>            | <b>12.9</b>            | <b>7.1</b>             | <b>2.5</b>             | <b>1.5</b>               | <b>0.8</b> | <b>100.0</b> |

**Figure 32 – Annual Household Income**



- **Trip Purpose** – These next two tables detail the current NJ TRANSIT and Coach USA passengers’ trip starting point and destination by place (i.e., home, work, school, etc.). Table 14 illustrates the place that each passenger is coming from, while Table 15 describes the place that said passenger is going to. Figure 33 graphically depicts these places and illustrates the overall trip purpose by place (i.e., the trip origins combined with the trip destinations). As the Table 14 and Table 15 detail, and as Figure 33 shows, work and home are the two most frequent destinations for NJ TRANSIT and Coach USA passengers.

“Home” and “Work” were the two largest trip origins and destinations for both NJ TRANSIT and Coach USA.

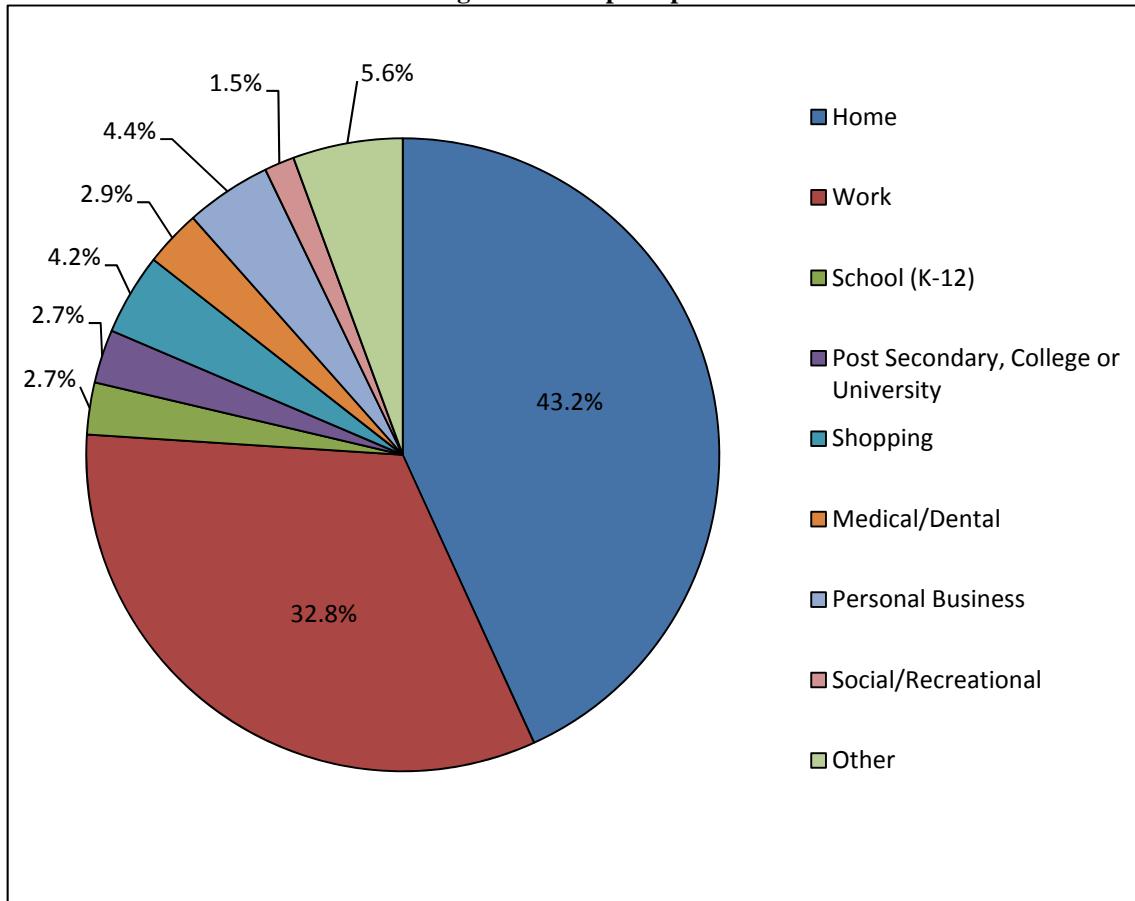
**Table 14 – Trip Origin by Place (Percent)**

| Carrier      | Home        | Work        | School (K-12) | Post-Secondary, College or University | Shopping   | Medical/Dental | Personal Business | Social/Recreational | Other      | Total        |
|--------------|-------------|-------------|---------------|---------------------------------------|------------|----------------|-------------------|---------------------|------------|--------------|
| NJ TRANSIT   | 58.2        | 24.2        | 2.1           | 2.1                                   | 3.7        | 2.1            | 2.8               | 1.1                 | 3.7        | 100.0        |
| Coach USA    | 62.1        | 19.4        | 1.9           | 1.6                                   | 2.6        | 2.7            | 4.6               | 1.1                 | 4.0        | 100.0        |
| <b>Total</b> | <b>58.8</b> | <b>23.5</b> | <b>2.1</b>    | <b>2.0</b>                            | <b>3.5</b> | <b>2.2</b>     | <b>3.1</b>        | <b>1.1</b>          | <b>3.7</b> | <b>100.0</b> |

**Table 15 – Trip Destination by Place (Percent)**

| Carrier      | Home        | Work        | School (K-12) | Post-Secondary, College or University | Shopping   | Medical/Dental | Personal Business | Social/Recreational | Other      | Total        |
|--------------|-------------|-------------|---------------|---------------------------------------|------------|----------------|-------------------|---------------------|------------|--------------|
| NJ TRANSIT   | 29.1        | 42.1        | 3.2           | 3.3                                   | 4.6        | 3.1            | 5.2               | 2.0                 | 7.4        | 100.0        |
| Coach USA    | 23.1        | 40.4        | 3.4           | 3.9                                   | 5.7        | 6.1            | 8.0               | 1.7                 | 7.7        | 100.0        |
| <b>Total</b> | <b>28.1</b> | <b>41.8</b> | <b>3.2</b>    | <b>3.4</b>                            | <b>4.8</b> | <b>3.5</b>     | <b>5.6</b>        | <b>2.0</b>          | <b>7.4</b> | <b>100.0</b> |

**Figure 33 – Trip Purpose**



- **Access/Egress** – The following tables present the NJ TRANSIT and Coach USA passengers' access to their respective vehicle and the egress from that vehicle (i.e., how they get to their bus and what mode they use to complete their trip). Table 16 details the mode choice to access their bus, while Table 17 describes the mode choice to complete their trip.

Walking is the predominant mode of access/egress to both NJ TRANSIT and Coach USA transit vehicles, followed by "another bus," which suggests the importance of an easy to manage transfer system.

**Table 16 – Access Mode (Percent)**

| Carrier      | Walk        | Drove      | Carpool/<br>Dropped Off | Another Bus | Newark City<br>Subway/Light Rail | PATH       | NJ TRANSIT Train | Bike       | Taxi       | Other      | Total        |
|--------------|-------------|------------|-------------------------|-------------|----------------------------------|------------|------------------|------------|------------|------------|--------------|
| NJ TRANSIT   | 77.1        | 1.2        | 1.1                     | 14.8        | 1.3                              | 1.3        | 1.6              | 0.0        | 0.3        | 1.3        | 100.0        |
| Coach USA    | 79.5        | 0.7        | 0.8                     | 13.8        | 1.4                              | 1.7        | 0.8              | 0.0        | 0.0        | 1.2        | 100.0        |
| <b>Total</b> | <b>77.5</b> | <b>1.1</b> | <b>1.1</b>              | <b>14.7</b> | <b>1.3</b>                       | <b>1.3</b> | <b>1.4</b>       | <b>0.0</b> | <b>0.3</b> | <b>1.3</b> | <b>100.0</b> |

**Table 17 – Mode to Complete Trip (Percent)**

| Carrier      | Walk        | Drove      | Carpool/<br>Dropped Off | Another Bus | Newark City<br>Subway/Light Rail | PATH       | NJ TRANSIT Train | Bike       | Taxi       | Other      | Total        |
|--------------|-------------|------------|-------------------------|-------------|----------------------------------|------------|------------------|------------|------------|------------|--------------|
| NJ TRANSIT   | 58.4        | 0.4        | 0.4                     | 27.0        | 1.8                              | 5.5        | 3.9              | 0.1        | 0.3        | 2.2        | 100.0        |
| Coach USA    | 63.8        | 0.1        | 0.3                     | 25.2        | 0.7                              | 5.1        | 3.1              | 0.2        | 0.1        | 1.3        | 100.0        |
| <b>Total</b> | <b>59.3</b> | <b>0.4</b> | <b>0.4</b>              | <b>26.7</b> | <b>1.6</b>                       | <b>5.5</b> | <b>3.8</b>       | <b>0.1</b> | <b>0.2</b> | <b>2.0</b> | <b>100.0</b> |

- **Fare Media** – This section describes the various fare media that were employed by the passengers of the NJ TRANSIT and Coach USA services who participated in the survey effort. Table 18 shows that monthly rail passes were used by over 50 percent of the total responding population, while one-way tickets were used by over 30 percent of the total.

**Table 18 – Fare Media (Percent)**

| Carrier      | One-Way     | Light Rail/Bus Monthly | Rail Monthly | Downtown Fare | 10-Trip    | Student Fare | Senior/Disabled/C<br>hild | Other      | Total        |
|--------------|-------------|------------------------|--------------|---------------|------------|--------------|---------------------------|------------|--------------|
| NJ TRANSIT   | 30.4        | 2.6                    | 52.9         | 3.4           | 0.8        | 1.6          | 5.7                       | 2.6        | 100.0        |
| Coach USA    | 31.8        | 3.9                    | 52.4         | 0.9           | 0.4        | 1.1          | 7.4                       | 2.1        | 100.0        |
| <b>Total</b> | <b>30.6</b> | <b>2.8</b>             | <b>52.8</b>  | <b>3.0</b>    | <b>0.8</b> | <b>1.5</b>   | <b>5.9</b>                | <b>2.5</b> | <b>100.0</b> |

- **Transportation Options** – These next set of tables detail the level to which passengers depend on the bus service they were utilizing when they received the survey. The first two tables in this section indicate the percentage of passengers who rely on transit because they have no other option. Table 19 provides details regarding the percentage of passengers who had another vehicle available to them while Table 20 depicts the percentage of riders who have a driver's license.

Over 75 percent of the total passengers across both agencies do not have a vehicle available for their transportation needs, while over 60 percent do not have a valid driver's license. These striking numbers demonstrate the ongoing need for bus transit across the GNBSS area.

**Table 19 – Vehicle Availability (Percent)**

| Carrier      | Vehicle Available for Use | No Available Vehicle | Total        |
|--------------|---------------------------|----------------------|--------------|
| NJ TRANSIT   | 25.6                      | 74.4                 | 100.0        |
| Coach USA    | 18.6                      | 81.4                 | 100.0        |
| <b>Total</b> | <b>24.5</b>               | <b>75.5</b>          | <b>100.0</b> |

**Table 20 – Licensed Drivers (Percent)**

| Carrier      | Has a Driver's License | Does Not Have a License | Total        |
|--------------|------------------------|-------------------------|--------------|
| NJ TRANSIT   | 39.9                   | 60.1                    | 100.0        |
| Coach USA    | 35.5                   | 64.5                    | 100.0        |
| <b>Total</b> | <b>39.2</b>            | <b>60.8</b>             | <b>100.0</b> |

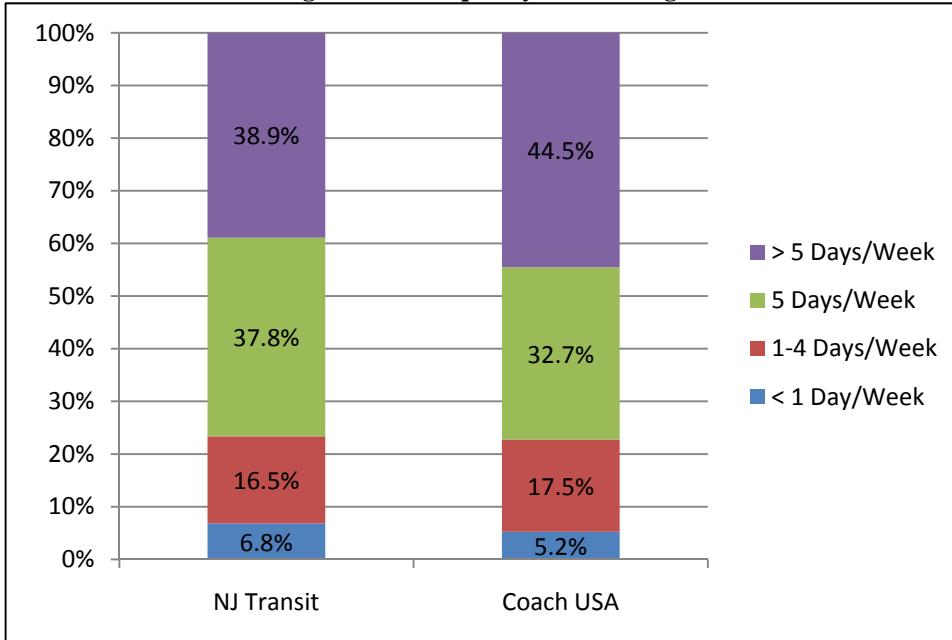
Tables 21 and 22 detail how often each passenger uses their service and how many years they have been using the bus, respectively. Additionally, Figures 34 and 35 graphically depict the information provided in Tables 21 and 22. As Table 22 and Figure 35 both detail, just under half of all of the passengers on both services combined have been riding their respective transit option for five years or longer.

The reliance on bus transit for either five, six or seven days per week in the GNBSS area is quite prevalent, as over 75 percent of the riding population across both carriers mention that they rely on bus transit daily.

**Table 21 – Frequency of Bus Usage (Percent)**

| Carrier      | 7 Days/<br>Week | 6 Days/<br>Week | 5 Days/<br>Week | 3-4<br>Days/<br>Week | 1-2<br>Days/<br>Week | 1-2<br>Days/<br>Month | <1 Day/<br>Month | 1st<br>Time | Total        |
|--------------|-----------------|-----------------|-----------------|----------------------|----------------------|-----------------------|------------------|-------------|--------------|
| NJ TRANSIT   | 22.0            | 16.9            | 37.8            | 9.8                  | 6.8                  | 3.5                   | 2.2              | 1.1         | 100.0        |
| Coach USA    | 28.5            | 16.0            | 32.7            | 10.7                 | 6.8                  | 2.5                   | 1.9              | 0.9         | 100.0        |
| <b>Total</b> | <b>23.0</b>     | <b>16.7</b>     | <b>37.0</b>     | <b>9.9</b>           | <b>6.8</b>           | <b>3.3</b>            | <b>2.2</b>       | <b>1.1</b>  | <b>100.0</b> |

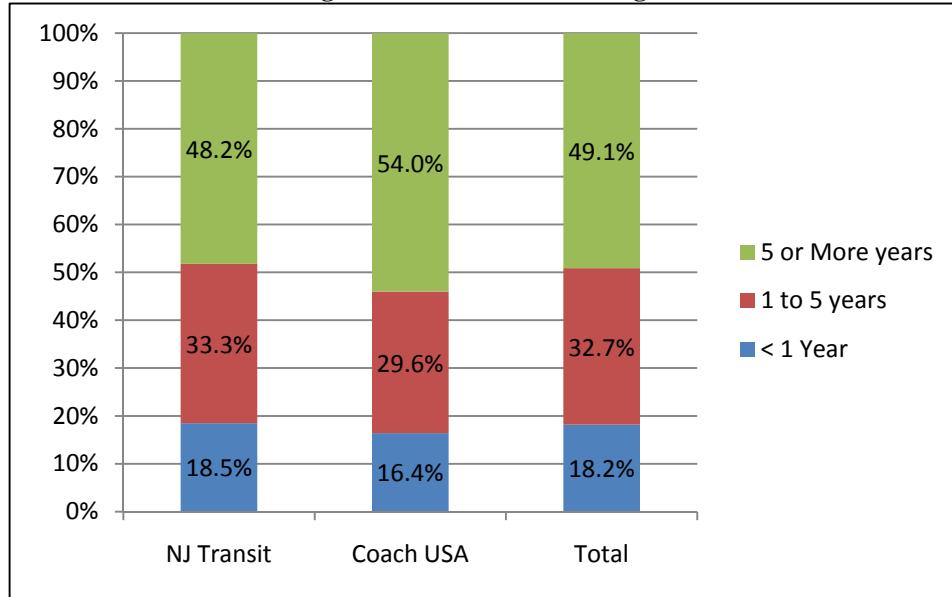
**Figure 34 – Frequency of Bus Usage**



**Table 22 – Years as a Passenger (Percent)**

| Carrier      | < 6 M      | 6M-1Y      | 1-2 Y       | 2-5 Y       | 5-10 Y      | 10+ Y       | Total        |
|--------------|------------|------------|-------------|-------------|-------------|-------------|--------------|
| NJ TRANSIT   | 9.3        | 9.2        | 11.2        | 22.1        | 16.6        | 31.6        | 100.0        |
| Coach USA    | 8.3        | 8.1        | 10.5        | 19.1        | 17.4        | 36.6        | 100.0        |
| <b>Total</b> | <b>9.1</b> | <b>9.0</b> | <b>11.1</b> | <b>21.7</b> | <b>16.7</b> | <b>32.4</b> | <b>100.0</b> |

**Figure 35 – Years as a Passenger**



- **Quality of Service** – The quality of service is described through the satisfaction of the passenger on both services and by the perceived change in the quality of service over the course of one year. Additionally, survey respondents were asked to provide one suggested improvement that they deem the most important to their service. Table 23 and Figure 36 illustrate the passenger satisfaction on a scale from zero to ten, while Table 24 details the perceived change in quality. Table 25 describes the one improvement that each passenger suggested, by category.

Great is categorized by scores of 9 and 10; Good is categorized by scores of 6, 7 and 8; Moderate is categorized by a score of 5; Fair is categorized by scores of 2, 3 and 4; and Poor is categorized by scores of 0 and 1.

As Table 23 demonstrates, the largest recorded response of the satisfaction of the service was for number 5, meaning the highest number of respondents thought that the service was adequate at best. However, when categorizing these numbers into groups, as detailed in Figure 36, over 60 percent of the responding population for both systems combined thought that the service was either good or great.

**Table 23 – Customer Satisfaction (Percent)**

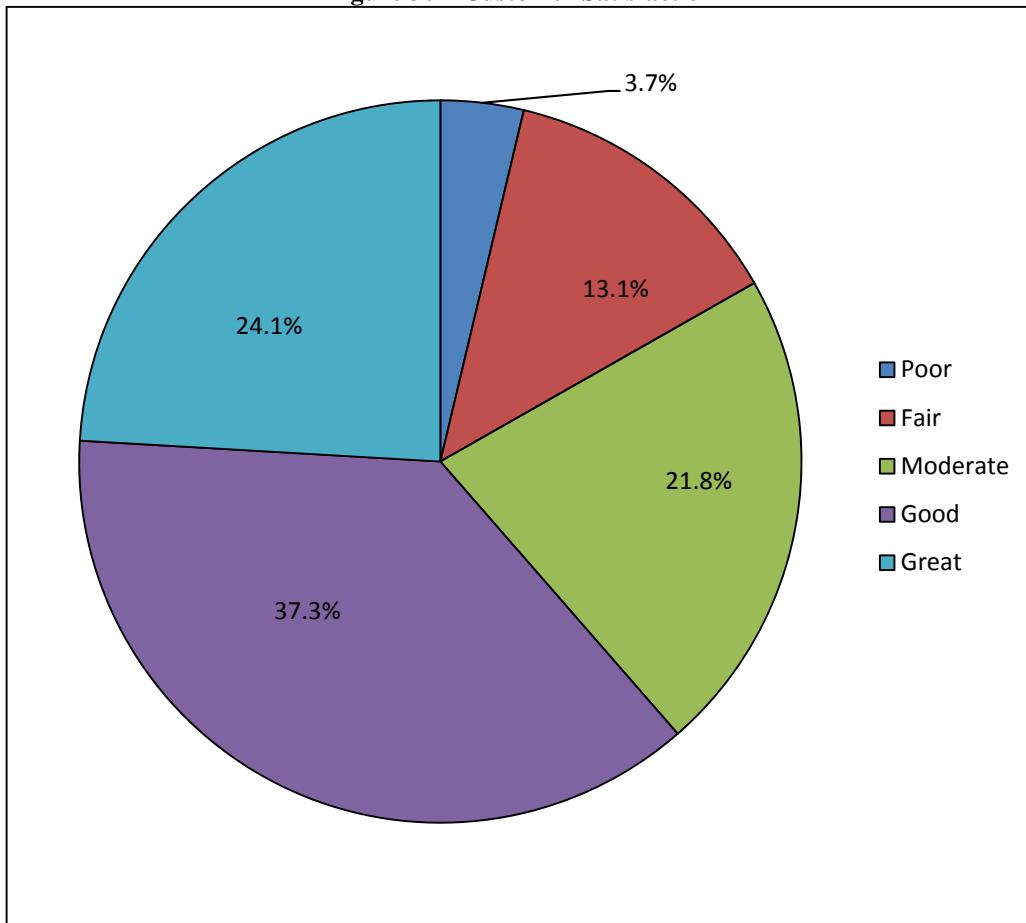
| Carrier      | 0          | 1          | 2          | 3          | 4          | 5           | 6          | 7           | 8           | 9          | 10          | Total        |
|--------------|------------|------------|------------|------------|------------|-------------|------------|-------------|-------------|------------|-------------|--------------|
| NJ TRANSIT   | 1.7        | 1.5        | 1.9        | 4.2        | 5.9        | 21.3        | 8.0        | 13.5        | 17.0        | 7.8        | 17.3        | 100.0        |
| Coach USA    | 4.9        | 2.1        | 3.4        | 7.0        | 8.6        | 24.4        | 7.3        | 10.7        | 13.1        | 5.8        | 12.7        | 100.0        |
| <b>Total</b> | <b>2.2</b> | <b>1.6</b> | <b>2.1</b> | <b>4.7</b> | <b>6.3</b> | <b>21.8</b> | <b>7.8</b> | <b>13.1</b> | <b>16.4</b> | <b>7.5</b> | <b>16.6</b> | <b>100.0</b> |

As mentioned, Table 24 details the perceived change in the quality of service over the previous year. Over 45 percent of the passengers from both services combined felt that the service has remained the same, while an additional 23 percent felt that the services have improved somewhat.

**Table 24 – Perceived Change in Service Quality (Percent)**

| Carrier      | Declined   | Somewhat Declined | Remained the Same | Somewhat Improved | Improved    | Total        |
|--------------|------------|-------------------|-------------------|-------------------|-------------|--------------|
| NJ TRANSIT   | 5.8        | 11.4              | 47.4              | 23.2              | 12.1        | 100.0        |
| Coach USA    | 10.7       | 14.8              | 41.9              | 21.5              | 11.2        | 100.0        |
| <b>Total</b> | <b>6.6</b> | <b>12.0</b>       | <b>46.5</b>       | <b>22.9</b>       | <b>11.9</b> | <b>100.0</b> |

**Figure 36 – Customer Satisfaction**



As for the suggested improvements which are listed in Table 25, just less than a quarter of the passengers felt that the frequency of the current service should be improved, while another 23 percent felt that the on-time performance was an issue that needs to be addressed. The third highest cited improvement was a need to address the customer service and information that is available (i.e., schedules).

**Table 25 – Suggested Improvements (Percent)**

| Carrier      | Frequency   | Span of Service | On-Time Performance | Cleanliness | Security   | Safety     | Fare System | Facilities/Equipment | Customer Service/Information | Service is Good as is | Crowding   | Other      | Total        |
|--------------|-------------|-----------------|---------------------|-------------|------------|------------|-------------|----------------------|------------------------------|-----------------------|------------|------------|--------------|
| NJ TRANSIT   | 25.0        | 4.7             | 20.4                | 4.0         | 2.0        | 1.3        | 5.4         | 5.2                  | 14.7                         | 7.3                   | 2.9        | 7.1        | 100.0        |
| Coach USA    | 23.0        | 2.1             | 33.8                | 2.6         | 1.4        | 0.9        | 3.4         | 3.4                  | 16.0                         | 5.0                   | 4.0        | 4.4        | 100.0        |
| <b>Total</b> | <b>24.6</b> | <b>4.2</b>      | <b>22.9</b>         | <b>3.7</b>  | <b>1.9</b> | <b>1.2</b> | <b>5.0</b>  | <b>4.8</b>           | <b>15.0</b>                  | <b>6.9</b>            | <b>3.1</b> | <b>6.6</b> | <b>100.0</b> |

• **Response Rate by Route** – Table 26 illustrates the response rate of the survey effort by route for the Weekday, Saturday and Sunday periods. Detailed in the table are the number of returned surveys, the average ridership of the route per period, the response rate and the calculated survey value per period for each route. It should be noted that the response rate represents a comparison of the number of returned surveys to the average daily ridership and not a comparison of returned surveys to distributed surveys. The survey value is calculated by dividing the average ridership by the number of returned surveys. Average ridership information for the Coach USA routes was not available.

The service with the highest response on weekdays was Route 42 (27% return); the highest response on Saturday was on Route 72 (12% return); and the highest response on Sunday was also on Route 72 (19% return).

**Table 26 – Response Rate by Route**

| Route              | Period   | Returned Surveys | Average Ridership | Response Rate | Survey Value |
|--------------------|----------|------------------|-------------------|---------------|--------------|
| 1                  | Weekday  | 749              | 7,598             | 10%           | 10.14        |
|                    | Saturday | 123              | 4,077             | 3%            | 33.15        |
|                    | Sunday   | 63               | 2,377             | 3%            | 37.73        |
| 5                  | Weekday  | 123              | 2,260             | 5%            | 18.37        |
|                    | Saturday | 0                | 840               | 0%            | 0.00         |
|                    | Sunday   | 14               | 381               | 4%            | 27.24        |
| 11, 28,<br>29 & 79 | Weekday  | 381              | 5,936             | 6%            | 15.58        |
|                    | Saturday | 168              | 4,113             | 4%            | 24.48        |
|                    | Sunday   | 129              | 2,051             | 6%            | 15.90        |
| 12                 | Weekday  | 5                | N/A               | N/A           | N/A          |
|                    | Saturday | 0                | N/A               | N/A           | N/A          |
|                    | Sunday   | 0                | N/A               | N/A           | N/A          |
| 13                 | Weekday  | 506              | 9,646             | 5%            | 19.06        |
|                    | Saturday | 176              | 6,202             | 3%            | 35.24        |
|                    | Sunday   | 42               | 2,863             | 1%            | 68.17        |
| 21                 | Weekday  | 396              | 5,053             | 8%            | 12.76        |
|                    | Saturday | 92               | 2,519             | 4%            | 27.38        |
|                    | Sunday   | 56               | 1,429             | 4%            | 25.52        |

| Route | Period   | Returned Surveys | Average Ridership | Response Rate | Survey Value |
|-------|----------|------------------|-------------------|---------------|--------------|
| 24    | Weekday  | 726              | N/A               | N/A           | N/A          |
|       | Saturday | 45               | N/A               | N/A           | N/A          |
|       | Sunday   | 172              | N/A               | N/A           | N/A          |
| 25    | Weekday  | 393              | 6,799             | 6%            | 17.30        |
|       | Saturday | 106              | 5,193             | 2%            | 48.99        |
|       | Sunday   | 52               | 3,053             | 2%            | 58.71        |
| 250   | Weekday  | 49               | N/A               | N/A           | N/A          |
|       | Saturday | N/A              | N/A               | N/A           | N/A          |
|       | Sunday   | N/A              | N/A               | N/A           | N/A          |
| 26    | Weekday  | 49               | 938               | 5%            | 19.14        |
|       | Saturday | 1                | 109               | 1%            | 109.00       |
|       | Sunday   | N/A              | N/A               | N/A           | N/A          |
| 27    | Weekday  | 356              | 8,477             | 4%            | 23.81        |
|       | Saturday | 57               | 5,966             | 1%            | 104.67       |
|       | Sunday   | 119              | 3,426             | 3%            | 28.79        |
| 31    | Weekday  | 442              | N/A               | N/A           | N/A          |
|       | Saturday | 84               | N/A               | N/A           | N/A          |
|       | Sunday   | 38               | N/A               | N/A           | N/A          |
| 34    | Weekday  | 324              | 5,635             | 6%            | 17.39        |
|       | Saturday | 76               | 2,402             | 3%            | 31.61        |
|       | Sunday   | 24               | 988               | 2%            | 41.17        |
| 37    | Weekday  | 69               | 815               | 8%            | 11.81        |
|       | Saturday | 31               | 475               | 7%            | 15.32        |
|       | Sunday   | 8                | 380               | 2%            | 47.50        |
| 39    | Weekday  | 392              | 5,400             | 7%            | 13.78        |
|       | Saturday | 45               | 2,846             | 2%            | 63.24        |
|       | Sunday   | 45               | 1,750             | 3%            | 38.88        |
| 40    | Weekday  | 75               | 1,212             | 6%            | 16.16        |
|       | Saturday | 63               | 745               | 8%            | 11.83        |
|       | Sunday   | 22               | 339               | 6%            | 15.41        |
| 41    | Weekday  | 149              | 2,046             | 7%            | 13.73        |
|       | Saturday | 23               | 1,089             | 2%            | 47.35        |
|       | Sunday   | 18               | 470               | 4%            | 26.11        |
| 42    | Weekday  | 30               | 112               | 27%           | 3.73         |
|       | Saturday | 0                | 0                 | 0%            | 0.00         |
|       | Sunday   | 0                | 0                 | 0%            | 0.00         |
| 44    | Weekday  | 195              | N/A               | N/A           | N/A          |
|       | Saturday | 35               | N/A               | N/A           | N/A          |
|       | Sunday   | 19               | N/A               | N/A           | N/A          |
| 52    | Weekday  | 62               | 1,574             | 4%            | 25.39        |
|       | Saturday | 7                | 761               | 1%            | 108.76       |
|       | Sunday   | N/A              | N/A               | N/A           | N/A          |
| 56    | Weekday  | 31               | 361               | 9%            | 11.66        |
|       | Saturday | 4                | 107               | 4%            | 26.08        |
|       | Sunday   | N/A              | N/A               | N/A           | N/A          |

| Route | Period   | Returned Surveys | Average Ridership | Response Rate | Survey Value |
|-------|----------|------------------|-------------------|---------------|--------------|
| 57    | Weekday  | 6                | 163               | 4%            | 27.11        |
|       | Saturday | 0                | 160               | 0%            | 0.00         |
|       | Sunday   | N/A              | N/A               | N/A           | N/A          |
| 58    | Weekday  | 62               | 1,006             | 6%            | 16.23        |
|       | Saturday | 21               | 310               | 7%            | 14.78        |
|       | Sunday   | N/A              | N/A               | N/A           | N/A          |
| 59    | Weekday  | 148              | 3,357             | 4%            | 22.68        |
|       | Saturday | 23               | 1,779             | 1%            | 77.35        |
|       | Sunday   | 17               | 811               | 2%            | 47.71        |
| 62    | Weekday  | 286              | 5,857             | 5%            | 20.48        |
|       | Saturday | 82               | 4,743             | 2%            | 57.84        |
|       | Sunday   | 119              | 3,874             | 3%            | 32.55        |
| 65    | Weekday  | 27               | 221               | 12%           | 8.19         |
|       | Saturday | N/A              | N/A               | N/A           | N/A          |
|       | Sunday   | N/A              | N/A               | N/A           | N/A          |
| 66    | Weekday  | 111              | 1,452             | 8%            | 13.08        |
|       | Saturday | 2                | 423               | 0%            | 211.67       |
|       | Sunday   | 2                | 350               | 1%            | 174.83       |
| 70    | Weekday  | 261              | 3,338             | 8%            | 12.79        |
|       | Saturday | 108              | 1,887             | 6%            | 17.47        |
|       | Sunday   | 65               | 808               | 8%            | 12.43        |
| 71    | Weekday  | 89               | 1,238             | 7%            | 13.91        |
|       | Saturday | 14               | 973               | 1%            | 69.50        |
|       | Sunday   | 28               | 272               | 10%           | 9.71         |
| 72    | Weekday  | 164              | 1,977             | 8%            | 12.05        |
|       | Saturday | 55               | 473               | 12%           | 8.60         |
|       | Sunday   | 52               | 275               | 19%           | 5.29         |
| 73    | Weekday  | 168              | 1,666             | 10%           | 9.92         |
|       | Saturday | 58               | 886               | 7%            | 15.28        |
|       | Sunday   | 9                | 477               | 2%            | 52.96        |
| 76    | Weekday  | 243              | 2,694             | 9%            | 11.09        |
|       | Saturday | 34               | 771               | 4%            | 22.68        |
|       | Sunday   | 46               | 479               | 10%           | 10.41        |
| 78    | Weekday  | 41               | 345               | 12%           | 8.41         |
|       | Saturday | 0                | 0                 | 0%            | 0.00         |
|       | Sunday   | 0                | 0                 | 0%            | 0.00         |
| 90    | Weekday  | 116              | 1,541             | 8%            | 13.28        |
|       | Saturday | 27               | 900               | 3%            | 33.35        |
|       | Sunday   | 26               | 539               | 5%            | 20.72        |
| 92    | Weekday  | 74               | 1,921             | 4%            | 25.96        |
|       | Saturday | 12               | 1,182             | 1%            | 98.47        |
|       | Sunday   | 21               | 353               | 6%            | 16.79        |
| 93    | Weekday  | 31               | 334               | 9%            | 10.78        |
|       | Saturday | N/A              | N/A               | N/A           | N/A          |
|       | Sunday   | N/A              | N/A               | N/A           | N/A          |

| Route | Period   | Returned Surveys | Average Ridership | Response Rate | Survey Value |
|-------|----------|------------------|-------------------|---------------|--------------|
| 94    | Weekday  | 324              | 7,050             | 5%            | 21.76        |
|       | Saturday | 51               | 3,932             | 1%            | 77.09        |
|       | Sunday   | 13               | 1,839             | 1%            | 141.49       |
| 96    | Weekday  | 61               | 1,045             | 6%            | 17.14        |
|       | Saturday | 12               | 339               | 4%            | 28.22        |
|       | Sunday   | N/A              | N/A               | N/A           | N/A          |
| 97    | Weekday  | 56               | 494               | 11%           | 8.82         |
|       | Saturday | 10               | 124               | 8%            | 12.40        |
|       | Sunday   | N/A              | N/A               | N/A           | N/A          |
| 99    | Weekday  | 128              | 2,591             | 5%            | 20.24        |
|       | Saturday | 21               | 1,075             | 2%            | 51.17        |
|       | Sunday   | 17               | 803               | 2%            | 47.24        |
| 107   | Weekday  | 233              | 2,193             | 11%           | 9.41         |
|       | Saturday | 36               | 1,357             | 3%            | 37.69        |
|       | Sunday   | 46               | 624               | 7%            | 13.57        |
| 108   | Weekday  | 112              | 624               | 18%           | 5.57         |
|       | Saturday | 13               | 471               | 3%            | 36.23        |
|       | Sunday   | 8                | 304               | 3%            | 38.00        |
| 112   | Weekday  | 50               | 1,263             | 4%            | 25.26        |
|       | Saturday | 5                | 739               | 1%            | 147.73       |
|       | Sunday   | 25               | 680               | 4%            | 27.20        |

## Appendix F – On-Board Ride Checks

Simultaneous with the rider origin-destination survey was an on-board ride check effort to collect data on passenger activity. Observations were recorded during the origin-destination survey, which took place during the spring of 2007 for Phase A, the fall of 2007 for Phase B and the fall of 2008 for Phases C and D. The following presents the results of this effort in terms of the passenger loads (“crush”) and an analysis of the running time of the GNBSS routes.

- **Passenger Loads** – The crush load for a non-articulated NJ TRANSIT vehicle was set at 55 passengers, while the routes employing articulated vehicles had a set crush load of 85 persons. Any instance of a vehicle having more than the set crush load is noted in the Table 27 for both the NJ TRANSIT and Coach USA routes that operate within the GNBSS study area.

The table lists all route that had at least once instance of the vehicle exceeding the crush load and details the phase of the study that the route was assigned, the day and direction where the crush load was exceeded, as well as the pattern and the trip start time. Additionally, the table shows the stop where the crush load was exceeded and the stop when the passenger load returned to below the set limit. Extreme crush loads (65 passengers or more on a standard NJ TRANSIT 40' vehicle, 90 patrons or more on an articulated vehicle) will be mentioned by trip.

Phase A had 33 instances of the crush limit being exceeded;  
 Phase B had 79 instances; and  
 Phases C & D, jointly, had 29 instances.

Route 1 experienced ten instances of the crush load being exceeded. Five of these ten instances began at Broad Street and Market Street. There were four trips that had an extremely large number of passengers on the vehicles: weekday inbound pattern IHAE starting its trip at 2:32 PM had a peak crush load of 83 persons; weekday inbound pattern IHRJS starting its trip at 5:30 AM had a peak crush load of 70 persons; weekday outbound pattern ALIH starting its trip at 3:24 PM had a peak crush load of 73 persons; and Saturday outbound pattern JSRIH starting its trip at 2:49 PM had a peak crush load of 68 persons.

Route 11, a phase A route, had three trips that experienced the crush load being surpassed. Of these three trips, one trip had a significant passenger load: weekday inbound pattern WB-WW starting its trip at 3:40 PM had a peak crush load of 74 patrons.

Phase B's Route 21 had 17 instances of the crush load being exceeded, with a majority of these instances occurring on West Market Street and Martin Luther King Jr. Boulevard. Two trips had higher crush loads: weekday inbound pattern ML-PS starting its trip at 9:02 AM had a peak

Several routes did not exceed the crush limit during the ride check effort. These routes, by phase, are Routes 13, 41, 76, 79 and 108 (Phase A); and Routes 5, 44, 52, 56, 57, 58, 65, 66, 92, 93 and 97 (Phases C & D). All of the Phase B routes had at least one instance of the crush limit being exceeded.

crush load of 68 passengers; and weekday outbound pattern PS-ML starting its trip at 2:55 PM had a peak crush load of 66 passengers. It is also interesting to note that there were nine weekday outbound trips that exceeded the crush load, while only four weekday inbound trips exceeded the same threshold.

**Table 27 – Occurrences of Crush Loads**

| Bus Route | Study Phase | Period/Direction | NJT Pattern ID | Trip Start Time | Location of Crush Beginning  | Location of Crush End            | Crush Peak |
|-----------|-------------|------------------|----------------|-----------------|------------------------------|----------------------------------|------------|
| 1         | A           | Wk -In           | IHRJS          | 5:30 AM         | Market & Broad               | Ferry & Lockwood                 | 70         |
|           |             |                  | IHAE           | 2:32 PM         | Market & Alling              | ---                              | 83         |
|           |             | Wk – Ou          | EPIH           | 3:04 PM         | Market & Broad               | 18th & Myrtle                    | 59         |
|           |             |                  | ALIH           | 3:24 PM         | Market & Broad               | Grove & Breckenridge             | 73         |
|           |             |                  |                | 2:35 PM         | Ferry & Madison              | Market & Mulberry                | 64         |
|           |             |                  | EPR2O          | 7:25 AM         | Raymond & Chapel             | Market & Raymond Plaza West      | 59         |
|           |             | Sat -In          | IHEP           | 4:48 PM         | 15th & Bedford               | Springfield & Irvine Turner Blvd | 56         |
|           |             |                  |                | 4:48 PM         | Market & Broad               | Ferry & Filmore                  | 62         |
|           |             | Sat Ou           | JSRIH          | 2:49 PM         | Market & Broad               | 16th & South 19th                | 68         |
|           |             | Sun -Ou          | ALIH           | 8:13 PM         | Market & Raymond Plaza West  | 16th & Camden                    | 57         |
| 11        | A           | Wk -In           | WB-WW          | 3:40 PM         | Bloomfield & Maple           | Bloomfield & Ward                | 56         |
|           |             |                  |                | 3:40 PM         | Bloomfield & Orange          | Bloomfield & Summer              | 74         |
|           |             | Sat - Ou         | WW-WB          | 10:00 AM        | Bloomfield & Park            | Bloomfield & North Willow        | 56         |
| 21        | B           | Wk -In           | ML-PS          | 9:02 AM         | MLK/Halsted                  | W. Market/MLK                    | 68         |
|           |             |                  |                | 9:22 AM         | MLK/S. Walnut                | MLK/Winans                       | 57         |
|           |             |                  | MD-PS          | 7:20 AM         | W. Market/Central            | W. Market/Bergen                 | 58         |
|           |             |                  |                | 7:44 AM         | MLK/Winans                   | W. Market/Wickliffe              | 63         |
|           |             | Wk -Ou           | PS-ML          | 7:06 AM         | MLK/N. Walnut                | MLK/N. Clinton                   | 55         |
|           |             | Wk -Ou           | PS-ML (cont.)  | 11:05 AM        | Orange/N. 14th               | MLK/N. Arlington                 | 56         |
|           |             |                  |                | 2:55 PM         | W. Market/Cabinet            | MLK/Lincoln                      | 66         |
|           |             |                  |                | 3:36 PM         | W. Market/Fairmount          | W. Market/Gray                   | 58         |
|           |             |                  |                | 3:58 PM         | W. Market/Wickliffe          | W. Market/N. 6th                 | 56         |
|           |             |                  |                | 3:58 PM         | MLK/N. Grove                 | MLK/N. Munn                      | 55         |
|           |             |                  |                | 7:00 PM         | Mulberry/Commerce            | MLK/N. 15th                      | 63         |
|           |             |                  |                | 8:45 PM         | W. Market/Richmond           | MLK/Greenwood                    | 62         |
|           |             |                  |                | 10:15 PM        | W. Market/1st                | MLK/Greenwood                    | 55         |
|           |             | Sat -In          | ML-PS          | 12:21 PM        | MLK/S. Walnut                | Market/Broad                     | 62         |
|           |             |                  |                | 1:09 PM         | MLK/S. Munn                  | W. Market/Bergen                 | 63         |
|           |             | Sat -Ou          | PS-ML          | 12:14 PM        | MLK/N. Grove                 | MLK/Prospect                     | 58         |
|           |             |                  |                | 8:35 PM         | Mulberry/Commerce            | W. Market/Fairmount              | 63         |
| 25        | A           | Wk -In           | 43EP           | 9:51 AM         | Springfield & Boyd           | Springfield & MLK Jr. Blvd       | 57         |
|           |             | Wk -Ou           | DW-43          | 3:40 PM         | Springfield & MLK Jr. Blvd   | Springfield & Hayes              | 59         |
| 26        | C&D         | Wk -In           | ITEL           | 8:34A           | New Street @ Springfield Ave | Morris Ave @ Kean Dr.            | 73         |
| 27        | A           | Wk -In           | IT-FH          | 2:25 PM         | Bloomfield & Mt. Prospect    | Mt. Prospect & E. 3rd            | 55         |
|           |             |                  | IT-BC          | 5:00 PM         | Broad & W. Park              | Broad & NJ TRANSIT Station       | 57         |

| Bus Route  | Study Phase | Period/Direction | NJT Pattern ID | Trip Start Time | Location of Crush Beginning | Location of Crush End         | Crush Peak |
|------------|-------------|------------------|----------------|-----------------|-----------------------------|-------------------------------|------------|
| 27 (cont.) | A (cont.)   | Wk-Ou            | BC-IT          | 5:00 PM         | Broad & Market              | Hawthorne & Osborne           | 63         |
|            |             | Sat-Ou           | FH-IT          | 4:56 PM         | Broad & Lombardy            | Elizabeth & W. Bigelow        | 65         |
| 28         | A           | Sun-Ou           | PNWB           | 9:40 AM         | Bloomfield & Clifton        | Bloomfield & N. 6th           | 57         |
|            |             |                  |                | 9:40 AM         | Bloomfield & Newark         | Willowbrook Mall              | 79         |
| 29         | A           | Sat-Ou           | WW-EM          | 6:55 AM         | Bloomfield & Hartley        | Bloomfield & Maple            | 59         |
| 31         | C&D         | Wk-In            | 31EBMPLW       | 7:30A           | S. Orange Ave @ Stuyvesant  | S. Orange Ave @ Howard St     | 63         |
|            |             |                  |                | 7:44A           | S. Orange Ave @ Stuyvesant  | S. Orange Ave @ Prince St     | 63         |
|            |             |                  |                | 8:00A           | S. Orange Ave @ S. 19th St  | S. Orange Ave @ S. 17th St    | 57         |
|            |             |                  |                | 8:18A           | S. Orange Ave @ Stuyvesant  | S. Orange Ave @ S. 14th St    | 58         |
|            |             |                  |                | 8:18A           | S. Orange Ave @ S. 11th St  | S. Orange Ave @ Fairmount     | 56         |
|            |             |                  |                | 8:18A           | S. Orange Ave @ Bruce St    | S. Orange Ave @ Howard St     | 57         |
|            |             |                  |                | 8:39A           | S. Orange Ave @ Bruce St    | S. Orange Ave @ Prince St     | 55         |
|            |             | Wk-Ou            | 31EBLVML       | 2:02P           | S. Orange Ave @ S. 14th St  | S. Orange Ave @ S. 11th St    | 55         |
|            |             |                  |                | 2:45P           | S. Orange Ave @ S. 14th St  | S. Orange Ave @ S. 16th St    | 55         |
|            |             |                  | 31WBMPLW       | 3:48P           | S. Orange Ave @ Bergen St   | S. Orange Ave @ Littleton Ave | 56         |
|            |             |                  |                | 2:55P           | S. Orange Ave @ Norfolk St  | S. Orange Ave @ Bergen St     | 55         |
|            |             |                  |                | 3:17P           | Springfield Ave @ MLK Blvd  | S. Orange Ave @ Bruce St      | 59         |
|            |             |                  |                | 4:40P           | Market St @ Broad St        | S. Orange Ave @ Norfolk St    | 56         |
|            |             |                  |                | 5:12P           | S. Orange Ave @ Bruce St    | S. Orange Ave @ S. 7th St     | 57         |
| 34         | A           | Wk-In            | BC-SP          | 12:40 PM        | 12th & Bergen               | W. Market & MLK Jr. Blvd      | 56         |
|            |             |                  | M-P            | 7:02 AM         | Roseville & Orange          | W. Market & Richmond          | 58         |
|            |             | Wk-Ou            | P-M            | 4:22 PM         | Market & Halsey             | Bergen & W. Market            | 56         |
|            |             | Sat-Ou           | P-M            | 1:50 PM         | Market & Halsey             | 12th & Littleton              | 59         |
| 39         | C&D         | Wk-In            | HGNA           | 3:31P           | Broad St @ W. Park          | Kearny Ave @ Hoyt St          | 93         |
| 40         | B           | Wk-Ou            | JGRL           | 2:34 PM         | PATH Station                | Davis/William                 | 72         |
| 59         | C&D         | Wk-In            | 1              | 7:10A           | Jersey Ave @ Grove St       | Broad St @ Jersey Ave         | 60         |
|            |             | Wk-In            | 3              | 2:59P           | Elizabeth Arch              | N. Broad St @ Fairmount Ave   | 55         |
| 62         | B           | Wk-In            | SD-AP          | 5:35 AM         | Broad/Parkhurst             | Broad/Pennington              | 55         |
|            |             |                  |                | 5:35 AM         | Broad/William               | Broad/Brandford               | 56         |
|            |             |                  |                | 2:53 PM         | Newark Airport Terminal C   | Broad/Brandford               | 59         |
|            |             |                  |                | 6:59 PM         | Newark Airport Terminal C   | Broad/Brandford               | 67         |
|            |             |                  |                | 9:08 PM         | Newark Airport Terminal C   | Broad/Chestnut                | 63         |
|            | Wk-Ou       | PAIWM            | PAFBJ          | 9:05 AM         | Broad/Brandford             | Rt 1-9/International Way      | 61         |
|            |             |                  | PAFBJ          | 11:15 AM        | Broad/W. Kinney             | Newark Airport Terminal A     | 60         |
|            |             |                  |                | 11:55 AM        | Broad/Edison                | Broad/Parkhurst               | 60         |

| Bus Route     | Study Phase  | Period/Direction | NJT Pattern ID | Trip Start Time | Location of Crush Beginning     | Location of Crush End          | Crush Peak |
|---------------|--------------|------------------|----------------|-----------------|---------------------------------|--------------------------------|------------|
| 62<br>(cont.) | B<br>(cont.) | Wk-Ou<br>(cont.) | PS-EC          | 11:45 AM        | Broad/Hill                      | Newark Airport Terminal A      | 63         |
|               |              |                  | PA-BJ          | 1:15 PM         | Broad/Edison                    | Newark Airport Terminal A      | 58         |
|               |              | Sat-In           | MCIAP          | 7:25 AM         | Newark Airport C Terminal       | Broad/Murray                   | 56         |
|               |              |                  | BJ-AP          | 3:25 PM         | Newark Airport C Terminal       | Broad/Chestnut                 | 64         |
|               |              | Sat-Ou           | PA-SD          | 7:35 AM         | Broad/Wright                    | Newark Airport Terminal A      | 65         |
|               |              |                  | PS-EC          | 12:25 PM        | Commerce St/Commerce Ct         | Newark Airport Terminal A      | 68         |
|               |              | Sun-In           | WM1AP          | 7:19 PM         | Newark Airport C Terminal       | Broad/Murray                   | 56         |
|               |              |                  | TA-PS          | 9:22 PM         | Broad/Murray                    | Broad/South                    | 55         |
|               |              | Sun-Ou           | PS-EC          | 11:25 AM        | Broad/Wright                    | Newark Airport Terminal A      | 60         |
| 70            | A            | Wk-In            | SH-PS          | 7:00 AM         | Avon & Tracy                    | Avon & Irvine Turner Blvd      | 57         |
|               |              | Wk-Ou            | PSVLM          | 6:00 AM         | Springfield & Chancellor        | Springfield & Rutgers          | 55         |
|               |              | Sat-Ou           | PSOLM          | 11:30 AM        | Springfield & Civic Square      | Broad & Maple                  | 69         |
|               |              | Sun-In           | LM-IT          | 7:30 PM         | Canoe Brook & Bonwit Teller     | Broad & Maple                  | 56         |
| 71            | B            | Wk-Ou            | PSOUF          | 7:35 AM         | Main/Lindsley                   | Prospect/Eagle Rock Apts       | 58         |
|               |              | Sun-In           | WEPS           | 5:25 PM         | Eagle Rock/Woodhull             | Main/Scotland                  | 61         |
| 72            | A            | Sat-Ou           | PS-BT          | 4:30 PM         | Penn Station                    | Bloomfield & Clifton           | 67         |
|               |              |                  |                | 4:30 PM         | Broad & Liberty                 | Broad & Almira                 | 56         |
|               |              |                  |                | 4:30 PM         | Broad & bay                     | Broad & Glen Ridge             | 55         |
| 73            | B            | Sat-In           | LFP15          | 6:26 PM         | S. Livingston/Concord           | Main/Bell                      | 62         |
|               |              | Sun-In           | LFH15          | 5:20 PM         | St Barnabas Medical Center      | Main/Jefferson                 | 58         |
| 90            | C&D          | Wk-In            | EP-CS          | 4:10P           | Springfield Ave @ Maple         | Grove St @ Berkeley Terrace    | 57         |
| 94            | C&D          | Wk-In            | BC-22          | 7:47P           | Stuyvesant @ Berkeley Terrace   | Stanley Terr. @ Ashwood Terr.  | 55         |
|               |              |                  |                | 3:50P           | S. Clinton Ave @ Elmwood Ave    | S. Clinton Ave @ S. Orange Ave | 58         |
|               |              |                  | BC-UC          | 4:29P           | Central Ave @ Halsted           | S. Clinton Ave @ Central Ave   | 58         |
|               |              | Wk-Ou            | 22-BC          | 3:49P           | Clinton Ave @ Stuyvesant        | Evergreen Place @ Freeway      | 67         |
|               |              |                  | LI-BC          | 5:10P           | Stuyvesant @ Chancellor         | Stuyvesant @ Colleen           | 62         |
| 99            | C&D          | Wk-In            | BC-CO          | 7:36A           | Irvine Turner @ Springfield Ave | Irvine Turner @ W. Kinney      | 55         |
|               |              |                  | SH-HS          | 3:24P           | Irvine Turner @ Springfield Ave | Bergen St @ W. Bigelow         | 65         |
|               |              | Wk-Ou            | HS-BC          | 7:14A           | Bergen St @ Avon                | Irvine Turner @ W. Kinney      | 57         |
|               |              |                  |                | 7:42A           | Avon @ Jeliff                   | Irvine Turner @ Avon           | 55         |
| 112           | C&D          | Sun-In           | 3              | 8:05A           | Jersey Ave @ Elmora             | Broad St @ Jersey Ave          | 68         |
| C12&24        | B            | Wk-In            | 24ASB          | 6:25 AM         | Broad/W. Kinney                 | Broad/Wright                   | 56         |
|               |              |                  |                | 7:04 AM         | Broad/W. Kinney                 | Broad/South                    | 58         |
|               |              |                  |                | 7:28 AM         | Central/Norfolk                 | Central/Lock                   | 55         |
|               |              |                  | 24ASB          | 10:07 AM        | Central/MLK                     | Central/University             | 55         |
|               |              |                  |                | 10:07 AM        | Broad/Cedar                     | Frelinghuysen/Noble            | 65         |
|               |              |                  |                | 10:07 AM        | Frelinghuysen/Meeker            | Frelinghuysen/Foster           | 58         |
|               |              |                  |                | 3:52 PM         | Broad/Westfield                 | Elizabeth/South                | 65         |

| Bus Route         | Study Phase  | Period/Direction | NJT Pattern ID   | Trip Start Time | Location of Crush Beginning   | Location of Crush End         | Crush Peak |
|-------------------|--------------|------------------|------------------|-----------------|-------------------------------|-------------------------------|------------|
| C12&24<br>(cont.) | B<br>(cont.) | Wk-In<br>(cont.) | 24ASB<br>(cont.) | 4:37 PM         | Broad/Market                  | Frelinghuysen/Dayton          | 69         |
|                   |              |                  |                  | 4:37 PM         | Elizabeth/Jefferson           | Elizabeth/High                | 60         |
|                   |              |                  |                  | 5:01 PM         | Broad/Hill                    | Broad/Court                   | 55         |
|                   |              |                  |                  | 6:05 PM         | Broad/Market                  | Frelinghuysen/S. Boyden Terr. | 74         |
|                   |              |                  |                  | 6:36 PM         | Broad/W. Kinney               | Frelinghuysen/Concord         | 59         |
|                   |              |                  | 24BSB            | 4:40 AM         | Broad/South                   | Frelinghuysen/Victoria        | 59         |
|                   |              |                  |                  | 12:15 PM        | Frelinghuysen/S. Boyden Terr. | Jersey Gardens                | 73         |
|                   |              |                  |                  | 1:15 PM         | E. Jersey/Madison             | E. Jersey/Division            | 55         |
|                   |              |                  |                  | 1:52 PM         | Broad/Court                   | Frelinghuysen/Peddie          | 57         |
|                   |              |                  |                  | 1:52 PM         | E. Jersey/Broad               | 3rd/E. Jersey                 | 70         |
|                   |              |                  |                  | 5:25 PM         | Broad/Wright                  | Frelinghuysen/Toler           | 57         |
|                   |              | Wk-Ou            | 24ANB            | 9:00 PM         | E. Jersey/7th                 | Jersey Gardens                | 61         |
|                   |              |                  |                  | 3:45 AM         | Broad/E. Jersey               | Newark/North                  | 59         |
|                   |              |                  |                  | 3:45 AM         | Frelinghuysen/Concord         | Broad/South                   | 56         |
|                   |              |                  |                  | 6:17 AM         | Frelinghuysen/Van Duyne       | Frelinghuysen/Cowell          | 55         |
|                   |              |                  |                  | 6:35 AM         | Frelinghuysen/Noble           | Frelinghuysen/Toler           | 55         |
|                   |              |                  | 24BNB            | 6:47 AM         | Elizabeth/6th                 | ?                             | 59         |
|                   |              |                  |                  | 12:38 PM        | Frelinghuysen/Victoria        | Broad/Murray                  | 57         |
|                   |              |                  |                  | 5:19 PM         | Frelinghuysen/Toler           | Broad/Walnut                  | 61         |
|                   |              |                  |                  | 6:16 PM         | Elizabeth/6th                 | Broad/Elizabeth               | 58         |
|                   |              | Sun-In           | 24BNB            | 6:16 PM         | N. Broad/Mary                 | Newark/Fairmount              | 55         |
|                   |              |                  |                  | 12:38 PM        | Frelinghuysen/Noble           | Broad/Walnut                  | 64         |
|                   |              |                  |                  | 1:24 PM         | Frelinghuysen/Noble           | Park Place/Raymond            | 65         |
|                   |              |                  | 24BNB            | 2:43 PM         | Frelinghuysen/Clifton         | Frelinghuysen/E. Alpine       | 55         |
|                   |              |                  |                  | 3:14 PM         | 1st/Magnolia                  | Elizabeth/Jefferson           | 61         |
|                   |              |                  |                  | 4:31 PM         | Central/S. 10th               | Central/S. Munn               | 61         |
|                   |              | Sun-Ou           | 24ANB            | 8:06 PM         | Broad/E. Jersey               | Newark/Fairmount              | 62         |
|                   |              |                  |                  | 7:06 PM         | Glimcher Rlty Way/Kapkowski   | Trumbull/1st                  | 55         |
|                   |              |                  | 24ASB            | 11:45 AM        | Broad/W. Jersey               | Elizabeth/4th                 | 60         |
|                   |              |                  |                  | 12:55 PM        | Elizabeth/High                | Elizabeth/4th                 | 59         |
|                   |              |                  | 24BNB            | 2:05 PM         | E. Jersey/Jefferson           | E. Jersey/Madison             | 55         |
|                   |              | Sat-Ou           | 24BNB            | 5:47 PM         | Broad/E. Jersey               | Newark/Alina                  | 67         |
|                   |              |                  |                  | 5:47 PM         | Frelinghuysen/McClellan       | Frelinghuysen/E. Alpine       | 59         |

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Route 25 had two trips that experienced crush loads being exceeded; however neither phase A trip had an exceedingly large crush load. Similarly, phases C and D's route 26 had a single trip that exceeded the crush load; however, this trip, weekday inbound pattern ITEL starting its trip at 8:34 AM had a peak crush load of 73 persons. Route 27, which was surveyed as part of phase A, had four crush load instances, with one of those trips having an extreme crush load: Saturday outbound pattern FH-IT starting its trip at 4:56 PM had a peak crush load of 65 patrons.

There were two instances of crush loads for the phase A route 28 service, but just one of these trips had an extreme crush load: Sunday outbound pattern PNNB starting its trip at 9:40 AM had a peak crush load of 79 passengers. Route 29, also a phase A route, had one instance of the crush load being exceeded.

Phases C and D's route 31 had 14 instances where the vehicle's crush load was exceeded; however none of these trips were severely impacted by passengers. Similarly, phase A's route 34, while having four instances of the crush levels being exceeded, had no extreme crush loads.

Route 39 which operates with articulated vehicles and was surveyed as part of phases C and D, had only one instance where the crush load was exceeded: weekday inbound pattern HGNA starting its trip at 3:31 PM had a peak crush load of 93 persons. Phase B's route 40 also had only one trip that exceeded the crush load: weekday outbound pattern JGRL starting its trip at 2:34 PM had a peak crush load of 72 passengers. Phases C and D's route 59 had two instances where the crush load was exceeded.

Route 62 of phase B has 17 cases of the crush load being surpassed. Of those 17 trips, six of them exceeded the crush load at Newark International Airport's Central Terminal. Two of the 17 trips had extreme crush loads of over 65 passengers: weekday inbound pattern SD-AP starting its trip at 6:59 PM had a peak crush load of 67 passengers, while Saturday outbound pattern PS-EC starting its trip at 12:25 PM had a peak crush load of 68 passengers.

The phase A route 70 had four instances where the crush load was exceeded, one of which was extreme: Saturday outbound pattern PSOLM starting its trip at 11:30 AM had a peak crush load of 69 persons.

Route 71 of phase B had two instances where the crush load was exceeded, while route 72 of phase A had three trips where the crush load was surpassed. Phase B's route 73 had two cases where the crush load was exceeded. With the exception of one of the route 71 trips, all of the instances of the crush loads being exceeded on these three routes occurred during the weekend period.

The phases C and D route 90 had one instance of the crush load being exceeded, while route 94 had 5 trips that surpassed the crush load. One of these route 94

trips, the weekday outbound pattern 22-BC starting at 3:49 PM, had a peak crush load of 67 passengers.

The Route 94 service, surveyed during phases C and D, had four trips where the passenger level surpassed the crush load. One of these trips, the weekday inbound pattern SH-HS starting at 3:24 PM, had a peak crush load of 65 passengers. Phases C and D's route 112 had one instance where the crush load was surpassed, with 68 persons using the Sunday inbound pattern 3 starting at 8:05 AM.

A number of data items were missing, making it difficult to analyze some of the recorded run times versus the scheduled run times. The effected data includes Routes 26, 39, 52, 58, 59, 66, 94 and 112.

The route 112 service, surveyed as part of phases C and D, had one trip that exceeded the crush load: Sunday inbound pattern 3 starting at 8:05 AM had a peak crush load of 68 persons.

Lastly, Coach USA route 12 and route 24, which were surveyed as part of phase B, had 40 trips that exceeded the crush load. Of those trips, eight are considered as severely crowded: weekday inbound pattern 24ASB starting at 10:07 AM (65 persons), 3:52 PM (65 persons), 4:37 PM (69 persons) and 6:05 PM (74 persons); weekday inbound pattern 24BSB starting at 12:15 PM (73 persons) and 1:52 PM (70 persons); weekday outbound pattern 24BNB starting at 1:24 PM (65 persons); and Sunday outbound pattern 24BNB starting at 5:47 PM (67 persons).

- **Running Time** – This section of the presents the analysis of the running time data (Form 5) for phases A, B, C & D of the GNBSS. The Form 5 data was collected during the on-board ride check effort. The ride check effort kept track of the boarding and alighting activity at each stop, as well as monitored the stop to stop running time for each route during the weekday period, and for Saturday and Sunday.

For this analysis, the observed times for each pattern have been averaged with the other observed times according to the time period which they operate, as provided by NJ TRANSIT. These averages where then compared to the scheduled time for each pattern by time period. Any discrepancy between the scheduled times and the averaged observed times larger than five minutes are noted in this memo by time period.

Table 28 present the routes by patterns and then by the time periods where discrepancies of larger than five minutes had occurred.

**Table 28 – Running Time Discrepancies**

| Bus Route | NJT Pattern ID | Period | Direction | Time Period | Scheduled | Average | Discrepancy (+/-) | Trips |
|-----------|----------------|--------|-----------|-------------|-----------|---------|-------------------|-------|
| 1         | 20AE           | WK     | IB        | 5:30A-7A    | 27        | 34      | 7                 | 1     |
|           |                |        |           | 9A-3P       | 31        | 38      | 7                 | 1     |
|           | 20AL           | WK     | IB        | 9A-3P       | 30        | 38.5    | 8.5               | 2     |
|           | 20R            | WK     | IB        | 5:30A-7A    | 28        | 36      | 8                 | 1     |
|           | 20REP          | WK     | IB        | 5:30A-7A    | 53        | 62      | 9                 | 1     |
|           | 20RJS          | WK     | IB        | 7A-9A       | 56        | 71      | 15                | 1     |
|           | IHAE           | WK     | IB        | 9A-3P       | 43        | 53      | 10                | 1     |
|           |                |        |           | 3P-6P       | 46        | 58.4    | 12.4              | 7     |
|           |                | Sat    | IB        | 10A-6:30P   | 47        | 61.7    | 14.7              | 3     |
|           | IHEP           | WK     | IB        | 3A-5:30A    | 58        | 68      | 10                | 1     |
|           |                |        |           | 7A-9A       | 70        | 80.5    | 10.5              | 2     |
|           |                |        |           | 3P-6P       | 70        | 88      | 18                | 1     |
|           | IHEU           | WK     | IB        | 9A-3P       | 42        | 59.6    | 17.6              | 5     |
|           | IHPS           | WK     | IB        | 3P-6P       | 33        | 44      | 11                | 1     |
|           |                |        |           | 6P-7P       | 30        | 45      | 15                | 1     |
|           | IHRJS          | WK     | IB        | 5:30A-7A    | 59        | 74      | 15                | 1     |
|           |                |        |           | 3P-6P       | 68        | 89      | 21                | 1     |
|           | AL20           | WK     | OB        | 3P-6P       | 34        | 53      | 19                | 1     |
|           |                |        |           | 6P-7P       | 31        | 41      | 10                | 1     |
|           | ALIH           | WK     | OB        | 9A-3P       | 43        | 54.7    | 11.7              | 10    |
|           |                |        |           | 3P-6P       | 46        | 62.9    | 16.9              | 9     |
|           |                |        |           | 6P-7P       | 43        | 52.5    | 9.5               | 2     |
|           |                |        |           | 10A-6P      | 49        | 57.7    | 8.7               | 3     |
|           | EP20           | WK     | OB        | 3A-7A       | 49        | 60      | 11                | 1     |
|           | EPIH           | WK     | OB        | 3P-6P       | 72        | 95      | 23                | 1     |
|           | EPR20          | WK     | OB        | 3A-7A       | 55        | 67      | 12                | 1     |
|           |                |        |           | 7A-9A       | 65        | 77      | 12                | 1     |
|           | EPRIH          | WK     | OB        | 7A-9A       | 77        | 86      | 9                 | 1     |
|           | PSIH           | WK     | OB        | 3P-6P       | 34        | 47      | 13                | 1     |
| 5         | PSX15          | Sat    | OB        | 6P-3A       | 25        | 35.0    | 10                | 1     |
| 11        | WB-PS          | WK     | IB        | 6:20P-10P   | 63        | 73      | 10                | 1     |
|           |                | Sat    | IB        | 7:30A-9:30P | 72        | 62      | -10               | 1     |
|           | WBSUB          | Sat    | IB        | 7:30A-9:30P | 55        | 44      | -11               | 2     |
|           | WBWW           | Sat    | IB        | 7:30A-9:30P | 74        | 57.8    | -16.2             | 5     |
|           | BLMWB          | WK     | OB        | 9A-3:30P    | 39        | 32      | -7                | 1     |
|           | PS-WB          | WK     | OB        | 6:20P-10P   | 69        | 78.5    | 9.5               | 2     |
|           | SUBWB          | Sat    | OB        | 7:30A-9:30P | 51        | 61      | 10                | 1     |
| 13        | BT-IT          | WK     | IB        | 3A-6:30A    | 42        | 50      | 8                 | 1     |
|           |                |        |           | 10:30A-3P   | 51        | 60      | 9                 | 1     |
|           |                |        |           | 7P-3A       | 43        | 62      | 19                | 1     |
|           |                | Sat    | IB        | 6:30A-6:30P | 45        | 55.8    | 10.8              | 5     |
|           | BT-VF          | WK     | IB        | 3A-7P       | 57        | 67      | 10                | 1     |

| Bus Route     | NJT Pattern ID | Period      | Direction  | Time Period  | Scheduled | Average | Discrepancy (+/-) | Trips |
|---------------|----------------|-------------|------------|--------------|-----------|---------|-------------------|-------|
| 13<br>(cont.) | BT-VF (cont.)  | Sat         | IB         | 6:30A-6:30P  | 47        | 58.4    | 11.4              | 9     |
|               |                |             |            | 6:30P-3A     | 44        | 57      | 13                | 1     |
|               | GC-IT          | WK          | IB         | 7P-3A        | 44        | 56      | 12                | 1     |
|               |                | Sat         | IB         | 6:30A-6:30P  | 47        | 60      | 13                | 1     |
|               | KB-VF          | WK          | IB         | 10:30A-3P    | 68        | 79      | 11                | 1     |
|               | KB-VF          | Sat         | IB         | 6:30A-6:30P  | 62        | 71      | 9                 | 1     |
|               |                | Sun         | IB         | 7A-6:30P     | 58        | 71      | 13                | 1     |
|               | MM-VF          | WK          | IB         | 6:30A-10:30P | 50        | 28.5    | -21.5             | 2     |
|               | KB-IT          | Sat         | IB         | 6:30P-3A     | 56        | 72      | 16                | 1     |
|               |                | Sun         | IB         | 3A-7A        | 52        | 64      | 12                | 1     |
|               | IT-BT          | WK          | OB         | 3P-8:30P     | 52        | 66      | 14                | 1     |
|               |                |             |            | 6:30P-3A     | 44        | 51.5    | 7.5               | 6     |
|               |                | Sat         | OB         | 3A-6:30A     | 40        | 63      | 23                | 1     |
|               |                |             |            | 6:30A-6:30P  | 47        | 58.7    | 11.7              | 7     |
|               |                | Sun         | OB         | 6:30P-3A     | 40        | 33      | -7                | 1     |
|               | VF-GC          | WK          | OB         | 3A-6:45A     | 48        | 58      | 10                | 1     |
|               |                |             |            | 3P-6:30P     | 58        | 79      | 21                | 1     |
|               |                | Sat         | OB         | 3A-6:30A     | 44        | 52      | 8                 | 1     |
|               |                |             |            | 6:30A-6:30P  | 50        | 63      | 13                | 1     |
|               |                | Sun         | OB         | 7A-6:30P     | 57        | 64      | 7                 | 1     |
|               | VF-KB          | WK          | OB         | 3P-6:30P     | 72        | 79      | 7                 | 1     |
|               |                |             |            | 6:30P-3A     | 61        | 79      | 18                | 1     |
|               |                | Sat         | OB         | 6:30A-6:30P  | 62        | 84      | 22                | 1     |
|               | IT-GC          | WK          | OB         | 6:30P-3A     | 45        | 61      | 16                | 1     |
|               |                | Sat         | OB         | 6:30A-6:30P  | 49        | 57      | 8                 | 1     |
|               | IT-KB          | Sat         | OB         | 6:30A-6:30P  | 61        | 71      | 10                | 1     |
|               | VF-BT          | Sun         | OB         | 7A-6:30P     | 43        | 50.5    | 7.5               | 4     |
| 21            | MD-PS          | WK          | IB         | 3A-6:15A     | 24        | 29      | 5                 | 1     |
|               | ML-PS          | WK          | IB         | 5:30P-3A     | 23        | 29      | 6                 | 1     |
|               |                | Sun         | IB         | 3A-6A        | 39        | 28      | -11               | 1     |
|               | ML-PS (cont.)  | Sun (cont.) | IB (cont.) | 5:30P-6:30P  | 40        | 34      | -6                | 1     |
|               |                |             |            | 6:30P-3A     | 39        | 31.8    | -7.2              | 4     |
|               | PS-MD          | Sun         | OB         | 3A-6:30A     | 25        | 32      | 7                 | 1     |
|               | PS-ML          | Sun         | OB         | 7:30P-3A     | 33        | 39.3    | 6.3               | 9     |
| 25            | 43EP           | WK          | IB         | 7:30A-1P     | 43        | 26.5    | -16.5             | 2     |
|               |                | Sat         | IB         | 7:30A-6P     | 49        | 38      | -11               | 1     |
|               | 43PS           | WK          | IB         | 6P-7:30P     | 30        | 18      | -12               | 1     |
|               | 43TOY          | WK          | IB         | 9A-2P        | 48        | 57      | 9                 | 1     |
|               | MW-DW          | WK          | IB         | 7:30P-1A     | 44        | 51      | 7                 | 1     |
|               |                | Sat         | IB         | 7P-1A        | 36        | 50      | 14                | 1     |
|               | MW-PS          | WK          | IB         | 7A-9A        | 39        | 46      | 7                 | 1     |
|               |                | Sat         | IB         | 3A-7:30A     | 24        | 41      | 17                | 1     |
|               |                |             |            | 7:30A-6P     | 31        | 42      | 11                | 1     |
|               | MW-PS          | Sun         | IB         | 7A-7P        | 26        | 35      | 9                 | 1     |
|               | MWTOY          | WK          | IB         | 7:30P-1A     | 48        | 40      | -8                | 1     |

| Bus Route     | NJT Pattern ID | Period | Direction | Time Period | Scheduled | Average | Discrepancy (+/-) | Trips |
|---------------|----------------|--------|-----------|-------------|-----------|---------|-------------------|-------|
| 25<br>(cont.) | MWTOY (cont.)  | Sun    | IB        | 7A-7P       | 43        | 67      | 24                | 1     |
|               | MWEP           | Sat    | IB        | 6P-7P       | 45        | 53      | 8                 | 1     |
|               |                |        |           | 7P-1A       | 37        | 55      | 18                | 1     |
|               | MWEP           | Sun    | IB        | 7P-1A       | 34        | 43      | 9                 | 1     |
|               | DNX43          | WK     | OB        | 4P-6P       | 40        | 31      | -9                | 1     |
|               | DW-43          | WK     | OB        | 3P-4P       | 45        | 53      | 8                 | 1     |
|               |                |        |           | 4P-7:30P    | 43        | 57      | 14                | 1     |
|               |                | Sat    | OB        | 7P-3A       | 50        | 62      | 12                | 1     |
|               | EP-43          | WK     | OB        | 3P-4P       | 46        | 60.5    | 14.5              | 2     |
|               | PS-43          | WK     | OB        | 7:30P-3A    | 26        | 33.5    | 7.5               | 2     |
|               | PS-MW          | WK     | OB        | 6P-7:30P    | 37        | 48      | 11                | 1     |
|               |                |        |           | 7:30P-3A    | 33        | 42      | 9                 | 1     |
|               | TOYMW          | WK     | OB        | 7A-3P       | 56        | 68      | 12                | 1     |
|               |                | Sun    | OB        | 7A-7:30P    | 46        | 62      | 16                | 1     |
| 27            | EPMW           | Sat    | OB        | 7P-3A       | 43        | 50.8    | 7.8               | 4     |
|               |                | Sun    | OB        | 7:30P-3A    | 39        | 46.3    | 7.3               | 3     |
|               | TOY43          | Sat    | OB        | 7P-3A       | 39        | 46      | 7                 | 1     |
|               | IT-BC          | WK     | IB        | 6P-3A       | 33        | 24.8    | -8.2              | 6     |
| 28            | IT-FH          | WK     | IB        | 4A-7A       | 43        | 58.5    | 15.5              | 2     |
|               | SCH3           | WK     | OB        | 7A-6P       | 45        | 55      | 10                | 1     |
|               | FH-IT          | Sat    | OB        | 9A-6P       | 46        | 53.8    | 7.8               | 6     |
|               | WBBW           | Sat    | IB        | 7:30A-10P   | 75        | 82      | 7                 | 1     |
| 29            | WW-MS          | WK     | OB        | 10P-3A      | 45        | 56      | 11                | 1     |
|               | WWWB           | Sat    | OB        | 7:30A-10P   | 73        | 82.5    | 9.5               | 3     |
|               | PN-WB          | Sun    | OB        | 7:30A-9:30P | 64        | 92      | 28                | 1     |
|               | EM-PS          | WK     | IB        | 3:30P-6:20P | 63        | 75      | 12                | 1     |
| 34            | PAPSK          | WK     | IB        | 6:30A-9A    | 80        | 72      | -8                | 1     |
|               | PAPSX          | WK     | IB        | 6:30A-9A    | 75        | 63      | -12               | 1     |
|               | PA-WW          | WK     | IB        | 9A-3:30P    | 88        | 101     | 13                | 1     |
|               | PS-EM          | WK     | OB        | 10P-3A      | 46        | 38      | -8                | 1     |
|               | PSPAL          | WK     | OB        | 3A-6:30A    | 69        | 84      | 15                | 1     |
|               | PSPAX          | WK     | OB        | 6:30A-3P    | 75        | 94      | 19                | 1     |
| 37            | BC-SP          | WK     | IB        | 3A-6A       | 45        | 36      | -9                | 1     |
|               | PC-SJ          | WK     | IB        | 6A-6:30P    | 59        | 70      | 11                | 1     |
|               | P-BC           | WK     | OB        | 6:30P-3A    | 28        | 40      | 12                | 1     |
|               | P-MH           | WK     | OB        | 7A-6:30P    | 44        | 52      | 8                 | 1     |
|               | SP-M           | WK     | OB        | 7A-6:30P    | 54        | 46      | -8                | 1     |
|               |                |        |           | 6:30P-3A    | 43        | 53      | 10                | 1     |
|               | SP-BC          | Sat    | OB        | 8A-7P       | 46        | 54      | 8                 | 1     |
|               |                | Sun    | OB        | 3A-3A       | 37        | 44.6    | 7.6               | 5     |
|               | SP-NP          | Sun    | OB        | 3A-3A       | 38        | 46.5    | 8.5               | 6     |
| 37            | IHNT           | Sat    | OB        | 9:30A-7:30P | 30        | 43.3    | 13.3              | 4     |
|               |                | Sun    | IB        | 3A-9:30A    | 29        | 42      | 13                | 1     |
|               |                |        |           | 9:30A-7:30P | 31        | 46      | 15                | 4     |
|               | NTIH           | Sat    | OB        | 3A-9:30A    | 38        | 48      | 10                | 1     |

| Bus Route | NJT Pattern ID | Period | Direction | Time Period | Scheduled | Average | Discrepancy (+/-) | Trips |
|-----------|----------------|--------|-----------|-------------|-----------|---------|-------------------|-------|
| 40        | BPPEC          | WK     | IB        | 6A-9A       | 68        | 50      | -18               | 1     |
|           | EXJG           | WK     | IB        | 6A-9A       | 83        | 96      | 13                | 1     |
|           |                | Sun    | IB        | 3A-3A       | 67        | 51      | -16               | 2     |
|           | RLEJG          | WK     | IB        | 3P-6:30P    | 60        | 69.5    | 9.5               | 2     |
|           | RL-EX          | WK     | IB        | 3A-6A       | 54        | 68      | 14                | 2     |
|           | RL-JG          | WK     | IB        | 3P-6:30P    | 75        | 82      | 7                 | 1     |
|           |                | Sat    | IB        | 3A-3A       | 64        | 69.7    | 5.7               | 6     |
|           | PSJG           | Sat    | IB        | 3A-3A       | 40        | 46.8    | 6.8               | 5     |
|           | PS-JG          | Sat    | IB        | 3A-3A       | 43        | 51      | 8                 | 1     |
|           | EX-RL          | WK     | OB        | 6A-7:30A    | 54        | 47      | -7                | 2     |
|           |                |        |           | 7:30A-9A    | 57        | 74      | 17                | 1     |
|           |                | Sat    | OB        | 3A-3A       | 49        | 55      | 6                 | 1     |
|           | JGPBP          | WK     | OB        | 3P-6:30P    | 94        | 62      | -32               | 1     |
|           | JGPRL          | WK     | OB        | 3P-6:30P    | 89        | 115     | 26                | 1     |
|           |                | Sat    | OB        | 3A-3A       | 67        | 73.7    | 6.7               | 7     |
|           |                | Sun    | OB        | 3A-3A       | 67        | 55.5    | -11.5             | 2     |
|           | JGRL           | WK     | OB        | 3P-6:30P    | 92        | 81.5    | -10.5             | 2     |
|           |                |        |           | 6:30P-3A    | 70        | 75      | 5                 | 1     |
|           | JG-RL          | WK     | OB        | 9A-3P       | 78        | 84.8    | 6.8               | 6     |
|           |                | Sat    | OB        | 3A-3A       | 64        | 70.5    | 6.5               | 4     |
|           |                | Sun    | OB        | 3A-3A       | 64        | 75      | 11                | 1     |
|           | JGXRL          | WK     | OB        | 6:30P-3A    | 57        | 71      | 14                | 1     |
|           | JGPPS          | Sat    | OB        | 3A-3A       | 46        | 53.5    | 7.5               | 2     |
|           | JGPS           | Sat    | OB        | 3A-3A       | 43        | 50      | 7                 | 1     |
|           | JGXPS          | Sat    | OB        | 3A-3A       | 35        | 49      | 14                | 2     |
| 41        | RR-LP          | Sun    | IB        | 3A-3A       | 27        | 36.8    | 9.8               | 6     |
|           | LP-RR          | Sun    | OB        | 3A-3A       | 27        | 35.4    | 8.4               | 6     |
| 56        | SW-CO          | WK     | IB        | 7P-3A       | 43        | 38      | -5                | 1     |
|           | CO-SW          | WK     | OB        | 3A-7A       | 46        | 53.5    | 7.5               | 2     |
|           | EL-WI          | WK     | OB        | 3:30P-7P    | 53        | 68.3    | 15.3              | 3     |
| 57        | LP-BJ          | WK     | IB        | 3:30P-7P    | 27        | 37      | 10                | 2     |
|           | LP-MV          | WK     | IB        | 7:30A-9:30A | 46        | 57      | 11                | 1     |
|           | BJ-LP          | WK     | OB        | 3A-7:30A    | 26        | 32      | 6                 | 2     |
|           |                |        |           | 9:30A-3:30P | 26        | 31.5    | 5.5               | 2     |
|           |                |        |           | 3:30P-7P    | 26        | 34.7    | 8.7               | 3     |
| 58        | CEL05          | Sat    | IB        | 3A-3A       | 39        | 46      | 7                 | 4     |
|           | CEL08          | Sat    | IB        | 3A-3A       | 30        | 35      | 5                 | 1     |
|           | CEL11          | Sat    | IB        | 3A-3A       | 36        | 41      | 5                 | 1     |
|           | ELC05          | Sat    | OB        | 3A-3A       | 36        | 42.8    | 6.8               | 5     |
| 59        | CFNW           | WK     | IB        | 3A-7A       | 49        | 60      | 11                | 1     |
|           | DNNW2          | WK     | IB        | 3A-7A       | 88        | 95.5    | 7.5               | 2     |
|           | GAEL2          | WK     | IB        | 7A-6P       | 23        | 28      | 5                 | 1     |
|           | GANW2          | WK     | IB        | 7A-6P       | 59        | 67      | 8                 | 1     |
|           | WFNW3          | WK     | IB        | 7A-6P       | 66        | 79.8    | 13.8              | 4     |
| 59        | DNEL4          | Sat    | IB        | 6P-3A       | 65        | 60      | -5                | 1     |

| Bus Route     | NJT Pattern ID | Period | Direction | Time Period | Scheduled | Average | Discrepancy (+/-) | Trips |
|---------------|----------------|--------|-----------|-------------|-----------|---------|-------------------|-------|
| 59<br>(cont.) | ELNW1          | Sat    | IB        | 3A-7A       | 31        | 47      | 16                | 1     |
|               | RONW2          | Sun    | IB        | 7A-6P       | 49        | 41      | -8                | 1     |
|               | NWWF4          | WK     | OB        | 7A-6P       | 65        | 48      | -17               | 1     |
|               | WPPFD          | WK     | OB        | 6P-3A       | 71        | 88      | 17                | 1     |
|               | NWKN4          | Sat    | OB        | 6P-3A       | 83        | 102     | 19                | 1     |
|               | NWKN3          | Sun    | OB        | 7A-6P       | 96        | 91      | -5                | 1     |
| 62            | MC-AP          | WK     | IB        | 2P-6P       | 63        | 74      | 11                | 1     |
|               | MPIAP          | WK     | IB        | 3A-6A       | 94        | 78      | -16               | 1     |
|               | SD-AP          | WK     | IB        | 3A-6A       | 101       | 90      | -11               | 1     |
|               | SD-AP          | WK     | IB        | 6A-2P       | 112       | 119.3   | 7.3               | 3     |
|               |                |        |           | 2P-6P       | 116       | 125     | 9                 | 2     |
|               |                |        |           | 6P-10P      | 112       | 97.5    | -14.5             | 2     |
|               |                | Sat    | IB        | 3A-11A      | 92        | 112.5   | 20.5              | 2     |
|               | SDIAP          | WK     | IB        | 10P-3A      | 112       | 107     | -5                | 1     |
|               | WM-AP          | WK     | IB        | 2P-6P       | 95        | 86      | -9                | 1     |
|               |                |        |           | 10P-3A      | 91        | 99      | 8                 | 1     |
|               |                |        |           | 7P-3A       | 78        | 95      | 17                | 1     |
|               | WMIAP          | WK     | IB        | 6A-2P       | 107       | 112     | 5                 | 3     |
|               |                | Sat    | IB        | 11A-7P      | 111       | 98.5    | -12.5             | 2     |
|               |                | Sun    | IB        | 7P-3A       | 90        | 98      | 8                 | 1     |
|               | MCIAP          | Sat    | IB        | 3A-11A      | 63        | 72      | 9                 | 1     |
|               | BJ-AP          | Sun    | IB        | 3A-11A      | 30        | 44      | 14                | 1     |
|               |                |        |           | 11A-7P      | 34        | 29      | -5                | 1     |
|               |                |        |           | 7P-3A       | 30        | 35      | 5                 | 1     |
|               | BJIAP          | Sun    | IB        | 11A-7P      | 46        | 51      | 5                 | 1     |
|               | PA-BJ          | WK     | OB        | 6A-2P       | 42        | 25      | -17               | 1     |
|               |                | Sat    | OB        | 3A-11A      | 39        | 34      | -5                | 1     |
|               | PAIBJ          | WK     | OB        | 2P-6P       | 52        | 58      | 6                 | 2     |
|               |                | Sat    | OB        | 11A-7P      | 54        | 62      | 8                 | 1     |
|               | PAISD          | WK     | OB        | 6P-10P      | 129       | 154     | 25                | 1     |
| 62<br>(cont.) | PAIWM          | WK     | OB        | 2P-6P       | 112       | 130     | 18                | 1     |
|               |                |        |           | 6P-10P      | 112       | 75      | -37               | 1     |
|               |                | Sun    | OB        | 3A-11A      | 97        | 107     | 10                | 1     |
|               |                |        |           | 11A-7P      | 106       | 93      | -13               | 1     |
|               | PA-SD          | WK     | OB        | 6A-2P       | 119       | 125.7   | 6.7               | 3     |
|               |                |        |           | 2P-6P       | 123       | 114     | -9                | 1     |
|               | PA-WM          | WK     | OB        | 6A-2P       | 102       | 95.5    | -6.5              | 2     |
|               | PA-WM          | WK     | OB        | 6P-10P      | 102       | 109     | 7                 | 1     |
|               | PS-FE          | WK     | OB        | 3A-6A       | 28        | 21      | -7                | 1     |
|               | PACWM          | Sat    | OB        | 11A-7P      | 107       | 118     | 11                | 3     |
|               | PAFIC          | Sat    | OB        | 7P-3A       | 67        | 75      | 8                 | 1     |
|               |                | Sun    | OB        | 7P-3A       | 64        | 69      | 5                 | 1     |
|               | PA1IC          | Sun    | OB        | 7P-3A       | 71        | 76      | 5                 | 1     |
|               | PS-EC          | Sun    | OB        | 11A-7P      | 25        | 19.9    | -5.1              | 9     |
| 65            | DWASH          | WK     | IB        | 9A-5P       | 73        | 86      | 13                | 1     |

| Bus Route     | NJT Pattern ID | Period | Direction | Time Period | Scheduled | Average | Discrepancy (+/-) | Trips |
|---------------|----------------|--------|-----------|-------------|-----------|---------|-------------------|-------|
| 65<br>(cont.) | WASHD          | WK     | OB        | 9A-6:30P    | 75        | 93.5    | 18.5              | 2     |
|               | WPBRK          | WK     | OB        | 3A-7A       | 76        | 85      | 9                 | 1     |
|               | HH-SM          | WK     | IB        | 6-7:30      | 70        | 80      | 10                | 1     |
|               | LHHPS          | WK     | IB        | 18-19       | 78        | 99      | 21                | 1     |
|               | LM-IT          | WK     | IB        | 18-19       | 53        | 60      | 7                 | 1     |
|               | LM-PS          | WK     | IB        | 6-7:30      | 79        | 102     | 23                | 1     |
|               |                |        |           | 7:30-9      | 83        | 91.5    | 8.5               | 2     |
|               |                | WK     | IB        | 19-13:15    | 64        | 80      | 16                | 1     |
|               | Sat            | IB     |           | 3-21:30     | 73        | 81.7    | 8.7               | 7     |
|               | RI-PS          | WK     | IB        | 6-Mar       | 53        | 60      | 7                 | 1     |
|               | SH-PS          | WK     | IB        | 6-7:30      | 67        | 77      | 10                | 1     |
|               | LPSUM          | Sat    | IB        | 3-21:30     | 69        | 82.2    | 13.2              | 5     |
|               |                | Sun    | IB        | 23-Mar      | 69        | 90.5    | 21.5              | 2     |
|               | LFSPS          | Sun    | IB        | 23-Mar      | 81        | 73      | -8                | 1     |
|               | PS-LM          | WK     | OB        | 15-Sep      | 83        | 90.4    | 7.4               | 9     |
|               | PSLUM          | Sat    | OB        | 3-Mar       | 70        | 79      | 9                 | 1     |
|               | IC-HH          | Sun    | OB        | 3-8:30      | 33        | 46      | 13                | 1     |
|               | ITMSH          | Sun    | OB        | 3-8:30      | 31        | 38      | 7                 | 1     |
|               | PSHSL          | Sun    | OB        | 3-8:30      | 65        | 58      | -7                | 1     |
|               | PSSFL          | Sun    | OB        | 8:30-18:30  | 83        | 98      | 15                | 1     |
| 70            | 71OUT          | WK     | IB        | 3A-7A       | 49        | 57      | 8                 | 1     |
|               | EBIPS          | WK     | IB        | 2:30P-6:20P | 70        | 80.4    | 10.4              | 5     |
|               | EBPS           | WK     | IB        | 3A-7A       | 56        | 64      | 8                 | 1     |
|               |                |        |           | 7A-10A      | 64        | 44.5    | -19.5             | 2     |
|               | EMM15          | WK     | IB        | 2:30P-6:20P | 73        | 99      | 26                | 1     |
|               |                |        |           | 6:20P-3A    | 68        | 95      | 27                | 1     |
|               | EMPEN          | WK     | IB        | 2:30P-6:20P | 85        | 91      | 6                 | 1     |
|               | LMP15          | WK     | IB        | 2:30P-6:20P | 38        | 51      | 13                | 1     |
|               | LPI15          | WK     | IB        | 6:20P-3A    | 53        | 58      | 5                 | 1     |
|               |                | WK     | IB        | 3A-7A       | 55        | 61      | 6                 | 1     |
| 71            | WEPS           | Sat    | IB        | 9A-5:20P    | 59        | 68      | 9                 | 1     |
|               |                | Sun    | IB        | 3A-3A       | 53        | 67.3    | 14.3              | 3     |
|               | PLK15          | Sun    | IB        | 3A-3A       | 22        | 27      | 5                 | 1     |
|               | PSOUF          | WK     | OB        | 3A-7A       | 90        | 100.7   | 10.7              | 3     |
|               | PSOUI          | WK     | OB        | 7A-9:30A    | 79        | 86      | 7                 | 2     |
|               | PSEM           | Sat    | OB        | 3A-6P       | 61        | 70      | 9                 | 1     |
|               |                |        |           | 6P-3A       | 56        | 62.5    | 6.5               | 2     |
| 72            | BT-PS          | Sat    | IB        | 39516       | 50        | 74      | 24                | 1     |
|               |                |        |           | 39710       | 62        | 71      | 9                 | 1     |
|               | PS-BT          | Sat    | OB        | 19-Sep      | 66        | 74      | 8                 | 1     |
|               |                |        |           | 19-3        | 53        | 64      | 11                | 1     |
|               |                | Sun    | OB        | 14-Mar      | 50        | 61      | 11                | 1     |
| 73            | BKPen          | WK     | IB        | 3A-7A       | 58        | 72      | 14                | 1     |
|               | LFH15          | WK     | IB        | 7A-3P       | 64        | 52      | -12               | 1     |
|               |                | Sat    | IB        | 7A-3A       | 58        | 71      | 13                | 1     |

| Bus Route     | NJT Pattern ID   | Period | Direction | Time Period | Scheduled | Average | Discrepancy (+/-) | Trips |
|---------------|------------------|--------|-----------|-------------|-----------|---------|-------------------|-------|
| 73<br>(cont.) | LFH15<br>(cont.) | Sun    | IB        | 3A-3A       | 40        | 50      | 10                | 1     |
|               | LFP15            | WK     | IB        | 9P-3A       | 56        | 61      | 5                 | 2     |
|               |                  | Sat    | IB        | 7A-3A       | 52        | 59.3    | 7.3               | 6     |
|               | LMIN3            | WK     | IB        | 3P-7P       | 66        | 73      | 7                 | 2     |
|               | LMIN6            | WK     | IB        | 3P-7P       | 53        | 60      | 7                 | 1     |
|               |                  |        |           | 7A-3P       | 54        | 63.5    | 9.5               | 2     |
|               | KI10             | WK     | OB        | 9:30A-3P    | 52        | 76      | 24                | 1     |
|               |                  |        |           | 3P-7P       | 52        | 63      | 11                | 1     |
|               | PKLVM            | WK     | OB        | 7A-9:30A    | 51        | 56      | 5                 | 1     |
|               | PMOU1            | WK     | OB        | 3A-7A       | 59        | 64.5    | 5.5               | 2     |
|               |                  |        |           | 7A-9:30A    | 66        | 74      | 8                 | 1     |
|               | PMOU2            | WK     | OB        | 3A-7A       | 66        | 73      | 7                 | 1     |
|               | PSHLM            | WK     | OB        | 7A-9:30A    | 59        | 67      | 8                 | 1     |
|               |                  |        |           | 3A-3A       | 60        | 68      | 8                 | 1     |
|               | PSIHFL           | WK     | OB        | 9:30A-3P    | 75        | 65      | -10               | 1     |
|               | PSRLT            | WK     | OB        | 3A-7A       | 68        | 76      | 8                 | 1     |
|               | 15FPL            | Sat    | OB        | 3A-3A       | 55        | 62.5    | 7.5               | 2     |
|               | 15LVM            | Sat    | OB        | 3A-3A       | 43        | 28.5    | -14.5             | 2     |
|               | 15HFL            | Sun    | OB        | 3A-3A       | 60        | 52      | -8                | 1     |
| 76            | HTLOP            | WK     | IB        | 3A-6P       | 83        | 91      | 8                 | 1     |
|               | HT-PS            | WK     | IB        | 5:15A-6:15A | 49        | 56.5    | 7.5               | 2     |
|               |                  |        |           | 9:35A-1:45P | 66        | 46.5    | -19.5             | 2     |
|               |                  |        |           | 1:45P-3P    | 66        | 82      | 16                | 1     |
|               |                  |        |           | 3P-6P       | 72        | 81      | 9                 | 1     |
|               | HTXPS            | WK     | IB        | 6:15A-9:35A | 51        | 63.7    | 12.7              | 3     |
|               | PSXHT            | WK     | OB        | 2:55P-7:15P | 56        | 69      | 13                | 1     |
| 78            | UPS              | WK     | IB        | 10A-3A      | 54        | 32      | -22               | 1     |
|               | SCHCN            | WK     | OB        | 2P-4:55P    | 61        | 71.5    | 10.5              | 2     |
| 79            | PS-PY            | WK     | OB        | 3A-7A       | 70        | 56      | -14               | 1     |
|               |                  |        |           | 9:30A-3P    | 75        | 60      | -15               | 1     |
|               | K15PY            | WK     | OB        | 3P-7P       | 62        | 42      | -20               | 1     |
| 90            | EP-CS            | WK     | IB        | 3P-7P       | 38        | 45.8    | 7.8               | 5     |
|               | CS-EP            | WK     | OB        | 4P-6P       | 37        | 42      | 5                 | 1     |
| 92            | SO-BW            | WK     | IB        | 3A-7A       | 29        | 37.3    | 8.3               | 3     |
|               | BW-SO            | WK     | OB        | 6A-7A       | 32        | 39      | 7                 | 1     |
| 99            | BC-22            | WK     | IB        | 3A-6:30A    | 54        | 64.5    | 10.5              | 2     |
|               |                  | Sun    | IB        | 6P-4A       | 59        | 52      | -7                | 1     |
|               | BC-IR            | WK     | IB        | 2:30P-6:30P | 39        | 28.5    | -10.5             | 4     |
|               | BC-IR            | WK     | IB        | 6:30P-3A    | 35        | 28.5    | -6.5              | 4     |
|               | BS-IR            | Sat    | IB        | 6P-4A       | 34        | 22      | -12               | 1     |
|               | LI-BC            | WK     | OB        | 6:30A-8A    | 78        | 86      | 8                 | 1     |
|               |                  | Sat    | OB        | 7P-4A       | 69        | 79      | 10                | 1     |
|               | 22-BC            | Sat    | OB        | 7A-7P       | 64        | 54      | -10               | 1     |
| 107           | IHNAYA           | WK     | IB        | 7P-3A       | 61        | 42      | -19               | 1     |
|               | IHNYL            | WK     | IB        | 7A-9A       | 62        | 80.5    | 18.5              | 2     |

| Bus Route        | Pattern ID | Period | Direction | Time Period | Scheduled | Average | Discrepancy (+/-) | Trips |
|------------------|------------|--------|-----------|-------------|-----------|---------|-------------------|-------|
| 107<br>(cont.)   | SONYE      | WK     | IB        | 7A-9A       | 55        | 65.3    | 10.3              | 4     |
|                  |            |        |           | 9A-3P       | 50        | 59.3    | 9.3               | 6     |
|                  | SONY       | Sat    | IB        | 3A-9:30A    | 57        | 68.5    | 11.5              | 2     |
|                  |            | Sun    | IB        | 9:30A-7:30P | 59        | 73      | 14                | 1     |
|                  | NYIHE      | WK     | OB        | 7A-2:15P    | 39        | 58      | 19                | 1     |
|                  | NYIHL      | WK     | OB        | 2:15P-7:30P | 58        | 68      | 10                | 1     |
|                  | NYSOL      | WK     | OB        | 7A-2:15P    | 58        | 72      | 14                | 1     |
|                  | NYSO       | Sat    | OB        | 10P-3A      | 59        | 50      | -9                | 1     |
|                  | NYITX      | Sun    | OB        | 10A-10P     | 36        | 47      | 11                | 1     |
| 108              | COLNY      | WK     | IB        | 3A-7A       | 36        | 52      | 16                | 1     |
|                  | COUNY      | WK     | IB        | 9:30A-3P    | 45        | 56.5    | 11.5              | 4     |
|                  |            |        |           | 3P-4:30P    | 67        | 91.7    | 24.7              | 3     |
|                  |            |        |           | 6P-7P       | 63        | 71      | 8                 | 1     |
|                  | Sat        | IB     | IB        | 9A-1:30P    | 47        | 60.5    | 13.5              | 2     |
|                  |            |        |           | 1:30P-7:15P | 43        | 68.5    | 25.5              | 2     |
|                  | Sun        | IB     | IB        | 1:30P-7:15P | 43        | 55      | 12                | 1     |
|                  | NYCOL      | WK     | OB        | 3P-15-6P    | 49        | 64      | 15                | 1     |
|                  | NYUCL      | WK     | OB        | 3A-10A      | 47        | 57.5    | 10.5              | 5     |
| 112              | CKNY3      | Sat    | IB        | 3A-3A       | 66        | 75.5    | 9.5               | 2     |
|                  |            | Sun    | IB        | 3A-3A       | 66        | 73.3    | 7.3               | 3     |
|                  | NYCK1      | Sat    | OB        | 3A-3A       | 64        | 75      | 11                | 2     |
| Coach<br>12 & 24 | ASB        | WK     | IB        | 3A-7A       | 87        | 93.8    | 6.8               | 5     |
|                  |            |        |           | 7A-9:30A    | 95        | 103.3   | 8.3               | 7     |
|                  |            |        |           | 7P-3A       | 75        | 104     | 29                | 1     |
|                  | BSB        | Sun    | IB        | 9:30A-3P    | 89        | 95.2    | 6.2               | 5     |
|                  |            |        |           | 9:30A-3P    | 89        | 96.9    | 7.9               | 16    |
|                  |            |        |           | 3P-7P       | 91        | 97.5    | 6.5               | 8     |
|                  | ANB        | Sat    | IB        | 7P-3A       | 68        | 78.6    | 10.6              | 5     |
|                  |            |        |           | 3P-7P       | 83        | 91.3    | 8.3               | 3     |
|                  |            |        |           | 7P-3A       | 69        | 81      | 12                | 2     |
|                  | BNB        | Sun    | IB        | 3A-7A       | 60        | 69      | 9                 | 2     |
|                  |            |        |           | 3P-7P       | 79        | 91.3    | 12.3              | 4     |
|                  |            |        |           | 7P-3A       | 67        | 73      | 6                 | 1     |
|                  |            |        |           | 3P-7P       | 91        | 103.6   | 12.6              | 8     |
|                  |            | Wk     | OB        | 7P-3A       | 73        | 64      | -9                | 1     |
|                  |            | Sat    | OB        | 7P-3A       | 77.5      | 83      | 5.5               | 2     |
|                  | BNB        | Sun    | OB        | 7A-9:30A    | 79        | 90      | 11                | 1     |
|                  |            |        |           | 7P-3A       | 71        | 77      | 6                 | 2     |
|                  |            |        |           | 7A-9:30A    | 84        | 95.6    | 11.6              | 5     |
|                  |            | Wk     | OB        | 3P-7P       | 85        | 99.5    | 14.5              | 8     |
|                  |            |        |           | 7P-3A       | 66        | 93      | 27                | 6     |
|                  |            | Sat    | OB        | 9:30A-3P    | 89        | 107     | 18                | 1     |
|                  |            |        |           | 3P-7P       | 82        | 88.5    | 6.5               | 2     |
|                  |            |        |           | 7P-3A       | 68        | 75.7    | 7.7               | 3     |
|                  |            | Sun    | OB        | 7A-9:30A    | 74        | 67      | -7                | 1     |

## Appendix G – Route Diagnostic Analysis

The route diagnostic analysis was prepared using calculations from the 2007 fiscal year data. For this report the data collection and calculation methods remain unchanged from the previous year's report, which is why much remains unchanged.

- **Analysis Overview** – As noted previously, the bus service operated by NJ TRANSIT in the study area includes approximately 50 bus routes. NJ TRANSIT utilizes an internal classification system for these bus routes; 29 of them are classified as “Essex and Union Counties Local” bus routes, eight of them are classified as “Suburban” bus routes, two of them are classified as “Essex and Hudson Counties Interstate” bus routes and one is classified as a “Somerset-Middlesex-Union Counties Interstate” bus route.

While the routes are grouped across four internal classifications, all routes have been analyzed and compared with each other as a single group.

The analysis presents overall statistics and different performance results (e.g., farebox recovery and productivity). The focus of this analysis is to delineate the characteristics of the NJ TRANSIT bus routes utilizing several analytical techniques. With these approaches, each bus route is treated as an individual operating entity. The performance characteristics of each bus route are compared to the other bus routes as well as to the overall system. In some cases, bus routes are assigned to specific categories to contrast performance for different criteria. The route level analysis is quantitative and focuses on financial and productivity measures. The examination also ranks the bus routes, thus reflecting the competitive nature of allocating limited transit resources.

An initial decision regarding the analysis was the time period for which data would be assembled, manipulated and analyzed and for which results would be reported. It was felt that the analysis should be based on recent conditions at current service levels. NJ TRANSIT maintains a variety of information regarding service characteristics at the route level, and accordingly data were gathered for the most recent fiscal year for which it was available (i.e., Fiscal Year 2007). No significant changes have been made to the bus system since June 30, 2007, so the last fiscal year provides a recent benchmark to assess performance by individual bus route.

- **Data Assembly** – The route level analysis requires considerable information on operating, financial and patronage statistics. Seven statistics were input to the process and included vehicle miles, vehicle hours, the number of vehicle days assigned to each route, bus trips, revenue, boardings and cost. NJ TRANSIT, as was previously mentioned, maintains an extensive database containing detailed information regarding each bus route. NJ TRANSIT compiles this data for its planning and various internal analyses. It provides a wealth of detailed and comprehensive information at the route level. Staff is to be complimented for routinely assembling this data base since many transit system have little or any

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route level statistics. Presented below is a brief description of the key information that was compiled for each bus route.

- **Vehicle Miles** – Information on vehicle miles by individual route is routinely reported and accumulated by NJ TRANSIT. The current data collection procedures record vehicle miles by route for each month as well as for the entire year.
- **Vehicle Hours** – The results for this operating statistic are also routinely gathered and reported by NJ TRANSIT in a similar manner to that utilized for vehicle miles.
- **Vehicle Days** – As the name implies, this statistic reflects the number of buses or vehicles in service along the bus route; NJ TRANSIT presents this statistic as the number of vehicles operated for a service day on each bus route. This statistic is then annualized and presents the number of vehicle days operated on each bus route in one year. The route level data for vehicle days was also taken directly from information compiled on a regular basis by NJ TRANSIT.
- **Bus Trips** – The NJ TRANSIT database also records bus trips operated on each route during the course of each month and the entire fiscal year.
- **Passengers** – NJ TRANSIT's registering fareboxes record passenger boardings as part of their routine monitoring of the bus system. Part of the drivers' responsibilities is to press the appropriate buttons on the registering farebox to indicate the type of fare, origin fare zone, destination fare zone. The fareboxes also record cumulative ridership by route and trip. A summary of this farebox data for FY2007 for each bus route was provided by NJ TRANSIT.
- **Revenue** – NJ TRANSIT also compiles information regarding each bus route's revenue. Revenue is gathered as both "passenger revenue" (i.e., revenue from passenger fares) as well as "other revenue" (e.g., revenue from advertising). These are then added and each bus route's "total revenue" is compiled by NJ TRANSIT as part of their monitoring of the bus system. The other revenue is a relatively small amount for all routes.
- **Cost** – Unlike many other public transportation systems, NJ TRANSIT estimates the cost associated with providing service along each bus route. While many public transportation systems gather cost information, NJ TRANSIT utilizes a cost allocation model to assign a portion of system-wide costs to each bus route. For this reason, reliance was placed on NJ TRANSIT's route level costs rather than developing and applying another cost estimation methodology. NJ

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TRANSIT tracks costs for three different components associated with each bus route: operational costs, facility costs and administrative costs. The operational costs are tracked in terms of “variable” costs and “other” costs, while the facility costs are tracked in terms of both the “garage” costs and “terminal” costs associated with each bus route. Finally, administrative costs are tracked in terms of both the “general” administrative costs as well administrative costs associated with a specific bus route (i.e., “bus” administration). For each bus route, these various cost elements are summed and the total expenses for each bus route were provided.

As was previously mentioned, this comprehensive approach to the routine monitoring and tracking of the various aspects of each bus route’s expenses allows for detailed analyses to be performed more easily. Most importantly, the time-consuming process of developing a cost allocation model for the bus system which then must be applied to each individual bus route can be avoided. It also allows the cost data presented in the GNBSS to be consistent and, thus, easily comparable, to cost data utilized by NJ TRANSIT in previous analyses.

These seven data items were assembled for each route and represent a recent one year period (i.e., Fiscal Year 2007) that is representative of current bus operations. It provides a reasonable basis to assess the performance of individual bus routes. The commendable extent to which NJ TRANSIT routinely gathers route level data allows a route diagnostics analysis to be conducted without requiring the excessive and time consuming manipulation of data from a variety of sources.

• **Diagnostic Techniques** – The discussion above provides an overview of the necessary data assembly process. Five procedures were utilized to assess current route performance and provide different perspectives of gauging route level efficiency and effectiveness, as summarized below:

- **Cost Centers** - This technique establishes the revenue, cost and resulting deficit of each bus route. Emphasis is placed on farebox recovery, which is the percentage of operating costs that is covered from fares. Typically, a major element of this effort is the development of a financial model that relates operating costs to service levels. However, in the current analysis, NJ TRANSIT was able to provide detailed cost information at the route level.
- **Contribution Analysis** - This procedure also places emphasis on the financial results of each bus route. The deficit is examined in terms of both relative amounts (i.e., farebox recovery) and absolute amounts (i.e., each route’s contribution to the system deficit). This method allows each route to be assigned to one of four categories which reflect the route’s performance in each measure and whether it is better or worse than the system average.

- **Strategic Planning** - This analysis procedure gauges route performance for two criteria. The first measure is deficit per passenger, which indicates the extent of route subsidy for each boarding passenger. The second factor is the market share of each route, which has been defined as the ratio of each route's passengers to the average route for the system. Values greater than one denote routes with relatively large market shares, while values lower than one indicate routes with relatively small market shares.
- **Ordinal Ranking** - This bus route evaluation procedure numerically ranks all bus routes from best to worst for seven performance indices. Three measures relate to productivity while another four present deficit relative to operating and passenger statistics. In turn, these results are combined for each group of criteria to arrive at a combined score and overall rank.
- **Supply and Demand Review** - The concluding analytical technique is a review of the relative balance between each route's supply of service and the resulting performance. The number of annual bus trips operated is compared to the passengers per hour and farebox recovery. There should be a directly proportional relationship in that routes with better performance have more service while routes that have low performance operate less service.

The discussion above provides a brief summary of each technique that was utilized in the current analysis. As noted previously, the results are for a recent, one year period that reflects the current route structure and service levels. Several points are worth noting at the outset. First, the techniques are diagnostic in that they indicate the need for more detailed analysis (e.g., a review of the ride check data) to remedy deficiencies and exploit opportunities. Second, they examine route level performance from a variety of perspectives to assure a comprehensive review of efficiency and effectiveness. Finally, the diagnostics review is only one input to the service development process, since issues such as need and equity must also be considered. Nonetheless, the current analysis provides a useful input to the preparation of service proposals.

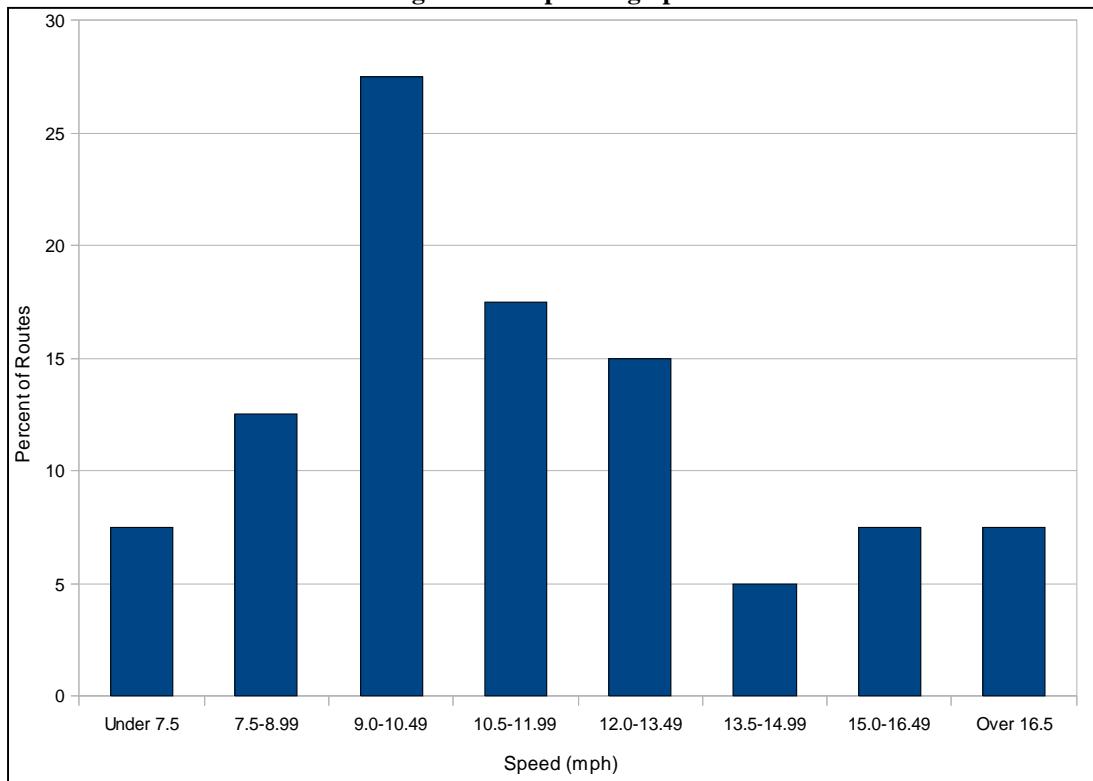
• **Cost Centers** – The primary objective of the cost centers analysis approach is that bus system operating, patronage, revenue and cost statistics can be examined at the individual route level. Utilizing these statistics, deficit and various other measures (e.g., farebox recovery) can be computed. As was previously mentioned, all necessary data items - including cost - can be obtained from NJ TRANSIT's records, data collection efforts and routine monitoring activities.

Because NJ TRANSIT tracks vehicle hours and vehicle miles at the route level, each bus route's operating speed (i.e., in miles per hour) can be computed. As shown in Figure 37, there is a wide range of operating speeds on NJ TRANSIT's

Newark area bus routes. This is consistent with the different characteristics of the streets traversed by each of the bus routes and the various types of development patterns through which they operate. Individual route speeds range from a low of 7.35 to a high of 19.71 miles per hour, with a system average of 10.68 miles per hour. Similar variations were noted for other measures such as vehicle miles and vehicle hours per vehicle, which is a surrogate measure for the extent of peaking and vehicle utilization.

Individual route speeds range from a low of 7.35 mph to a high of 19.71 mph. The system average for the GNBSS bus routes is 10.68 miles per hour, with the largest number of buses operating between 9.0 and 10.49 mph.

**Figure 37 – Operating Speeds**



- **Route Financial Performance -** The previous sections described the data collection procedures for establishing the database of route level information. The next step was to apply this data to the various route level operating statistics established for each bus route. The financial results are shown in Table 29.

Route 21 has the highest farebox recovery of 51.08%, while Route 93 has the lowest (i.e., 8.95 %). The next lowest route is Route 42, which recovers 11.48% of its costs from the farebox.

**Table 29 - Financial Summary (FY09)**

| Item             | Value         |
|------------------|---------------|
| Revenue          | \$64,083,500  |
| Cost             | \$161,372,100 |
| Deficit          | \$97,288,600  |
| Farebox Recovery | 39.71%        |

The farebox recovery for the NJ TRANSIT bus routes comprising the GNBSS is 39.71 percent. This indicates that nearly 40 percent of the system's total operational expenses (i.e., not including capital costs) are "recovered" from passenger fares.

There are 18 routes that exceeded the system average (39.71%), while the remaining 22 routes fell below the average.

The results of the cost centers analysis by individual route are presented in Table 30, which indicates the revenue, cost and deficit (i.e., necessary subsidy) for the one year analysis period. The first method utilized to rate bus routes and to categorize their financial performance is to examine their farebox recovery. Overall, the NJ TRANSIT bus routes operated in the Newark area achieve a farebox recovery of 40 percent, which implies a subsidy of \$1.50 for each dollar paid in fares.

**Table 30 – Financial Results by Route (FY09)**

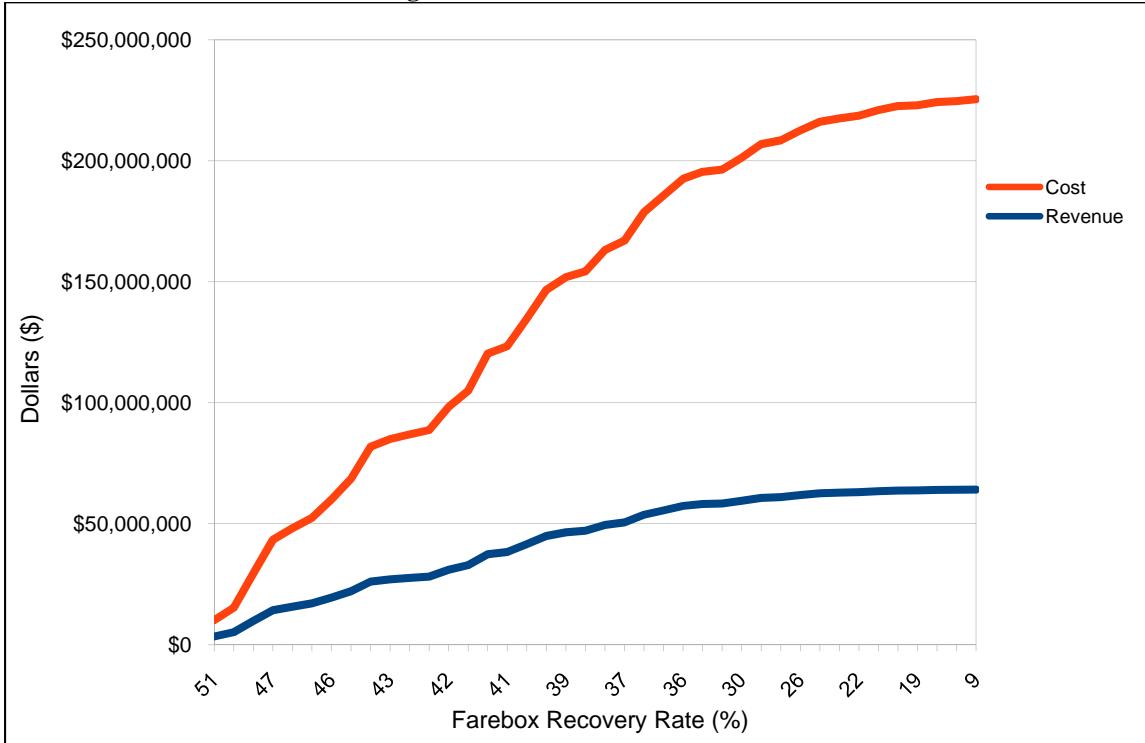
| Bus Route | Revenue (\$) | Cost (\$)  | Deficit (\$) | Farebox Recovery (%) | Rank | Better (%) | Worse (%) |
|-----------|--------------|------------|--------------|----------------------|------|------------|-----------|
| 1         | 4,492,711    | 10,867,459 | 6,374,748    | 41.34                | 15   | 4.10       | --        |
| 5         | 410,501      | 1,961,221  | 1,550,720    | 20.93                | 35   | --         | -47.29    |
| 11        | 1,478,150    | 3,800,006  | 2,321,856    | 38.90                | 19   | --         | -2.04     |
| 13        | 4,645,074    | 9,527,982  | 4,882,908    | 48.75                | 3    | 22.77      | --        |
| 21        | 3,426,157    | 6,707,006  | 3,280,848    | 51.08                | 1    | 28.64      | --        |
| 25        | 3,939,021    | 9,226,912  | 5,287,891    | 42.69                | 9    | 7.50       | --        |
| 26        | 536,613      | 1,276,328  | 739,716      | 42.04                | 12   | 5.87       | --        |
| 27        | 3,267,981    | 8,095,698  | 4,827,717    | 40.37                | 17   | 1.65       | --        |
| 28        | 1,065,845    | 2,888,752  | 1,822,907    | 36.89                | 22   | --         | -7.09     |
| 29        | 1,943,599    | 4,679,845  | 2,736,246    | 41.53                | 14   | 4.58       | --        |
| 34        | 2,830,625    | 6,792,890  | 3,962,265    | 41.67                | 13   | 4.93       | --        |
| 37        | 659,222      | 1,703,498  | 1,044,276    | 38.70                | 20   | --         | -2.56     |
| 39        | 3,389,603    | 8,509,327  | 5,119,724    | 39.83                | 18   | 0.31       | --        |
| 40        | 717,735      | 2,901,421  | 2,183,686    | 24.74                | 32   | --         | -37.71    |
| 41        | 1,355,471    | 2,945,629  | 1,590,157    | 46.02                | 6    | 15.88      | --        |
| 42        | 40,391       | 341,304    | 300,914      | 11.84                | 39   | --         | -70.19    |
| 52        | 324,554      | 1,222,412  | 897,858      | 26.55                | 30   | --         | -33.13    |
| 56        | 208,266      | 1,133,248  | 924,982      | 18.38                | 38   | --         | -53.71    |
| 57        | 223,817      | 660,924    | 437,107      | 33.86                | 27   | --         | -14.73    |
| 58        | 556,615      | 1,321,087  | 764,472      | 42.13                | 11   | 6.09       | --        |
| 59        | 2,399,214    | 5,254,270  | 2,855,056    | 45.66                | 7    | 14.98      | --        |

| Bus Route | Revenue (\$) | Cost (\$)   | Deficit (\$) | Farebox Recovery (%) | Rank | Better (%) | Worse (%) |
|-----------|--------------|-------------|--------------|----------------------|------|------------|-----------|
| 62        | 3,143,562    | 8,605,157   | 5,461,595    | 36.53                | 23   | --         | -8.01     |
| 65        | 249,905      | 1,093,713   | 843,808      | 22.85                | 33   | --         | -42.46    |
| 66        | 853,179      | 3,247,343   | 2,394,164    | 26.27                | 31   | --         | -33.84    |
| 70        | 2,405,944    | 6,381,257   | 3,975,313    | 37.70                | 21   | --         | -5.06     |
| 71        | 1,134,850    | 3,747,750   | 2,612,900    | 30.28                | 28   | --         | -23.75    |
| 72        | 1,517,151    | 3,266,934   | 1,749,783    | 46.44                | 5    | 16.95      | --        |
| 73        | 1,824,806    | 5,050,964   | 3,226,158    | 36.13                | 25   | --         | -9.03     |
| 76        | 1,833,891    | 5,024,629   | 3,190,738    | 36.50                | 24   | --         | -8.09     |
| 78        | 270,324      | 1,360,483   | 1,090,159    | 19.87                | 36   | --         | -49.97    |
| 90        | 958,132      | 2,253,448   | 1,295,316    | 42.52                | 10   | 7.07       | --        |
| 92        | 898,016      | 2,178,889   | 1,280,873    | 41.21                | 16   | 3.78       | --        |
| 93        | 65,394       | 730,813     | 665,419      | 8.95                 | 40   | --         | -77.46    |
| 94        | 4,403,407    | 9,464,172   | 5,060,765    | 46.53                | 4    | 17.16      | --        |
| 96        | 199,516      | 913,572     | 714,056      | 21.84                | 34   | --         | -45.01    |
| 99        | 1,196,763    | 4,466,008   | 3,269,246    | 26.80                | 29   | --         | -32.52    |
| 107       | 2,646,424    | 5,906,731   | 3,260,306    | 44.80                | 8    | 12.82      | --        |
| 108       | 777,180      | 2,176,288   | 1,399,108    | 35.71                | 26   | --         | -10.07    |
| 112       | 1,745,759    | 3,432,966   | 1,687,207    | 50.85                | 2    | 28.06      | --        |
| Total     | 64,083,475   | 161,372,142 | 97,288,667   | 39.71                |      |            |           |

As with many of the analyses presented here, there is a wide disparity between the results for each individual NJ TRANSIT bus route. One concluding point is that the comparison of individual route performance relative to the system average is a common feature of the diagnostic techniques, although the criteria and measures differ.

- **Contribution Analysis** – The next method utilized to rate the system's bus routes and to categorize their financial performance is to examine both their farebox recovery rates and deficit amounts in combination. As can be seen in Figure 38, the system deficit grows larger as each bus route's operating cost and revenue are accounted for. By considering the bus routes in descending order of farebox recovery, the system's operating cost continues to increase but aggregate revenue begins to "flatten out", thus contributing to a mounting deficit.

**Figure 38 – Contribution to Deficit**



Each bus route was rated relative to the system average in terms of farebox recover, as previously analyzed in the route financial performance, and contribution to the overall deficit. As shown in Table 31, the farebox recovery rates of all of the bus routes were indicated as being either “better” or “worse” than the system average. In a similar manner, the 40 bus routes were rated with respect to their contribution to the deficit. For ease of presentation, the deficit amounts have been calculated relative to each route contributing 1/40th of the deficit. On average each bus route should contribute about 2.5 percent of the system deficit, or about \$2.3 million. For example, Route 1 had a deficit of nearly \$6.4 million, which is roughly 2.62 times greater than the average. However, whether a route actually contributes more or less to the cumulative deficit is reflected in the table.

There are 23 routes that contribute less to the deficit than the average (categorized as “Better”) and 17 routes which contribute more to the deficit than the average (“Worse”).

**Table 31 – Farebox Recovery and Contribution to Deficit**

| Route | Farebox Recovery (%) | Rating | Contribution To Deficit | Rating | Category |
|-------|----------------------|--------|-------------------------|--------|----------|
| 1     | 41.34                | Better | 2.62                    | Worse  | 3        |
| 5     | 20.93                | Worse  | 0.64                    | Better | 2        |
| 11    | 38.90                | Worse  | 0.95                    | Better | 2        |
| 13    | 48.75                | Better | 2.01                    | Worse  | 3        |
| 21    | 51.08                | Better | 1.35                    | Worse  | 3        |

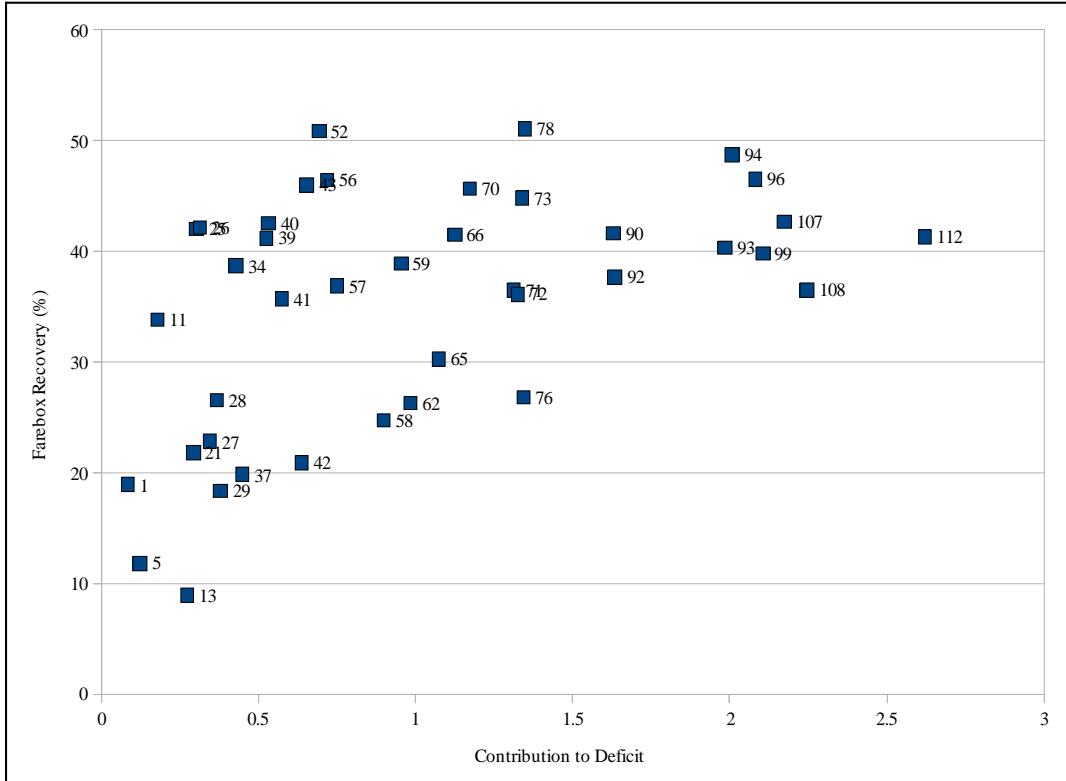
| Route | Farebox Recovery (%) | Rating | Contribution To Deficit | Rating | Category |
|-------|----------------------|--------|-------------------------|--------|----------|
| 25    | 42.69                | Better | 2.17                    | Worse  | 3        |
| 26    | 42.04                | Better | 0.30                    | Better | 1        |
| 27    | 40.37                | Better | 1.98                    | Worse  | 3        |
| 28    | 36.89                | Worse  | 0.75                    | Better | 2        |
| 29    | 41.53                | Better | 1.12                    | Worse  | 3        |
| 34    | 41.67                | Better | 1.63                    | Worse  | 3        |
| 37    | 38.70                | Worse  | 0.43                    | Better | 2        |
| 39    | 39.83                | Better | 2.10                    | Worse  | 3        |
| 40    | 24.74                | Worse  | 0.90                    | Better | 2        |
| 41    | 46.02                | Better | 0.65                    | Better | 1        |
| 42    | 11.84                | Worse  | 0.12                    | Better | 2        |
| 43    | 18.95                | Worse  | 0.08                    | Better | 2        |
| 52    | 26.55                | Worse  | 0.37                    | Better | 2        |
| 56    | 18.38                | Worse  | 0.38                    | Better | 2        |
| 57    | 33.86                | Worse  | 0.18                    | Better | 2        |
| 58    | 42.13                | Better | 0.31                    | Better | 1        |
| 59    | 45.66                | Better | 1.17                    | Worse  | 3        |
| 62    | 36.53                | Worse  | 2.25                    | Worse  | 4        |
| 65    | 22.85                | Worse  | 0.35                    | Better | 2        |
| 66    | 26.27                | Worse  | 0.98                    | Better | 2        |
| 70    | 37.70                | Worse  | 1.63                    | Worse  | 4        |
| 71    | 30.28                | Worse  | 1.07                    | Worse  | 4        |
| 72    | 46.44                | Better | 0.72                    | Better | 1        |
| 73    | 36.13                | Worse  | 1.33                    | Worse  | 4        |
| 76    | 36.50                | Worse  | 1.31                    | Worse  | 4        |
| 78    | 19.87                | Worse  | 0.45                    | Better | 2        |
| 90    | 42.52                | Better | 0.53                    | Better | 1        |
| 92    | 41.21                | Better | 0.53                    | Better | 1        |
| 93    | 8.95                 | Worse  | 0.27                    | Better | 2        |
| 94    | 46.53                | Better | 2.08                    | Worse  | 3        |
| 96    | 21.84                | Worse  | 0.29                    | Better | 2        |
| 99    | 26.80                | Worse  | 1.34                    | Worse  | 4        |
| 107   | 44.80                | Better | 1.34                    | Worse  | 3        |
| 108   | 35.71                | Worse  | 0.58                    | Better | 2        |
| 112   | 50.85                | Better | 0.69                    | Better | 1        |

All 40 regular bus routes have been rated relative to their deficit contribution and farebox recovery. By utilizing this two-way stratification, four route categories were determined as described in Table 32. Placed in the first category are those bus routes that have a superior rating in terms of both relative and absolute measures of deficit. Seven bus routes fall in this category. On the other hand, the six bus routes which fall into the fourth category attain poor ratings for both measures. For these bus routes, consideration should be given to changes which can more closely balance the supply and demand characteristics of the service.

**Table 32 – Contribution Analysis Stratification System**

| Farebox Recovery | Contribution to Deficit | Category | Number of Routes |
|------------------|-------------------------|----------|------------------|
| Better           | Better                  | 1        | 7                |
| Worse            | Better                  | 2        | 16               |
| Better           | Worse                   | 3        | 11               |
| Worse            | Worse                   | 4        | 6                |

The other two categories reflect mixed results. For example, Category 2 routes have relatively low farebox recovery values, but only contribute a modest amount to the deficit. This would suggest limited service. These 16 routes include more than one-third of all bus routes. The results for the third category are reversed from those for the second group. While the farebox recovery is favorable, the deficit contribution is relatively high, with 11 bus routes falling in this category. These routes exhibit superior performance on a rate basis, but are larger routes which contribute significantly to the system deficit. The results, as graphically depicted in Figure 39, would seem to suggest some disparity in performance for both financial measures and the need to examine financial performance in terms of both rate (i.e., farebox recovery) and aggregate (i.e., contribution) measures.

**Figure 39 – Farebox Recovery and Contribution to Deficit**


- **Strategic Planning** – This diagnostic tool examines each route on the basis of its deficit per passenger and each route's share of the system ridership. This is a transit adaptation of strategic planning in the private sector. As noted above, one

criterion used in the analysis is route deficit on a per passenger basis. The importance of this statistic is that it represents the subsidy provided each boarding passenger. It reflects the level of service and the resulting costs as well as patronage and the present fare structure.

Similar to the previous analysis, routes have been classified for two performance criteria (i.e., deficit and ridership levels) relative to the system average. The former uses deficit per passenger relative to the system-wide average deficit per passenger. This ratio indicates how well a route is performing in comparison to other routes. For example, Route 5 has a deficit per passenger of \$2.87 while the system average was \$1.71, equating to a ratio of 1.68. Routes with ratios less than one have a low deficit per passenger rating, while routes with values in excess of one have a higher deficit per passenger rating.

To define a relative measure of ridership, market share has been used. It represents the ratio of each route's ridership to the average route ridership for the system. A route that achieves a value greater than one indicates a relatively high ridership when compared to the system as a whole, while values less than one denote a lower level of ridership.

The need for a ridership measure is apparent from the cumulative distribution of riders by route. The non-uniform distribution of riders between routes suggests that portions of the bus system reflect the desire to provide an amount of service where the demand alone would not warrant these levels of service. However, latent demand alone should not be the deciding factor on whether a bus route should continue to operate. The analysis of a routes deficit per passenger and its market share attempts to classify routes in terms of the subsidy attributed to each patron and a routes ridership level, respectively and together. As shown in Table 33, all routes have been rated relative to deficit per passenger and market share.

**Table 33 – Deficit per Passenger and Market Share**

| Route | Deficit Per Passenger |        | Market Share |        | Category |
|-------|-----------------------|--------|--------------|--------|----------|
|       | Value                 | Rating | Value        | Rating |          |
| 1     | 1.47                  | Low    | 4,327,800    | High   | 2        |
| 5     | 2.87                  | High   | 540,900      | Low    | 3        |
| 11    | 2.10                  | High   | 1,107,900    | Low    | 3        |
| 13    | 0.96                  | Low    | 5,064,200    | High   | 2        |
| 21    | 1.04                  | Low    | 3,140,800    | High   | 2        |
| 25    | 1.29                  | Low    | 4,093,300    | High   | 2        |
| 26    | 1.69                  | Low    | 437,100      | Low    | 4        |
| 27    | 1.27                  | Low    | 3,810,900    | High   | 2        |
| 28    | 1.90                  | High   | 961,900      | Low    | 3        |
| 29    | 1.85                  | High   | 1,480,300    | High   | 1        |
| 34    | 1.40                  | Low    | 2,836,900    | High   | 2        |

| Route | Deficit Per Passenger |        | Market Share |        | Category |
|-------|-----------------------|--------|--------------|--------|----------|
|       | Value                 | Rating | Value        | Rating |          |
| 37    | 1.78                  | High   | 587,700      | Low    | 3        |
| 39    | 1.43                  | Low    | 3,589,400    | High   | 2        |
| 40    | 3.26                  | High   | 669,900      | Low    | 3        |
| 41    | 1.23                  | Low    | 1,294,600    | Low    | 4        |
| 42    | 8.38                  | High   | 35,900       | Low    | 3        |
| 43    | 5.06                  | High   | 40,600       | Low    | 3        |
| 52    | 2.45                  | High   | 365,800      | Low    | 3        |
| 56    | 5.22                  | High   | 177,100      | Low    | 3        |
| 57    | 2.77                  | High   | 158,000      | Low    | 3        |
| 58    | 1.61                  | Low    | 474,900      | Low    | 4        |
| 59    | 1.58                  | Low    | 1,808,500    | High   | 2        |
| 62    | 1.81                  | High   | 3,012,500    | High   | 1        |
| 65    | 5.07                  | High   | 166,400      | Low    | 3        |
| 66    | 3.53                  | High   | 677,300      | Low    | 3        |
| 70    | 2.02                  | High   | 1,967,800    | High   | 1        |
| 71    | 3.34                  | High   | 781,600      | Low    | 3        |
| 72    | 1.71                  | Low    | 1,021,300    | Low    | 4        |
| 73    | 3.08                  | High   | 1,048,000    | Low    | 3        |
| 76    | 2.32                  | High   | 1,376,800    | Low    | 3        |
| 78    | 6.72                  | High   | 162,300      | Low    | 3        |
| 90    | 1.33                  | Low    | 975,600      | Low    | 4        |
| 92    | 1.38                  | Low    | 928,200      | Low    | 4        |
| 93    | 6.61                  | High   | 100,600      | Low    | 3        |
| 94    | 1.24                  | Low    | 4,088,000    | High   | 2        |
| 96    | 2.94                  | High   | 242,800      | Low    | 3        |
| 99    | 2.48                  | High   | 1,318,800    | Low    | 3        |
| 107   | 2.92                  | High   | 1,115,800    | Low    | 3        |
| 108   | 4.22                  | High   | 331,300      | Low    | 3        |
| 112   | 2.43                  | High   | 693,300      | Low    | 3        |

Based on this two-way stratification system, four route categories were determined as described in Table 34. Category 1 bus routes are those which have high relative ridership levels and yet incur a large deficit for each passenger carried. The net impact is typically a large deficit to operate the route. A preferred situation is Category 2, where route ridership is high, but the deficit per passenger is low. Nine bus lines fall into this category. The third category exhibits high deficit per passenger, but the level of service and number of passengers is low. These different performance levels offset one another. This situation may not necessarily place a significant financial burden on the transit

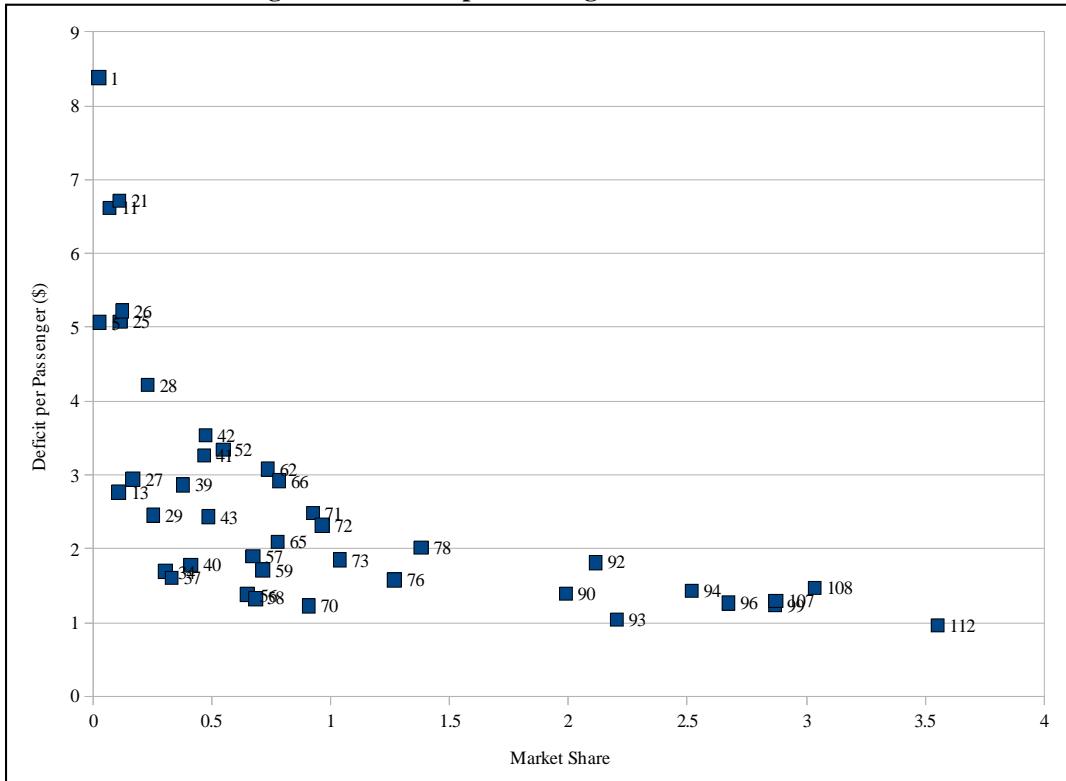
system. Twenty-two bus routes, or more than half of the bus lines, fall into this classification category. Category 4 bus routes also do not place a significant financial burden on the transit system. Deficit per passenger and route ridership levels are both relatively low. Six of the NJ TRANSIT bus routes fall into this category.

**Table 34 – Strategic Planning Stratification System**

| Deficit per Passenger | Market Share | Category | Number of Routes |
|-----------------------|--------------|----------|------------------|
| High                  | High         | 1        | 3                |
| Low                   | High         | 2        | 9                |
| High                  | Low          | 3        | 22               |
| Low                   | Low          | 4        | 6                |

The route classification is graphically depicted in Figure 40. As with the other classification system, the two-way stratification provides a framework for gauging performance. The results show a desirable inverse relationship between market share and deficit per passenger. Service is concentrated on those routes where deficit per passenger is relatively low.

**Figure 40 – Deficit per Passenger and Market Share**



- **Ordinal Ranking** – Another type of evaluation procedure is termed ordinal ranking, where all 40 bus routes are ranked from best to worst across several performance indices. In turn, these results are combined to provide an overall

assessment of route performance. The application of this route evaluation technique consists of three sequential steps.

The first is the selection of measures or criteria to gauge each bus route's performance. In the current analysis, these indices have been grouped into two broad categories to assess productivity and deficit. In all cases, the criteria are specified as rates in that they compare ridership and deficit relative to various operating statistics. This definition of each evaluation yardstick permits routes with different service levels and requirements to be readily compared. As with other evaluation measures, these results are informative and useful inputs to the planning process.

The next step in the route diagnostic process is to rank the routes from best to worst in terms of performance for each of the seven evaluation criteria. In the case of the productivity (passenger) measures, higher route values indicate favorable performance, with these routes assigned low rankings. The route with the highest productivity value and exhibiting the best performance would be assigned a rank of one. Conversely, routes that exhibit relatively low productivity results would denote deficient performance. For example, the route with the lowest productivity value would exhibit the worst performance and therefore would be ranked 40<sup>th</sup>. In a similar fashion, each of the routes comprising the bus system were ranked for four deficit measures. One difference is that for these measures, low values indicate better relative performance and high values denote relatively poor performance.

The concluding step in the ordinal ranking process is to combine results for the individual criteria into aggregate ratings for productivity and deficit requirements. For the three productivity measures, the ranks for each route were summed to determine a score. In turn, this score was used to establish an overall ranking for each route for the three productivity measures. Similarly, scores and ranks were computed for the four deficit indices.

- **Productivity Results** – Three distinct measures were specified which relate the ability of each route to attract patrons relative to the resources necessary to provide bus service. Consistent with factors that influence costs, the productivity measures utilized were passengers per vehicle mile, per vehicle hour and per vehicle day.

In terms of passenger productivity, the top five services (and their respective ranking) are Routes 13 (1), 21 (2), 25 & 27 (3), and 90 (5). With the exception of Route 90, these routes were all in preferred category 2 in the strategic planning stratification.

As seen in Table 35, all three measures were calculated and each bus route was ranked. The table illustrates the range of results, which vary substantially. Table 36 then illustrates how the rankings were then combined to generate an overall score, which itself was ranked. In terms of passenger

The five least productive routes (and their respective ranking) in terms of passengers productivity are Routes 78 (40), 65 & 93 (38), 43 (37), and 42 (36).

productivity, the most productive route appears to be Route 13, with the least productive route being Route 78.

**Table 35 – Passenger Productivity Score and Rank**

| Bus Route | Vehicle Mile Value | Rank | Vehicle Hour Value | Rank | Vehicle Day Value | Rank | Combined Score | Rank |
|-----------|--------------------|------|--------------------|------|-------------------|------|----------------|------|
| 1         | 4.89               | 7    | 41.75              | 11   | 511.93            | 11   | 29             | 9    |
| 5         | 3.45               | 15   | 29.00              | 25   | 331.00            | 22   | 62             | 20   |
| 11        | 2.74               | 23   | 29.96              | 23   | 395.82            | 20   | 66             | 24   |
| 13        | 5.95               | 3    | 55.19              | 1    | 729.92            | 2    | 6              | 1    |
| 21        | 6.59               | 1    | 48.59              | 3    | 645.46            | 3    | 7              | 2    |
| 25        | 6.31               | 2    | 46.54              | 4    | 559.28            | 8    | 14             | 3    |
| 26        | 3.97               | 13   | 36.10              | 13   | 413.15            | 18   | 44             | 15   |
| 27        | 5.12               | 5    | 48.63              | 2    | 585.67            | 7    | 14             | 3    |
| 28        | 3.33               | 16   | 33.69              | 17   | 604.94            | 5    | 38             | 13   |
| 29        | 2.82               | 22   | 32.90              | 19   | 364.43            | 21   | 62             | 20   |
| 34        | 4.59               | 10   | 42.54              | 10   | 501.14            | 12   | 32             | 11   |
| 37        | 2.15               | 26   | 36.30              | 12   | 437.26            | 15   | 53             | 17   |
| 39        | 5.31               | 4    | 44.93              | 7    | 538.79            | 10   | 21             | 6    |
| 40        | 1.91               | 27   | 24.24              | 28   | 271.76            | 31   | 86             | 27   |
| 41        | 5.09               | 6    | 45.38              | 5    | 427.27            | 17   | 28             | 8    |
| 42        | 1.78               | 29   | 13.05              | 40   | 48.07             | 40   | 109            | 36   |
| 43        | 1.20               | 37   | 19.26              | 34   | 79.97             | 39   | 110            | 37   |
| 52        | 3.08               | 17   | 31.83              | 21   | 327.47            | 24   | 62             | 20   |
| 56        | 1.35               | 33   | 15.85              | 36   | 178.76            | 35   | 104            | 34   |
| 57        | 1.61               | 32   | 24.32              | 27   | 279.22            | 28   | 87             | 28   |
| 58        | 3.51               | 14   | 36.00              | 14   | 542.69            | 9    | 37             | 12   |
| 59        | 2.94               | 19   | 34.64              | 16   | 443.26            | 14   | 49             | 16   |
| 62        | 2.98               | 18   | 35.43              | 15   | 598.68            | 6    | 39             | 14   |
| 65        | 0.79               | 40   | 15.51              | 37   | 156.51            | 36   | 113            | 38   |
| 66        | 1.66               | 30   | 20.97              | 32   | 277.00            | 29   | 91             | 30   |
| 70        | 2.49               | 24   | 32.71              | 20   | 403.57            | 19   | 63             | 23   |
| 71        | 1.86               | 28   | 21.64              | 29   | 238.21            | 32   | 89             | 29   |
| 72        | 2.93               | 20   | 33.57              | 18   | 432.74            | 16   | 54             | 18   |
| 73        | 1.63               | 31   | 21.54              | 30   | 237.92            | 33   | 94             | 32   |
| 76        | 2.27               | 25   | 29.46              | 24   | 298.59            | 27   | 76             | 26   |
| 78        | 0.97               | 39   | 13.34              | 39   | 91.87             | 38   | 116            | 40   |
| 90        | 4.88               | 8    | 44.95              | 6    | 634.74            | 4    | 18             | 5    |
| 92        | 4.07               | 12   | 42.65              | 9    | 741.94            | 1    | 22             | 7    |
| 93        | 1.16               | 38   | 14.36              | 38   | 119.10            | 37   | 113            | 38   |

| Bus Route | Vehicle Mile Value | Rank | Vehicle Hour Value | Rank | Vehicle Day Value | Rank | Combined Score | Rank |
|-----------|--------------------|------|--------------------|------|-------------------|------|----------------|------|
| 94        | 4.66               | 9    | 44.22              | 8    | 480.49            | 13   | 30             | 10   |
| 96        | 2.85               | 21   | 27.11              | 26   | 320.33            | 25   | 72             | 25   |
| 99        | 4.09               | 11   | 31.08              | 22   | 330.85            | 23   | 56             | 19   |
| 107       | 1.27               | 34   | 20.54              | 33   | 272.80            | 30   | 97             | 33   |
| 108       | 1.23               | 35   | 16.85              | 35   | 224.12            | 34   | 104            | 34   |
| 112       | 1.21               | 36   | 21.20              | 31   | 309.77            | 26   | 93             | 31   |

**Table 36 – Productivity Results by Route**

| Measure                     | Best      |        | Worst     |       |
|-----------------------------|-----------|--------|-----------|-------|
|                             | Bus Route | Value  | Bus Route | Value |
| Passengers Per Vehicle Mile | 21        | 6.59   | 65        | 0.79  |
| Passengers Per Vehicle Hour | 13        | 55.19  | 42        | 13.05 |
| Passengers Per Vehicle Day  | 92        | 741.94 | 42        | 48.07 |

The results show a fairly consistent pattern in route level productivity regardless of the performance measure. Some differences are noted, which are attributable to different speeds and vehicle utilization.

- **Deficit Results** – In a similar fashion, four subsidy measures were specified and analyzed, as shown in Table 37. Three of these measures record the deficit, or amount of tax subsidy, by operating statistic performance in relation to vehicle mile, vehicle hour and vehicle day, respectively. The other criterion is the ratio of subsidy (or deficit) per passenger. It should be recognized that the subsidy per passenger not only relates to route performance, but also measures the equity in distributing funds to support the bus system. Consistent with the previous analyses, each route is ranked relative to each other and the results summed to attain a score which is then, subsequently, the basis for an overall deficit ranking.

The five most productive routes (and their respective ranking) in terms of their combined deficit score are Routes 94 (1), 13 & 59 (2), 41 (4), and 21 (5). The least productive are routes 5 (40, 46 (39), 96 (38), 97 (37) and 99 (36).

**Table 37 – Deficit Score and Rank**

| Bus Route | Vehicle Mile Value | Rank | Vehicle Hour Value | Rank | Vehicle Day Value | Rank | Passenger Score | Rank | Combined Score | Rank |
|-----------|--------------------|------|--------------------|------|-------------------|------|-----------------|------|----------------|------|
| 1         | 7.20               | 32   | 61.49              | 16   | 754.06            | 18   | 1.47            | 11   | 77             | 21   |
| 5         | 9.88               | 38   | 83.14              | 36   | 949.02            | 36   | 2.87            | 27   | 137            | 40   |
| 11        | 5.75               | 17   | 62.78              | 18   | 829.51            | 29   | 2.10            | 21   | 85             | 24   |

| Bus Route | Vehicle Mile Value | Rank | Vehicle Hour Value | Rank | Vehicle Day Value | Rank | Passenger Score | Rank | Combined Score | Rank |
|-----------|--------------------|------|--------------------|------|-------------------|------|-----------------|------|----------------|------|
| 13        | 5.74               | 16   | 53.21              | 3    | 703.79            | 12   | 0.96            | 1    | 32             | 2    |
| 21        | 6.88               | 30   | 50.76              | 1    | 674.23            | 7    | 1.04            | 2    | 40             | 5    |
| 25        | 8.15               | 36   | 60.12              | 13   | 722.49            | 13   | 1.29            | 6    | 68             | 15   |
| 26        | 6.72               | 29   | 61.09              | 15   | 699.15            | 9    | 1.69            | 14   | 67             | 12   |
| 27        | 6.49               | 27   | 61.60              | 17   | 741.92            | 16   | 1.27            | 5    | 65             | 11   |
| 28        | 6.31               | 24   | 63.85              | 19   | 1,146.54          | 40   | 1.90            | 19   | 102            | 28   |
| 29        | 5.20               | 11   | 60.80              | 14   | 673.61            | 6    | 1.85            | 18   | 49             | 8    |
| 34        | 6.41               | 25   | 59.42              | 10   | 699.93            | 11   | 1.40            | 9    | 55             | 9    |
| 37        | 3.82               | 3    | 64.50              | 22   | 777.01            | 21   | 1.78            | 16   | 62             | 10   |
| 39        | 7.58               | 34   | 64.08              | 20   | 768.49            | 19   | 1.43            | 10   | 83             | 23   |
| 40        | 6.23               | 22   | 79.03              | 33   | 885.88            | 32   | 3.26            | 31   | 118            | 33   |
| 41        | 6.25               | 23   | 55.73              | 6    | 524.79            | 3    | 1.23            | 3    | 35             | 4    |
| 42        | 14.88              | 40   | 109.32             | 40   | 402.81            | 1    | 8.38            | 40   | 121            | 35   |
| 43        | 6.07               | 20   | 97.50              | 39   | 404.92            | 2    | 5.06            | 35   | 96             | 27   |
| 52        | 7.56               | 33   | 78.13              | 31   | 803.76            | 26   | 2.45            | 24   | 114            | 32   |
| 56        | 7.03               | 31   | 82.74              | 35   | 933.30            | 33   | 5.22            | 37   | 136            | 39   |
| 57        | 4.46               | 5    | 67.26              | 25   | 772.26            | 20   | 2.77            | 26   | 76             | 20   |
| 58        | 5.65               | 15   | 57.97              | 8    | 873.71            | 31   | 1.61            | 13   | 67             | 12   |
| 59        | 4.64               | 6    | 54.68              | 4    | 699.78            | 10   | 1.58            | 12   | 32             | 2    |
| 62        | 5.41               | 13   | 64.24              | 21   | 1,085.37          | 39   | 1.81            | 17   | 90             | 25   |
| 65        | 3.99               | 4    | 78.67              | 32   | 793.79            | 23   | 5.07            | 36   | 95             | 26   |
| 66        | 5.85               | 19   | 74.13              | 29   | 979.18            | 37   | 3.53            | 33   | 118            | 33   |
| 70        | 5.03               | 9    | 66.08              | 23   | 815.30            | 27   | 2.02            | 20   | 79             | 22   |
| 71        | 6.21               | 21   | 72.34              | 28   | 796.40            | 24   | 3.34            | 32   | 105            | 29   |
| 72        | 5.01               | 8    | 57.52              | 7    | 741.40            | 15   | 1.71            | 15   | 45             | 7    |
| 73        | 5.01               | 7    | 66.32              | 24   | 732.40            | 14   | 3.08            | 30   | 75             | 19   |
| 76        | 5.27               | 12   | 68.28              | 26   | 691.98            | 8    | 2.32            | 22   | 68             | 15   |
| 78        | 6.55               | 28   | 89.61              | 37   | 617.33            | 5    | 6.72            | 39   | 109            | 31   |
| 90        | 6.48               | 26   | 59.68              | 11   | 842.75            | 30   | 1.33            | 7    | 74             | 18   |
| 92        | 5.61               | 14   | 58.85              | 9    | 1,023.90          | 38   | 1.38            | 8    | 69             | 17   |
| 93        | 7.65               | 35   | 94.94              | 38   | 787.46            | 22   | 6.61            | 38   | 133            | 37   |
| 94        | 5.76               | 18   | 54.74              | 5    | 594.83            | 4    | 1.24            | 4    | 31             | 1    |
| 96        | 8.37               | 37   | 79.72              | 34   | 942.08            | 34   | 2.94            | 29   | 134            | 38   |
| 99        | 10.14              | 39   | 77.05              | 30   | 820.17            | 28   | 2.48            | 25   | 122            | 36   |
| 107       | 3.71               | 2    | 60.01              | 12   | 797.14            | 25   | 2.92            | 28   | 67             | 12   |
| 108       | 5.20               | 10   | 71.16              | 27   | 946.62            | 35   | 4.22            | 34   | 106            | 30   |
| 112       | 2.94               | 1    | 51.61              | 2    | 753.89            | 17   | 2.43            | 23   | 43             | 6    |

As shown in Table 38, and similar to the results exhibited for productivity, the individual route performances vary substantially. Typically, routes receive similar results for many deficit measures; although some significant differences are noted, such as route 42, which scored last in three categories, but first in the other category.

**Table 38 – Deficit Results by Route**

| Measure                  | Best      |        | Worst     |          |
|--------------------------|-----------|--------|-----------|----------|
|                          | Bus Route | Value  | Bus Route | Value    |
| Deficit per Vehicle Mile | 112       | 2.94   | 42        | 14.88    |
| Deficit per Vehicle Hour | 21        | 50.76  | 42        | 109.32   |
| Deficit per Vehicle Day  | 42        | 402.81 | 28        | 1,146.54 |
| Deficit per Passenger    | 13        | 0.96   | 42        | 8.38     |

In the aggregate, a generally consistent pattern of route performance emerges, although some differences are noted and the results are about as uniform as with the productivity measures. Typically, routes that attain a particular rating in terms of productivity achieve a similar performance level for the deficit measures. Differences are attributable to different speeds, vehicle utilization and average fare.

- **Supply and Demand Review** – The concluding analytical technique is a review of the relative balance between the bus service provided on each route relative to its performance for certain key measures. The analysis compares the number of annual bus trips to two performance measures – passengers per vehicle hour and farebox recovery. A ratio is computed which is merely the quotient of annual trips and either productivity or farebox recovery, respectively. This ratio, or rating, is shown in Table 39 for both measures. In addition, each route was assigned to one of three categories depending on the system average. Routes with ratios less than two-thirds of the system average are rated low while routes that are one-third greater than the average are rated high. Routes with ratios that are within one-third of the system average are rated medium.

There are 11 routes that earned a rating of “High” in terms of the passengers per hour ratio, with another 18 routes earning a “Medium” rating and 11 being rated as “Low.”

In terms of the farebox recovery rate, there are 12 routes that rated as “High,” 15 that rated as “Medium,” and 13 that are classified as “Low.”

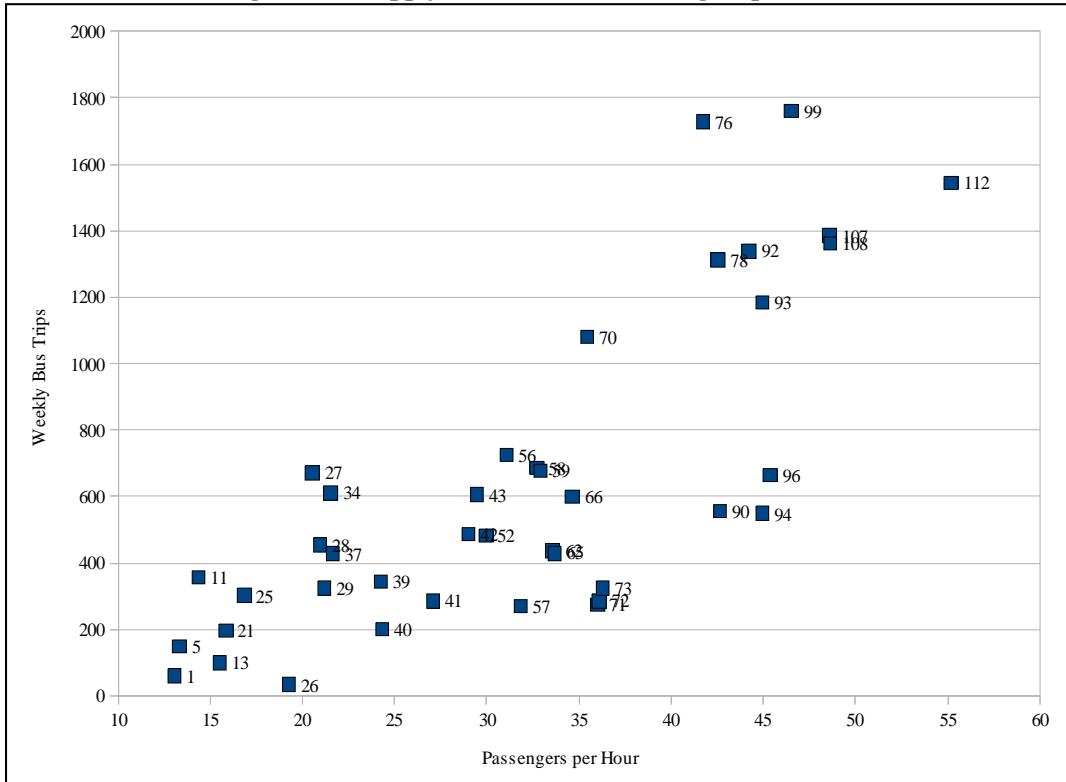
**Table 39 – Service Supply Characteristics**

| Bus Route | Passengers per Hour Ratio | Rating | Farebox Recovery Ratio | Rating |
|-----------|---------------------------|--------|------------------------|--------|
| 1         | 2,151.64                  | High   | 2,172.82               | High   |
| 5         | 872.48                    | Medium | 1,208.78               | High   |
| 11        | 836.86                    | Medium | 644.50                 | Medium |
| 13        | 1,453.88                  | High   | 1,645.80               | High   |
| 21        | 1,482.34                  | High   | 1,409.99               | High   |
| 25        | 1,967.03                  | High   | 2,144.25               | High   |
| 26        | 412.17                    | Low    | 353.90                 | Low    |
| 27        | 1,457.78                  | High   | 1,756.13               | High   |
| 28        | 662.32                    | Medium | 604.78                 | Medium |
| 29        | 1,069.39                  | Medium | 847.02                 | Medium |
| 34        | 1,603.18                  | High   | 1,636.81               | High   |
| 37        | 464.46                    | Low    | 435.67                 | Low    |
| 39        | 1,370.67                  | Medium | 1,545.89               | High   |
| 40        | 735.38                    | Medium | 720.76                 | Medium |
| 41        | 760.20                    | Medium | 749.64                 | Medium |
| 42        | 237.79                    | Low    | 262.06                 | Low    |
| 43        | 92.38                     | Low    | 93.87                  | Low    |
| 52        | 440.69                    | Low    | 528.28                 | Low    |
| 56        | 647.21                    | Medium | 558.00                 | Low    |
| 57        | 431.99                    | Low    | 310.22                 | Low    |
| 58        | 395.87                    | Low    | 338.30                 | Low    |
| 59        | 901.27                    | Medium | 683.64                 | Medium |
| 62        | 1,585.14                  | High   | 1,537.55               | High   |
| 65        | 333.32                    | Low    | 226.27                 | Low    |
| 66        | 1,124.26                  | Medium | 897.35                 | Medium |
| 70        | 1,091.71                  | Medium | 947.08                 | Medium |
| 71        | 1,028.47                  | Medium | 734.96                 | Medium |
| 72        | 678.42                    | Medium | 490.40                 | Low    |
| 73        | 1,474.20                  | High   | 879.08                 | Medium |
| 76        | 1,068.78                  | Medium | 862.78                 | Medium |
| 78        | 579.22                    | Low    | 388.82                 | Low    |
| 90        | 635.29                    | Low    | 671.67                 | Medium |
| 92        | 677.52                    | Medium | 701.08                 | Medium |
| 93        | 1,296.00                  | High   | 2,079.43               | High   |
| 94        | 1,574.66                  | High   | 1,496.57               | High   |
| 96        | 549.33                    | Low    | 681.88                 | Medium |

| Bus Route | Passengers per Hour Ratio | Rating | Farebox Recovery Ratio | Rating |
|-----------|---------------------------|--------|------------------------|--------|
| 99        | 1,212.14                  | Medium | 1,405.85               | High   |
| 107       | 1,700.28                  | High   | 779.43                 | Medium |
| 108       | 935.37                    | Medium | 441.31                 | Low    |
| 112       | 794.02                    | Medium | 331.09                 | Low    |

As shown in Figure 41, the annual trips are reviewed in relation to passenger productivity in a graphical fashion. The most desirable pattern would be annual trips directly proportional to passengers per hour. In essence, bus routes with high passengers per hour should have a relatively high number of annual trips. Conversely, low passengers per hour should result in fewer numbers of annual trips.

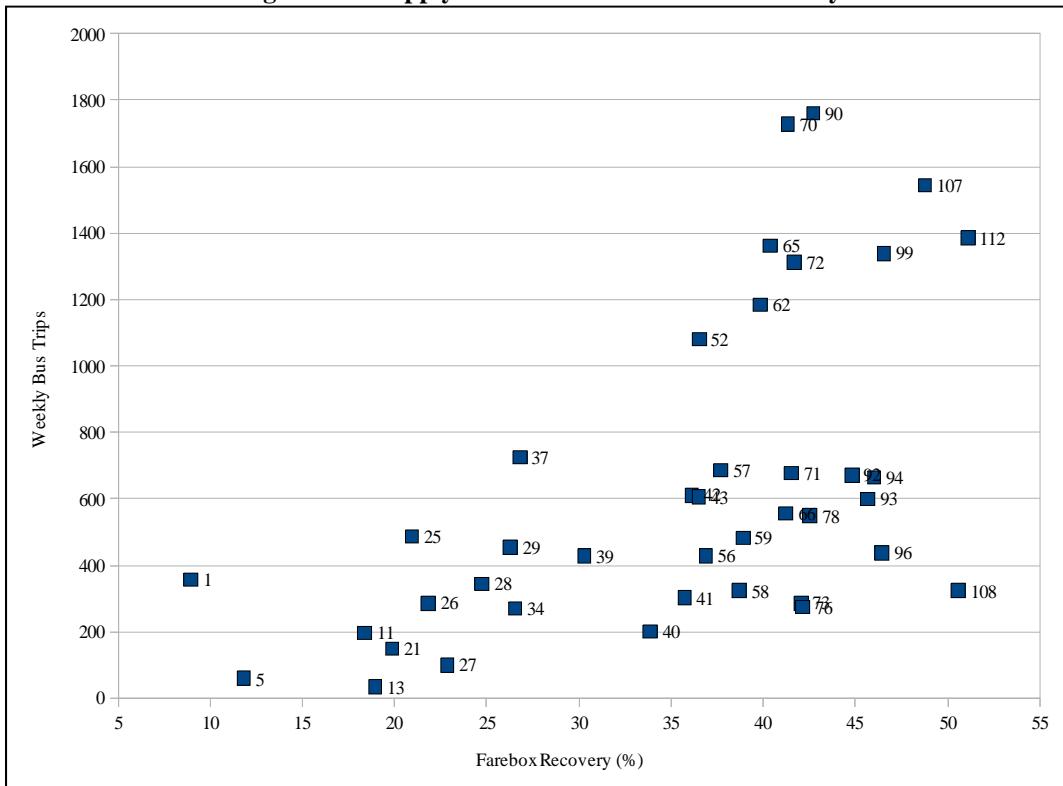
**Figure 41 – Supply and Demand – Passengers per Hour**



The routes generally exhibit a directly proportional linear pattern, which indicates a favorable relationship between the supply of service and the passenger productivity. Moreover, a regression analysis was performed which quantitatively establishes this pattern. This suggests that system supply and demand characteristics are balanced, but for several routes there is no directly proportional relationship between service levels and performance. It is recognized that service levels are established not only in response to demand, but also with consideration of policy levels which indicate the need for service in numerous neighborhoods.

In a similar manner, the relationship between annual trips and farebox recovery were plotted, as shown in Figure 42. This exhibit also confirms that a relative balance exists between transit supply and demand. The regression analysis indicates a similarly “loose” linear relationship for farebox recovery as with productivity. Routes with better financial performance are provided more service, with lower performing routes having less frequent service.

**Figure 42 – Supply and Demand – Farebox Recovery**



COACH USA was approached to take part in this effort; however, do to the proprietary nature of their business, COACH USA was not willing to share statistics on their routes usage, expenses, revenue, etc.

## Appendix H – Focus Group – Educational Facilities Results

**Date:** xx/xx/xx

Attendees:

Kristin Cohen, VP for Enrollment Management, Bloomfield College

Ollyn Lettman, Coordinator, Urban Development, UMDNJ

Joe Vocaturo, Parking Manager, Rutgers Newark

Jimmy Rivera, Public Safety, Rutgers Newark

Gerald Massenburg, Rutgers Newark

Farima deCarvalho, Director, Center for Student Involvement, MSU

Albert Martinex, Associate Director, Campus Center Operations, NJIT

Donna Minnich Spuhler, Director, Campus Center

Gerry Lenihan, Security Manager, Seton Hall Law

### • Overall Issues/Themes

- For students traveling to NYC, difficulty getting back to campus late at night via public transit
- Using public transit can be intimidating
- Free travel weeks on public transit have been popular with students
- Newark Light Rail
  - Improve station aesthetics
  - Security at stations (perceived lack of) is an issue with students
- Increased use of transit - big environmental push - help w/greening of campuses
- Create student guide to NJ TRANSIT
  - Include info on how to travel to other campuses (e.g., Rutgers, Montclair State, Seton Hall, etc.)
  - Have key destinations listed
- Include transit information in new student/transfer student orientation packets

### • Rutgers - Newark

- 24/7 campus
- 10,000 students; 1,200 live on campus
- Does operate campus shuttle services
- Would like to see NJT routes go thru more of campus
- Security concern on transit
- No police presence during off hours (Newark Light Rail)
- Parking is tight
- Currently restructuring orientation program
- Has identified cell phones as a viable means to communicate information regarding transit
- Rutgers Business School moving to 1 Washington Park
- Old Law School at 1500 Washington to be converted to retail/housing

- Need more transit stops in Harrison/Kearny
- Survey of 500 resident students - want access to retail areas in city of Newark
- Retail shuttle to start to Jersey Gardens, Newport Mall
- Part of mission - expand offerings beyond the city

• **Bloomfield College**

- More than ½ students come from Newark and Jersey City
- Other Essex county locations (e.g., Irvington)
- In Union County - Elizabeth is a popular origin
- Primarily a commuter college
- House 20% of student population (400 beds)
- Some students reside in area hotels
- Hope to expand campus
- Looking at University Center - would run shuttle service to this location
- Access is difficult
  - Many students come by bus - travel 1-2 hours
  - Bus travel may involve sometimes 2-3 transfers
- NJT rail—stops in Bloomfield
  - Schedule not great for reverse commute
  - Frequency only 1x/hour
- Bus lines - several buses stop in Bloomfield Center
  - Would like more direct routes or stop closer to campus (e.g., Broad Street)
- Faculty/staff have more widespread commutes than students, some from as far as South Jersey

• **UMDNJ**

- 3,000 students; 10,000 faculty/staff
- Primarily graduate students
- Most students have cars
- Currently operate 3 Shuttle routes
  - 6:15am-10:15pm
  - \$300K annual cost
  - Connects Science/Cancer Center/Dental school/Public Health (ICPH)
  - 25 minutes frequencies
  - Vehicles hold 60 people each
  - Also stop at Penn Station and Broad and Market
- Just built parking facility at Bergen /Orange Street
- Housing - Norfolk and 12<sup>th</sup> Street: 460 units; ¾ full
- Conducted survey of where faculty/staff come from
- Have considered commuter education program; do not have one currently
- Concentration - live in city
- Interested in connections to Central Jersey - Piscataway/New Brunswick
- Cancer Center – located at Bergen/Orange Street
- Within 12-18 months - transportation/parking issues will occur

- State/University Heights Connector project - 1<sup>st</sup> Street to Northern Edge of campus - Will help alleviate traffic congestion
- Observations - NJT buses mostly run east/west
  - Not a lot of north/south routes
  - Lack of service on Bergen St.
  - More service options along University Ave.
  - Lack of service on MLK Boulevard
  - Issue for people living south of campus
- Themes:
  - Information
  - Service coordination

• **Montclair State University**

- Served by Routes 28 and 705, requires connections
- Students use DeCamp Bus Lines to get into the new York City
- Parking deck used by freshmen & sophomores
- No weekend train service available currently
- Food service and maintenance staff use buses
- Issues in staffing evening events on campuses due to lack of transit options
- Often pay for cabs for employees late in the evening in order to staff on-campus events
- Use cell phones to disseminate transit information to students/staff

• **NJIT**

- NJIT runs van service from Harrison and Kearny to campus and from campus to Penn Station
- Free shuttle popular with international students
- Students don't know how to access existing transit services
- Faculty often work past 5 pm
- Parking constraints will soon become an issue
- May look at changing parking policies; currently parking is open to all, with no restrictions (e.g., time)
- NJIT to use current parking lot for Greek Village; may build another deck

• **Seton Hall Law**

- 100% Commuter
  - Older students - majority drive
- No on-campus housing available
- Within next 3 years, hope to have housing adjacent to PSE&G garage
- Parking available in garage at Mulberry Street
- Some take NJ TRANSIT Rail
- Out of state students live in Renaissance Towers
- Other issues
  - Propose transit villages
  - University Heights
  - Norfolk Street

## **Appendix I – Outreach – Newark Liberty International Airport and Ports of Newark & Elizabeth Results**

### **Attendees/Interviews:**

Senior Port Authority Staff, Newark Liberty International Airport  
Station Managers' Meeting, Newark Liberty International Airport  
Port Authority Traffic Engineering Division  
Newark International Airport Cargo Committee  
EWR Council for Airport Opportunities  
Continental Airlines  
Continental Air Cargo  
Federal Express  
Gateway Security  
HMS Host Services  
Worldwide Flight Services (WFS)  
Meadowlink  
US Customs and Border Protection  
US Transportation Security Administration  
Port Authority of New York & New Jersey - Senior Staff, Ports of Newark & Elizabeth  
New England Motor Freight  
East Cost Warehouse  
Port Users Group at Ports of Newark & Elizabeth  
Seaman's Church Institute

#### **• EWR Council For Airport Opportunities (CAO)**

- CAO does recruiting for various airport businesses
- Transportation problems are not a barrier for Newark residents to reach jobs at the airport
  - It had been a problem, he said, but the Meadowlink shuttle to Newark Penn Station had solved it

#### **• Worldwide Flight Services (WFS)**

- WFS is one of a number of companies providing staff for functions airlines decide to outsource
- WFS currently has 436 employees on the airport
- WFS currently handles ticketing, aircraft cleaning and baggage handling for a number of "foreign flag" carriers at EWR
- 65% of employee discharges are due to problems with bus transportation
- Is not part of the Meadowlink shuttle to Newark Penn Station, but shuttle may help their problem

#### **• Gateway Security**

- Gateway provides security and staffing similar to that of WFS
- Operates the Port Authority Taxi Dispatch Program
- Operates the Port Authority Customer Care Program

- Provides the red-jacketed Customer Service Agents in the terminals
- Has approximately 1000 employees on the airport property
- Two specific issues:
  - Need for greater Route 62 frequency during early morning hours (shifts start at 5:00 AM, current Route 62 gets employees to work either too early or too late) and more service during late night times
  - Need for service between Newark Penn Station and the North Area of Airport

• **US Customs and Border Protection**

- CBP has no bus transportation issues. All their people drive

• **Federal Express**

- 2,200 people on the airport property
- Most employees work between 10:00 PM and 6:00 AM.
- Seasonal employees raise the total employee population before the December holidays
- Bus transportation is important, as they have lost 1,000 airport parking spaces due to a recent runway extension
- Spends over \$100,000 a month on employee parking, including their own shuttle system

• **HMS Host**

- Employs 450 people
- Most live in Essex County area (Newark and the Oranges)
- About 65%-70% of employees use public transportation to get to work
- Shifts are from 4:00 AM to 12:00 PM and between 12:00 PM and 10:00 PM
- Out of the 450 employees about 150 start between 4:00 AM and 5:00 AM shift
- Biggest problem is that many of their employees get to work late and they are not able to open the stores on time
- HMS Host has a very high employee turnover rate (approximately 83%)
- Employees from Hillside, Linden, Kearny and Jersey City have difficulties getting to the Airport
  - Need for more frequent service on Route 62 between 3:30 AM and 5:00 AM, as well as in the afternoon between 4:00 PM and 6:00 PM when buses are crowded and many have to wait for another bus to get home
- HMS Host pays for employee parking (\$35/person/month)
- Would be willing to convert the cost of parking for possible vanpool service

• **Continental Airlines**

- 13,000 employees at the Newark Airport
- Approximately 6,000 commute to work everyday
- Other employees include flight attendees, pilots, etc., who stay at local hotels and shared apartments (i.e., "Crash Pads")
- Continental is going through huge expansion – increasing flights from 5% - 7%

- Plan to hire an additional 2,000 employees
- Recruiting within 20-25 miles area - Newark, Elizabeth, E. Orange and Maplewood
  - Many employees use public transportation
  - Main issue is that the Route 62 buses are full, especially at 6:00 PM; many have to wait before the next bus arrives
  - In summer, from June to August, many employees are required to work overtime and they stay at work until 12:30 AM – 1:00 AM. More frequent service on Route 62 bus would be helpful at that time
- **Port Authority of New York & New Jersey - Ports Newark & Elizabeth staff**
  - PA staff are aware of the operational issues facing NJ TRANSIT's Route 40 service
  - Staff said that most of the Port Newark/Elizabeth employees drive
  - Warehouses' staff is exception, these employees are located largely on Polaris Street, Tyler Street, Mohawk Street, Maracaibo Street, Export Street and Distribution Street
- **Seaman's Church Institute (SCI)**
  - SCI provides services to the non-resident sailors who arrive at the Port in the morning and leave with their ships in the late afternoon, or evening of the same day
  - Approximately 15 ships per day, each with 25 sailors (375 people total), arrive at the Port between January and June
  - 30 ships per day arrive (750 people total) between July and December
  - While the SCI runs a shuttle to the nearby Jersey Gardens Mall, many of these sailors wish to go into Newark for the day, but find that the evening schedule on Route 40 between approximately 8:00 PM and 10:00 PM is insufficient and unreliable
- **Port Authority of New York & New Jersey - Traffic Engineering**
  - The PA Traffic Engineering Division is planning a study of bus stop placements at Ports of Newark & Elizabeth
  - The issues center on conflict between the buses and the high volume and high speed of Port truck traffic.

## Appendix J – Stakeholder Meeting Results

The Greater Newark Bus Study consists of one of the largest quantitative analyses of the area's bus system in almost 25 years. NJ TRANSIT has undertaken a variety of surveys activities to assess how well the system serves the greater Newark community, an area which has experienced significant change in the past two decades. In order to supplement the quantitative data gathered throughout the project, interviews were conducted with community leaders to seek their perceptions and views on the bus system. The stakeholder interview process consisted of three basic steps: (1) identification of stakeholders, (2) preparation of a list of topics to be discussed and (3) the conduct of the interviews. Each of these steps and the results are presented in this interim report.

- **Stakeholders** – The list of stakeholders was selected in consultation with NJ TRANSIT staff and the consultant team. They included representatives from the private, public and non-profit communities. The stakeholders identified fell under a number of broader categories which serve different constituents throughout the greater Newark area and which represent a variety of interests in terms of needs and expectations toward public transportation. The broader categories identified were:
  - Civic Groups
  - Cultural/Religious Institution
  - Government
  - Human Service Provider
  - Hospitals
  - Land Use Developers
  - Major Employers
  - Retail Establishments
- **Interviews** – Two sessions of group interviews were held over the span of two days (October 8 and 9, 2007) at NJ TRANSIT headquarters located at One Penn Plaza East in Newark, NJ. A total of 16 individuals participated in the interviews over the two days.
- **Findings and Results** – Each interview session lasted approximately 90 minutes which provided ample time for individuals to participate and create a group discussion. The size of the groups each day enabled each person to have adequate time to speak and provided an atmosphere where everyone was encouraged to contribute to the discussion. The mix of stakeholders enabled a fuller discussion of how different constituencies use and need the bus system. At the beginning of each session, the project was introduced to those in attendance and focus was put on NJ TRANSIT's bus system in Newark and no other modes of transit administered by NJ TRANSIT. The stakeholders discussed topics such as awareness of the bus system, system performance, gaps in the system, desired system improvements, and the role of NJ TRANSIT in the community. NJ

TRANSIT representatives were not present during the sessions in order to allow participants to feel comfortable in expressing their ideas, regardless of their message.

It should be noted that some comments reflect the opinion of a single individual while others represent a widely held view. The majority of the participants were not regular bus riders and thus, their reflections on the bus system are primarily by reference, perceptions, or attitudes. Nevertheless, their views are important in shedding light on how the community as a whole views the greater Newark bus system.

○ **Knowledge and image of the current system**

Participants were given index cards and were asked to describe the current bus system serving the greater Newark area. Numerous people listed the following attributes to the current system:

- Crowded, especially during rush hours
- Unreliable
- Slow
- Unsafe
- Dirty, unclean, poorly maintained vehicles
- Would rather take light rail (clean, new, nice)

It was interesting to note that during this exercise, one stakeholder actually held the opposite view and heard from her clients that the buses were reliable, convenient and available.

Another interesting comment was that school kids take the public bus because it is safer than dealing with gangs and violence on the yellow school buses. This, in turn, reflects the numerous comments made that buses are extremely crowded when school lets out.

Difficulty to navigate the system was also mentioned. This was especially true for those who do not often ride the bus or who want to take it on occasion but cannot figure out the schedule. A number of people linked this comment to the lack of use of the system.

○ **Performance of the current system**

Participants were asked to express what they felt was working well or not well. The aspects of the system which work well are:

- Overall, participants were content with service and mentioned that service is extensive, especially in efficiently moving people from outer areas into the downtown. There was also mention that the NJ TRANSIT web site was easy to access and use, especially the “Trip Planner” portion of the site.

- A number of participants agreed that it was good to see very few breakdowns of bus vehicles on the street and were happy to have a “road worthy” fleet of buses. There was also mention that the fare boxes work well and efficiently in getting people on and off the bus.

The areas where stakeholders felt improvement was needed are:

- Scheduling needs improvement because there is a bottlenecking of vehicles at stops where there are long waits and then numerous buses all at once. Scheduling should also be better coordinated with work and school schedules.
- It was mentioned that the zone system is confusing, especially when trying to coordinate transfers and how to pay for transfers. Uniform payment for multi-modal transit services was suggested.
- In terms of service, more routes to the airport and port were mentioned because they are major area employers. It was also mentioned that employers want more express service because they want their employees to get to work on time. From the area of University Heights, it was noted that there are a lack of north-south routes.
- From a marketing perspective, participants felt that while the web site was easy to access, it takes for granted that everyone has access to the Internet. Also, with the Trip Planner, it was mentioned that the cost isn't specified according to each leg of the trip, which makes it hard to know how to divide up the total cost when actually making the trip. Following up on those with no Internet access, many of the participants noted that the paper schedules are very difficult to read and understand. It was also suggested that marketing materials be translated into Spanish because of the large and growing Hispanic population in the area. There was also a sense that NJ TRANSIT needs to work on changing the poor perception many have of the bus system and its riders, along with trying to make the system more user-friendly for visitors.
- Participants mentioned that bus stops are often difficult to see, especially from far away. Better signage was suggested along with bus shelters for inclement weather. Lastly, it was noted that homeless teenagers can't get the school pass that other children can. Participants in the education field felt that this is something that needs to be addressed.

- **Benefits of the existing system and primary users**

Bus users were identified and possessing one or more of the following qualities:

- Can't afford a car
- Have to share a car
- Students
- Local travelers

The relationship between bus riding and other forms of transit was also discussed. Participants felt that bus ridership is increased due to a lack of reliable and good taxi service. However, fare hikes hurt ridership and low parking rates encourages people to drive to work. Participants also felt that if the distance between work and home was too far, people were unwilling to take the bus.

There were many benefits mentioned to the existing bus system. The discussion was more focused on secondary benefits such as improvements to health and safety with fewer cars on the road. A number of participants felt that fewer cars meant safer conditions for pedestrians and overall better health and environmental conditions (such as reduced pollution). As stated before, compared to the yellow bus system, participants from the education community noted that the NJ TRANSIT bus system is safer. With that being said, participants felt safety needed to be improved, especially in terms of creating safe bus stops with shelters, better lighting, and more prominent signage.

Another benefit mentioned was affordability. Most participants felt that the bus was a form of affordable mobility, comparatively cheap when compared to the automobile. Also, with bus transit's extensive service, people can get around the greater Newark area with relative ease.

Alleviation of congestion was another benefit identified by participants. With fewer cars there is less traffic, which also relates to the perceived health benefits listed above. Furthermore, participants were impressed that the downtown Newark stops were centrally located and stopped at most major places in the downtown area.

- **How well does NJ TRANSIT meet the needs of the community and the future transportation needs for the greater Newark area**

Participants recognized that the bus system has potential to further displace cars with certain improvements. The improvement mentioned included:

- Easier system to understand and ride (less complicated routes)
- Easier payment system (like a Metrocard)
- More frequent service

- Special “school” buses when school lets out in the afternoon
- Maintain cleaner vehicles
- Encourage transit villages in the greater Newark area that are transportation hubs
- Make bus stops safer (see comments above)

Participants also expressed the perception that NJ TRANSIT is not really well connected to the Newark community. They suggested things like offering ad space to the community at reduced or no cost and fostering programs with Newark youth including a public arts project on the buses. It was mentioned that if the youth felt more ownership and involvement on the buses, they might respect the vehicles and NJ TRANSIT employees more.

The use of shuttles and jitneys were discussed. Many stated that these vehicles exist because NJ TRANSIT doesn't provide reliable or adequate service to the places where some people need to go. They described the university consortium that runs the university loop and employers that use shuttles to pick up and drop off employees in a safe and efficient manner. Participants felt that if the bus system were adequate, there would not be a need for the shuttles. One suggestion was made to for NJ TRANSIT to use shuttles or smaller vehicles to alleviate pressure on the current system, especially during times like the hour after school or throughout the evening rush hour period.

- **Gaps in the current system**

Overall participants did not feel that there were many gaps in the system. Some areas where people wanted service or increased service were:

- Ports
- Airport
- Up to Essex Mall
- Outlying areas (suburban communities)

Other service changes mentioned were:

- increase off-hour service (early morning/late night)
- increase service in the South Ward
- possible routes that bypass the downtown

- **Desired transit improvements**

Most participants reiterated improvements mentioned in early discussions. These improvements include:

- More user-friendly system (better maps, more visible stops)
- More express buses and more service during busier periods (e.g., school dismissals evening rush hour)
- More reliable service in terms of buses coming on time and reduced bunching

- Create a good feedback system with a hotline for customer service and better visibility of the agency in the community
  - New routes in areas like the South Ward and Phillipsburg
  - Better and bi-lingual marketing
- **NJ TRANSIT as an organization**  
Most participants felt that NJ TRANSIT is a capable organization, based on a foundation of a good bus system. In addition to mentioning marketing throughout the discussion, participants felt NJ TRANSIT needs to better brand itself as a mobility agency.  
  
It was also mentioned that the community views the executives of NJ TRANSIT as non-users and that it would be advisable for the leaders of the agency to be seen in the community as users of their services, specifically the bus system.

Bus drivers were mentioned as NJ TRANSIT's daily representatives with a large impact on how a person or community views the agency as a whole. It was mentioned that the drivers are the "faces" of NJ TRANSIT. Thus, polite and customer service-oriented drivers are important.

A suggestion was made to have NJ TRANSIT send out "mystery shoppers," that is, agency employees that would ride the service and then advise the agency on necessary changes to the service.

Participants also recognized that NJ TRANSIT needs to capture new customers because it was perceived that the agency cannot "make ends meet" with their current rider population. A way to be more visible and attract riders is to make partnerships with local organization, schools, and parents to create a visible citizens' committee. It was also mentioned that having meetings during the work day is not ideal but that this outreach effort was very much appreciated.

## Appendix K – Bus Operator Meeting Comments

### Hilton Garage

#### Route 25

- Overcrowding/Frequency
  - Express – need more service 3:00 PM – 4:30 PM toward Newark to help with crush loads from school students.
  - After 9:00 AM headway goes to 10 minutes – have heavy loads in the inbound direction by Sanford Avenue. Need a 7 minute headway to Penn Station at least until 10:00 AM.
- Scheduling Issues
  - Passengers complain that there are not enough trips to Doremus Avenue in Newark.
- Alignment Issues
  - Need service to the Home Depot in the Vauxhall area of Union – there is also a new nursing home and Target in this area. There should be two legs on the 25, rather than one via Vauxhall because the 70 already operates this way, the 25 should go to Maplewood via Millburn Avenue at all times.
- Bus Stop Issues
  - Too many bus stops along Springfield Avenue between Grove to 10<sup>th</sup> – do not need bus stops on every corner in this area.
- Management/Street Supervision Issues
  - When road construction has buses operating on a detour due to bridge work, there are no signs posted to tell passengers where to board the bus. Regional Supervisors should be assigned to the area to inform passengers of where to catch the bus.
- Passenger Activity Issues
  - 120 Milburn Avenue is a medical building – lots of passenger activity between 9:00 AM and 3:00 PM.
- Other Issues
  - Need to post signs about fare zone changes.
  - Fare zone boundary should be moved to New Street.
  - There are always passengers who want to get off the 25X on the 25 local segment.

#### Route 1

- Overcrowding/Frequency Issues
  - 8:00 AM – 9:40 AM inbound direction – now have a 20 minute headway – need 12 minute headway. Inbound trips are crowded by the 5<sup>th</sup> stop during this period.
- Scheduling Issues
  - Should have an express from Jersey City to Penn Station. Should run via Raymond Blvd. with the first stop at River Terminal in South Kearny. Should run 6:00 AM – 8:00 or 9:00 AM and 4:00 PM to 6:30 PM. Should also have a Journal Square leg.
  - Need more Ivy Hill services – does not need 20<sup>th</sup> Street bus during the 8:00AM-9:40AM period.
  - 7:15 AM – 7:45 AM – Lots of students going from Ivy Hill to East Side High School at Ferry and Van Buren. Maybe there should be an express from Ivy Hill to East Side HS between 7:25AM and 7:40AM, coming back 2:30PM – 3:00PM.

- Alignment Issues
  - Should Route 1 be broken into separate routes? Not an issue with drivers. Just need more recovery time. Ivy Hill people do want to go to Journal Square or to Exchange Place.
  - Cannot make the turn from Mott Street onto Fleming due to double parking at the corner store.
  - Euclid routing is confusing. Destination signs should say Lockwood or Chapel instead of Euclid.
  - There are too many legs on Route 1.
- Running Time Issues
  - Currently have 5 minutes between Chapel St. and Penn Station. Too much time between MLK Blvd. and 20<sup>th</sup> Street – need 4 more minutes from 20<sup>th</sup> Street to Ivy Hill and 4 more from Penn Station to Chapel St.

### **Route 26**

- Overcrowding/Frequency
  - There should be 30 minute headway on Route 26. The current 60 minute headway after 9:00 AM is not enough service.
- Bus Stop Issues
  - There should be a bus stop by the Union train station at King College between Salem Road and King College going toward Union Station. This would help with Maggie Avenue.
- Running Time Issues
  - There are running time issues on the 26.

### **Route 27**

- Overcrowding/Frequency
  - There should be more short turn service to Lincoln Park.
- Scheduling Issues
  - Between 4:00 PM and 4:15PM, there should be another tripper from Bloomfield Avenue.
- Alignment Issues
  - Need to look at Washington Avenue.
  - There are always double parked cars at Mt. Prospect Avenue and Heller Parkway. Makes the right from Heller onto Mt. Prospect difficult.
- Running Time Issues
  - There are running time issues on the route.

### **Route 13**

- Alignment Issues
  - There needs to be more Valley Fair service – more people use the 13 to get to Valley Fair than travel to the Irvington Terminal.
- Scheduling Issues
  - In the AM peak, operate the Mill Street trips to Bellville
  - Should be later evening service along Joralemon branch to Clara Maas Hospital.

### **Route 37**

- Overcrowding/Frequency Issues
  - Need more midday service. Needs a 20 – 30 minute headway instead of the current 40 minutes. Right now there is a private shuttle from the Airport terminals to Penn Station at certain times.

- Scheduling Issues
  - Need inbound service from the Airport terminals at least as early as 5:30 AM.
  - There is very little layover time on the 37. Drivers need at least 15 minutes layover.
  - The three peak trips that end at Irvington Terminal should go to Ivy Hill instead.
- Alignment Issues
  - When the Route 37 crosses Highways 1 & 9 there is not enough room to get over to where you need to be.
- Passenger Activity
  - People do get off at Haynes Avenue – lots of people working at the rental car place.
  - Lots of people getting off at Haynes Avenue and transferring to Route 24 to go to Newark and Elizabeth.
  - The 107 is unreliable coming out of New York, so passengers always look for the 37.
  - Only one driver said that he has seen sailors getting on the 37 at North Terminal.
  - Lots of passengers on the 37 and 107 with luggage. This is especially true in the peak hours with people trying to catch 7:00 AM and 8:00 AM flights.
- Management/Street Supervision Issues
  - Flooding occurs at the airport once every three weeks or so. There should be a Regional Supervisor assigned to the Airport to instruct passengers at other terminals to pick up the 37 at Terminal A. When flooding occurs, the buses can get into Terminal A but not into Terminals B or C.
- Vehicle Issues
  - Should not use cruiser buses on the 107 - since they cannot have fareboxes and drivers do not want to handle cash on the local trips. Maybe take seats out of the 107 buses and put in luggage racks.

### **Route 39**

- Overcrowding/Frequency
  - Full loads from North Arlington to Kearny.
- Passenger Activity
  - Most passengers from Kearny are only going as far as downtown Newark (Broad & Market or Broad Street Station), very few passengers riding through.
  - From Kearny, the bulk of riders are going to Broad & Market or Military Park.
- Alignment Issues
  - Should 39 be split? There are heavy loads in Kearny/Harrison. If you could not use arterials in Kearny, frequency of service would need to be higher.
  - Lose lots of time on Commerce between Mulberry and Broad.
- Bus Stop Issues
  - Need official bus stops in Kearny. Now, you have to stop at every corner.

### **Route 42**

- Scheduling Issues
  - Make 42 a pickable route.
  - Some drivers think 42 should be eliminated.
- Passenger Activity
  - There is nobody riding along Grove to Springfield.

### **Route 52**

- Scheduling Issues
  - Passengers ask for weekend service on the 52.

- Passenger Activity
  - There are a lot of college students using the 52 to go to Elizabeth for shopping and retail jobs.
  - At Morris Ave. and Mountain Ave, lots of passengers are transferring between the 70. Many are day laborers coming from Elizabeth and Hillside connecting at Morris & Mountain to get to Summit. This occurs Monday – Sunday.

### **Route 70**

- Overcrowding/Frequency
  - Weekend service – need a 20 minute headway. Pick up 80-85 people on every trip.
- Scheduling Issues
  - Not enough recovery time during the peak hours on the Newark side.
  - Route 70 is a long trip and there is not enough recovery time. Need 15 to 20 minutes of layover time – it takes 5 minutes just to walk from the layover spot to the mall.
  - Need earlier morning service and later service (until 7:00 PM) between Maplewood and Florham Park.
- Alignment Issues
  - Should be a bus from west of Irvington Terminal area (Maplewood) direct to PABT.
- Passenger Activity
  - Weekends - Lots of day laborers getting on bus between Irvington Terminal and Maplewood (Hilton Garage) going to the train station.
  - Irvington Terminal to Short Hills Mall weekday service. Lots of passengers to the office building across from Short Hills next to the Hilton. If the bus went into the Hilton, the passengers could walk over to the office building.
  - Lots of people from Maplewood transferring from the 25 to the 107 for service to NYC.
  - In AM people take 70 to Short Hills and transfer to the MCM3 – probably for service to Morristown. 70 should either go to Morristown or have a better connection between the 70 and the MCM3.
- Running Time Issues
  - Mornings – need 3-4 more minutes between Maplewood and Irvington Terminal, 3 more minutes from Irvington to Avon Avenue.
  - Avon Avenue to Irvington Terminal – need 5 more minutes of running time between 9:00 AM – 1:00 PM – lots of passenger activity. Another driver said this change is needed in the peaks as well.
  - Passengers complain about service running late – mainly in the peak periods.

### **Route 107**

- Alignment Issues
  - Having the 107 go through the Airport terminals would help with off peak loads on the 37.
- Passenger Activity
  - Lots of passengers on the 37 and 107 with luggage. This is especially true in the peak hours with people trying to catch 7:00 AM and 8:00 AM flights.
- Vehicle Issues
  - Should not use cruiser buses on the 107 to address the issue of passenger luggage since cruiser buses cannot be equipped with fareboxes and drivers do not want to handle cash on the local trips. Maybe take seats out of the 107 buses and put in luggage racks.

### **Route 108**

- Alignment Issues

- People at the Colonnade want the express service back.
- Before 10 AM, lots of people want to go from Penn Station to Union City. If the 108 did this, it would not be able to use the XBL and the people going to NYC would not use it.
- Passenger Activity
  - No ridership going to Ferry Street and no riders on Ferry Street are going to NYC.

### Fares

- A one zone fare structure would be good because it would get rid of the complication.
- Should encourage people to buy passes to take advantage of the discount.
- Passengers do not use the 1 zone bus cards.
- A multi-mode system pass would be a very good idea.
- Using lottery outlets – the tickets would have to be very clear as to what it is. Operators do not have time to read tickets. Scratch off tickets would only work if the print is big enough for the operator to see it easily.

### Public Information

- Some people do not know how to read the timetables – people think that the time points are the only bus stops.
- Maps should show different legs of the routes in different colors.
- Fare zone changes should be shown in different colors on maps and schedules.
- Bus shelters should have schedules and maps.
- Schedules and maps should be provided at all transfer points (at least frequency tables).
- No one reads notices that are posted behind the driver seats. No one reads pamphlets.
- To communicate service changes to passengers, NJ TRANSIT should:
  - use scrolling messages on electronic signs in the buses
  - have automated intercom announcements
  - put information on bus passes
  - use scrolling message or commercial on cable channel - News 12
  - send text messaging through cell phones
  - put summary of service changes in Star Ledger

### Newark Liberty International Airport

- Fed Ex and Continental – some people in the AM peak observed on Route 70
- Airport employees – lots living along Springfield Avenue.
- Should be a Springfield Avenue – Irvington Terminal – Airport route at certain times of the day.
- There is a need for an Ivy Hill – Airport route even more than from Springfield Avenue. Could be Springfield Avenue – Florence Avenue – Ivy Hill.

### New York City

- Lots of passengers on the 25 going to Penn Station to continue on to NYC.

### Destinations

- Jersey Gardens Mall from Ivy Hill-Newark
- 107X (express) on the weekends
- More service to Firmenich Way in Newark

### Orange Garage

#### Route 5

- Overcrowding/Frequency Issues

- New Central High School is going to open next fall on 18<sup>th</sup> Street between Bergen and Irvine Turner. This is going to have a big impact on the route.
- Lots of school kids riding Route 5.
- Alignment Issues
  - Reroute the 5 in East Orange: current routing is Steuben, right on Sussex, left on 14<sup>th</sup>. Should just stay straight on Steuben, then right on Main and layover on Main by Western Beef.
- Bus Stop Issues
  - Passengers wait for the bus at 15<sup>th</sup> & Main on the eastbound side of the street – but this is just a layover spot, not a bus stop.
- Management/Street Supervision Issues
  - Lane 1 in Penn Station is a problem if you don't arrive on schedule.
  - Operators like driving Route 5 because it is one zone route.

### **Routes 11/28/29 – Bloomfield Avenue Corridor**

- Scheduling Issues
  - The 6:20 AM OB 29X – the lead bus is 10 minutes ahead – by Caldwell, the X catches the leader. No one is on the X after Caldwell.
  - 29 should go all the way to Parsippany (US 46 & US 202) during the midday.
  - Route 28 should run all day from Montclair State to Willowbrook – lots of college kids want to work and shop at the mall. Now they have to go to Montclair center and transfer.
- Running Time Issues
  - Route 29 – Essex Mall area and only have 6 minutes from Penn Station to Broad Street Station.
- Alignment Issues
  - There are only 6 or 7 people on the 7:46 AM IB trip from Parsippany – should terminate at Broad Street Station, passengers going to Penn Station can take the light rail.
  - 29X should not go to Lake Hiawatha-Parsippany.
  - Service should be extended to Willowbrook from West Essex Mall to service the jobs on Passaic Avenue in Fairfield.
  - Route 11 – should alternate between downtown Little Falls and Highway 23.
- Passenger Activity
  - Passengers get on 29X and still want to get off at local stops.

### **Route 21**

- Running Time Issues
  - The PM tripper from Main & Day to Penn Station currently has 22 minutes; should be 29 minutes.
- Scheduling Issues
  - Having the trippers from Main & Day helps.

### **Route 27**

- Overcrowding/Frequency Issues
  - 7:00 AM trip from Forest Hill to Irvington is overcrowded. Lots of passengers get off at Bloomfield Avenue. Overcrowding occurs on Mount Prospect between Verona Avenue and Bloomfield Avenue.
  - 7:59 AM trip from Forest Hill – the 7:36 AM trip from Clifton/Nutley is supposed to be in front of the 7:59 Forest Hills trip – but the Nutley trip gets caught up and does not lead the 7:59 Forest Hill trip. The 7:59 Forest Hill trip then gets all of the passengers and gets

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overcrowded with school kids. Start passing up passengers by former Ballentine Brewery.

- Running Time Issues
  - If the trip is running time, there is too much running time from Elizabeth and Clinton to Fabyan Place.
  - Running times between Lincoln Park and Irvington Terminal need to be adjusted. The overall running time is OK, but the point to point times need to be adjusted.
- Alignment Issues
  - Making the left from 20<sup>th</sup> Street to Clinton Avenue on the way to Irvington is difficult since there is no traffic light at the intersection.
  - The right onto Mt. Prospect Avenue from Heller Parkway is difficult due to the current sidewalk construction.
- Passenger Activity
  - Ridership is light between Lincoln Park and Irvington Terminal, only 5 to 10 people per trip – most passengers use the 13 to make this trip. From downtown to Irvington Terminal, people would rather use the 13.

### Route 34

- Overcrowding/Frequency Issues
  - Run 5 on the 34 - 7:14AM trip from Montclair is overcrowded with East Side HS students by 4<sup>th</sup> Avenue.
  - Need service to Montclair on Sundays and holidays as well as after 7:00 PM on weekdays.
  - Frequency in the Ironbound should be more than 30 minutes.
- Scheduling Issues
  - The Sunday schedule is very difficult for drivers. Trips on the north side of the route end at the North Park Street Loop. There are no facilities for drivers at this location.
  - Need 14 minutes total of running time from Montclair to Orange.
  - There should not be any more reliefs; all service should be pull-outs from, and pull-ins to, the garage.
- Running Time Issues
  - Bloomfield (Liberty & Broad) to Renshaw & Prospect – current running time is 6 minutes – this is not enough.
- Alignment Issues
  - There is lots of double parking going on in front of the school at Roseville and Orange.
  - The right onto Pennington from Hermon is difficult to make due to people in the apartment building parking on Pacific and blocking the turn. The route should just take a right onto Pacific from South Street.
  - Buses get hung up at Elm Street and Union Street in Montclair due to trucks making deliveries and cars double parking.
  - If the 34 were split, the Ironbound route should continue as far north as 4<sup>th</sup> & Roseville – the route could layover like the 96 on Delvan Avenue.
  - If the 34 were split, could use 30' buses which would address some issues – however, enforcement of double parking would still be needed.
  - An Ironbound route should go to the factories on South Street.
  - Under the current 34 routing (loop in Ironbound), driver has to take his layover with passengers waiting on the bus.
  - Passengers ride around the loop and do not pay a fare for the inbound trip.

- Passenger Activity
  - Every morning there are hundreds of East Side HS students waiting for buses at Broad and Market to go to the school.
  - There is a clinic on Clifford Street where a lot of passengers are traveling.
  - No passengers are traveling through downtown between Montclair and the Ironbound.
  - Do not see many passengers wanting to go from the Ironbound to the Airport.

### **Route 41**

- Scheduling Issues
  - Trip spacing should be consistent – instead of 3, 5, 15 minute spacing, it should be every 8 minutes.
  - Passengers want to go to Fairfield more often.
- Alignment Issues
  - Clifton Avenue, Park, 7<sup>th</sup> Avenue, MLK Boulevard – traffic is very bad.
  - The right on Clifton from Park is difficult because traffic getting onto I-280 can hold up the bus for 15 minutes. Should continue straight on Park then right on Summer, left on 7<sup>th</sup> Avenue.
- Passenger Activity
  - Heavy ridership – crush load by Grove Street in the AM.
  - The 3 trips in the PM to Lincoln Park carry 360 people.
  - People working at Raymond Blvd. & Park.
  - Ridership mixed, some people going to Penn Station, some transferring to Route 40.
- Other Issues
  - Some drivers do not pick up passengers on the way back in from Lincoln Park.

### **Routes 71/73**

- Overcrowding/Frequency Issues
- Scheduling Issues
  - Route 10 service – people want to go to Gibbs College. Livingston Mall closes at 10:00 PM; last IB bus should be at 11:00 PM.
  - Need another bus during the midday on Route 71.
  - Route 73 – Need service to St. Barnabas Hospital on Sunday.
- Running Time Issues
  - Route 71 – 12:25 PM OB has running time issues.
- Alignment Issues
  - Should only pick up to the Erie Loop.
  - 71 X from Erie Loop to Becker Farm Road when it comes off I-280.

### **Route 79**

- Scheduling Issues
  - Need service in both directions all day, 7 days/week.
- Alignment Issues
  - Should make a stop at Main & Day in Orange.

### **Route 92**

- Overcrowding/Frequency Issues
  - Need more weekend service. Frequency should be 30-45 minutes.
  - Need more frequent midday service.
- Running Time Issues
  - 6:16 AM trip from South Orange gets:

- 4 minutes from S. Orange to Argyle – should be 6
- 7 minutes from Argyle to Main Street – should be 10
- 7 minutes from Main to Garage – should be 10
- Alignment Issues
  - There are layover location issues with this route.
- Passenger Activity
  - People transfer to the 34 but the routes do not meet up well.
  - Lots of seniors ride the 92.

### Route 93

- Scheduling Issues
  - The route is a short ride with not a lot of traffic.
  - Do need the route. Should have more service.

### Route 94

- Alignment Issues
  - Split the 94 in Union Center.
  - Union side bus should extend to Linden Aviation Plaza. 56 and 57 are too infrequent to those shopping centers.
  - 94 across should operate via the US 22 branch and end at the Cranford Train Station.
  - People want to go to Kohl's and other shopping along US 22.
- Passenger Activity
  - There is a methadone clinic on Main Street in Orange.
- Vehicle Issues
  - There is too much turning on Route 94 to use an artic.

### Route 96

- Running Time Issues
  - There are running time issues with the route.
  - Only get 24 minutes from Bloomfield to Valley Fair; need more time.

### Route 97

- Running Time Issues
  - Only get 5 minutes of layover time at each end.
- Scheduling Issues
  - There is currently no service in that area on Sunday.

### Fares

- There is a subway transfer issue.
- Flat fare structure would be good. Most Orange riders are 2 zone riders.
- Lottery sales outlets? Lottery ticket - bad idea – tickets would be hard to read. Scratch off ticket idea – as long as it is easy for the operator to read quickly.

### Public Information

- Fare should be better explained on timetable.
- Need to educate the public about the fare structure.
- Need information in Spanish.
- Need an info booth at the bus lanes at Penn Station.
- Should highlight the time points on the timetable maps.
- NJ TRANSIT should communicate information about service changes to passengers by:
  - Playing recorded recurring announcements in buses
  - Scrolling messages on electronic signs on buses

- Airing commercials on cable channel News 12 and Radio 1010

### Newark Liberty International Airport

- There should be a route from North Orange – Main Street – Parkway – 78 – Airport.
- Lots of people going to the Airport from Main Street and Bloomfield Avenue in Caldwell.
- 21 to the airport – used to serve airport? Would be a long ride.
- Extending the 37 Irvington Terminal to East Orange? That would be out of the way and too long.
- Should be Penn Station to Airport Express route.
- Consider Route 94 corridor to the airport – could be Stuyvesant, Lyons Avenue to I-78
- Maybe Irvington Terminal to Airport Express would be good idea.

### New York City

- Need Bloomfield & East Orange to New York – people go to NYC.
- 29 to Glen Ridge Train Station.

### Destinations

- Need service from Avon & Bergen to I-280 – lots of new housing.
- Should do outreach to seniors about riding.
- South Orange to Maplewood.
- Milbourne Avenue.
- Wal-Mart in Kearny.
- Post Office in Kearny.
- Passaic Avenue in Kearny.
- Route 46 and Fairfield Avenue

### Other Input

- Children under 12 should ride for free
- Should alternate Mississippi/Erie Loop trips
- Need enforcement of fare zones.
- NJ TRANSIT PD should ride the whole trip.

### Big Tree Garage

#### Route 13

- Overcrowding/Frequency Issues
  - Sunday night service is not frequent enough. Overcrowding is occurring and drivers must pass up passengers.
- Running Time Issues
  - Clinton to Valley Fair – have 8 minutes – need at least 10 minutes.
  - Need at least 12 minutes from Clinton Place to Valley Fair. There is heavy ridership with school kids and people going to the supermarkets and restaurants on Lyons Avenue. There is passenger activity at every stop, which affects the running time.
  - Not enough time from Big Tree Garage to Broadway & Verona on weekends. There is a lot of passenger activity along this segment with people going shopping.
- Scheduling Issues
  - Get less layover and running time going to Valley Fair.
  - Joralemon Street (13J) needs service after 7:00PM.
  - Run 34 – PM OB trip should not be an express – nobody rides the trip. Should operate as a local trip.
- Passenger Activity

- At the split, typically have 10-15 people going to Irvington, but 40 people going to Valley Fair. This is the case all day, every day.
- Not a lot of ridership to Styertown Plaza (Clifton) anymore.
- There is lots of activity on Industrial Way (Clifton). People are transferring to the 192.
- Alignment Issues
  - Get lots of requests from passengers for service to Clifton Commons. Especially on Friday nights and weekends. Some are people working there.

#### **Route 40**

- Running Time Issues
  - Freight trains cause delays at night on Delancy Street – up to 15 minutes.
- Scheduling Issues
  - All weekend trips should go to the prison. Also, need some evening trips into the prison.
- Alignment Issues
  - The lunch truck disrupts service 7:00AM – 9:30AM on Frontage Road
  - Limo drivers wait in the circle on Frontage Road, sometimes double parked, which causes a problem.
  - All buses should come down and turn at Doremus Avenue rather than Marlin, it would be safer.
  - The left from Harrison onto Frank E. Rodgers is tough due to the traffic around the Harrison PATH station every morning. Cannot predict how long it is going to take to make the turn. Local police do not address the issue. Current bridge work is making the situation worse.
  - Harrison floods at 4<sup>th</sup> near the Harrison PATH station in heavy rains.
  - The construction at Broad Street Station is making it unsafe for passengers to wait for the bus.
  - Trips should go right Mulberry, left Park Place, left Rector, left Broad.
  - It is hard to make the left onto Van Buren from Market because cars are parked right up to the corner. Should eliminate the bus stop on Van Buren. OR: stay straight on Raymond off the ramp from the bridge – this would be safer. Passengers do get off on Van Buren, so need a bus stop at Cape May Street, or stay on the ramp and make the stop at Jefferson on Raymond Blvd.
  - After the stop at Madison, it is difficult to get back into traffic and make the left onto the bridge. Need to look at the Harrison/Stadium/Bridge area routing.
  - The prison is doing a better job lately of keeping the road clear.
  - The bus bottoms out when leaving the prison.
  - Route 40 should go into Airport terminals.
- Passenger Activity
  - Hotel employees walk along the highways to get to the hotels in the US 1 & 9 infield. These people are mainly coming from Kearny and Harrison.
  - At the Port – most people get off at Doremus and Navy. The bus used to go down there, but now there is a gate and the bus cannot get in.
  - Sailors who board at the Port want to go to the liquor store, to go to Penn Station to get to NYC or would like a bus directly to NYC. They also want to get to Jersey Gardens Mall to buy clothes. They typically travel in groups with one member able to speak English. Most are Eastern Europeans.
- Bus Stop Issues

- Cannot see if anyone is waiting at the stop on Lyle King because of the tractor trailers.  
Need to move the stop to the corner. Also need a pedestrian crosswalk in the area.
- There should be a stop by the Immigration building on McLester Street across from Apple Trucking in the IB direction. Lots of passengers wait there, but there is no official stop.
- Other Issues
  - There should be a sign in the port area that says that buses must stop at the railroad tracks. When buses stop, there are a lot of near accidents with trucks rear ending the buses.

### **Route 76**

- Overcrowding/Frequency Issues
  - Route is overcrowded on Sundays due to 65 minute frequency. Need more frequent service.
- Running Time Issues
  - The 5:20AM OB trip to Hackensack - currently get 11 minutes from Broad Street Station to Ridge & Bellville Turnpike, need at least 14 minutes.
  - 76 L (21 run) – need 5 – 6 more minutes to get to Lyndhurst.
  - (Run 13) 7:25AM trip to Newark – always runs late from North Arlington Loop to Broad Street Station – need 15 minutes more. Too much time between Rutherford Station and North Arlington Loop.
- Scheduling Issues
  - Should re-order the patterns in the afternoon – the L trip at 4:46 PM gets over 100 passengers - If the 76 P at 4:15 PM is running late, then the 4:46 L trip gets even more passengers.
- Alignment Issues
  - Express routing is unsafe – should go over Park Avenue and get on Route 3 via the second ramp.
  - New Pattern Suggestion – should have a 76 Express from Hackensack to Penn Station.
  - Should serve the Meadowlands Race Track and Sports Complex.
- Passenger Activity
  - Lots of passengers work in the office buildings in Lyndhurst.
  - On the early AM OB trips (to Hackensack) lots of passengers getting off in Kearny at the Bellview Drive School, industrial area, Wal-Mart, grocery stores.
- Bus Stop Issues
  - Need a NB bus stop on Polifly Road around Essex Street by the Rite Aid so people can get to the hospital. SB is direction stop is OK.
- Vehicle Issues
  - Need a 2-door bus on the 76.

### **Route 78**

- Overcrowding/Frequency Issues
  - Afternoon trips out of Secaucus are overcrowded.
- Scheduling Issue
  - Last trip – should drop people off at Secaucus and then get on the highway.
- Alignment Issue
  - If there was a special transfer fare – 78 should end at Secaucus Junction and let the passengers transfer to the train. Times on the 78 would need to line up better with the train.

## Route 99

- Overcrowding/Frequency Issues
  - Run 7, Run 14 – starting at 3:45 PM, trips get overcrowded with school kids starting at 7<sup>th</sup> Avenue.
  - IB trips in the afternoon are overcrowded by the University Hospital.
- Scheduling Issues
  - The 2:55 PM trip from Hillside should leave later because the trip does not pick up many passengers but the next IB trip gets overcrowded.
  - The Beth Israel trips in the afternoon are spaced too closely.
- Alignment Issues
  - Orange & MLK by the I-280 off ramp – the traffic light at the train trestle is very short. You have to go into the box to be able to make the turn – Monday through Friday AM and PM rush hours. Morning is not as bad as PM because people are getting onto 280.
  - Bergen & S. Orange – Left from Bergen to S. Orange – need a left arrow signal – turn is tough all day.
  - From Jones left onto S. Orange – turn is tough all day – need a left arrow signal.
  - One set of railroad tracks on Ramsey Avenue is not active – buses should not have to stop. There is also a crossing over the inactive track on Chestnut Avenue.
- Bus Stop Issues
  - At Bergen & W. Market – make left onto W. Market and the first stop is not until Bruce – this is too far. There is a stop closer, but it is not marked as a 99 stop.
  - The bus stop at W. Market and Bruce should be moved or eliminated. It is difficult to get back out into traffic after making the stop.
  - There are no bus stops from UMDNJ to S. Orange & Bruce.
- Vehicle Issues
  - Hillside does not want artics – maybe could use artics on Beth Israel trips.
- Management Issues
  - When drivers report overcrowding, the Control Center wants drivers to make stops and tell waiting passengers that they cannot board due to overcrowding. However, once the bus stops and the doors open, passengers will try to crowd on. The driver then must try to get the passenger to de-board. This causes delay and friction with the passenger.

## General Operating

- Need police to address the double parking on Mulberry between Market and Raymond. People are using the Commerce Bank ATM by PSE&G.
- 2 bus stops at Hillside & Broadway – one should be eliminated.

## Public Information

- Passengers know the trip times during the weekday, but do not know the weekend schedules.
- Passengers do not know how to read the timetables.
- Should list major bus stops on timetables.
- Passengers ask a lot of questions about fares.
- Need bigger print schedules for seniors.
- Fare zone changes should be highlighted or colored differently on the maps.
- Need posted information at transfer points.
- Need more posted information at Broad & Market, Broad Street Station and all major transfer locations.
- People do not read information that is posted behind the drivers.

- Bus drivers get lots of questions about trains – especially on Route 78. Drivers need information about which trains go where.
- NJ TRANSIT should communicate upcoming service changes through:
  - Brightly colored information cards the size of schedules that are put next to schedules.
  - Automated recorded announcements in buses.
  - Pass out flyers at major stops.
  - Use the display boards at Broad Street Station.
- Why don't people use passes:
  - People don't understand the savings involved in using passes over cash.
  - Need campaigns to educate people about benefits of using a pass.
  - Should produce a DVD about why and how you should buy a pass.
  - Do automated voice announcements on the bus.
- Where should NJ TRANSIT sell passes:
  - Lottery ticket idea – ticket should have NJ TRANSIT logo on them.
  - Until NJ TRANSIT has an electronic system, would be hard to do day passes.
  - Should be one company pass for bus/rail with zones.
- Most drivers felt NJ TRANSIT should not get rid of fare zones because it would end up being a fare increase for too many riders.

### **Destinations**

- Wal-Mart in Kearny
- Nutley to Meadowlands/American Dream - Meadowlands
- Need more service into the Lyndhurst Office Park – more afternoon trips – 3:15 PM out of Penn Station.
- More service on Joralemon leg to Clara Maas Hospital.
- Jersey City to Kearny
- Kearny/Harrison into the Airport terminals.
- Secaucus Junction to the Meadowlands.
- Downtown Paterson to Newark

### **Other Input**

- Need more employee parking at Big Tree

### **Ironbound Garage**

#### **Route 52**

- Alignment Issues
  - Extend to Union County College
- Scheduling Issues
  - Need more Elizabeth to Union service, especially on Saturdays.

#### **Route 62**

- Overcrowding/Frequency Issues
  - Between 11:25 AM and 1:35 PM, bus has 60 to 70 passengers by Broad and Branford. Lots of passengers going to the airport. Still get overcrowded with airport bound passengers even with added buses on the route.
  - Lots of overcrowding in the AM peak as well as during the night hours.
  - Some heavy trips from Perth Amboy to Newark Penn Station.
  - Inbound Woodbridge trips have over 100 people by Oak Tree Road.
- Scheduling Issues

- The short turn trip (Linden via Highway) is supposed to be behind the long trip, but ends up ahead and gets overcrowded while the long trip via IKEA is empty.
- Alignment Issues
  - The Woodbridge bus should stay on Route 1.
  - There are 7 different types of 62 trips going through the airport. People just get on a 62 expecting that all 62 buses are going to Penn Station.
  - Should the 62 be split? Could be two routes, Newark-Elizabeth-Woodbridge and Downtown-Airport-IKEA-Elizabeth. If it is split, the route still serving the airport should retain the #62 designation, or have totally new numbers for both routes.
  - There should be an express from Newark Penn Station to the airport.
  - The turn off of Main Street and Elizabeth in Rahway is difficult due to vans from a company located there double parking.
  - Turning out of Metropark onto Route 27 is difficult.
  - During the holidays, it is very difficult to get out of the Woodbridge Mall.
- Bus Stop Issues
  - Route 62 should stop at Broad and Academy.
- Management/Street Supervision Issues
  - From Newark Penn Station to Commerce at Mulberry – bus gets stuck in traffic and is held up from double parking at the construction site at the intersection. Sometimes get stuck for 10 to 12 minutes. Cars from the car service double park in the area.
  - FedEx buses block the 62 at Terminal A Courtyard.
- Passenger Activity
  - Lots of passengers traveling to Woodbridge Mall from Broad and Jersey in Elizabeth on the 2:42 PM trip; all week.
  - Lots of transferring between 62 and Coach Route 24 in Elizabeth.
  - Lots of Union County College students riding.
  - 30 students on one trip from Linden High School.
  - IKEA is busy during the holidays.
  - Some people who have layovers at the airport want to go to IKEA. People do not have exact change to board. Others want to go to Jersey Gardens Mall and don't know that the airport provides a shuttle bus to the mall.
  - Lots of air crews stay in apartments on Broad Street.
  - On Sundays, people want to get to from the airport to Penn Station to PATH for service to New York.
  - Passengers do use the 62 between Woodbridge Mall and Metropark rail station; or they will use Route 804.
  - People want to go to Menlo Park Mall on the 62.
  - People connect at the Menlo Park Mall to Route 815 to travel to New Brunswick. Do get some requests for direct service to New Brunswick on the 62, but not a lot.
- Vehicle Issues
  - Should the 62 be operated with artics? There would be a problem at Terminal A because you have to back out of the courtyard. Certain times of the day, artics would not be needed south of Elizabeth.
  - Luggage racks on buses are useful, but are not big enough. Any airport route should have vehicles with two luggage racks in the front.
  - Should be second racks toward the middle of the bus. Passengers do not want to leave their bag in the front of the bus and then sit in the back.

- Other
  - Destination signs on certain trips still say IKEA even though the bus has already gone to IKEA. This confuses passengers.
  - Port Authority should allow employees to ride Air Train for free.
  - There are fare zone issues on Saturday for Perth Amboy and Woodbridge because the bus goes through Carteret.

### **Route 112**

- Alignment Issues
  - Route 112 should just be express to New York. People making local trips will get on the 112 because they can get change when paying cash. The trip often gets crowded with local trip passengers and has to bypass passengers traveling to New York.
  - All Route 112 trips should go to New York.
- Bus Stop Issues
  - Bus stop issue at Broad and Jersey in Elizabeth towards Scotch Plains.

### **Route 113**

- Bus Stop Issues
  - Bus stop spacing is too close between the stop at Dunkin Donuts on Rahway Avenue in Elizabeth and the next stop.

### **Route 114**

- Overcrowding/Frequency Issues
  - 137 people on one trip – workers getting on and off points all along the route through Mountainside, Plainfield and Dunellen.
- Alignment Issues
  - Route 114 should just serve New York and have Routes 65/66 serve the 22 and 28 corridors west of Mountainside to Plainfield and Dunellen.
- Scheduling Issues
  - There should be more buses from Mountainside to New York City.
- Bus Stop Issues
  - The bus stop on Union Avenue at Morgan Lane is dangerous due to a big ditch on the side of the road.
  - Need a specific marked bus stop on Mountain Avenue in Plainfield. Currently have to stop at every corner.
- Passenger Activity
  - Lots of ridership out of Plainfield – people get on and off in Plainfield all day. Lots of ridership from Plainfield to Bridgewater Commons Mall.
  - Need a bus from Plainfield to Union County College.

### **Route 116**

- Alignment Issues
  - Coming over the bridge into Port Reading, it is difficult to make the stop at the pool supply company.

### **Fares**

- Should NJ TRANSIT sell tickets through lottery machines? Would be too much to read, and don't have time to inspect the tickets enough.
- NJ TRANSIT should sell bus passes at rail stations.
- Sell tickets on commuter buses.
- Scratch off ticket idea? Bad idea, too difficult to enforce.

- NJ TRANSIT should have more ticket vending machines. Put machines in grocery stores, transfer points, Rite Aids, Broad and Market, Airport, Metropark, etc.
- It would be a good idea to collapse fare zones 1 and 2 for a flat fare of \$2.

### Public Information

- People take timetables off 62 buses all the time.
- If NJ TRANSIT had schedules and maps at the bus stops, would not need as many timetables.
- The internet cannot serve everyone in terms of service information.
- Need service information in Spanish.
- People do not understand or use the information on the monitor screens at Newark Penn Station.
- There should be a system map with a frequency table to distribute to passengers.
- There should be a how to ride brochure.
- There should be monitors showing service information on the buses.
- How should NJ TRANSIT communicate service changes?
  - The bright yellow signs in the buses and at Newark Penn Station worked well.
  - Use a PA system at Broad and Market and at Newark Penn Station.
  - Automated announcements on the bus and at major stops.
  - Have a booklet for the drivers listing all upcoming changes.
  - Post a map behind the drivers.
  - Have supervisors standing at major stops distributing flyers.
  - Email.
  - CD/DVD describing changes for drivers and passengers.
  - Cable TV – Community Bulletin Board, News 12, CN8
  - Post changes in the Star Ledger, both editions.

### Destinations

- Elizabeth, Linden, Union to Warrinanco Park for soccer games.
- Jersey City and Bayonne to the airport.
- Airport to the GW Bridge Bus Station in New York.
- Airport to Atlantic City.
- People get off buses at the Hemisphere Center along US 1/9 South and to go to work at the Ramada and the Best Western.

### Big Ideas

- Post maps at bus stops.
- More express routes for New York commuters.
- Longer service span on the 62.
- Simplify the fare structure.
- Easier to read service information.
- Monthly passes that cannot be counterfeited.
- Buses with bathrooms for long trips.
- More comfortable operator compartments.

### Other Input

- There is a bus stop issue at Broad and Branford in the southbound direction.
- The stops at Lafayette and at Branford are too close.
- Perth Amboy is good about enforcing parking at bus stops, but it is a problem in Elizabeth.

- The bus stop in Linden past Park Avenue – Gilcrest – in the southbound direction is unsafe.

### **Coach USA Elizabeth Garage**

#### **Route 12**

- Overcrowding/Frequency
  - Route should be more frequent during the weekday peaks.
- Bus Stop Issues
  - Numerous bus stops along the route that list 24 as stopping there, but not 12; especially in Orange, Newark and Elizabeth.
  - Bus stop signs are missing along route.
  - Some intersections are marked as stops but are not.

#### **Route 24**

- Scheduling Issues
  - Run 21 on Route 24 on Saturday only get two minutes of recovery time; needs more.
  - Not enough recovery time on all runs; should have 10 minutes.
  - After 2:00 PM in Elizabeth, there is heavy traffic and heavy passenger activity; is difficult to stay on schedule.
- Bus Stop Issues
  - Bus stop signs are missing along route.
  - Some intersections are marked as stops but are not.
  - At Broad and Elizabeth, going towards Elizabeth, the first bus stop should be removed.
- Passenger Activity Issues
  - Passengers want to go to Roseland on Route 24 from Orange.
  - Lots of transferring between NJ TRANSIT 37 at Haynes Avenue – people are going to Linden and Elizabeth, some to Newark.

#### **Route 31**

- Overcrowding/Frequency
  - In afternoon, school kids cause overcrowding and late running. Pick up students from Newark Academy, West Side High School, Essex County College, St. Benedict's, Arts High, Science Park High School; heavy boarding activity at Broad and Market and at Springfield Avenue and MLK Blvd.
  - The Livingston Mall bus runs more frequently on weekends than on weekdays. Need more weekday frequency. Frequency should be every 30 minutes to Livingston in the peak for employees.
- Scheduling Issues
  - Route 31 gets too much running time in the morning (6:00 AM – 11:00 AM) and not enough in the PM peak (2:00 PM – 7:00 PM). Always run 6 to 7 minutes late in the afternoon.
  - Need to go to Maplewood loop on weekends; at least every 120 minutes.
- Bus Stop Issues
  - In Newark on South Orange, there are three bus stops between Bergen and Littleton; only need two, one at Pathmark, one at Littleton.
- Management/Street Supervision Issues
  - It is difficult for Coach buses to get out of Newark Penn Station on nights when there is an event at the Prudential Center. Need another traffic police officer at Raymond and Mulberry between 5:00 PM and 7:30 PM on event nights.
  - Drivers need to receive notices of events and other detours ahead of time.

- Passenger Activity Issues
  - Lots of transferring on Grove Street to NJ TRANSIT routes 5, 90, 94, 99.
  - Passengers want to make train connections in Secaucus from South Orange Avenue (can do this on NJ TRANSIT 78).
  - Passengers do not ride from Maplewood through to South Orange.

### Route 44

- Scheduling Issues
  - Not enough recovery time on all runs; should have 10 minutes.
  - After 8:30 PM there is only one bus on the route (Run 65); needs more layover time.
- Management/Street Supervision Issues
  - NJ TRANSIT buses block Coach buses in Lane 4 of Newark Penn Station.

### Fares

- More than half of Coach riders use monthly passes. Many more use bus tickets.
- Cash fares are a problem; people do not have exact change and never have cash ready when boarding.
- Should have ticket machines at Broad and Market; Broad and East Jersey; Frelinghuysen.
- Is selling tickets through the Lottery sales vending machines a good idea? Bad idea – would be a lot to read and passengers would not give the driver the ticket; people play games when there are lots of passengers boarding.
- Would using scratch off tickets/passes be a good idea? Yes, could cut down on counterfeiting.
- Should sell tokens and have a token machine in Penn Station and other major boarding locations.
- Coach should have day passes, weekly passes or 10 trip tickets and give the shorter time frame passes/tickets the same percentage discount as the monthly passes – people cannot afford monthly passes.
- Swipe cards would be a good idea – should pursue any changes that cut down on passengers using cash, especially change.
- Passengers do not know where to buy passes.
- Lots of passengers board the 24 and 44 with a rail pass and pay an additional \$1.05.
- Coach and all NJ TRANSIT modes should have standardized fares and passes.

### Public Information

- Coach drivers need to have a ride guide of NJ TRANSIT routes – lots of transferring occurring and Coach drivers get lots of questions about NJ TRANSIT routes. Now, passengers know how the NJ TRANSIT routes operate better than the Coach drivers.
- Coach needs to distribute more timetables to passengers.
- The writing is too small on the timetables.
- People think that the bus only stops at the time points listed in the timetables.
- Need to post and communicate connecting information.
- Should put posted information at major stops such as Path Mark, UMDNJ, train stations, etc.
- There should be a list of all major stops on the cover of the timetables.
- If a major destination (hospital, shopping center, etc.) is at the time point, then list the destination as the time point, not the intersection.
- People want real time information to know if connecting buses have left, are running late, etc.
- Should post information on cell phone ads/text messages.

- Drivers need basic information about all routes – major stops, frequency, hours of operation; should also post this at major bus stops.
- Passengers always ask for information about the NJ TRANSIT 107.
- Should have public information in Spanish – Spanish is the most common second language on the Coach ONE services.
- There should be an option on the NJ TRANSIT customer service number for Spanish.
- Passengers say they cannot get through to the NJ TRANSIT customer service number; long waits.
- There should be pocket sized schedules.
- Not all passengers have access to the internet; cannot rely solely on the internet to communicate information.
- There should be information cases at Newark Penn Station for timetables and posted maps.

### **Destinations**

- From Airport, people are traveling to Linden, downtown Elizabeth, and Roselle.
- People want to get to the DMV in Wayne (can make the trip on NJ TRANSIT).
- Lots of passengers want to get to employment locations on Division Street; Division and Magnolia, Monday through Friday.
- Passengers want to get to Dowd Avenue in Elizabeth – Shop Rite warehouse.

### **Big Ideas**

- Need an enforced bus lane to University Avenue on Market.
- Need the lights to be coordinated between McCarter Highway and Newark Penn Station.
- Need counterflow lanes in downtown Newark.
- Need more benches at bus stops.
- Should only accept tickets and passes – no cash for fares.
- Need better communication between Coach and NJ TRANSIT.
- Drivers need more information about the alternatives between Coach and NJ TRANSIT.
- Need more express routes.
- Need an express to Jersey Gardens from Newark Penn Station.
- Need to use more short turns.
- Need to focus on security of the driver.
- Need fare enforcement – should be checked by someone other than the driver.
- All buses should have the brighter orange destination signs. Information on destination signs should be shorter.

### **Other Input**

- NJ TRANSIT drivers do not recognize the Coach USA employee passes.

## Appendix L – Service Guidelines

### Introduction

More than two decades have passed since routes serving the City of Newark and the surrounding area have been subjected to a comprehensive review. While changes have been made to the bus route network, they typically have been in response to specific requests for service or problems that have been identified. The vintage of this earlier work and its findings, many of which have been implemented, would suggest the need for a current examination of the bus system. This need is underscored by the number of bus riders that depend on public transportation for mobility and the revitalization of Newark, which is continuing in terms of residences, employment and cultural activities.

In response to these needs, NJ Transit has undertaken the Greater Newark Bus System Study (GNBSS) to develop a comprehensive set of service proposals that remedy current deficiencies and exploit opportunities for the future. The study area includes the Greater Newark area, which encompasses the City of Newark and surrounding communities in Essex, Union, Hudson, Bergen, Passaic and Morris Counties. A total of 40 bus routes have been identified for analysis and include some of the most heavily utilized bus lines in the state. Reflecting the magnitude of the assignment, the routes have been divided into several phases, which will be analyzed in a sequential fashion over the next three years.

The GNBSS consists of several interrelated tasks which include an extensive program of data collection such as rider surveys and focus groups, along with analysis of information routinely compiled by NJ Transit. The study will also seek out the views of Newark stakeholders, civic groups and the general public regarding mobility and desired improvements for the bus system. Input is being sought from NJ Transit operating personnel since they interact with bus riders on a daily basis. Based on this input and various analysis tools, alternatives will be formulated for both near term and longer range horizon periods. Based on subsequent discussions with study participants and interested parties, the proposals will be evaluated and a recommended plan delineated for implementation.

During the course of the study, various tasks will be completed and the results and findings documented in interim reports. These reports are then used to solicit review and comment at key milestones of the project. This report presents a set of service guidelines which will be used throughout the study to assess the adequacy of existing services and guide the formulation of service proposals in each phase of the GNBSS. This report presents approximately a dozen criteria that can be used to assess current bus service from the perspective of the rider, the operator and the broader community served by NJ Transit. Further, it provides input to the development of service proposals.

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## Background

To evaluate the adequacy of NJ Transit's existing bus services in the Greater Newark area and to guide the development of a recommended public transportation plan for this area, it is necessary to establish a service guidelines policy which will provide a set of quantified transit performance criteria. Initially, these criteria will be used as minimum guidelines in assessing the present transit service. In a subsequent phase of the current study, they will be used to help formulate a public transportation improvement plan.

The development of service guidelines for the NJ Transit bus routes serving the Greater Newark area is based on several key factors. These include:

- Suitability to the characteristics of the service territory and requirements.
- Consideration of the cost implications of each standard.
- Ease of use in that the parameters defined in each standard permit a straightforward evaluation of actual system performance and set forth clear guidelines for evaluating service alternatives.
- Compatibility with past practices to the extent that they represent community acceptance of current transit policies.
- Prevailing practice in both the transit industry as a whole as well as within northern New Jersey.
- Prior efforts in this area by NJ Transit staff.

The service guidelines have been prepared and adjusted based on the items listed above as well as professional judgment. This basic set of guidelines has been used successfully in more than two dozen similar assignments completed by the consultant.

Service guidelines deal with policy guidelines concerning the quantity of service as well as minimum performance levels related to service quality. As such, they represent a management tool which articulates a minimum acceptable level of service. It should be recognized that service guidelines represent only one standard that can be applied to the NJ Transit bus system. Other types of guidelines would include those related to management effectiveness (e.g., buses per mechanic or the ratio of pay hours to vehicle hours) as well as design criteria such as the dimensions of bus shelters. Since the focus of the current study is route planning, guidelines are primarily related to service and planning issues. Because the service guidelines include factors considered by the traveling public in selecting travel modes as well as its overall perception of the NJ Transit bus system, these are the most important guidelines. From the operator's viewpoint, the guidelines are essential since they will directly influence the cost of providing transit service to area residents. An important feature of the service guidelines is that they provide a framework for assessing the tradeoffs associated with different elements of the performance criteria.

Several points should be made with respect to the development and subsequent application of the service guidelines. First, reasonable judgment must be utilized in applying the service guidelines to assess current NJ Transit service. While the guidelines are quantitative for the most part, unusual situations may arise which warrant special consideration. Further, issues related to public policy in terms of funding cannot always be addressed fully by numerical guidelines. Second, the service guidelines may conflict with one another since some yardsticks relate to the benefits to be derived from transit service while others relate to their costs. Nonetheless, the guidelines permit the tradeoffs to be delineated and an informed decision made to resolve differences. Third, the comparison of actual performance with the guidelines should not be made on a “pass-fail” basis. Instead, results should be viewed in terms of the proportion the standard is met or the level of attainment. Fourth, the guidelines have been set at reasonable values that can be achieved in the near future. It should also be noted that for certain attributes, the service guidelines were developed by both bus service type and day. Finally, it is important to keep in mind that the service guidelines are meant to be utilized as guidelines in the evaluation of new route proposals or route modifications; they are not meant to evaluate a bus route’s merits in an absolute manner.

## Route and Service Types

It is necessary for a bus system as complex as NJ Transit’s to define the different types of bus routes that comprise the public transportation system. Differences exist between the various service types that can be operated within a single mode (e.g., a commuter bus route as opposed to a local bus route). In New Jersey, service operates in widely differing geographic and socioeconomic areas, with differing fare structures on different services affecting each route’s performance characteristics. Therefore, in evaluating services it is helpful to define different route and service types which will serve as the basis for developing comparative guidelines. During the past few years, NJ Transit has developed different bus route classifications schemes depending on the intended analysis. In an earlier effort at preparing bus service guidelines, a classification system included four service types as follows:

- **Long Distance Interstate Commuter Routes** - These bus routes operate between certain communities and/or park-and-ride lots in suburban New Jersey and New York City. These bus routes typically serve the Port Authority Bus Terminal in Manhattan and tend to operate a significant portion of their route alignment along limited access highways. They are scheduled to serve the demands of commuters in large employment markets.
- **Short Distance Interstate Commuter Routes** - These bus routes are similar to the Long Distance Interstate Commuter Routes with the exception that they serve communities in New Jersey which are closer to New York City, thus reducing the total trip time.
- **Intrastate Commuter Routes** - These bus routes are similar to the previous types of commuter bus routes; however, instead of serving New York City they serve the needs of commuters in large employment markets in New Jersey such as Newark.
- **Local Bus Routes** - These bus routes operate local service throughout northern New Jersey and the Greater Newark area. These routes serve the daily needs of urban

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residents as well as employment-oriented trips. These routes tend to be shorter than commuter bus routes and are characterized by significant boarding and alighting activity (i.e., turnover of seats).

In addition, NJ Transit has also developed another route category system which distinguishes routes by service territory and whether the route operates within New Jersey or serves interstate travelers. A summary of this system, which includes numerous service types, is highlighted below:

- **Local Lines** - These are routes that are oriented to a specific geographical area where trip lengths, for many in this grouping, are relatively short. These routes include both radial and crosstown bus lines. NJ Transit further stratifies this category by county. Of interest in the current analysis are the Essex and Union local bus lines which primarily serve the densely developed areas. Other local lines are identified such as Hudson, Passaic, Mercer and Camden Counties based on their service area.
- **Suburban Lines** - Other routes have been identified as Newark suburban lines which connect downtown Newark to adjacent suburban communities such as Livingston and West Caldwell. Clearly, these are routes that are part of the current analysis.
- **Interstate** - These are routes that link New Jersey residents with destinations in New York City and Philadelphia which reflects both historical and current development and commuting patterns. Similar to the local lines, several interstate categories are specified which reflect the geographical coverage of NJ Transit service. For the current analysis, the Essex and Hudson interstate lines are of interest along with those that have passenger collection and distribution in the study area (e.g., Somerset, Middlesex-Union interstate lines). Other types in this category vary by county (e.g., Bergen-PABT, Monmouth-Ocean and Passaic).

This categorization of bus routes is quite extensive since it considers the nature of the service area and its location within the state (i.e., county). It should be recognized that it is compatible with the other scheme, although it does not reflect the different ridership patterns and service area characteristics by county. It should also be noted that several bus routes could be considered “mixed market” and operate significant portions of their alignments in more than one of the three classifications listed above.

It is suggested that the GNBSS utilize a simple classification of local, suburban and interstate for only the Essex and Union Counties service areas. The GNBSS routes assigned to each category are listed in Table 1. Those routes that could be considered “mixed market” are represented as such in the table. For the few interstate routes, the focus would only be on those portions of the route that are within New Jersey since they serve both intrastate and interstate transit patrons. One concluding point is that for some guidelines, acceptable performance varies by service type while for others no distinction is made by route category.

In addition to service type or category, many of the service guidelines also distinguish between day of the week (i.e., weekday, Saturday and Sunday) as well as by time period. To provide uniformity throughout both the definition of the service guidelines as well as the

subsequent analysis of the various NJ Transit bus services, the definition of the peak periods must be delineated. The morning peak period starts at 6:30AM and ends at 9:00AM on weekdays. The afternoon peak period starts at 3:30PM and ends at 6:00PM on weekdays. Unless distinguished by day, all other time periods are designated as off-peak or base periods.

The service guidelines delineated in this report are for the three types of bus routes described previously (local, suburban and interstate) for the communities in Essex and Union Counties which are the focus of the current analysis. The guidelines have been organized into attributes related to service coverage, patron convenience, fiscal condition and passenger comfort. One point to note is that specifying threshold values is an iterative process. Some of the criteria may be modified as the routes are evaluated and subjected to more detailed scrutiny. Also, for routes designated as mixed market, guidelines are not specified for each combination. In these cases, judgment based on typical ridership experience and travel behavior should be used in combination with the standards to determine the level of service or degree of attainment the route achieves relative to the suggested guidelines for the three classifications. Further, the service guidelines policy presented here could be a prototype for other service areas and routes operated by NJ Transit.

**GNBSS Routes and Route Types**

| Route Number | Route Name                         | Route Type     |
|--------------|------------------------------------|----------------|
| 1            | Newark                             | Local          |
| 5            | Kinney                             | Local          |
| 11           | Newark-Willowbrook                 | Local          |
| 13           | Broad Street - Clinton Avenue      | Local          |
| 21           | Main Street - Orange               | Local          |
| 25           | Springfield Avenue                 | Local          |
| 26           | Irvington - Elizabeth              | Local          |
| 27           | Mount Prospect                     | Local          |
| 28           | Newark-Montclair State-Willowbrook | Local          |
| 29           | Bloomfield                         | Local          |
| 34           | Market Street                      | Local          |
| 37           | Lyons Avenue                       | Local          |
| 39           | Chancellor Avenue - Kearney Avenue | Local          |
| 40           | Kearney-Jersey Gardens             | Local          |
| 41           | Park Avenue                        | Local          |
| 42           | 18 <sup>th</sup> Avenue            | Local          |
| 43           | Newark-Jersey City                 | Local          |
| 52           | Morris Avenue                      | Local          |
| 56           | Elizabeth-Winfield                 | Local          |
| 57           | Tremley                            | Local          |
| 58           | Elizabeth-Kenilworth               | Local          |
| 59           | Plainfield-Newark                  | Local          |
| 62           | Newark-Woodbridge-Perth Amboy      | Local/Suburban |
| 65           | Newark-Somerville                  | Suburban       |
| 66           | Newark-Mountainside                | Local/Suburban |
| 70           | Newark-Livingston Mall             | Suburban       |
| 71           | Newark-West Caldwell               | Suburban       |
| 72           | Paterson-Newark                    | Local          |

| Route Number | Route Name                        | Route Type          |
|--------------|-----------------------------------|---------------------|
| 73           | Newark-Orange-Livingston          | Suburban            |
| 76           | Hackensack-Newark                 | Local               |
| 78           | Newark-Secaucus                   | Suburban            |
| 90           | Grove Street Crosstown            | Local               |
| 92           | Orange Crosstown                  | Local               |
| 93           | Bloomfield-Newark Light Rail      | Local               |
| 94           | Stuyvesant Crosstown              | Local               |
| 96           | 18 <sup>th</sup> Street Crosstown | Local               |
| 99           | Clifton Avenue Crosstown          | Local               |
| 107          | Irvington-New York                | Suburban/Interstate |
| 108          | Newark-New York                   | Interstate          |
| 112          | Clark-New York                    | Suburban/Interstate |

## Service Coverage

This category deals with routes and schedules and includes guidelines related to service availability, span and frequency of service and first identifies where bus service should be provided throughout the service area as well as when and how often those bus routes should operate. This category also provides guidelines for the structure or design of the bus routes used to serve and connect the generators in the study area along with the simplicity of the route network and individual bus lines.

**Availability** - A transit operator inevitably receives many requests for service from citizens who are not within walking distance of any route, or who desire that buses operating in their neighborhoods serve different destinations. Since transit resources are limited, it is unlikely that everyone will be accommodated to the same extent and to a satisfactory degree. Therefore,

it is necessary to determine how to allocate the available resources to provide the best possible service.

In developing availability measures to gauge NJ Transit service, this standard has been divided into two separate components that reflect travel concentrations, trip purpose and the need for bus service. Availability guidelines are developed for the residential trip end that produces travel and the non-home end that attracts travel. A description of each of these two is presented below:

- **Production End** - Determination of which residential neighborhoods should be candidates for service is a function of reasonable walking distance. Numerous studies have indicated that the maximum distance an average person can reside from a bus route and still be considered to "have service" is approximately one-quarter mile, which is roughly equivalent to a five-minute walk. However, this rule of thumb must be applied in conjunction with data regarding automobile ownership and population density of an area to determine optimum spacing of bus routes.

The accompanying table provides the suggested bus service proximity guideline for NJ Transit. The chart provides a guideline for the maximum distance someone should be from the nearest NJ Transit bus route given certain demographic and socioeconomic conditions in the area. As seen in the chart, these guidelines are based on the automobile ownership rates in terms of percentage of households without an automobile and population density of an area. The former criterion reflects the need for public transportation service while the latter measures the concentration of development necessary to support reasonable utilization levels. The suggested standard would mandate 1/4 mile walking distance between home and the closest bus route in high density and low automobile ownership areas. In contrast, for those areas where residential density is relatively low and automobile ownership is relatively high, walking distance can be as much as a mile to a bus route and still meet the standard. These guidelines apply where the percentage of households without automobiles and the population density are sufficient to justify such limited transit coverage. In areas that do not exhibit characteristics associated with need or propensity to use transit, the guideline permits no service to be provided. Patrons must rely on auto access or other modes to reach the bus system.

**Bus Service Proximity Guide**

| Percent Zero Car Households | Population Density (Persons Per Square Mile) |                |                |                |             |
|-----------------------------|--|----------------|----------------|----------------|-------------|
|                             | 10,000 and above                             | 4,500 to 9,999 | 2,500 to 4,499 | 1,000 to 2,499 | Below 1,000 |
| 40.0 and above              | 1/4 mile                                     | 1/4 mile       | 1/4 mile       | 3/8 mile       | ½ mile      |
| 25.0-39.9                   | 1/4 mile                                     | 1/4 mile       | 3/8 mile       | ½ mile         | 1 mile      |
| 10.0-24.9                   | 1/4 mile                                     | 3/8 mile       | ½ mile         | 1 mile         | *           |
| Below 10.0                  | 3/8 mile                                     | ½ mile         | 1 mile         | *              | *           |

\* Only serve population concentrations as needed.

Data Source: 2000 US Census

The bus service proximity guide and its application is just that, a guide. It is not an exact measurement. In some areas, the street pattern is not uniform or major generators are further apart than the guide indicates. NJ Transit bus service may not and should probably not conform to the guide in all areas. Service should, however, meet the intent of the guide - more densely populated areas, especially those with low rates of automobile ownership, need more transit service than sparsely populated areas with high auto ownership.

- **Attraction End** - Activity centers deserve transit service if they are large enough to attract an adequate number of transit trips. To assist in this determination, threshold levels have been established for different categories of activity centers. These threshold levels are based on past experience and judgment, and should serve as guidelines in determining which centers in each category should be given consideration for service. It should also be noted that other factors, such as the proximity of the center to existing routes, should be considered before providing new service to a major activity center.
  - **Employers** - Employers with 1,000 or more employees are large enough to warrant consideration for service. This standard applies to individual employers. Groups of employers in a concentrated area, as in an industrial or business park, should all be considered major activity centers.
  - **Shopping Centers** - Shopping trips constitute a major reason for transit travel. Shopping centers with more than 250,000 square feet of leased retail space are large enough to warrant consideration for NJ Transit bus service. Typically, malls with three anchor stores have over 500,000 square feet of leased space. Shopping centers that would meet the threshold could include enclosed malls or individual entrance shopping centers with at least one large anchor store. Also, stand alone Wal-Mart and other big box stores typically encompass 50,000 to 225,000 square feet, however, some newer stand alone stores are larger than 250,000. Central business districts, mixed-use retail and office complexes can also be included within this category.

- **Post Secondary Educational Facilities** - Students can comprise a major segment of the transportation dependent population in a community. For this reason, colleges and universities have been included in the availability standard. All of these institutions with more than 500 full-time or 1,000 total students should be considered major activity centers.
- **Medical Care Facilities** - These usually do not attract a large number of trips. These facilities do, however, often serve those who depend on transit. Therefore, institutions of 200 beds or more may be considered candidates for NJ Transit bus service. Hospitals with more than 500 employees would also meet the major employer threshold.
- **Social Service/Government Centers** - Public agencies, government centers and community facilities attract some volume of traffic. While the nature and size of these facilities varies greatly, it can be generally stated that those serving at least 200 clients daily warrant public transit service.
- **Entertainment/Recreation Venues** - This category includes large scale entertainment complexes and sports/concert venues.

The categories of generators listed above represent the destination end of the transit trip. Combined with the availability guidelines for the other trip end (production), they provide a comprehensive view of service requirements within the NJ Transit service area.

**Span of Service** - This measure is the duration of time each bus route is made available or operated during the day. Considerations for span of service include the desires of the transit constituency and the financial capability of the operator.

Span of service should be related to the nature of the trips and the activity centers served by the bus route. For this reason, service oriented primarily to the journey to work would mandate service during both the AM and PM peak periods. However, for NJ Transit bus service to be attractive, operations should consider the needs of the worker who occasionally works late or have nontraditional hours. Routes which serve traffic generators which are characterized by day-long activity require spans of service which include both midday and evening periods on weekdays.

In addition, the span of service should be established to not only permit users (e.g., shoppers) to utilize NJ Transit bus service but also to permit employees to make the trips via public transportation. The weekday span of service guidelines are shown in the accompanying table. The span of service guidelines for both Saturday and Sunday are also shown in the accompanying table. It should be noted that the spans of service presented here define a minimum guideline; clearly, if a certain bus route requires a lengthier span of service, then these guidelines do not preclude that option.

On weekends, work travel is considerably less and there is a corresponding increase in non-work trips, therefore the spans of service are somewhat reduced. This reflects the reduced

system utilization and the need to operate service within reasonable financial limits. Finally, the recommended span of service guidelines are intended to apply to those routes that are already operating during a given service day; they are not intended to indicate that every route in a certain route category should be operating during the recommended span of service.

**Minimum Span of Service**

| Type       | Weekday          | Saturday         | Sunday           |
|------------|------------------|------------------|------------------|
| Local      | 5:00AM - 1:00PM  | 6:00AM - 12:00AM | 7:00AM - 11:00PM |
| Suburban   | 5:00AM - 12:00AM | 6:00AM - 12:00AM | 7:00AM - 11:00PM |
| Interstate | 5:00AM - 12:00AM | 6:00AM - 12:00AM | 7:00AM - 11:00PM |

Specific routes can start earlier or later than the suggested span depending on the need for service in a specific area, the generators served and the types of trip purposes. Variations to these minimum span of service guidelines (e.g., for “owl” service) are permitted to allow NJ Transit bus service to respond to the unique characteristics of trip makers and activity centers served.

**Frequency of Service** - This guideline is one of the commonly applied measures of transit adequacy, particularly from the patron’s point of view. Consequently, it is one service characteristic which is typically the source of some patron dissatisfaction.

In general, frequencies or headways (i.e., the time from one bus to the next at the same location) are established to provide enough vehicles past the maximum load point(s) on a route to accommodate the passenger volume and stay within the recommended loading guidelines, which are discussed later. If passenger loads are so light that an excessive time is needed between vehicles before exceeding loading guidelines, then headways should be set on the basis of policy considerations.

For periods in which service is operated, the following headways are suggested and service can be operated more frequently than the standard, but the headways should generally not be larger than those presented in the accompanying table.

**Minimum Frequency of Service (Minutes)**

| Route Category | Weekday |          | Saturday | Sunday |
|----------------|---------|----------|----------|--------|
|                | Peak    | Off-Peak |          |        |
| Local          | 30      | 30       | 30       | 60     |
| Suburban       | 30      | 60       | 60       | 60     |
| Interstate     | 30      | 60       | 60       | 60     |

In the above chart, off-peak primarily relates to base midday service. Evening service frequencies could be set at wider intervals based on demand.

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The headway matrix should be considered a guide, not an absolute measure. Further, headways should be designed, wherever possible, to conform with regularly recurring clock face intervals. Related to the frequency of transit service is the amount of time required to transfer between bus routes. The headway policy above may be modified if a timed transfer is provided for in the schedule, either to another bus route or to another mode of public transportation.

**Directness** – This standard addresses the need for system coordination, coherence and convenience. Complicated circuitous routes and inordinate trip travel times discourage transit use. Therefore, the design of the services offered is highly important in promoting patronage as well as providing quality service to passengers. It must be recognized, however, that NJ Transit cannot provide door-to-door bus service, or even a single ride trip (one-seat ride), for every passenger.

Two components are involved in measuring the directness of NJ Transit's bus routes in the study area. First, the ratio of the actual route path distance to the straight line mileage between route terminals should be no more than 1.60. That is, the distance from one terminal to the other should be no more than fifty percent greater than the straightest (airline) distance between the route's termini. This allows for deviation caused by both road alignment and route circulation. Routes with ratios that exceed 1.60 should be subjected to examination for cause, and modified if practical.

Service guidelines permit tradeoffs regarding service attributes. For example, if a particular route exhibits a directness ratio of 2.00, perhaps the route is attempting to serve too many places. To straighten out the alignment, deletion of service to certain generators may be necessary. If NJ Transit wishes to continue serving these locations, development of a new route or a realignment of an existing route may be in order. The tradeoff appears when weighing the costs of the new route or route realignment versus the expected ridership gain from offering a more direct and swift service.

The second component of the directness guideline states that no more than 33 percent of the system's patrons should need to transfer between vehicles to complete their trip. For purposes of this analysis, the transfer rate is determined as the ratio of transfers to total boardings and which, appropriately for this analysis, will not include those transferring to or from other modes for service to New York City (e.g., PATH). Also, transfer connections should be scheduled as closely as possible to minimize waiting times. Passengers should be required to wait no longer than 15 minutes and preferably ten minutes or less.

**Simplicity** – This service guideline concerns the simplicity of the route structure in terms of route variations, or patterns as they are referred to by NJ Transit. A structure which is too complex or has several variations for each bus service is confusing to existing riders and serves as a deterrent to new riders. The guideline suggests that there should be no more than five, preferably three, routing variations or patterns by direction excluding short-turn patterns. It is recognized that the short-turn patterns provide additional capacity along the trunk portion of various routes to accommodate ridership where terminal to terminal frequency adjustments are not practical or beyond the limit of available resources. This guideline will reinforce for passengers the impression that the NJ Transit bus services are simple and easy to use.

## Patron Convenience

The next four service guidelines - speed, loading, bus stop spacing and dependability - are concerned primarily with patron convenience in using the system, but also influence system operating costs.

**Speed** - Buses face certain unavoidable constraints that all vehicles on public streets experience. Thus, the speed of transit vehicles, in the absence of any preferential treatments, will not exceed the speed of traffic in general. Passenger boarding and alighting volumes, route alignments, bus stop spacing and fare collection methods are factors under the operator's control which influence the speed of service.

While there are several measures of speed which may be employed in the evaluation of this criterion, the most meaningful to the patron is running speed, which is route miles/running time (excluding layover). As might be expected, passenger activity, traffic and safety conditions will influence running speed. To facilitate an analysis of the adequacy of current service in terms of this attribute, the suggested standard provides acceptable speeds for each route type. This recognizes that the NJ Transit system operates in a variety of settings within the Greater Newark service area. Each individual route may serve a variety of settings (e.g., urban and suburban areas) or highway types (e.g., arterial and limited access highway) and that overall operating running times will be affected by the extent to which each setting is served. To account for this, a range of acceptable running speeds, rather than a single measure, has been suggested for each of the three route types. The different running speeds by route type are shown in the accompanying table.

| Running Speed (Miles Per Hour) |             |
|--------------------------------|-------------|
| Service Area                   | Speed (MPH) |
| Local                          | 8-14        |
| Suburban                       | 12-18       |
| Outlying                       | 16-24       |

The suggested standard considers the fact that higher running speeds should be expected on routes serving the more suburban and outlying portions of the region or those that operate on limited access highways due to the nature of the area served and the lower level of passenger activity.

**Loading** - To ensure that most passengers will be able to obtain a seat on a NJ Transit bus for at least a major portion of the trip, loading guidelines must be established and schedules devised that reflect passenger volumes. This standard is measured as the ratio of passengers on board to the seated bus capacity expressed as a percent. Values of 100 percent or less indicate all riders are provided a seated ride while values of more than 100 percent denote standees. Loading guidelines indicate the degree of crowding (i.e., standees) which is acceptable, with consideration given to the operating period.

### Loading Guide

| Route Type | Weekday |          | Saturday | Sunday |
|------------|---------|----------|----------|--------|
|            | Peak    | Off-Peak |          |        |
| Local      | 125     | 100      | 100      | 100    |
| Suburban   | 125     | 100      | 100      | 100    |
| Interstate | 125*    | 100      | 100      | 100    |

\*On local route segments only

At the maximum load point, some standees are acceptable on the local and suburban bus routes during the peak periods. However, the maximum amount of time during those peak periods during which standees should be allowed is 15 minutes. Also, standees are acceptable on interstate routes on the local segments of the route. Because of the nature of the service, all passengers on interstate bus routes should be afforded a seat at all times (i.e., a 100 percent loading standard) while operating on limited access highways. During the off-peak periods on these bus routes, the loading factor should not exceed 100 percent.

**Bus Stop Spacing** - While route alignments are the primary determinants of transit availability, a second influence on the proximity of transit service is the bus stop spacing along those routes. Obviously, stops at every intersection provide the shortest walking distance to the bus; however, it reduces the speed of operation. Therefore, a bus stop spacing guideline must consider the density of the service area, the characteristics of the land uses served and the resulting impact on operating speed. The bus stop spacing standard suggested for NJ Transit is summarized in the accompanying table.

### Bus Stop Spacing

| Service Area | Spacing (Stops/Mile) | Distance (Feet) |
|--------------|----------------------|-----------------|
| Urban Core   | 6 - 8                | 660-880         |
| Urban Fringe | 5 - 6                | 880-1,060       |
| Suburban     | 5 - 6                | 880-1,060       |
| Outlying     | 3 - 4                | 1,320-1,760     |

Urban areas with regular street patterns can be more effectively considered on a block by block basis with a desired spacing of a stop ever block or two depending on density of development. Within portions of the central business district, it is reasonable to expect bus stops every block. It should be noted that in some instances, the bus stop spacing standard should be discarded in favor of simply considering the location of patron concentration. This is especially true for stops that serve major activity centers. In more suburban corridors, bus stops could be located at intervals of approximately 1,000 feet. While in outlying areas, consideration would be given to cross streets and the location of passenger origins and destinations. Also, in outlying areas, particularly those that have not adopted bus stop ordinances, flag stops and/or courtesy stops are acceptable.

The exact placement of a bus stop in the area of a signalized intersection is also a matter of concern. Some transit agencies prefer a near-side bus stop, where the bus stop is located just before an intersection. Other transit agencies prefer a far-side bus stop, which is located just after the intersection. In some cases a mid-block bus stop is utilized. In any event, site-specific traffic and street conditions (e.g., sight distance) should ultimately determine bus stop locations, and the exact placement of a bus stop should always be a matter for individual traffic engineering analysis. Overall, the intent of this aspect of the bus stop placement standard is that a consistent policy should be pursued with respect to location.

It also must be noted that the spacing and location of bus stops are a municipal function in New Jersey and are beyond the control of NJ Transit.

**Dependability** - Published timetables must provide the transit patron with a reasonable guarantee that the scheduled service will operate, and will operate on time. The dependability of NJ Transit is important to people who typically plan trips around the availability of bus service. Moreover, riders associate a time penalty with unreliable bus service, which reduces the attractiveness of public transportation.

There are several ways to measure NJ Transit's dependability. The first group of measures indicate the level of dependability of NJ Transit vehicles and staff to actually operate its scheduled service. Measures of actual versus scheduled service are expressed as the percentage of scheduled trips, percentage of scheduled bus pull-outs which are actually made and the miles between road calls. For NJ Transit, the missed trip standard is established at 99.5 percent. Therefore, only one trip in 200 can be missed and still meet the standard. This reflects the difficulty in recovering promptly from a vehicle breakdown and delays due to traffic accidents.

Since it is easier to recover from service disruptions at a garage than out in the field, an even more stringent standard of 99.9 percent is appropriate for missed pull-outs. This permits one missed pull-out in 1,000. NJ Transit should have sufficient spare buses and extra board bus drivers to ensure that both the trip and pull-out guidelines are met. The final measure concerning the dependability of NJ Transit vehicles is the number of miles operated between service

disruption road calls. A general guide for NJ Transit should be 6,000 miles between road calls (i.e., when a bus is taken out of revenue service and cannot complete its scheduled trip).

A second way to measure dependability is to examine how well the service operated by NJ Transit adheres to its posted schedule, that is, the difference between scheduled time and the time the bus actually passes a particular location. The schedule adherence standard consists of two parts: (1) the definition of on-time; and (2) the proportion of buses that operate within the on-time range. For purposes of assessing NJ Transit's dependability, on-time is established as the departure time being zero minutes early to five minutes late in comparison to the scheduled time. This allows the bus a reasonable latitude for encountering general delays, without unduly inconveniencing the waiting patron. For most persons, a wait of up to five additional minutes would not be regarded as excessive. Buses should never be early, for this would cause patrons to miss the bus entirely and subject many riders to an even longer wait for the next scheduled bus.

The guideline for NJ Transit schedule adherence is established at between 75 and 90 percent during peak service periods and 95 percent during off-peak hours. As shown in the accompanying table, an on-time performance rate of 90 percent is acceptable for routes that operate at a frequency of 30 minutes or less during the peak period. This is due to the fact that on high frequency routes, if a trip is missed or late, patrons do not have an extensive waiting period until the next bus arrives. Also, a separate guideline has been established for interstate routes since they must travel through the Lincoln Tunnel into the Port Authority Bus Terminal.

**Schedule Adherence (Percent on Time)**

| Headway<br>(In Minutes) | Weekday |          | Saturday | Sunday |
|-------------------------|---------|----------|----------|--------|
|                         | Peak    | Off-Peak |          |        |
| 10 or less              | 75      | 80       | 90       | 90     |
| 11 - 29                 | 85      | 90       | 90       | 95     |
| 30 or more              | 90      | 95       | 95       | 95     |
| Interstate Routes       | 85      | 90       | 90       | 90     |

## Fiscal Condition

NJ Transit's financial situation can be defined, both for the system and individual routes, in terms of three guidelines; fare structure, farebox recovery and productivity.

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**Fare Structure** - A transit system's fare structure should be easy to understand, easy to remember, and easy to administer. There is a tradeoff, however, between simplicity and equity. For example, a zone structure would charge people more equitably by having those who ride farther pay more, but the zones add another dimension to the fare structure. On the other hand, a flat fare is simple to understand and administer, but those who ride short distances pay just as much as long distance travelers. Another facet of fares to consider is special fares for certain ridership groups such as senior citizens.

Fare structure is a subjective element for which no quantitative measure is established for NJ Transit. Rather, judgment and/or local policy considerations must be used to establish or change the fare structure. Six qualitative criteria should guide that process:

- **Equity** - How equitable is the fare structure?
- **Administrative Ease** - How easily is the fare structure administered?
- **Patron Comprehension** - How easy is the fare structure for people to understand?
- **Revenue Generation** - Can the fare structure encourage new ridership?
- **Fiscal Integrity** - Will the fare structure provide a reasonable level of revenue?
- **Seamless** - How convenient is it for riders who use other routes or modes?

**Farebox Recovery** - One of NJ Transit's primary objectives is to provide area residents with the best possible service within a reasonable budget constraint. To achieve this, each route should be examined individually to determine if any bus line is placing an inordinate financial burden on the entire system. Routes should be periodically compared to systemwide averages so that operating deficit is controlled and equipment is deployed productively.

To accomplish this, two farebox recovery (i.e., the ratio of passenger revenue to operating costs) measures are suggested. The first relates to the performance of the GNBSS routes as a system; a farebox recovery standard of 40 percent is suggested for the GNBSS routes as a whole. The farebox recovery rate for GNBSS routes in 2006 was 40.8 percent. The suggested value requires the system to maintain this level in spite of escalating costs.

The second farebox recovery measure looks at the performance of each individual NJ Transit GNBSS bus route. Each bus route's farebox recovery ratio should be calculated. System costs must be computed for each route, and the route's revenue compared to its calculated cost. Individual route performance should then be compared to the suggested farebox recovery standard for GNBSS routes overall. The accompanying table provides guidelines for evaluating route performance against the suggested standard.

| Farebox Recovery<br>(Percent of System Average) |          |
|---|----------|
| Rating  | Percent  |
| Successful                                      | Over 80  |
| Acceptable                                      | 60-80    |
| Problem   | Under 60 |

For the individual route standard, routes above 80 percent of the suggested farebox recovery standard (i.e., above 32 percent) are considered successful. Similarly, routes from 60 to 80 percent of the standard (i.e., 24 to 32 percent) are deemed acceptable with changes made on an opportunistic basis. Routes which fall below 60 percent of the suggested standard (i.e., below 24 percent farebox recovery) are problem bus lines and candidates for modification or elimination. It should be noted that the GNBSS routes are only being compared to other GNBSS routes as a group. Also, each route is being compared to the GNBSS group average inclusive of the performance of the particular route.

NJ Transit may consider the operation of some routes deemed problem routes by this analysis as necessary for various reasons. NJ Transit may choose to continue the unmodified operation of certain of these routes. The analysis, however, will identify the routes that may be hindering NJ Transit from attaining its farebox recovery standard and allow them to make more informed decisions regarding the allocation of transit resources. Application of the route level guideline will also help control the operating deficit and ensure that transit resources are used in an efficient manner. In the current analysis, the systemwide values and in turn the route categories are the same for all three service types (i.e., local, suburban and interstate)

The farebox recovery standard should be applied to a new route or route extension with some caution. Any new service takes time to build its ridership base. In many cases, new services are not fully productive for several months. Therefore, 50 percent of the standard presented previously should be considered acceptable at the end of a reasonable trial period. New services should be monitored closely during the first few weeks of operation. A trial period extending approximately six months should be adequate to help determine whether or not the service change should be made permanent.

Another point is that the demand elasticity for bus service is less than one. For example, a ten percent increase in service and costs will not produce a corresponding increase in ridership and revenue. Further, performance may decline as service is extended to new areas or expanded in communities other than the regional core. Accordingly, it is reasonable to expect expanded service to result in a reduction in farebox recovery and other performance measures. However, the change in performance measures must be compared to the benefits to riders and the community of expanded bus service.

**Productivity** - The average fare paid by passengers varies by type of fare paid (e.g., senior citizen discounts) on each transit route, and therefore, productivity is a useful performance measure to supplement farebox recovery results. Productivity is measured in terms of how many passengers a transit system carries for each unit of service. The two most common measures are

passengers per hour and passengers per mile. Passengers per hour is the more commonly used of the two, and is more appropriate for NJ Transit.

Similar to farebox recovery, there are two measures for passengers per revenue hour. However, unlike the farebox recovery standard, each route type is assigned a separate standard value. This is due to the fact that the farebox recovery performance of the three route types is similar and facilitates a single value while the route types vary significantly in terms of passenger per revenue hour. This would be expected given the nature of the service provided and the typical trip lengths of the passengers on the different service types. Therefore, individual guidelines for each category was deemed most appropriate for this measure.

Therefore, the first productivity measure relates to the performance of the GNBSS routes within each route type category as a group; a passengers per revenue hour standard of 42 is suggested for local routes included in the GNBSS, 28 for suburban routes and 20 for GNBSS interstate routes. This is consistent with results for 2006. These passengers per revenue hour figures are targets that should be realized with service improvements identified in this study.

The second passengers per revenue hour measure looks at the performance of each individual route. Each bus route's passengers per revenue hour rate should be calculated. Individual route performance should then be compared to the suggested standard for the appropriate category. The accompanying table provides guidelines for evaluating route performance against the suggested guideline.

| Productivity<br>(Percent of Category Average) |          |
|---|----------|
| Rating  | Percent  |
| Successful                                    | Over 80  |
| Acceptable                                    | 60-80    |
| Problem                                       | Under 60 |

For the individual route standard, routes above 80 percent of the suggested passenger per revenue hour standard are considered successful. Similarly, routes from 60 to 80 percent of the standard are deemed acceptable with changes made on an opportunistic basis. Routes which fall below 60 percent of the suggested standard are problem bus lines and candidates for modification or elimination. The accompanying table shows how this standard applies to each route category.

| Performance Range (Passengers Per Revenue Hour) |             |             |             |
|---|-------------|-------------|-------------|
| Rating  | Local       | Suburban    | Interstate  |
| Successful                                      | Above 33.6  | Above 22.4  | Above 16.0  |
| Acceptable                                      | 25.2 - 33.6 | 16.8 - 22.4 | 12.0 - 16.0 |
| Problem   | Below 25.2  | Below 16.8  | Below 12.0  |

As noted with farebox recovery, NJ Transit may consider the operation of some routes deemed problem routes by this analysis as necessary for various reasons and may choose to continue the unmodified operation of certain of these routes. The analysis, however, will identify the routes that may be hindering NJ Transit from attaining its passengers per revenue hour standard and allow them to make more informed decisions regarding the allocation of transit resources. Application of the route level standard will also help control the operating deficit and ensure that transit resources are used in an efficient manner.

As with farebox recovery, the passengers per hour guides should not be directly applied to a new route or route extension. Any new service takes time to build its ridership base. In many cases, new services are not fully productive for several months. Therefore, 50 percent of the values presented previously should be considered acceptable during the first year.

## Passenger Comfort

The final set of guidelines deals with increasing system utilization by providing a comfortable and functional environment. Guidelines in this category deal primarily with NJ Transit's equipment and facilities and includes bus shelters, benches, bus stop signs, revenue equipment and public information.

**Bus Shelters** - A major concern of transit riders is the amount of time spent on the street exposed to the elements. Bus shelters should be installed where daily passenger boardings exceed 200 passengers. In recognition of the fact that NJ Transit cannot always place shelters at all desired locations, the accompanying table provides a guide for the bus shelter priority that should be assigned to each bus stop. This will allow NJ Transit to prioritize new shelter locations since resources are limited. The priorities listed below are a function of the number of boardings and service frequency (headway) at the bus stop. It is recognized that municipalities must request that a bus shelter be installed and, therefore, bus shelter placement is somewhat beyond the control of NJ Transit. Nonetheless, the guideline presented here provides a means to prioritize the shelter program in the Newark area.

**Bus Shelter Priority Guide**

| Daily Boardings | Headway in Minutes (Peak) |            |
|-----------------|---------------------------|------------|
|                 | Over 30                   | 30 or Less |
| Over 400        | 1st                       | 1st        |
| 300 - 400       | 1st                       | 2nd        |
| 200 - 299       | 2nd                       | 3rd        |

Also, where bus shelters are made available, shelters should display bus service information including route numbers and schedules for those routes which serve that bus stop.

**Benches** - Benches are another amenity that should be provided to riders. Below is a priority scheme based on daily boardings to determine which bus stops should be furnished with a bench.

**Bench Priority Guide**

| Daily Boardings | Priority |
|-----------------|----------|
| Over 100        | 1st      |
| 50 - 100        | 2nd      |

**Bus Stop Signs** - All bus stops in the system should be identified by a bus stop sign bearing the NJ Transit logo, international symbol for bus stop, telephone information number and website address. All bus stop signs should be of a uniform style and include the route numbers of buses that stop at that location.

**Revenue Equipment** - To maximize the pleasure and comfort of the bus rider, and thereby spur demand, NJ Transit should provide attractive and comfortable vehicles. This standard is primarily a matter of maintenance: seats should not be loose or ripped, floor covering should be in good repair, lighting should be operational, and the overall interior should be clean. Of particular importance is the riding environment for the patron, which would mandate the proper operation of air conditioning (when applicable), ventilation and heating systems.

Buses should also be attractive for the community in general. Noise, smoke and odor should be kept to as low a level as possible through use of the latest equipment and strict maintenance procedures. Bus exteriors should be washed at least every other day, preferably daily, and body damage and loose panels or doors should be scheduled for immediate repair. Bus exteriors should also display the agency name, logo, telephone information number and website address.

Traditionally, buses have a route destination sign overhead in front and also one on the side. This signage should display route number and destination information that is easily understood by the transit patron. Signage should also clearly and correctly designate the route on which the bus is presently operating. Another aspect of this standard is to have a route identification sign on the back of the vehicle, to help patrons who are approaching several buses from multiple routes at a common bus stop to identify their bus.

**Public Information** - A transit system should develop and maintain a public information program which not only provides information to those who ask for it, but aggressively educates the public about the transit system and how to use it.

Bus route timetables should include all the information necessary for a new patron to make a trip on the bus, including route maps, schedules which show intermediate time points, fare information and transfer information. Timetables should include a map of the route. Route maps should label each street upon which the bus operates as well as the direction in which the route operates. The lines marking the bus routing on the map should appear in a different color or weight than all other streets appearing on the map. Updated timetables should be published and be made available to the public a minimum of one week prior to the implementation of service changes. All timetables should include a beginning effective date.

The public timetables should be available and prominently displayed on all buses. Appropriate sets of timetables should also be available in major activity centers and all shelters

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should display detailed bus route information. All buses, shelters and bus stop signs should display NJ Transit's telephone information number and website address. A map of the service area showing all of NJ Transit's bus routes should be available at no cost and also be widely distributed. Because of the multiple transit modes and services in the Newark service area (e.g., NJ Transit rail, PATH, etc.), connecting service information should be shown in the public timetables as well as on the system map. In this way, patrons can determine how to make trips utilizing not only more than one NJ Transit bus but also utilizing different service providers.

Information should be available by phone during service hours. Passengers should be able to access information on all NJ Transit routes through a single telephone number. A procedure for handling and processing complaints or compliments should also be in place with all comments logged and their nature recorded. It should include mechanisms to take action to assure that the complaint is satisfactorily resolved or the compliment is delivered to the proper employee, and to inform the passenger that their comment was handled. To assist passengers in providing complete and accurate feedback, vehicle numbers should be displayed on the exterior and interior of each bus, and each shelter and bus stop sign should display a prominent NJ Transit logo, the phone information number and the website address.

Passengers should be able to provide feedback to the person answering the telephone information number, or that person should be able to directly transfer the phone call to the employee who handles such matters. Passengers should not be told that they must hang up and make another phone call to a different number. Finally, the NJ Transit website - in addition to providing schedule and service information - should have a mechanism which allows passengers to provide feedback via the internet.

## **Summary**

This report has provided guidelines to gauge the performance of the NJ Transit GNBSS bus routes for about a dozen different criteria which have been grouped into four categories: service coverage, patron convenience, fiscal condition and passenger comfort. They represent the broad views of transit riders, NJ Transit and the community which is served. As mentioned previously, the guidelines are not meant to be used as inflexible measures, but rather as benchmarks to assist in the preparation and implementation of transit service programs and other NJ Transit policies. One concluding point is that the service guidelines should not be static, but are expected to change over time and may be modified as the current services are further analyzed.

## Appendix M – Recommended Routes

### O-N-E Central Core Proposals

#### Routes 1, 3 & 9

##### ***Restructured Route 1 – Newark/Ivy Hill to Kearny/River Terminal***

- The base **Route 1** service will operate between the Ivy Hill Loop in Newark and the River Terminal in Kearny.
- On the east side of Newark Penn Station, all Route 1 trips will utilize Market Street and Ferry Street eastbound to access Raymond Boulevard; westbound they will utilize Raymond Boulevard, Chapel Street, Fleming Street and Mott Street to return to Ferry Street westbound towards Newark Penn Station.
- Service on Route 1 should operate until 3:00 AM, seven days per week. This will provide service on Springfield Avenue, as well as through the Ironbound, and allow for airport employees traveling to Newark Penn Station on other NJ TRANSIT services to transfer to routes that will allow them to finish their trip home.
- In subsequent phases of service changes, Route 1 could be extended beyond the River Terminal via US Highway 1 and Route 440 to the Jersey City State College campus, potentially ending at the proposed Hudson-Bergen Light Rail station on Route 440.

##### ***New Route 3 – Newark/University Heights to Jersey City/Journal Square***

- A new route – **Route 3** – will be implemented to replace the eliminated Route 1 service east of the River Terminal in Kearny and will operate between University Heights and the Journal Square Transportation Center in Jersey City. This new route will begin at a layover location on Witcliffe Street south of Warren Street. From the layover location, the route will then deadhead via Witcliffe Street, West Market Street, and Bergen Street to the beginning of the route on Bergen Street north of 12<sup>th</sup> Avenue. From there, eastbound Route 3 will operate via Bergen Street, 12<sup>th</sup> Avenue, West Market Street, Norfolk Street, Warren Street, Martin Luther King Boulevard, Market Street, Ferry Street, Raymond Boulevard, serve the River Terminal in Kearney, then Raymond Boulevard, Communipaw Avenue, West Side Avenue, and Sip Avenue to the Journal Square Transportation Center where the route will terminate and layover. Westbound trips will begin at the Journal Square Transportation Center and operate via Sip Avenue, West Side Avenue, Communipaw Avenue, Raymond Boulevard, serve the River Terminal in Kearney, then Raymond Boulevard, Chapel Street, Fleming Avenue, Mott Street, Ferry Street, Market Street, Martin Luther King Boulevard, Warren Street, Norfolk Street, West Market Street, Bergen Street and terminate on Bergen Street north of 12<sup>th</sup> Avenue. From there, Route 3 buses will deadhead to the University Heights layover location at Witcliffe Street south of Warren Street via Bergen Street, 12<sup>th</sup> Avenue, Norfolk Street, Warren Street, and layover at the layover location. This route will not serve the Albert Avenue/Lockwood Street area.

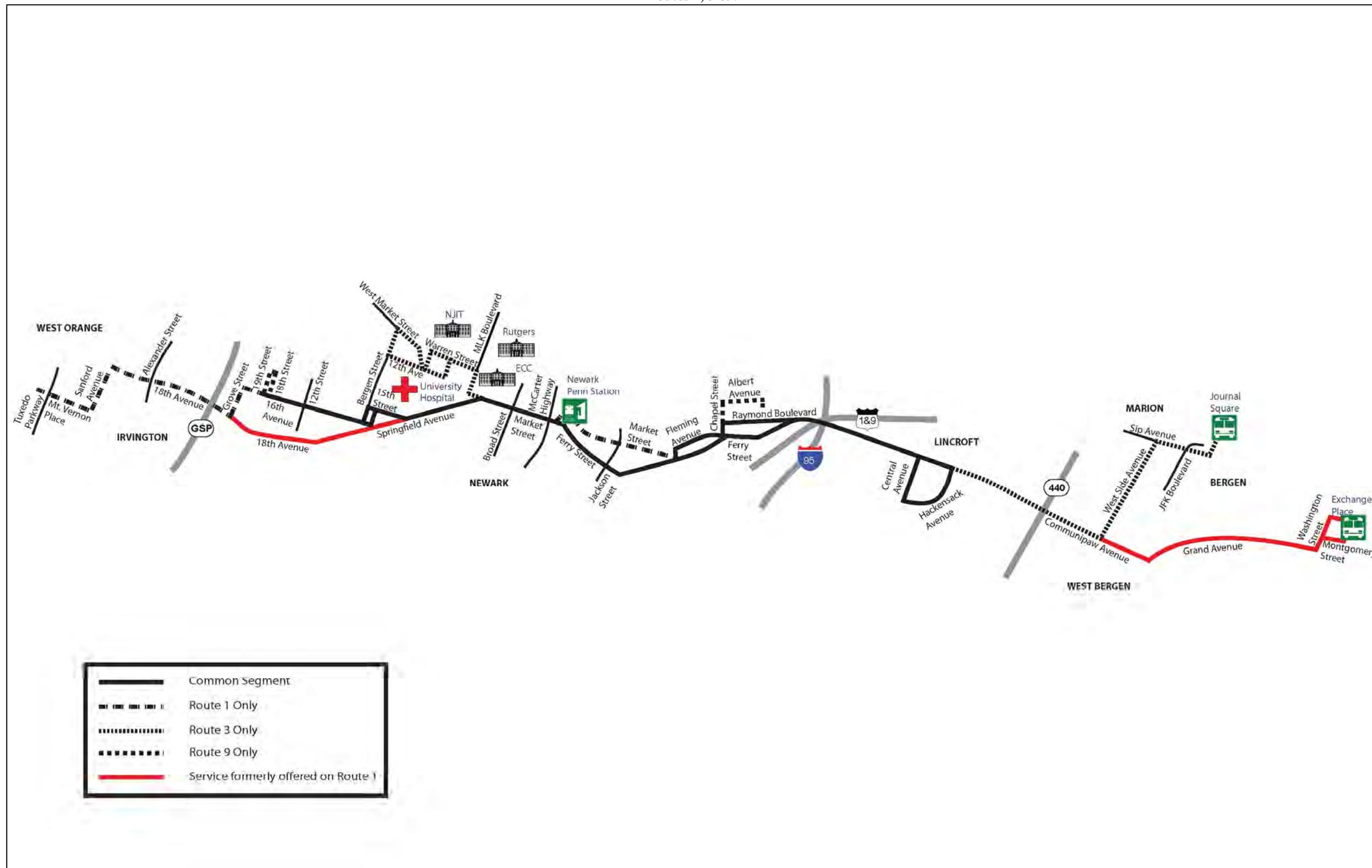
**New Route 9 – Newark-16<sup>th</sup> Avenue to Newark-Albert/Lockwood**

- **Route 9** – will operate between the 16<sup>th</sup> Avenue/19<sup>th</sup> Street turnback location and the Albert Avenue/Lockwood Street route alignment. The Route 1 alignment will be followed between Springfield Avenue and Market Street, on Ferry Street all the way through the Ironbound eastbound. Eastbound routing will then follow Ferry Street, Chapel Street, Albert Avenue, Esther Street and Euclid Avenue where the route will terminate and layover. Westbound, the route will follow Euclid Avenue, Lockwood Street, Albert Street, Chapel Street, Fleming Avenue, and Mott Street to return to Ferry Street westbound. Ride checks for the Albert Avenue variation showed the need to continue service in this area.
- One impact of the proposed Route 1 and Route 9 alignments will be the fact that passengers cannot travel from Irvington to Journal Square. Results of the origin/destination survey showed that this would affect less than 20 passengers daily.

**Route 42 - Eliminated**

- Eliminate **Route 42** due to poor performance. Its resources should be reinvested back into the existing system to help address running time and other operational performance issues.

Routes 1, 3 & 9



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## Routes 40, 35, 34 & 36

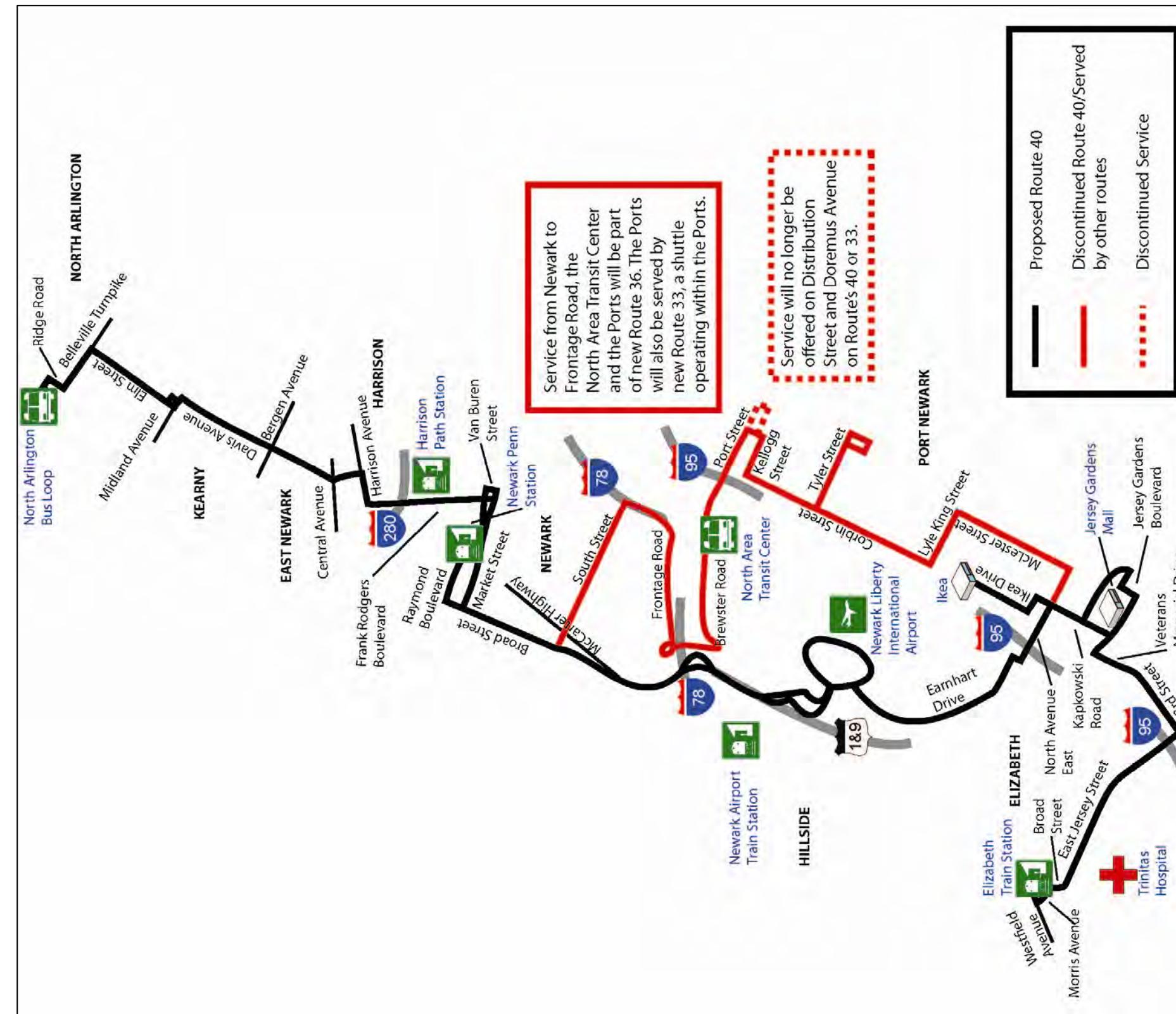
***Restructured Route 40 – North Arlington – Jersey Gardens via downtown Newark & Airport***

- **Route 40** will continue its current routing from the North Arlington Loop, through Kearny to the intersection of Broad and Market Streets in downtown Newark via Newark Penn Station. From there, Route 40 will continue on Broad Street to the McCarter Highway (State Highway 21), then U.S. Routes 1 and 9, serve the Central Terminal Area (Terminals A, B, and C) of the airport via the HOV roadway, then continue to the Airport South Area via Earhart Drive, then North Avenue East, IKEA Drive (serving IKEA), Kapkowski Road, Jersey Gardens Boulevard (serving the Jersey Gardens Mall), then Veterans Memorial Drive, 3<sup>rd</sup> Street, East Jersey Street, Broad Street, Railroad Place, and Morris Avenue to the Elizabeth Rail Station on NJ TRANSIT's Northeast Corridor Line. Northbound trips will travel along Westfield Avenue to Broad Street and then follow the southbound alignment in the opposite direction.
- The span of service on Route 40 will be increased so that it is a 24-hour-a-day bus route.

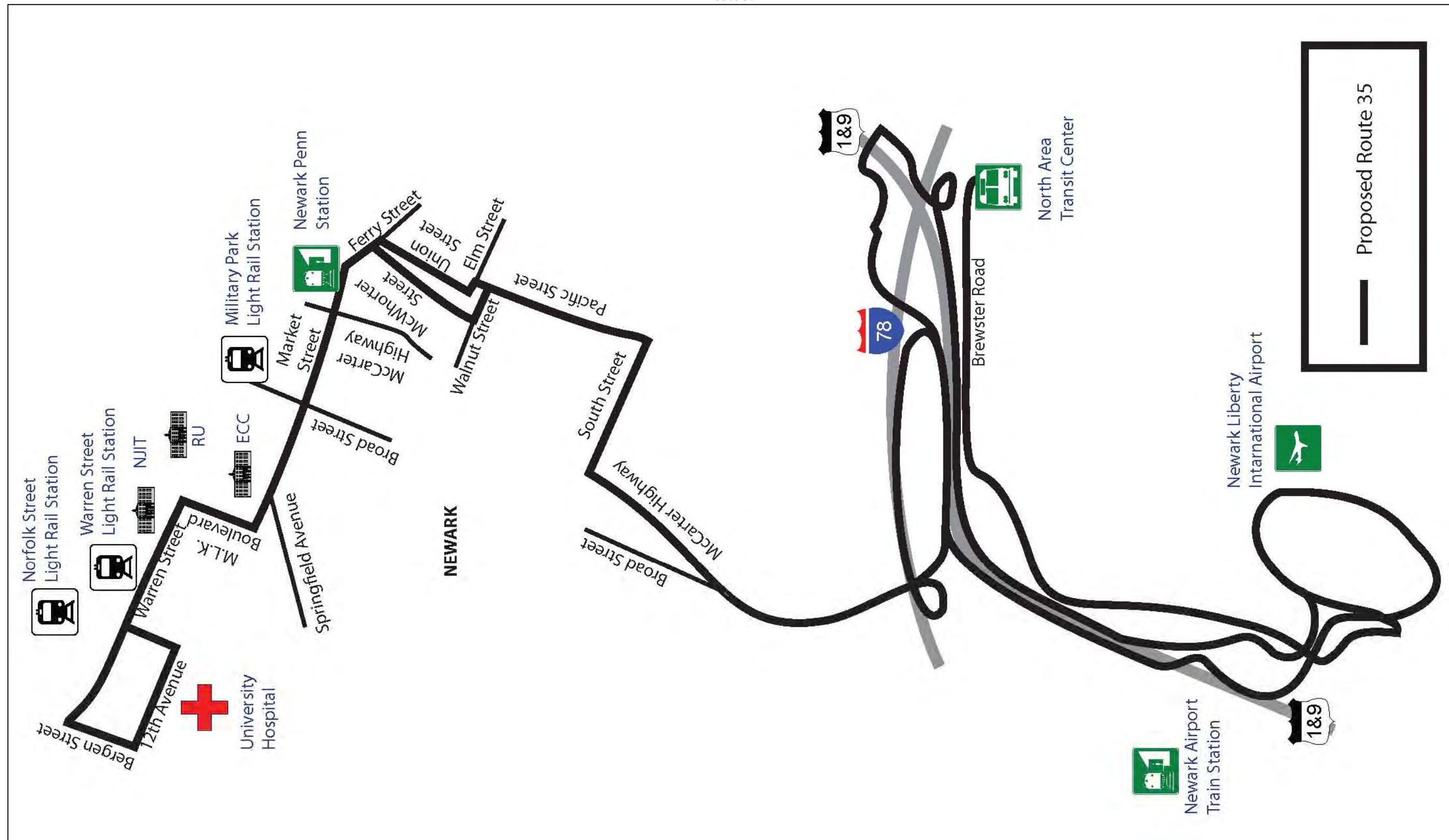
***New Route 35 – Newark-University Heights to Newark Airport***

- The new **Route 35** will operate between the University Heights area of Newark and Newark International Airport's North Area Transit Center via the Central Terminal area. Route 35 will approach Newark Penn Station from westbound Ferry Street and operate via Market Street, Dr. Martin Luther King Jr. Boulevard, Warren Street, West Market Street, Bergen Street, and 12<sup>th</sup> Avenue. From there, Route 35 buses will deadhead via 12<sup>th</sup> Avenue, West Market Street, Norfolk Street, Warren Street, and Witcliffe Street and layover at the University Heights layover location on Witcliffe Street south of Warren Street. From the layover location, Route 35 will deadhead via Witcliffe Street, West Market Street, and Bergen Street to the beginning of the route on Bergen Street north of 12<sup>th</sup> Avenue. Southbound trips will then travel via Bergen Street, 12<sup>th</sup> Avenue, West Market Street, Norfolk Street, Warren Street and Dr. Martin Luther King, Jr. Boulevard, and Market Street to Ferry Street.
- The route alignment to Newark Liberty International Airport will follow Ferry Street, the McWhorter/Union Streets couplet, the Elm/Walnut Streets couplet and Pacific Street to South Street, from where it will utilize McCarter Highway and Interstate 78 to access the hotels isolated along U.S. Routes 1 and 9 on the north side of the airport. From this hotel area, Route 35 will use U.S. Routes 1 and 9 to access the Central Terminal Area and serve all terminals via the HOV roadway. From there, it will utilize Brewster Road (serving the North Cargo Area) and terminate at the Newark Airport North Area Transit Center.
- On the return trip, Route 35 will serve Brewster Road, the Central Terminal Area and the isolated hotels located along U.S. Routes 1 and 9 north of the airport before utilizing McCarter Highway to return to South and Pacific Streets.
- A direct connection between the Ironbound and the airport is desirable, given that the Airport Employees Address Database shows 188 employees living in the Ironbound. In addition, the hotels isolated along U.S. Routes 1 and 9 north of the airport now have service in both directions of the route, preventing their employees from needing to walk along access ramps and other non-sidewalked roadways to reach the hotels.

Route 40



Route 35



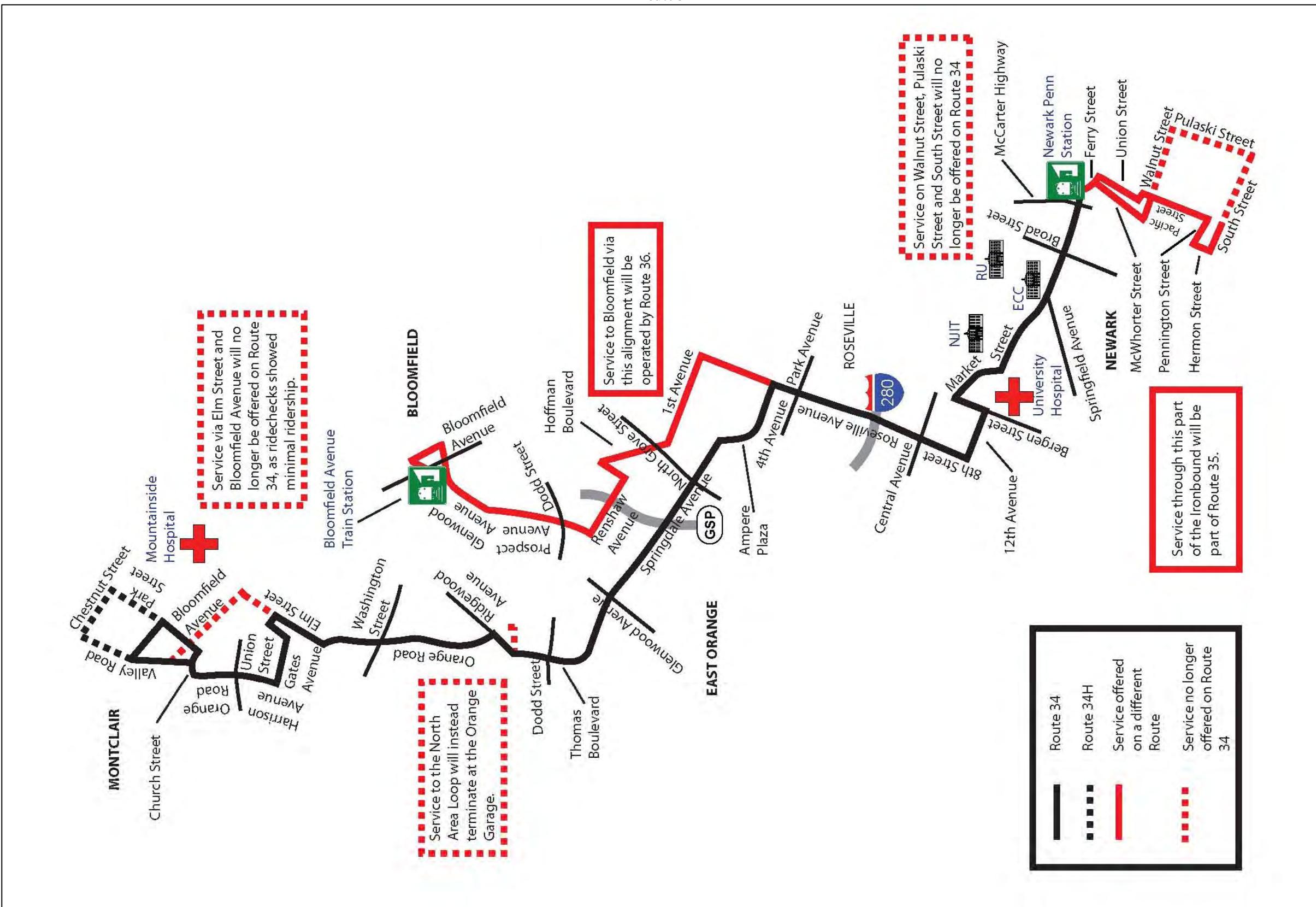
### ***Restructured Route 34 – Montclair to Newark Penn Station***

- The base **Route 34** service will operate between Bloomfield Avenue and Park Street in Montclair and Newark Penn Station.
- The route alignment through Montclair will be altered. Northbound trips will travel north on Orange Road, right on Elm Street, left on Hawthorne Place, left on Gates Avenue, right on Harrison Avenue, continuing north on Orange Road, right on Church Street, left on Park Street to terminate at the current layover location on Park north of Bloomfield Avenue. Southbound trips will operate from Park Avenue at Bloomfield, then left on Claremont Avenue, left on Valley Road, right on Church Street, left on Orange Road, continuing south on Harrison Avenue, left on Gates Avenue, right on Hawthorne Place, right on Elm Street and left onto Orange Road to continue the current route alignment. Under this alignment, the southbound stop on Elm Street at Union Street, and the northbound stop on Elm Street at Washington Street (both in Montclair), will no longer be served. Ride checks showed no activity at these stops.
- All service operating on the Bloomfield branch will now be part of a new route, Route 36.
- On the southern side of the route, all Route 34 service will end at Newark Penn Station.
- The variation to serve the high school will be continued and be designated “**Route 34S**”.
- Service to the Orange Garage turnback will continue and will be called “**Route 34G**”.
- Service on Route 34 G should be provided until 3:00 AM, seven days per week. This will provide service to East Orange and Orange and allow for airport employees traveling to Newark Penn Station on other NJ TRANSIT services to transfer to routes that will allow them to finish their trip home.
- Sunday service on Route 34 to Montclair should be introduced over a span in line with service guidelines.
- Ride checks show that all trips currently terminating at North Park Street Loop could instead terminate at the Orange Garage.

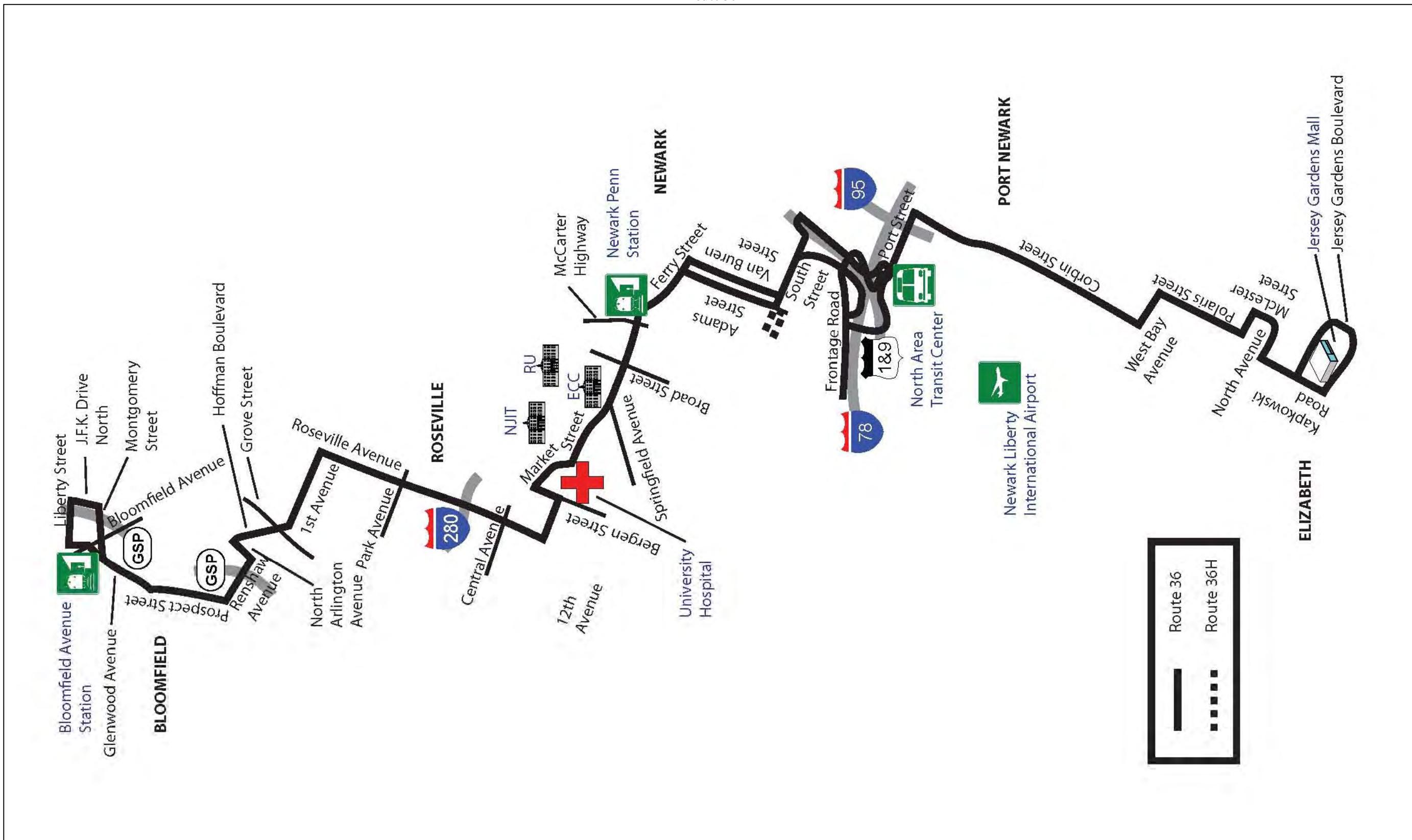
### ***New Route 36 – Bloomfield to Newark Airport-North Area Transit Center***

- The new **Route 36** will operate between Bloomfield and the Newark Liberty International Airport North Area Transit Center via the intersection of Broad and Market Streets, Newark Penn Station and the Ironbound. The segment of Route 36 east of Newark Penn Station will operate via Ferry Street, the Adams/Van Buren Streets couplet, South Street and then follow the current Route 40 alignment (serving the Frontage Road area and the Northern State Prison) as far as the Newark Airport North Area Transit Center.
- Route 36 will then proceed south to the Jersey Gardens Mall via the Ports.
- On its return trip from the Ports, Route 36 will duplicate the current alignment of Route 40 and will serve the Frontage Road area first and then serve the Newark Airport North Area Transit Center before proceeding back to South Street via U.S. Routes 1 and 9.
- There will be one variation to Route 36, designated **Route 36H**. Route 36H will follow the Route 36 routing between Bloomfield and the intersection of Van Buren Street and South Street in the Ironbound. From there, Route 36H will travel west on South Street and layover at the current Route 34 layover spot on South Street at Jefferson Street. Northbound trips will then travel south on Jefferson Street, east on Thomas Street, and north on Adams Street, from where Route 36H will resume Route 36 routing.

Route 34



Route 3



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## Routes 25 & 70

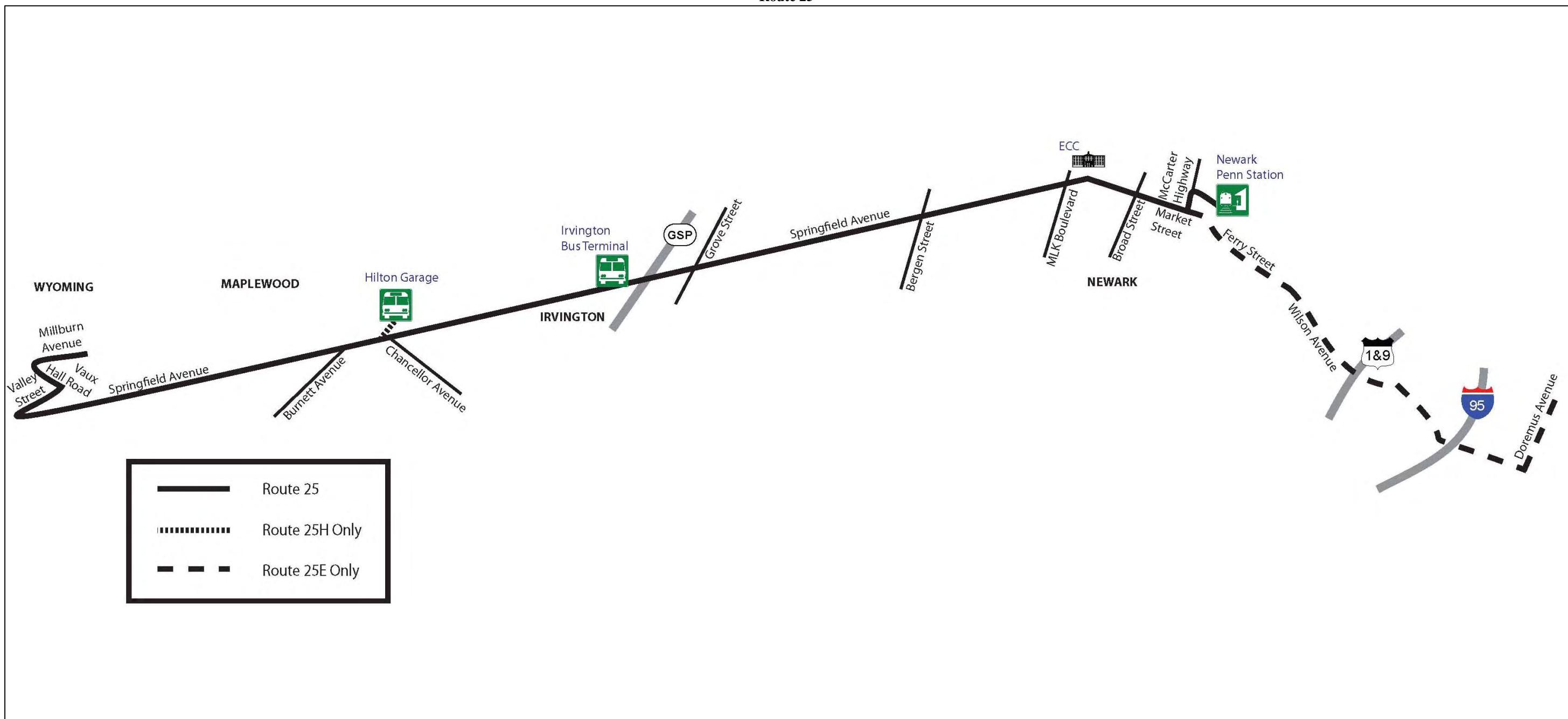
***Restructured Route 25 – Maplewood to Newark via Springfield Avenue***

- The base route, which will continue to be designated **Route 25** will operate between Newark Penn Station and the Maplewood Loop along the current Route 25 routing to the intersection of Springfield Avenue and Millburn Avenue in Maplewood. From there, the route will continue west on Springfield Avenue, north on Valley Street, north on Vaux Hall Road, and east on Millburn Avenue to the Maplewood Loop, where the route will terminate. The inbound route alignment will follow the same alignment in the opposite direction.
- A variation or Route 25 will operate only between Newark Penn Station and the Hilton Garage. This variation could terminate at the Irvington Bus Terminal, but due to capacity constraints at the terminal, the variation will operate to the Hilton Garage. For the purposes of passenger communication, outbound (westbound) trips from Newark Penn Station on this variation will be designated **Route 25H**.
- A second variation will begin at the Irvington Bus Terminal and operate the current Route 25 route alignment to Newark Penn Station and then operate via Ferry Street, Wilson Avenue, and Doremus Avenue, terminating at the Essex County Correctional Facility. All trips will operate the full length of the route along one pattern. For the purposes of passenger communication, trips on this variation will be designated **Route 25E**.

***Restructured Route 70 – Newark-Penn Station to Livingston Mall***

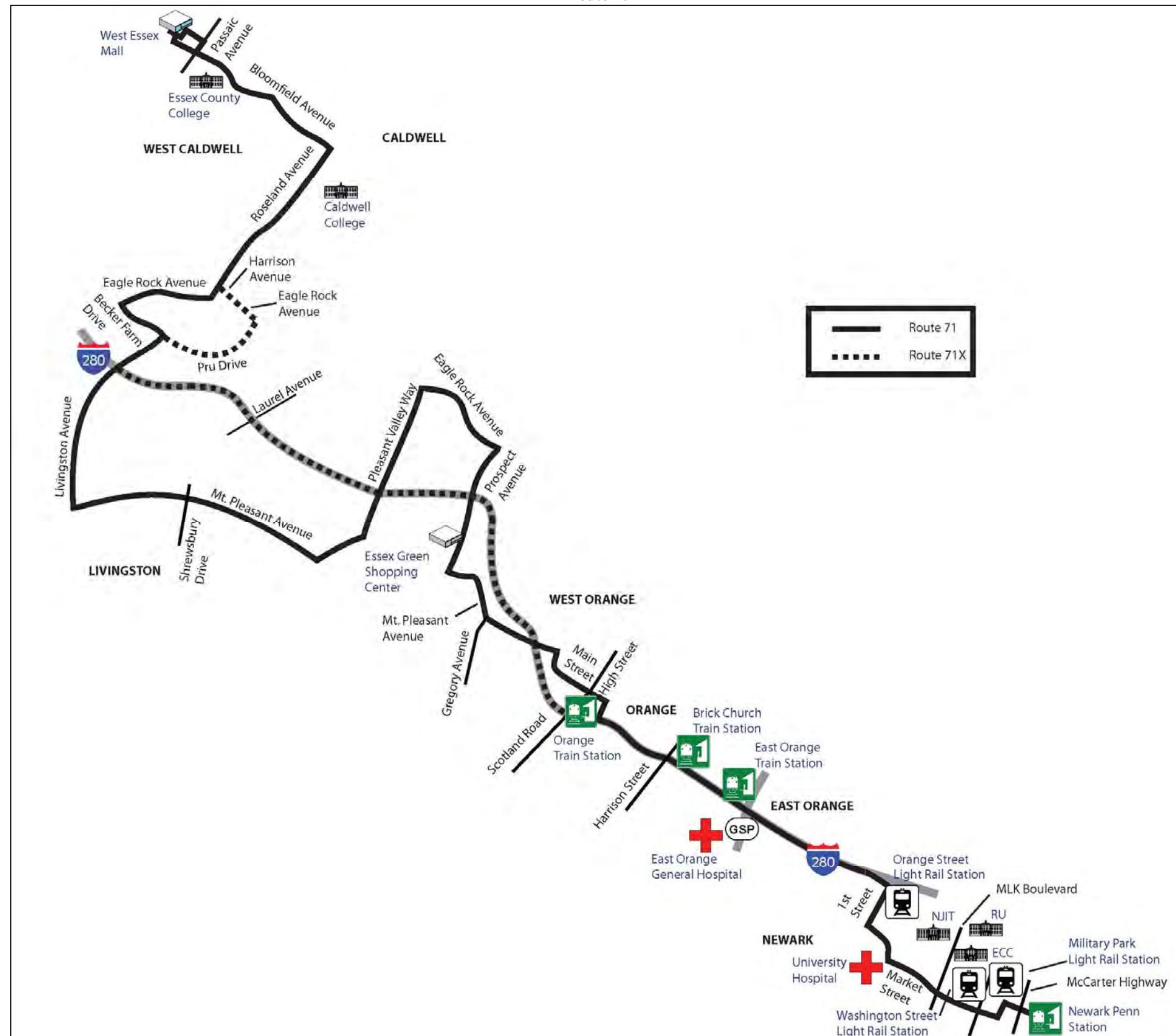
- The base **Route 70** will operate between Newark Penn Station and the Livingston Mall, utilizing the Springfield Avenue route alignment through Union.
- In later phases of implementation, as resources permit, the inbound evening trips which currently short turn at Irvington Bus Terminal will be extended to Newark Penn Station to provide later evening service along Avon Avenue.
- The current route alignment via the Maplewood Loop and Millburn Station will continue to operate on an hourly basis. For the purposes of passenger communication, trips on this variation will be designated **Route 70M**.
- Peak period service to Florham Park will be continued and will be designated **Route 70F**. Outbound trips that serve Florham Park will be designated as such. A consistent alignment will be used for all 70F trips. In the outbound direction, 70F trips will bypass Livingston Mall, serve Florham Park following the current routing and terminate at Livingston Mall. All 70F inbound trips will begin at the Livingston Mall, then serve Florham Park via the current routing and not serve Livingston Mall again on the inbound direction. In addition, all trips serving Florham Park should serve the base Route 70 routing (Springfield Avenue) to avoid the need for an additional variation (i.e., Florham Park via Millburn, Florham Park via Springfield Avenue).
- Service will no longer enter the Short Hills Hilton property. Results of ride checks and the Origin-Destination Survey show that this change will affect approximately 16 passengers daily.
- On weekends, Route 70 should utilize standard 40-foot transit buses. The 70M variation will operate all day on Sunday and during evenings on weekdays and Saturday.

**Route 25**



Greater Newark Bus System Study

Route 70



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## Routes 5 & 91

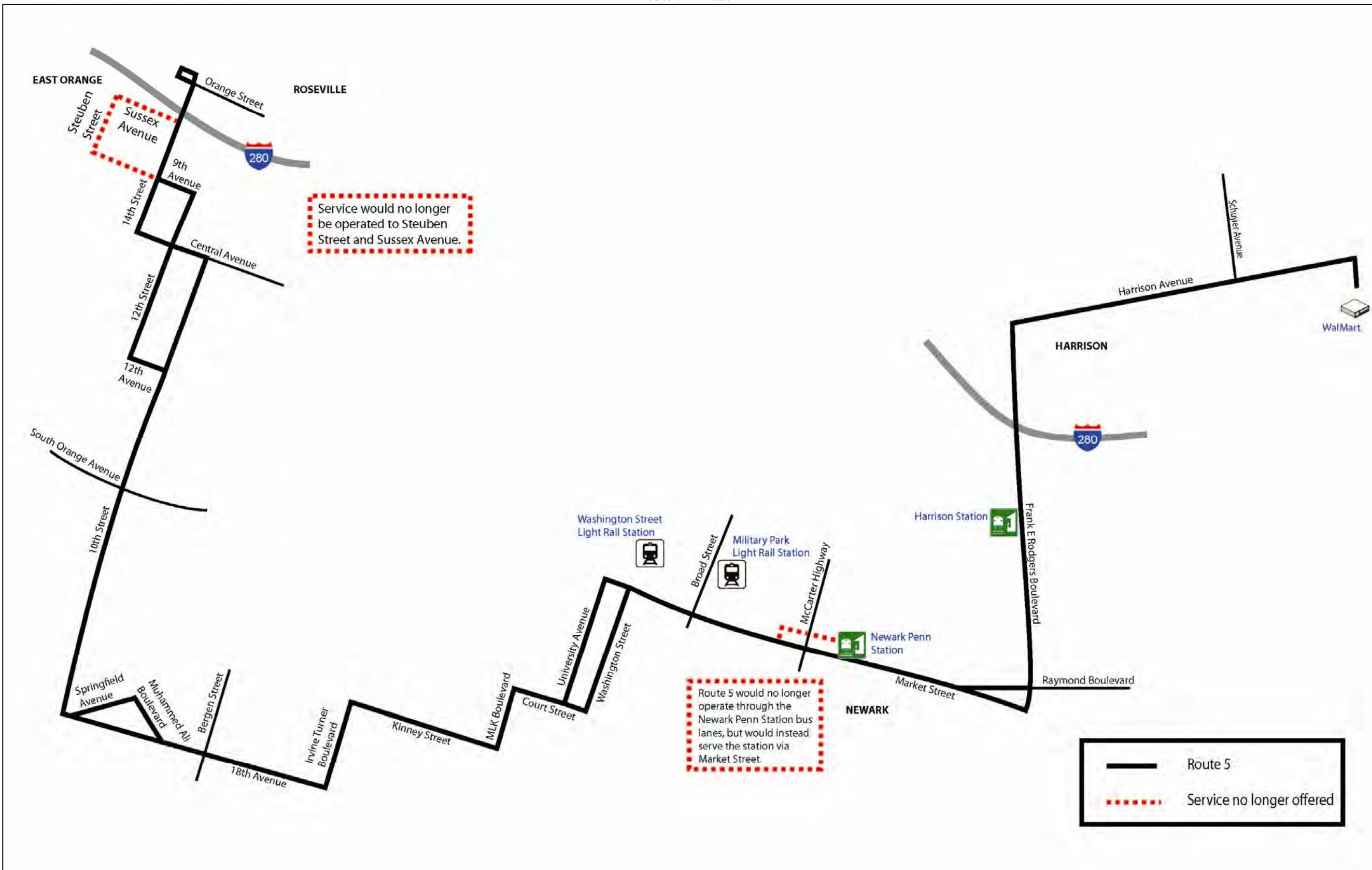
### ***Restructured Route 5 – East Orange to Newark-Penn Station***

- **Phase 1** - One redevelopment goal for the City of Newark is to develop large scale (big box) retail along Freylinghuysen Avenue. Until that development occurs **Route 5** will continue to connect East Orange to Newark Penn Station; however, the route will be extended into Harrison via Market Street, Frank E. Rodgers Boulevard and Harrison Avenue, where the route will terminate at the Wal-Mart. Additionally, the vehicle will not enter the bus lanes at Newark Penn Station, instead remaining on Market Street and serving the station from there. Additionally, while the western terminus in East Orange will remain the same – Martin Luther King Jr. Boulevard at 15<sup>th</sup> Street – the route will no longer deviate to Stueben Street via Sussex Avenue/9<sup>th</sup> Avenue.
- **Phase 2** - service will operate as it does today between Springfield Avenue and Newark Penn Station with the same exception as the phase 1 service – the route will not enter the Newark Penn Station bus lanes. As with phase 1, the route will serve Harrison via Market Street, Frank E. Rodgers Boulevard and terminate at the Wal-Mart on Harrison Avenue. The portion of the route that operates north and west of Springfield Avenue will be served by the new Route 91.

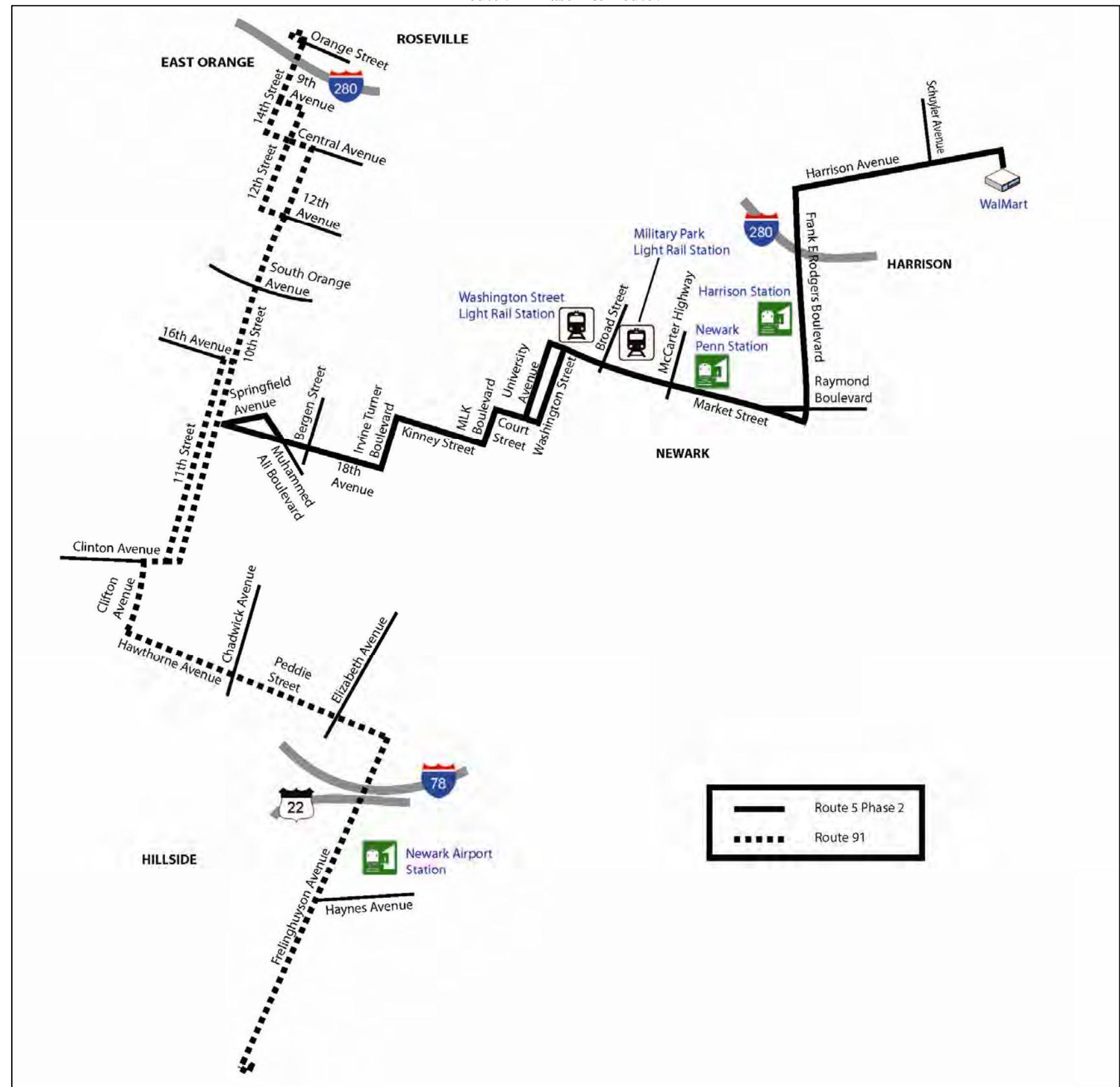
### ***New Route 91 – East Orange to Elizabeth***

- As projected retail development along Freylinghuysen Avenue is complete, the proposed new **Route 91** will operate the current route 5's alignment between Martin Luther King Jr. Boulevard at 15<sup>th</sup> Street in East Orange and 10<sup>th</sup> Street at 18<sup>th</sup> Avenue in Newark. From there, the route will employ the 10<sup>th</sup> Street/11<sup>th</sup> Street couplet to Clinton Avenue, and then follow Clinton Avenue, Clinton Place, Hawthorne Avenue, West Peddie Street and Freylinghuysen Avenue to the area targeted for retail development.

Route 5 – Phase 1



Route 5 – Phase 2 & Route 91



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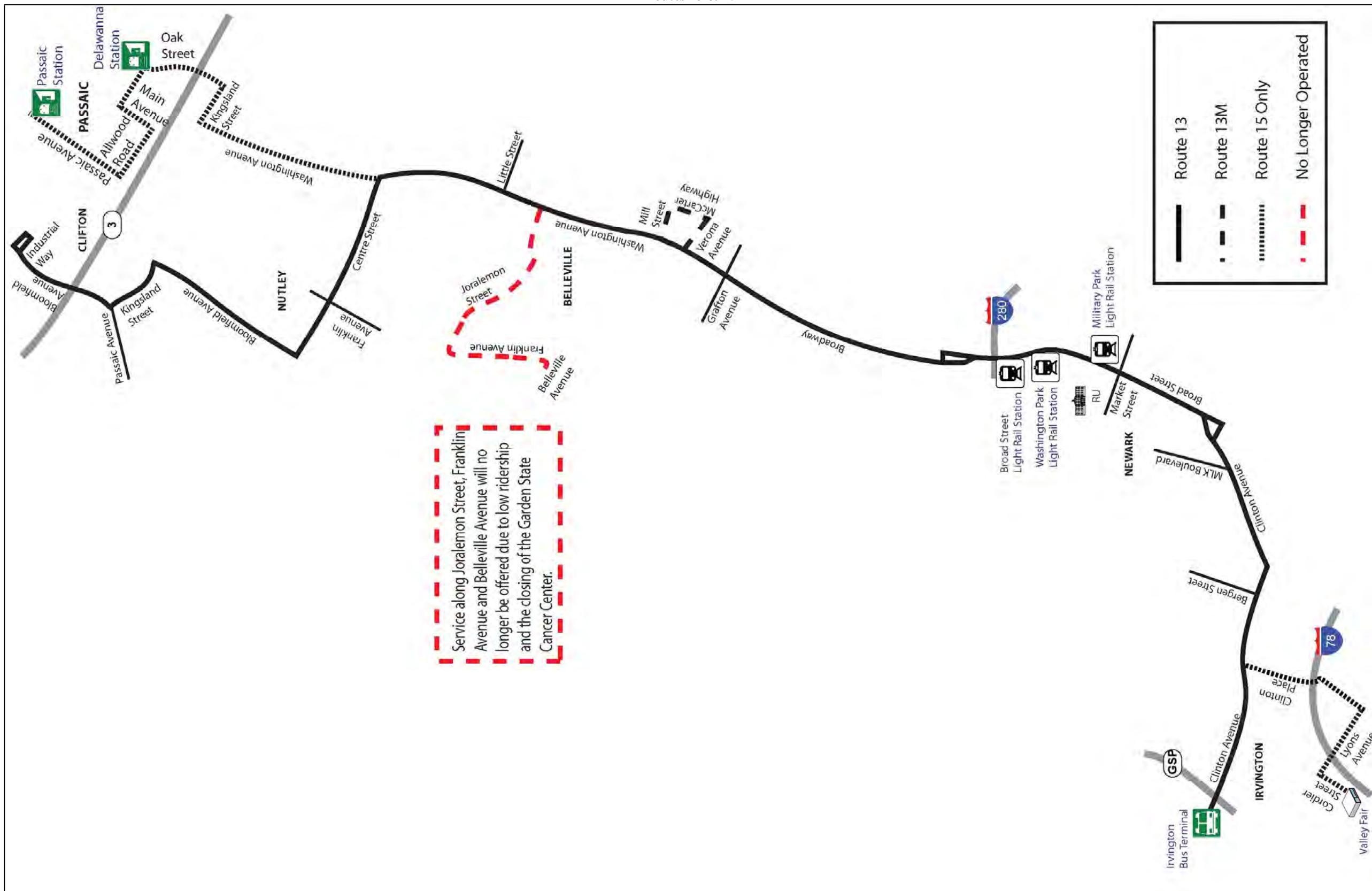
**Routes 13 & 15*****Restructured Route 13 – Nutley to Irvington Bus Terminal via Newark***

- The current Route 13 will be separated into two routes. The first route will operate between Industrial Way and the Irvington Bus Terminal. This alignment will continue to operate as **Route 13**.
- Route 13 (Irvington – Industrial Way) will continue to have a short turn at Mill and Main Streets, with service continuing to Industrial Way. Four buses per hour will serve as far north as Mill and Main Streets, with two buses per hour extending to Industrial Way. Outbound (northbound) trips terminating at Mill and Main Streets will be designated as “**Route 13M**”. Buses that would deadhead to or from Mill and Main Streets will remain in revenue service to/from the Big Tree Garage. Outbound trips (northbound) on this pattern will be designated as “**Route 13G**”.
- The branch along Joralemon Street to the Garden State Cancer Center will be eliminated due to low ridership and the closing of the Garden State Cancer Center.
- There will be no express trips via McCarter Highway on either route; all trips will run local.

***New Route 15 – Passaic Rail Station to Irvington – Valley Fair via Newark***

- The second route will operate between the Passaic Train Station and Valley Fair. This alignment will be designated as **Route 15**. Both routes will be operated with articulated buses.
- Due to the fact that NJ TRANSIT is not allowed to operate on the property of Clifton Commons, the northern terminus of Route 15 will follow an alignment of north on Washington Avenue, east on Kingsland Street, north on River Road, west on Delawanna Avenue, south on Main Avenue, west on Allwood Road, north on Passaic Avenue, to Tom Saba Square where the route will layover and terminate at the NJ TRANSIT Passaic Commuter Rail Station. This will require the elimination of between 13 and 20 parking spaces at the train station depending on whether a single lane or double lane layover location is implemented. These are currently free parking spaces. This option allows for a more reliable layover location and provides additional intermodal opportunities. Under this option, the current bus stop on Kingsland at Washington (west of Washington) would not be served by Route 15. Ride checks for Route 74 showed minimal ridership at this stop. The stop will continue to be served by Route 74.
- A second potential terminal loop/layover arrangement for the Route 15 would have the route travel north on Washington Avenue, west on Kingsland Street (serving the current bus stop on Kingsland at Washington), north on Passaic Avenue/Main Avenue, east on Delawanna Avenue, south on River Road, then terminate and layover at the large shoulder on the bridge just to the east of the La Quinta hotel. Operators could potentially use the La Quinta hotel for facilities. Southbound trips would leave this layover location and travel south on River Road, west on Kingsland Street, and south on Washington Avenue. During bridge construction on Kingsland Street, Route 15 would travel via Washington Avenue, then east on Kingsland Street, north on River Road, west on Delawanna Avenue, south on Oak Street, and south on River Road to the layover location at the wide shoulder next to La Quinta.

Routes 13 & 15



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## Route 27

### ***Restructured Route 27 – Bloomfield to Irvington Bus Terminal via Newark***

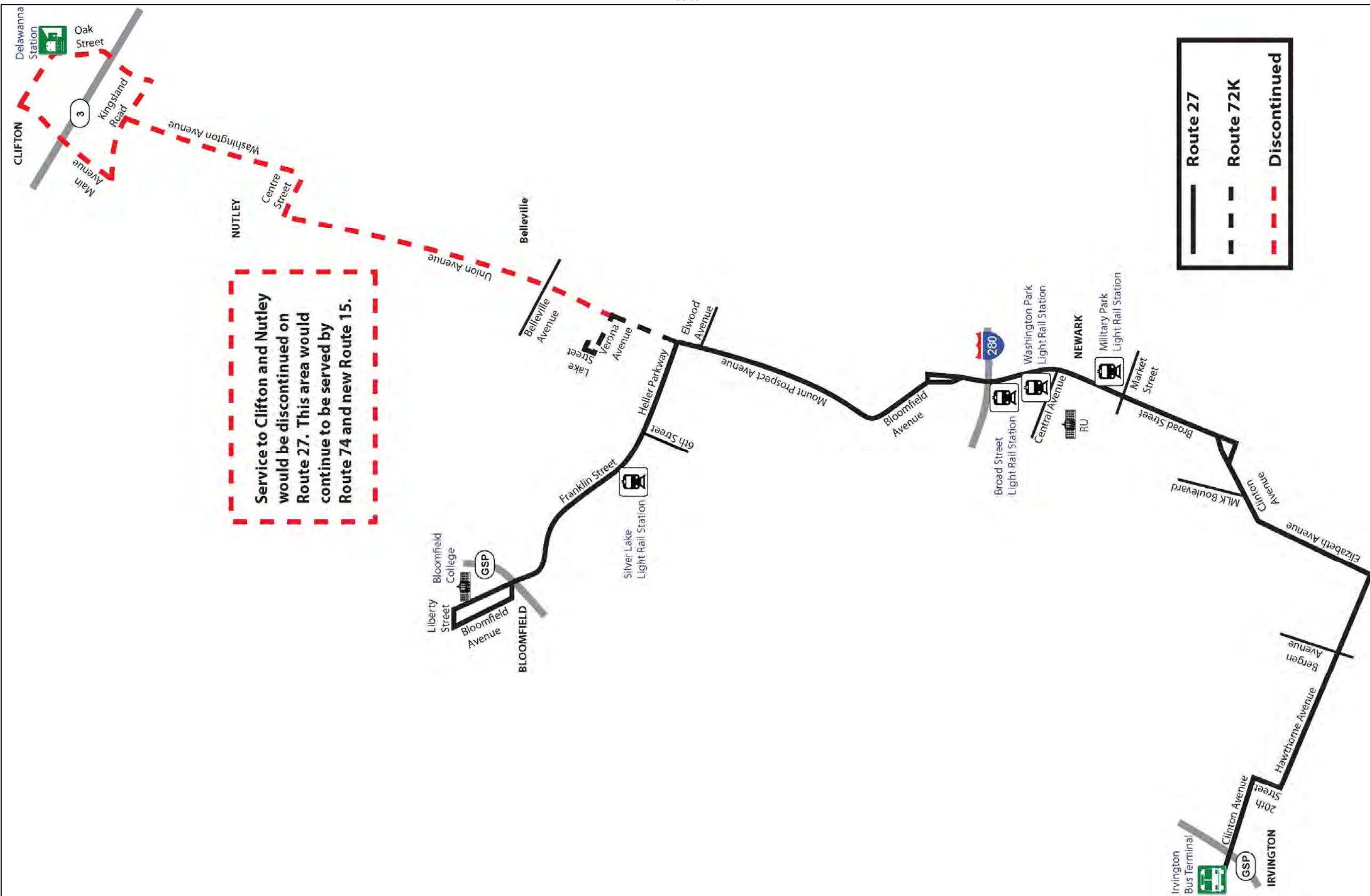
- The base **Route 27** service will operate between Bloomfield and the Irvington Bus Terminal via downtown Newark.
- Lake Street Loop service will continue and be designated **Route 27K**. In addition, service to Clifton and Nutley will be eliminated since the area is served by Route 74. Results of the origin/destination survey show that this will affect approximately 180 passengers (one-way) daily. Trips currently operating to Clifton and Nutley will terminate at Lake Street Loop.
- Bloomfield Vo-Tech High School trips will be continued.

## Route 21

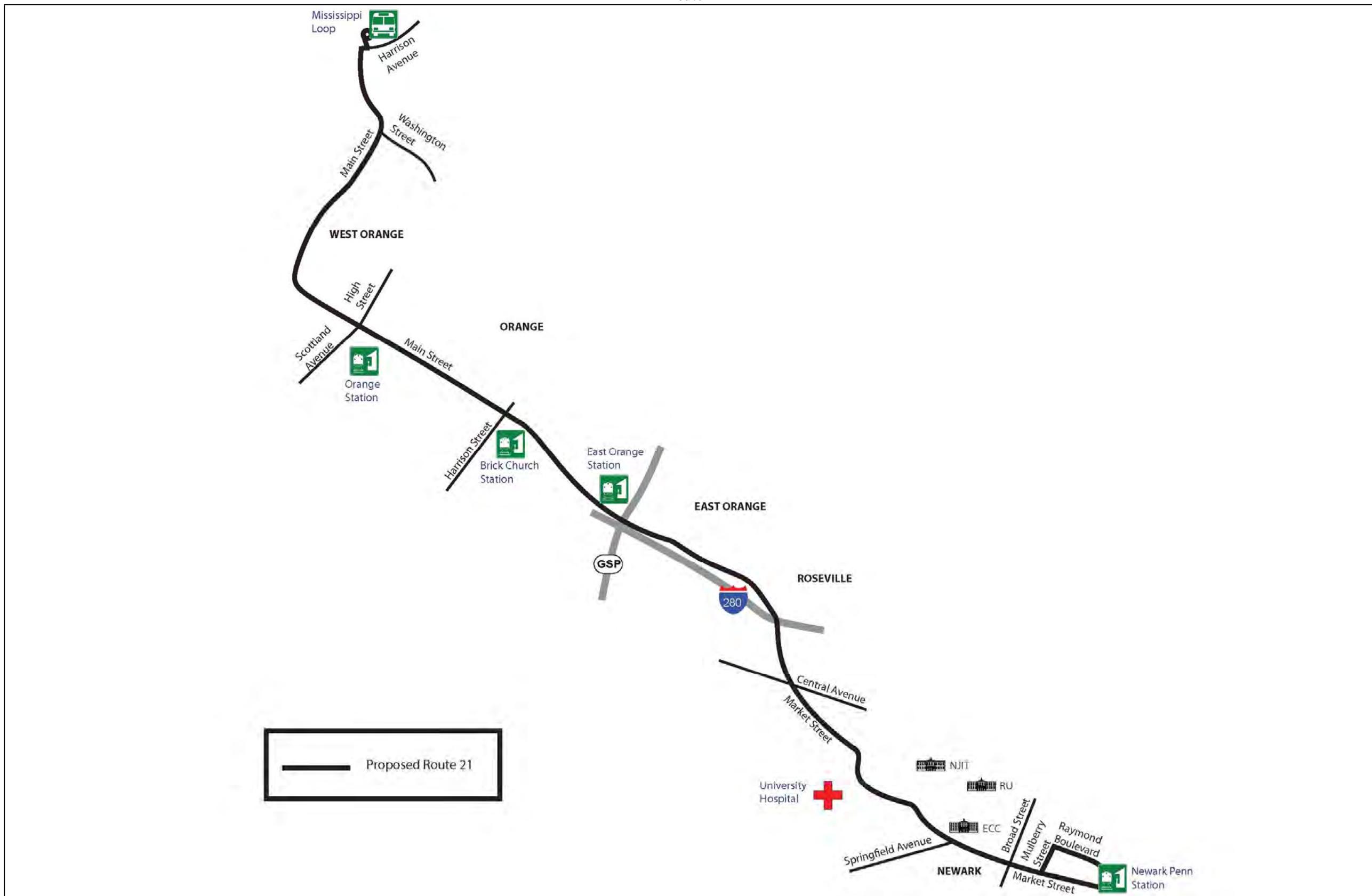
### ***Route 21 – Newark-Penn Station to Harrison Avenue***

- No changes are proposed for Route 21. The only recommendation would be that Route 21 be designated for articulated buses. However, additional short trips may need to be added in the peak period to accommodate passengers no longer served by 71, 73, and 79.

Route 27



**Route 21**



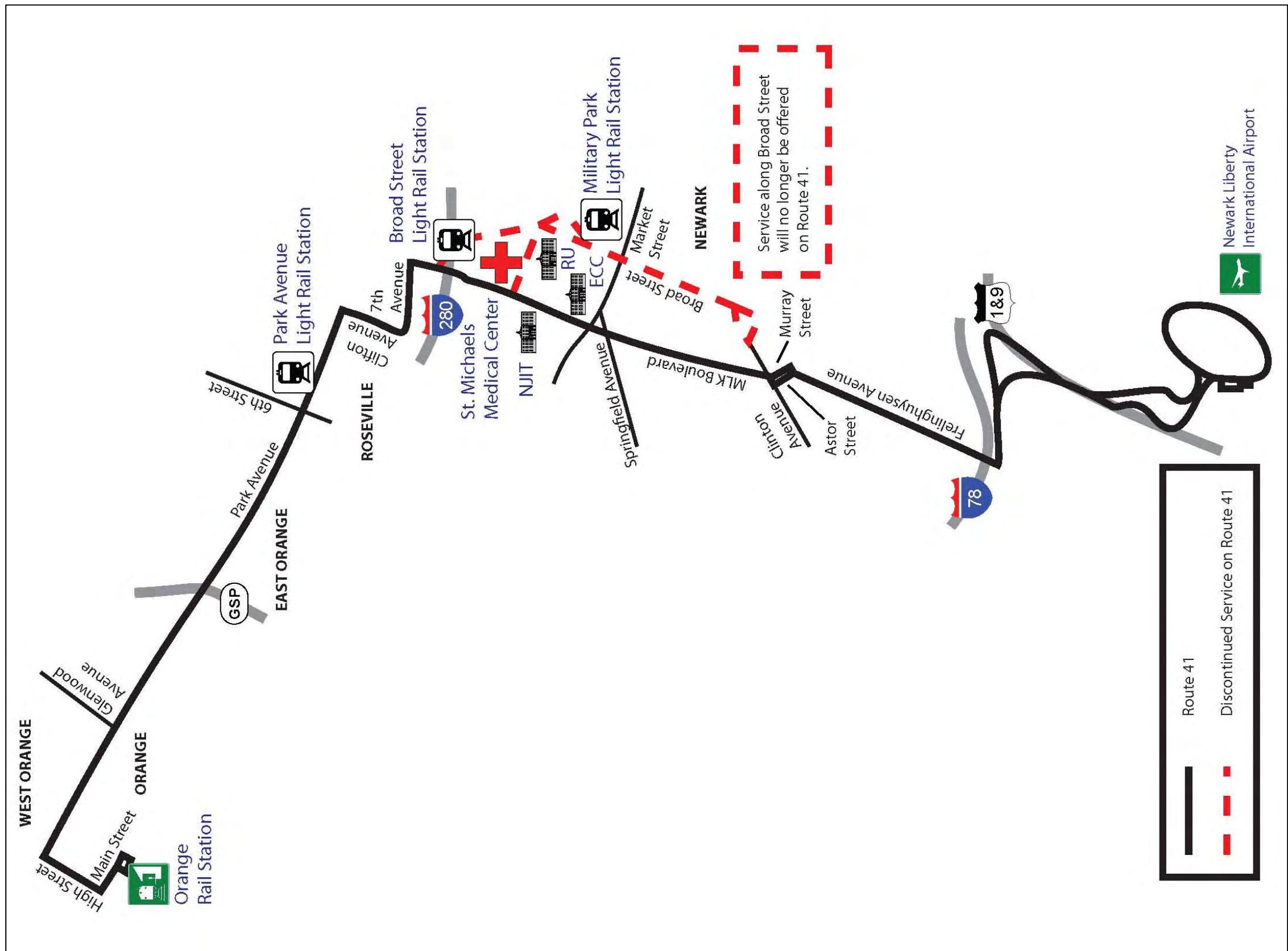
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## Route 41

### ***Restructured Route 41 – Park Avenue to Newark Airport***

- Instead of terminating at Lincoln Park, the new southern terminal for **Route 41** will be Newark Liberty International Airport. Route 41 will always utilize Martin Luther King, Jr. Boulevard along the west side of Broad Street Station, thus serving both Broad Street Station as well as the Newark Light Rail. Route 41 will continue along Martin Luther King, Jr. Boulevard and therefore serve to provide a new continuous crosstown connection through the heart of the University Heights area in Newark. Route 41 will then utilize the Astor/Murray Streets couplet and Sherman Avenue to access Frelinghuysen Avenue. From there, Route 41 will utilize U.S. Route 22 and U.S. Routes 1 and 9 to serve the airport's Central Terminal Area (Terminals A, B, and C) via the HOV roadway. Route 41 will then take layover in the Terminal A bus courtyard. The return trip will again serve all three terminals via the HOV roadway before proceeding to U.S. Routes 1 and 9, U.S. Route 22 and Frelinghuysen Avenue to return to downtown Newark via Martin Luther King, Jr. Boulevard.
- The possibility of terminating Route 41 at the Park Avenue station of the Newark Light Rail station was examined. However, the results of the origin-destination survey show that over 100 passengers use Route 41 to travel south of Broad and Market Streets daily. If Route 41 ended at the Park Avenue station, these people will now be forced to transfer twice. However, by serving Broad Street Station, Route 41 will still have more intermodal connections than if it had terminated at the Park Avenue station and will allow those traveling south of Broad and Market Streets to transfer to the Bloomfield Avenue bus routes or the Liberty Corridor BRT service (i.e., Go Bus 28), which will serve Broad Street south of Market Street.
- The peak period short turns to and from the Park Avenue station will continue to operate and will be called "**Route 41P**".
- In the long term, Route 41 could serve the Newark Liberty International Airport Rail Station, if permitted to do so by the Port Authority.

Route 41



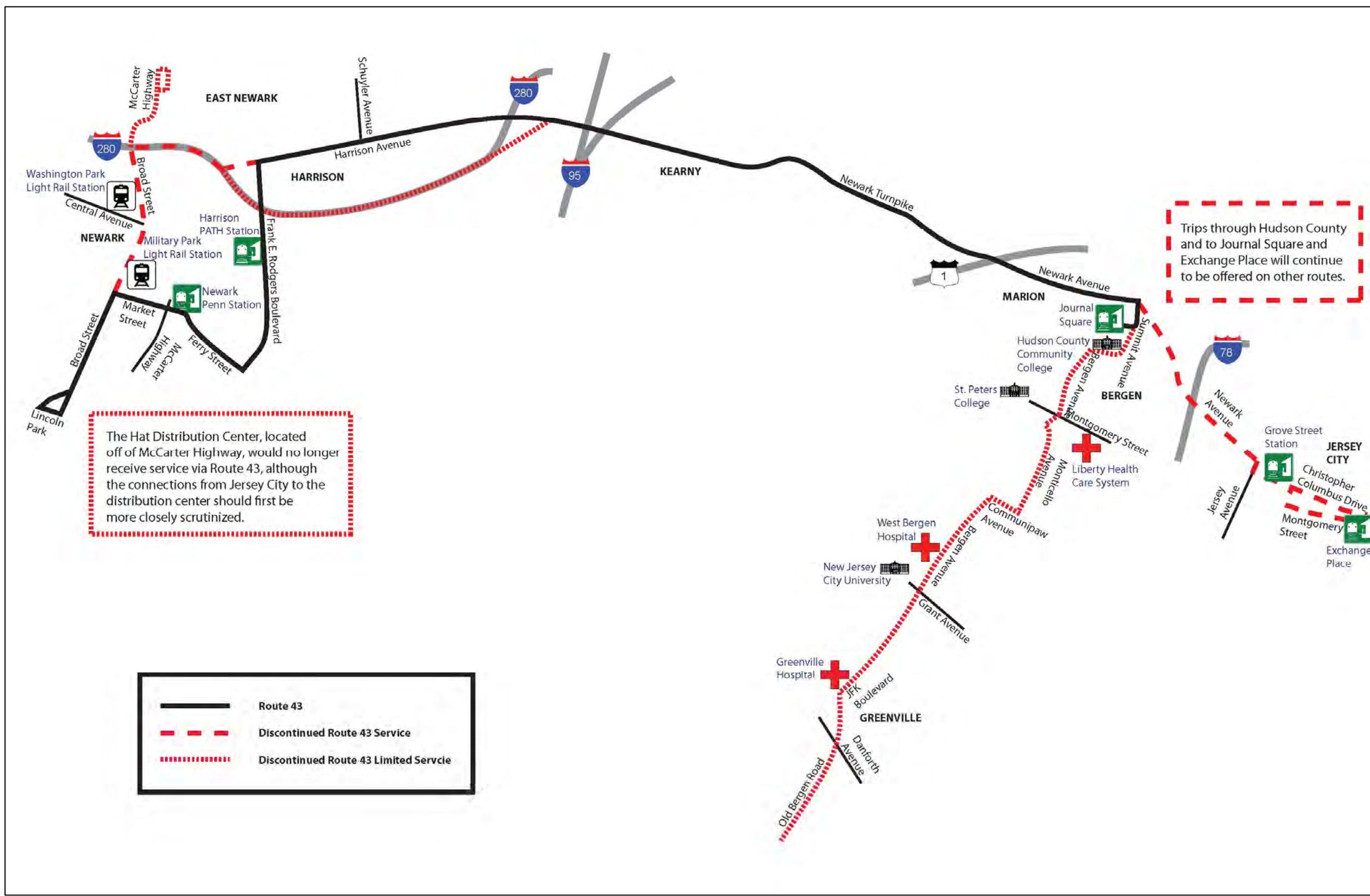
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## Route 43

### ***Restructured Route 43 – Lincoln Park to Journal Square***

- **Route 43** will begin at Lincoln Park and will operate local along the following route alignment: Broad Street, Market Street, Ferry Street, Jackson Street, Frank E. Rogers Boulevard South and Harrison Avenue and will then follow its current routing to Journal Square on all trips.
- The route will operate every 60 minutes and will directly serve Wal-Mart in both directions.
- The local route alignment through the Ironbound will connect another residential neighborhood with the Wal-Mart in Kearny and will also provide a direct connection between the center of the Ironbound and the Red Bulls soccer stadium in Harrison.
- The feasibility of this proposal still needs to be confirmed with NJ TRANSIT-collected ride checks. In addition, the connections between Jersey City and the hat distribution center need to be examined.

Route 43



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## **Bus Rapid Transit (BRT) Proposals**

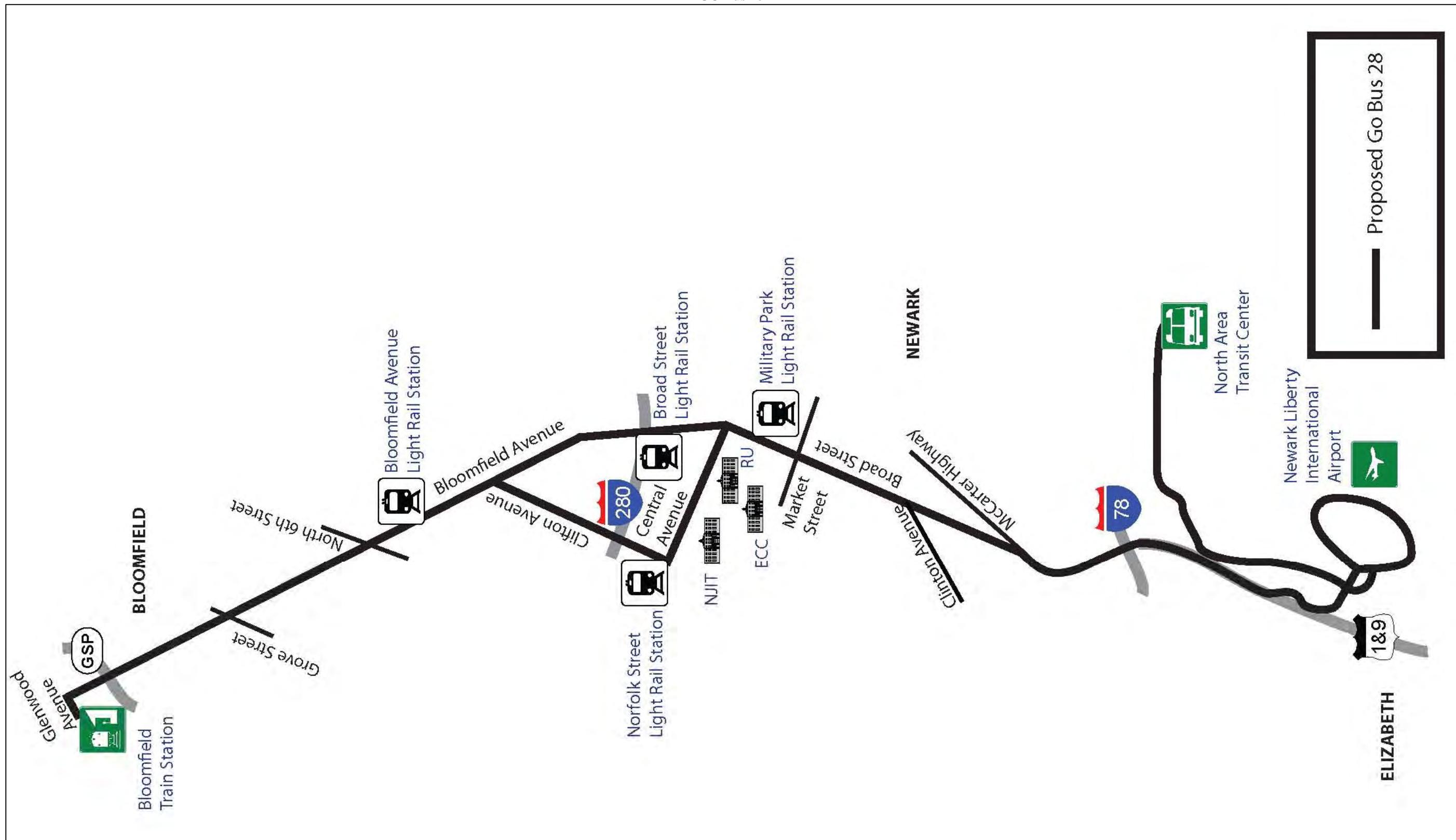
### **Go Bus 28 & Route 28**

#### ***Go Bus 28 – Liberty Corridor BRT***

- The Bloomfield Avenue corridor has been selected as a bus rapid transit (BRT) corridor as part of the Liberty Corridor project. The Liberty Corridor continues beyond downtown Newark to the Newark Liberty International Airport and Ports Newark and Elizabeth.
- The initial route, **GO Bus 28**, will have two variations both traveling between the Bloomfield NJ TRANSIT commuter rail station and the North Area Transit Center at the airport. The first variation will leave the Bloomfield Station and travel via Glenwood Avenue, Conger Street, Municipal Plaza, Bloomfield Avenue, Broadway, Broad Street, State Highway 21, the Newark Liberty International Airport terminal area (serving all terminals) and Brewster Road. Service to the North Area Transit Center is contingent upon improvements implemented by the Port Authority of New York and New Jersey.
- Along this alignment, GO Bus 28 will make the following stops:
  - Bloomfield Station - Lackawanna Place at Glenwood Avenue (Terminal)
  - Bloomfield Avenue at Burroughs Place (SB)/ Bloomfield Avenue at Municipal Plaza (NB)
  - Bloomfield Avenue at Watsessing Avenue (SB and NB)
  - Bloomfield Avenue at North 12<sup>th</sup> Street (SB and NB)
  - Bloomfield Avenue at Bloomfield Newark Light Rail Station (SB and NB)
  - Bloomfield Avenue at Clifton (SB and NB)
  - Bloomfield Avenue at Summer (SB)/ Bloomfield Avenue at Park Avenue (NB)
  - Broad Street at Lackawanna Avenue (SB)/ Broad Street at Broad Street Station (NB)
  - Broad Street and Lombardy Street (SB)/ Washington Street at James Street (NB)
  - Broad Street at Cedar Street (SB)/ Washington Street at Raymond Boulevard (NB)
  - Broad Street at Market (Far Side) (SB)/ Market Street at Broad (NB)
  - Broad Street at Court Street (SB and NB)
  - Broad Street at Pennington Street (SB and NB)
  - Newark Liberty International Airport (serving Terminals A, B, and C via the HOV lane) (SB & NB)
  - Brewster Road at United Cargo – Building #95 (SB & NB)
  - Brewster Road at Conrad Road – Building #15 & #70 (SB & NB)
  - Brewster Road at Airis Drive – Building #100 & #339 (SB & NB)
  - Newark Liberty Airport North Area Transit Center (Terminal)
- The second variation is designed to provide connections from University Heights area of Newark to the Bloomfield corridor and the airport. This variation will leave the Bloomfield Station and travel via Glenwood Avenue, Conger Street, Municipal Plaza, Bloomfield Avenue, Norfolk Street/Clifton Avenue, Central Avenue, Broad Street (northbound via Park Place to Central), State Highway 21, the Newark Liberty International Airport terminal area (serving all terminals) and Brewster Road. Along the University Heights alignment, Go Bus 28 will make the following stops:
  - Bloomfield Station - Lackawanna Place at Glenwood Avenue (Terminal)
  - Bloomfield Avenue at Burroughs Place (SB)/ Bloomfield Avenue at Municipal Plaza (NB)
  - Bloomfield Avenue at Watsessing Avenue (SB and NB)
  - Bloomfield Avenue at North 12<sup>th</sup> Street (SB and NB)
  - Bloomfield Avenue at Bloomfield Newark Light Rail Station (SB and NB)
  - Bloomfield Avenue at Clifton (SB and NB)
  - Colonnade - Clifton Avenue at 7<sup>th</sup> Avenue (SB & NB)

- Norfolk Street at Central Avenue (SB & NB)
- University Center – Central Avenue at Locke Street (SB & NB)
- Rutgers – Central Avenue at University Avenue (SB & NB)
- Broad Street at Cedar Street (SB)/ Washington Street at Raymond Boulevard (NB)
- Broad Street at Market (Far Side) (SB)/ Market Street at Broad (NB)
- Broad Street at Court Street (SB and NB)
- Broad Street at Pennington Street (SB and NB)
- Newark Liberty International Airport (serving Terminals A, B, and C via the HOV lane) (SB & NB)
- Brewster Road at United Cargo – Building #95 (SB & NB)
- Brewster Road at Conrad Road – Building #15 & #70 (SB & NB)
- Brewster Road at Airis Drive – Building #100 & #339 (SB & NB)
- Newark Liberty Airport North Area Transit Center (Terminal)
- The bus stops to be served were selected with consideration given to:
  - *passenger activity* - all stops had over 100 total passengers boardings or alightings throughout the service day;
  - *stop spacing* - in general, stops have been spaced every 1/3 to ½ mile; and
  - *transfer activity* – consideration was given to allowing for intermodal transfers as well as transfers to other bus routes.
- Subsequent phases of implementation will include northern extensions to Montclair State University, with the ultimate northern terminal at Paterson. The rationale for designating the Bloomfield Station as the northern terminus in the early phases of implementation is to maintain a sufficient headway given the available equipment. As part of subsequent phases, the southern terminal will be extended to the Port Employment Center, with an ultimate southern terminus potentially at Jersey Gardens Mall or the new development adjacent to this mall.
- Liberty Corridor GO Bus 28 will be operated at a frequency of 10 minutes from 4:00AM-9:30AM, every 15 minutes from 9:30AM-12:00PM, every 10 minutes from 12:00PM-6:30PM, every 15 minutes from 6:30PM-8:00PM, every 10 minutes 8:00PM-12:00AM, and every 20 minutes 12:00AM-2:00AM. This schedule will be operated seven days per week. These service frequencies have been designed to coincide with airport shift peak demand periods as well as traditional work commute peak periods.
- The second implementation phase for the GO Bus 28 will include an extension to the Montclair State University campus and commuter rail station. Under this proposed extension, the GO Bus 28 will no longer serve the Bloomfield commuter rail station. From Bloomfield municipal center, GO Bus 28 will follow Bloomfield Avenue and Valley Road to the Montclair State University campus and commuter rail station. As part of this extension, the route will make the following stops:
  - MSU Train Station (Terminal)
  - MSU Campus (SB and NB)
  - Bloomfield Avenue at Church Street (SB)/Bloomfield Avenue at Glen Ridge Avenue (NB)
  - Bloomfield Avenue at Maple Avenue (SB)/ Bloomfield Avenue at Pine (NB)
  - Bloomfield Avenue at Ridgewood (SB and NB)
- Bus stops and alignment for the remaining extensions (i.e., northbound to Paterson, and southbound to the Port Employment Center and the Jersey Gardens Mall) will be determined as implementation progresses.

GO Bus 28

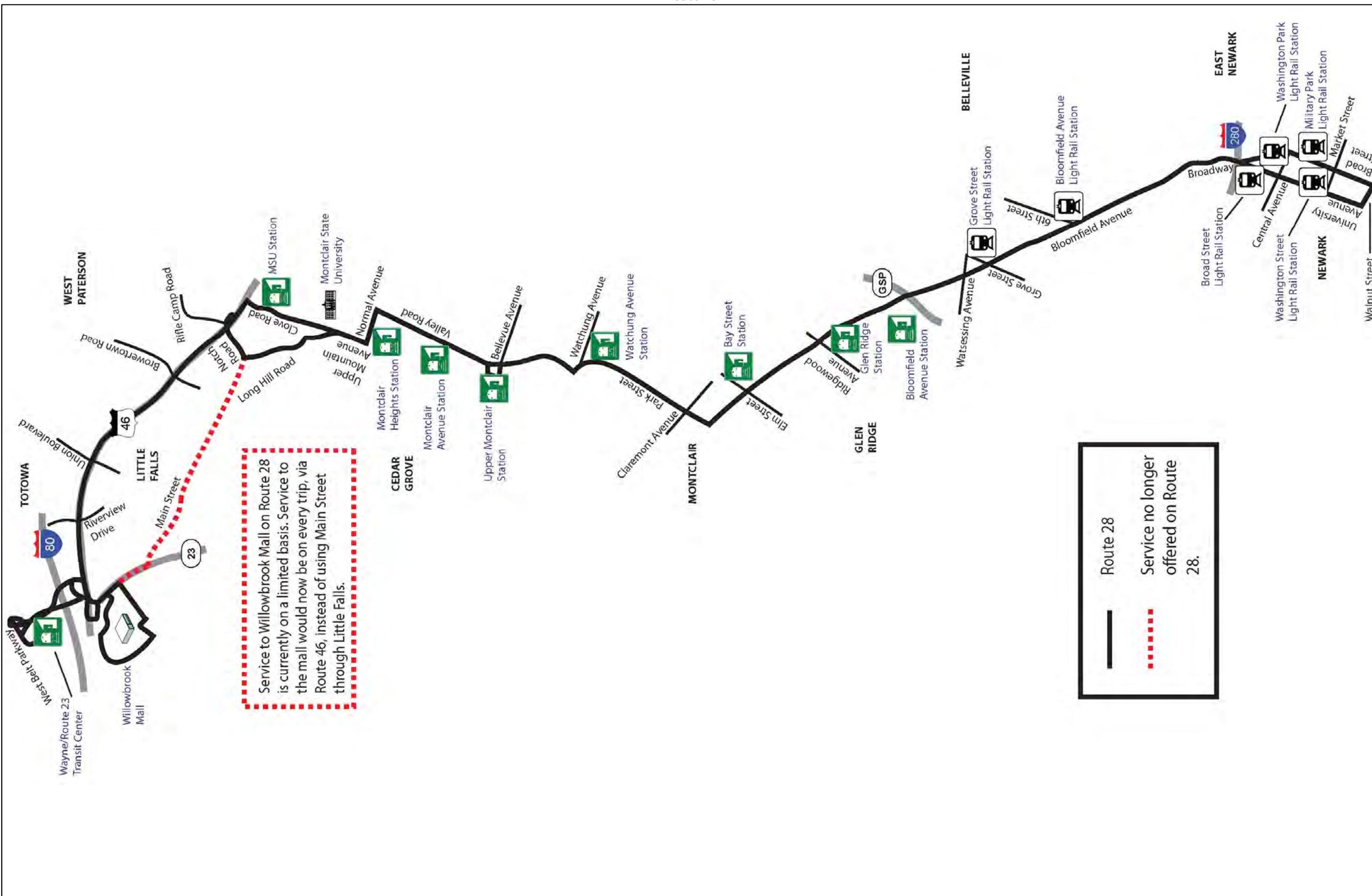


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**Restructured Route 28 – Newark to Willowbrook Mall/Wayne Transit Center**

- The base **Route 28** service will operate between downtown Newark and the Willowbrook Mall or the Wayne Transit Center. After serving Montclair State Rail Station, Route 28 will run express to the Willowbrook Mall on all trips via the current routing in the westbound direction to Notch Road, from where the route will access U.S. Highway 46 West, then Valley Brook Road to the Willowbrook Mall. Time permitting; Route 28 will then be extended to the Wayne Transit Center via Route 23. Extending the Route to the Wayne Transit Center will allow for connections to other NJ TRANSIT bus services as well as rail service. In addition, extending Route 28 to Wayne Transit Center will address issues with laying over buses at Willowbrook Mall. In the southbound direction, Route 28 will begin at the Wayne Transit Center; serve the Willowbrook Mall, then U.S. Highway 46 East to Clove Road, then to the Montclair State Rail Station and campus from where the route will resume the current alignment.
- In later implementation phases, Route 28 will have a southern terminus of the Bloomfield Avenue Newark Light Rail Station as the Liberty Corridor GO Bus is implemented. Results of the origin/destination survey show that this would affect approximately 580 passengers (one-way) daily.
- Upon completion of the full interchange between U.S. Route 46 and Clove Road, any extensions of Route 28 between Montclair State University and the Wayne/Route 23 Transit Center via the Willowbrook Mall will operate north on Clove Road, then to the Willowbrook Mall via U.S. Route 46 and to the Wayne/Route 23 Transit Center via State Route 23.
- One variation to Route 28 will be **Route 28B**. Route 28 B will only operate between the Wayne/Route 23 Transit Center (or the Willowbrook Mall) and the Bloomfield Avenue Newark Light Rail station. This variation will allow for resource savings as the Go Bus 28 – Liberty Corridor BRT service is implemented. It is envisioned that when the Go Bus 28 is extended to Montclair State University, all trips on Route 28 will operate the Route 28B variation.
- Service will be operated to Newark Penn Station on weekday evenings, Saturday evenings, and Sundays as is currently done. Consideration should be given to having all trips on Saturday operate to and from Newark Penn Station. For the purpose of passenger communication, inbound trips on this variation will be designated as **Route 28P**.

Route 28



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## **GO Bus 24/Route 24 (group Coach USA routes together)**

### ***GO Bus 24 – Frelinghuysen Corridor BRT***

See description on page 289 and map on page 290.

### ***Restructured COACH USA Route 24 – Elizabeth to Newark***

See description on page 289 and map on page 290.

## **Go Bus 25 & Routes 25 & 70**

### ***GO Bus 25 - Springfield Corridor BRT***

- All trips on all the aforementioned patterns of Route 25 will operate local service. Peak period limited stop service along the peak segment of the corridor between the Irvington Bus Terminal and Newark Penn Station will be provided by the new Springfield Avenue **Go Bus 25** service. Every other trip of Go Bus 25 will be extended to the Maplewood Loop via Springfield Avenue and Millburn Avenue and will make the following stops:
  - Irvington Bus Terminal (on Springfield Avenue) (EB and WB)
  - Springfield Avenue at Stuyvesant Avenue (EB and WB)
  - Springfield Avenue at Chancellor Avenue (Hilton Garage) (EB and WB)
  - Springfield Avenue at Park Avenue (WB)/ Springfield Avenue at Prospect Street (EB)
  - Maplewood Loop (Terminal)
- The second phase of Go Bus 25 implementation will be the extension of peak period, peak direction service to the Maplewood Loop using the alignment described above. The third phase of implementation will include the introduction of bi-directional peak period service on the route. The fourth phase will provide a full day bi-directional schedule. Later phases of implementation will include extensions of the route with the potential western terminus in Morristown.

### ***Restructured Route 25 Maplewood to Newark via Springfield Avenue***

See description on page 202 and map on page 203

### ***Restructured Route 70 – Newark-Penn Station to Livingston Mall via Springfield Avenue/Maplewood/Florham Park***

See description on page 202 and map on page 204

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## GO Bus 59 & GO Bus 51

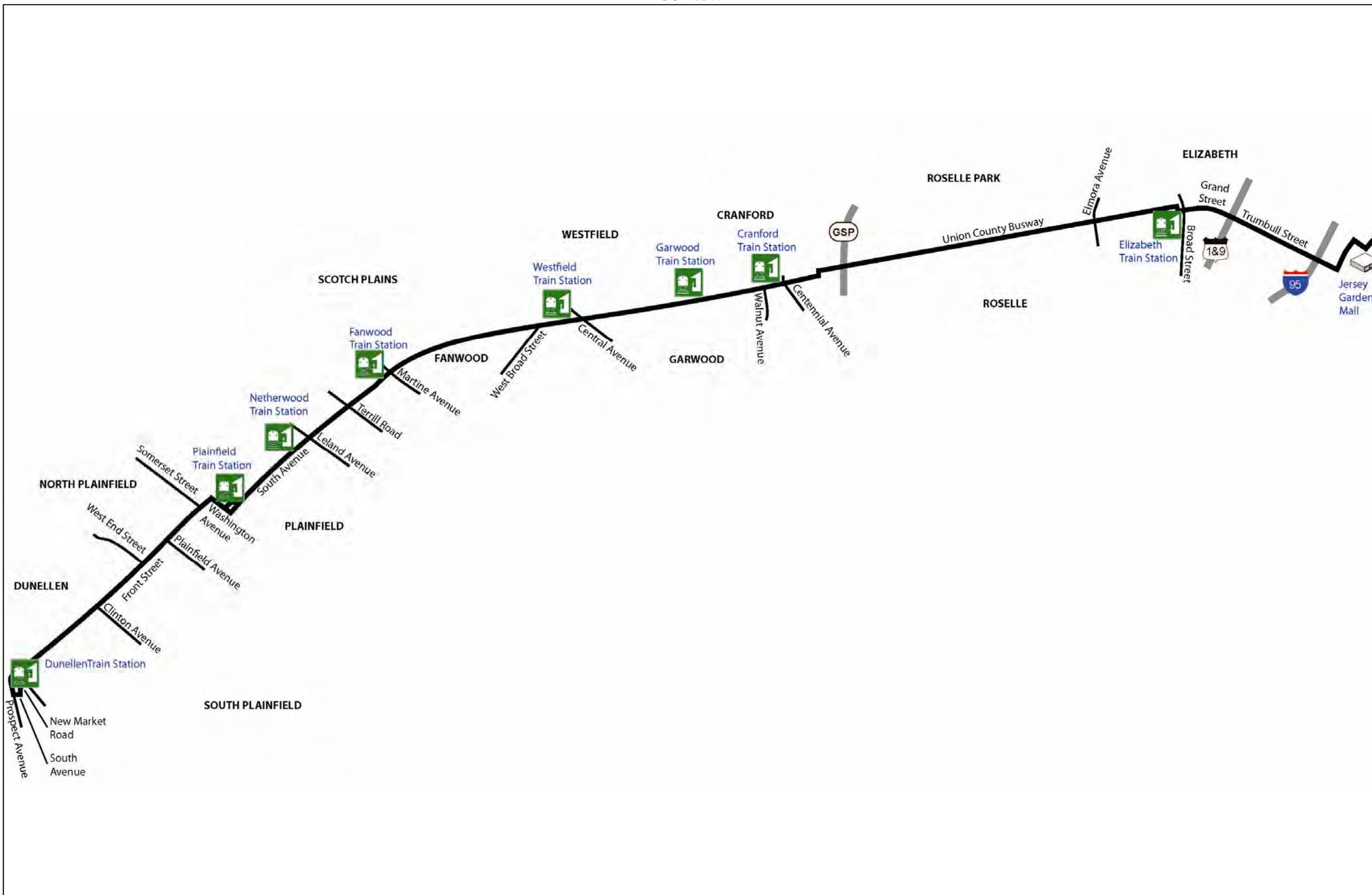
### ***New GO Bus 59 Jersey Gardens-Elizabeth to Plainfield***

- A new GO Bus corridor would be established with a **GO Bus 59** overlay service being offered. The GO Bus 59 would begin in downtown Elizabeth at the Elizabeth Station; from the station, the GO Bus 59 would use the Union County Busway through Garwood and then operate to Plainfield following the Route 59 alignment on a limited stop basis making the following stops once the route leaves the Busway:
  - South Avenue at Broad Street (Westfield Railroad Station)
  - South Avenue at Crossway Place
  - South Avenue at Hetfield Avenue
  - South Avenue at Martine Avenue (Fanwood Railroad Station)
  - South Avenue at Terrill Road
  - Plainfield Railroad Station

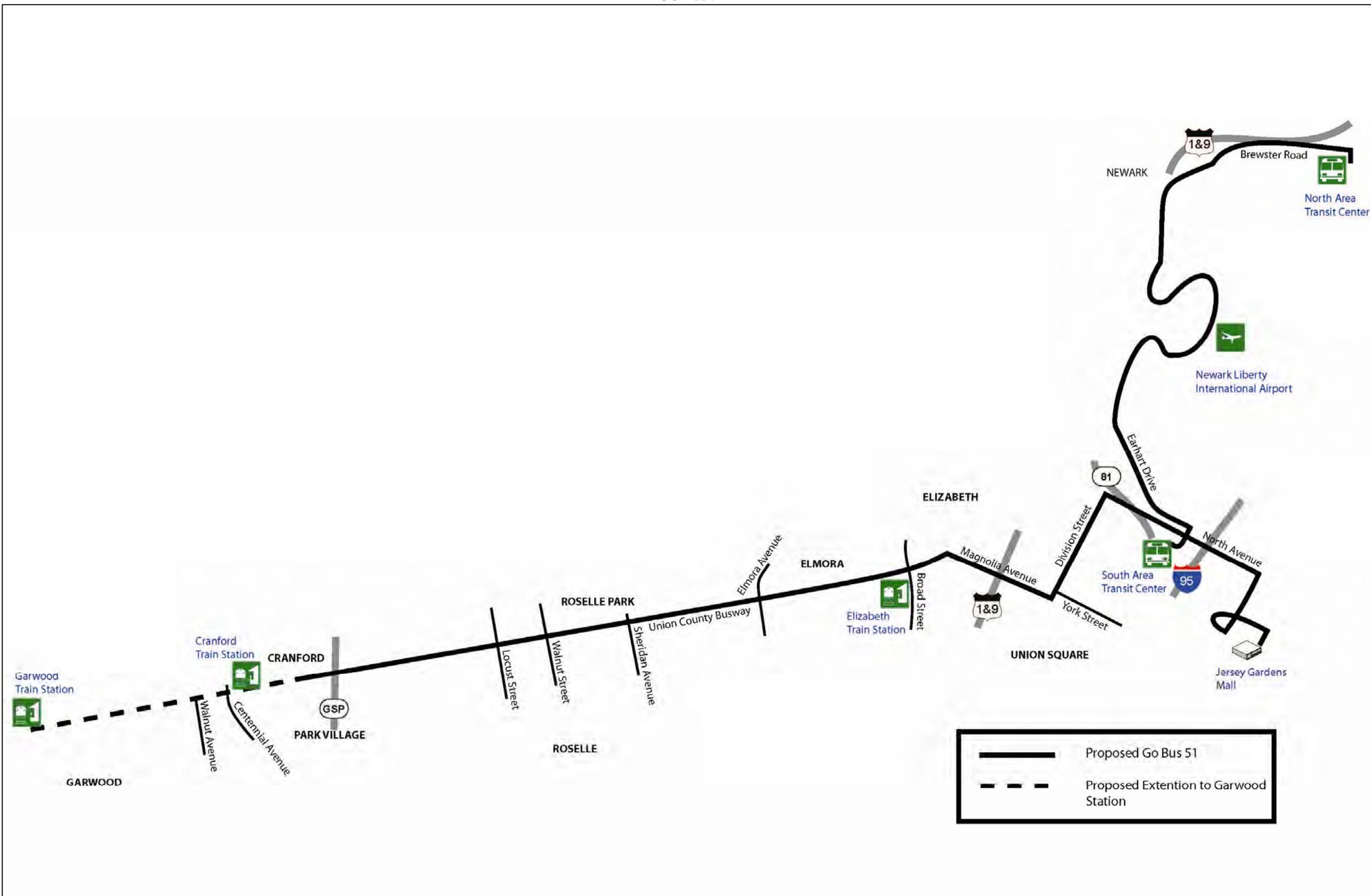
### ***New GO Bus 51 Newark Airport North Area Transit Center-Elizabeth to Cranford/Garwood***

- **GO Bus 51** would operate from the western terminus of the Union County Busway (either Cranford or Garwood Station), through Elizabeth and the Jersey Garden Mall, and to Newark Liberty International Airport's Central Area Terminal and the North Area Transit Center.
- The stops for this service would be on a limited basis.
- An alternative alignment to the Jersey Garden Mall would be via Trumbull Street; however, this alignment would require an arrangement with Coach USA to allow access onto this corridor.

**GO Bus 59**



GO Bus 51



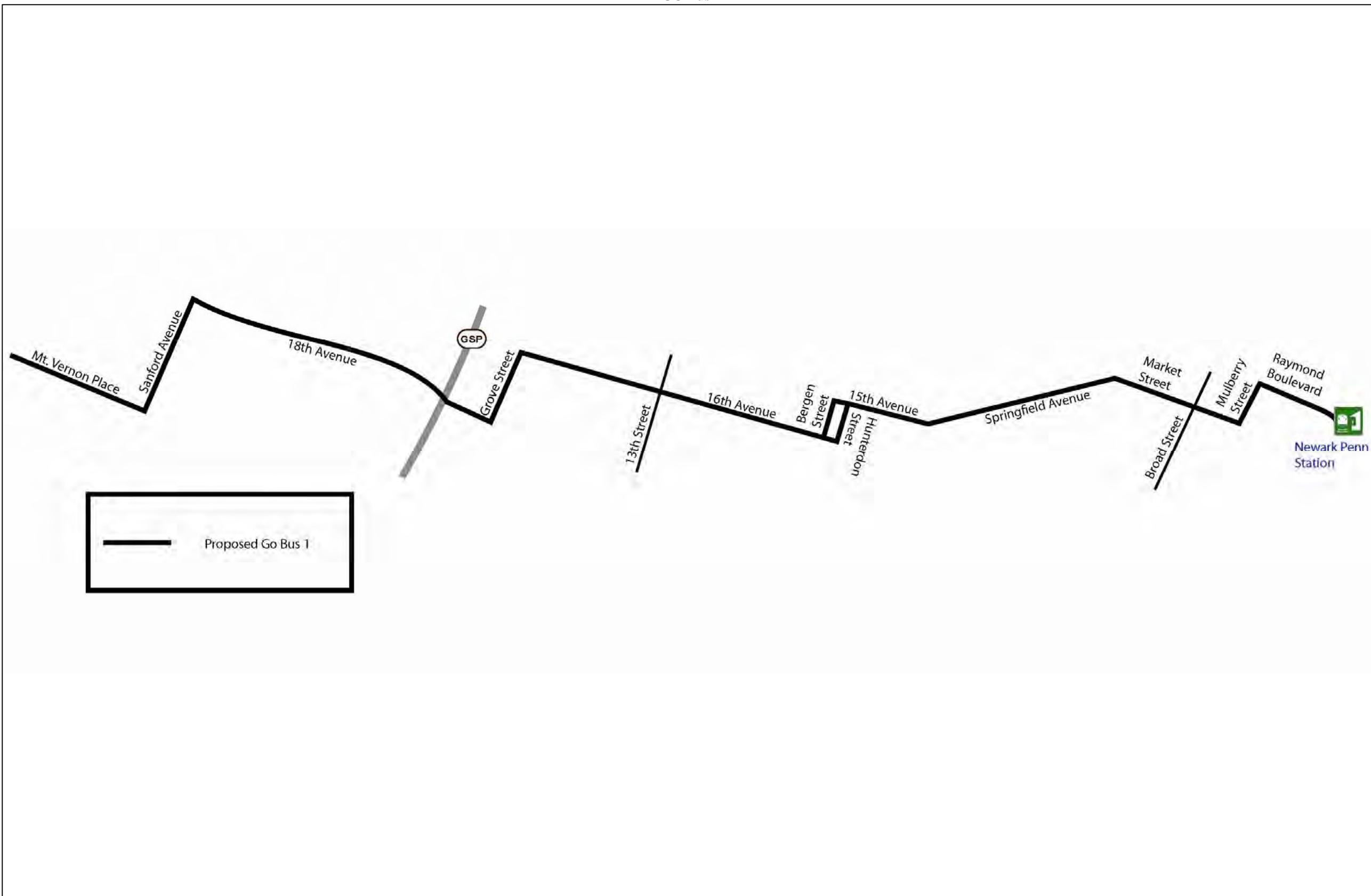
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## GO Bus 1

### New Go Bus 1 – Newark-Penn Station to Ivy Hill

- Current trips designated as Route 1X will be replaced with a new GO Bus route, **GO Bus 1**, providing limited stop service between Ivy Hill and Newark Penn Station
- Initial implementation of the GO Bus 1 will include bi-directional service from the beginning of the AM peak throughout the midday period and through the end of the PM peak.
- The new GO Bus 1 trips will operate via the base service's route alignment and will make the following stops:
  - Newark Penn Station
  - Market Street at Mulberry Street
  - Market Street at Broad Street
  - Market Street at Washington Street
  - Springfield Avenue at Martin Luther King Boulevard
  - Springfield Avenue at Irvine Turner Boulevard
  - 16<sup>th</sup> Avenue at Bergen Street
  - 16<sup>th</sup> Avenue at South 10<sup>th</sup> Street
  - Grove Street at 16<sup>th</sup> Avenue
  - 18<sup>th</sup> Avenue at Myrtle Avenue
  - 18<sup>th</sup> Avenue at Stuyvesant Avenue
  - Sanford Avenue at Mount Vernon Place
  - Ivy Hill Loop
- Eastbound trips will travel along the same alignment serving the corresponding eastbound stops to those listed above.

**GO Bus 1**



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## GO Bus 44 & GO Bus 31

### ***GO Bus 44***

See description on page 291.

### ***GO Bus 31***

See description on page 291 and map on page 292.

## **Crosstown Services**

### **Routes 94 & 50**

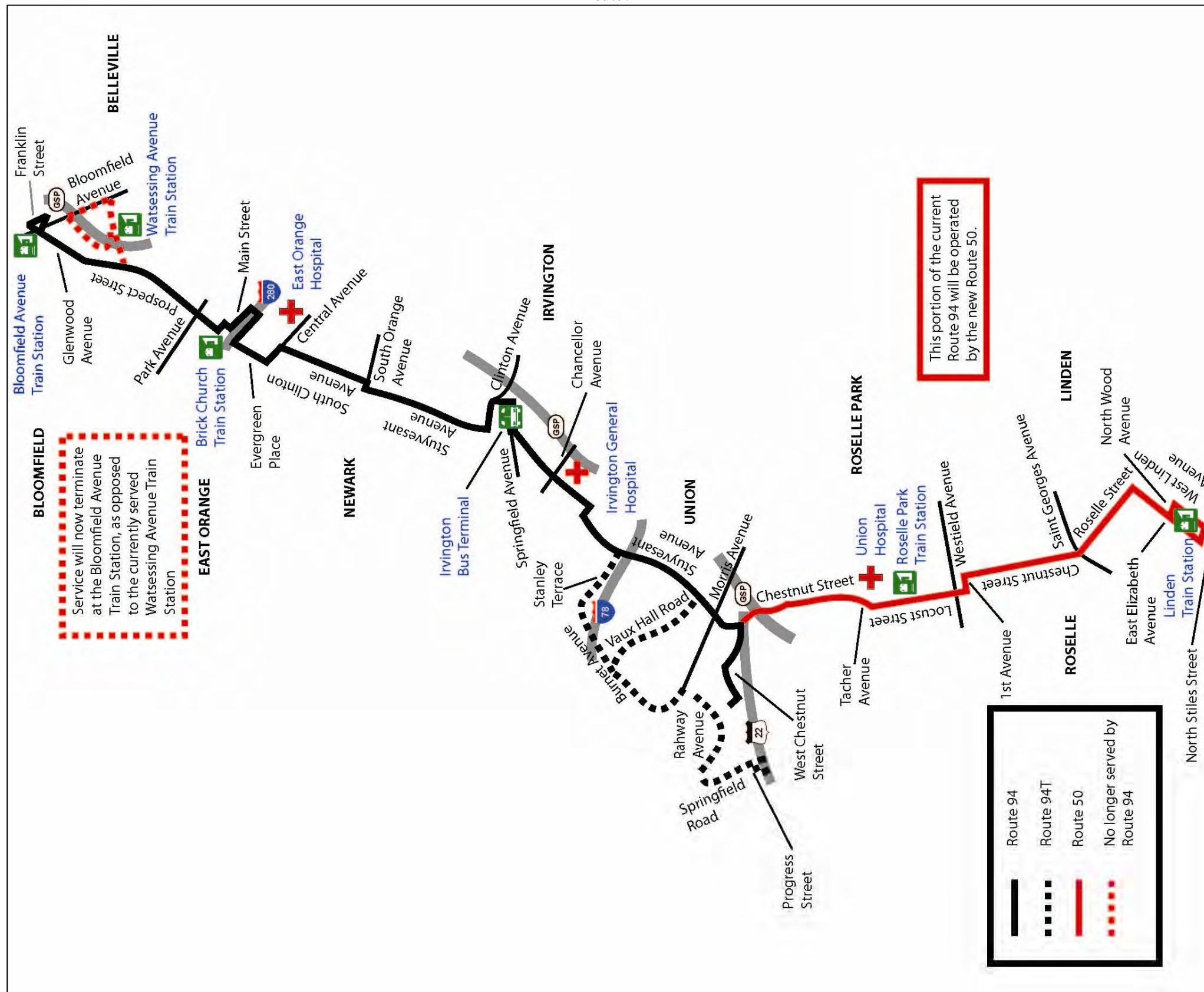
#### ***Restructured Route 94 – Bloomfield to Union***

- The Route 94 service will operate as it does today between Bloomfield and U.S. Route 22 in Union. Where the current route employs Chestnut Street to head towards Roselle, the proposed routing will instead head westbound West Chestnut Street and terminate at or near the Costco located on West Chestnut Street at Hudson Street right off of US Route 22.
- A layover site will need to be determined.
- The Stanley Terrace variation will continue to be served by this route.
- NJ TRANSIT should continue to pursue having Union County extend the Route 22 shuttle into the center of Union.

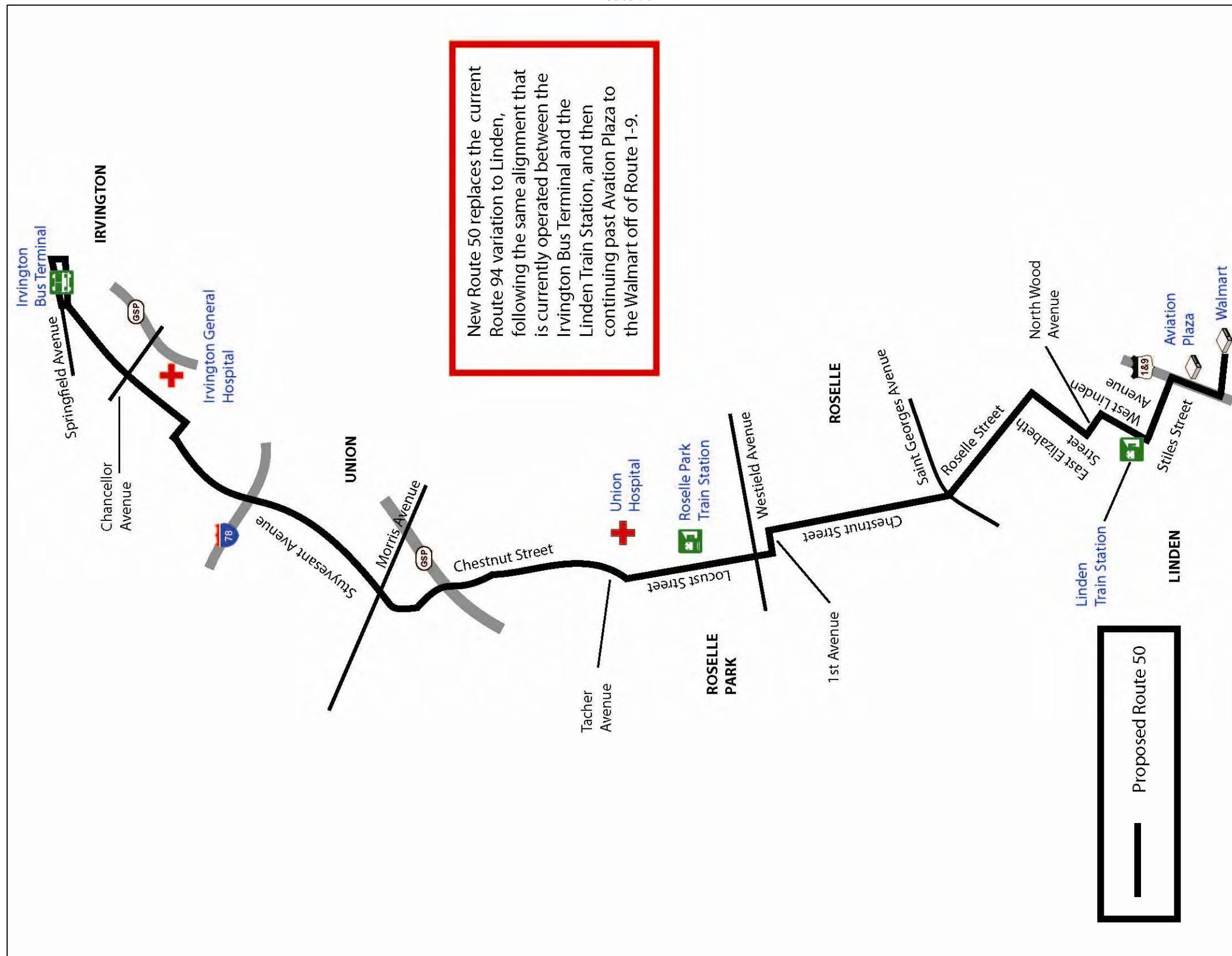
#### ***New Route 50 – Irvington Bus Terminal to Linden Station***

- Route 50 will operate between Irvington Bus Terminal and the Linden Station via the current Route 94's alignment.
- Service would be extended to Aviation Plaza once the former General Motors site is redeveloped.
- Prior to that, Route 50 will terminate at the current Route 94 termination point in Linden.

Route 94



Route 50



## Routes 93, 96 & 97

### ***Route 93 – Proposed for Elimination***

- This route is recommended for elimination.

### ***Route 96 – Proposed for Elimination***

- This route is recommended for elimination.

### ***Route 97 – Proposed for Elimination***

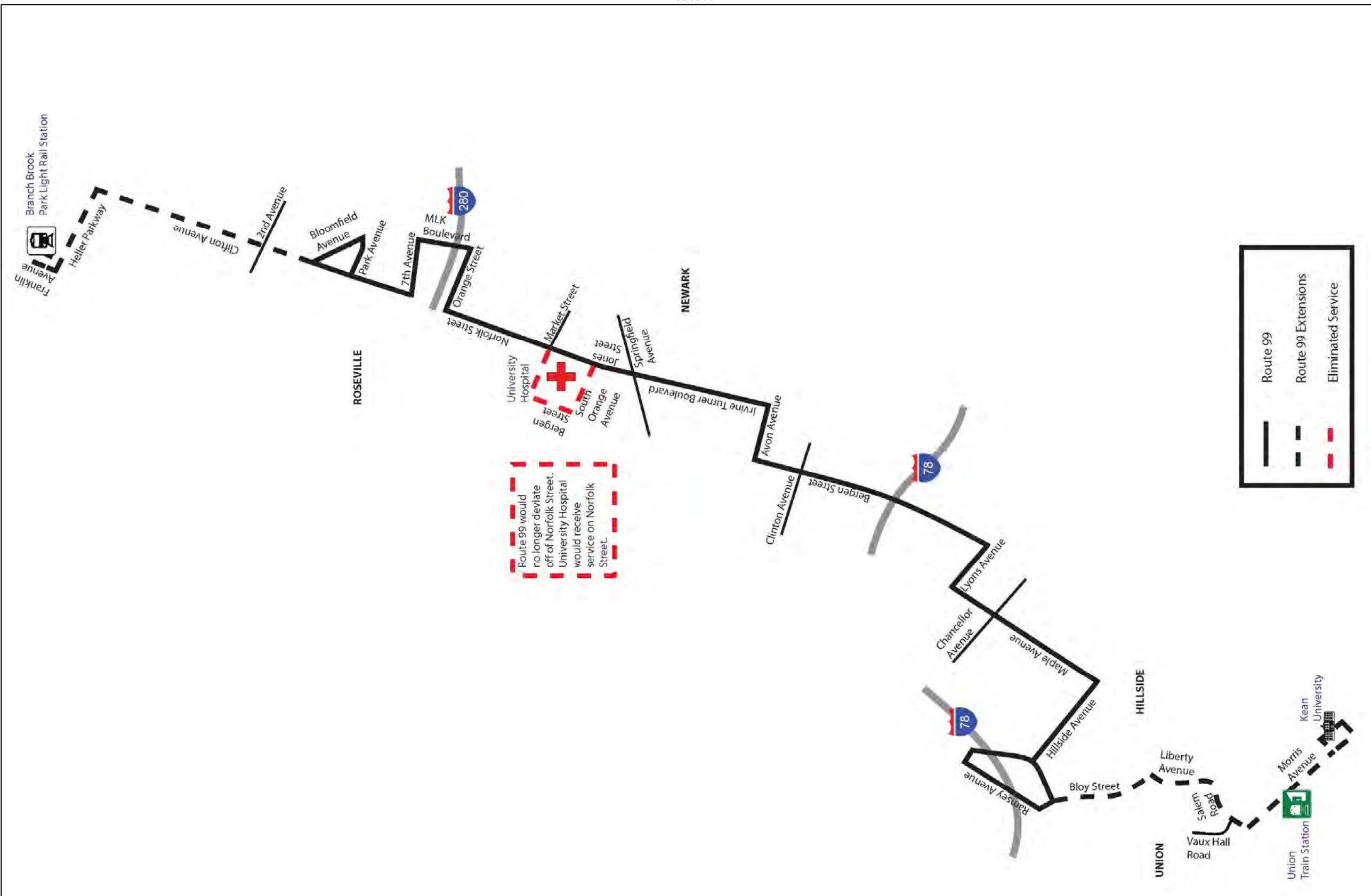
- This route is recommended for elimination.

## Route 99

### ***Extended Route 99 – Kean University to Branch Brook Park Station***

- **Route 99** will continue to operate as it does today, with the exception of one minor change to the alignment along Norfolk Street in Newark.
- The route will no longer deviate off of Norfolk Street at the University Hospital.
- In the future, consideration should be given to extending this route north to the Branch Brook Park Station via Mt. Prospect Avenue, Heller Parkway and Franklin Avenue. At the same time that the northern terminus is extended, the southern terminus should be extended to Kean University, during weekday trips only, via Bloy Street, Liberty Avenue/Salem Road and Morris Avenue. This southern extension will provide service to the Union Railroad Station and terminate on Kean University's campus.

Route 99



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## Routes 90 & 26

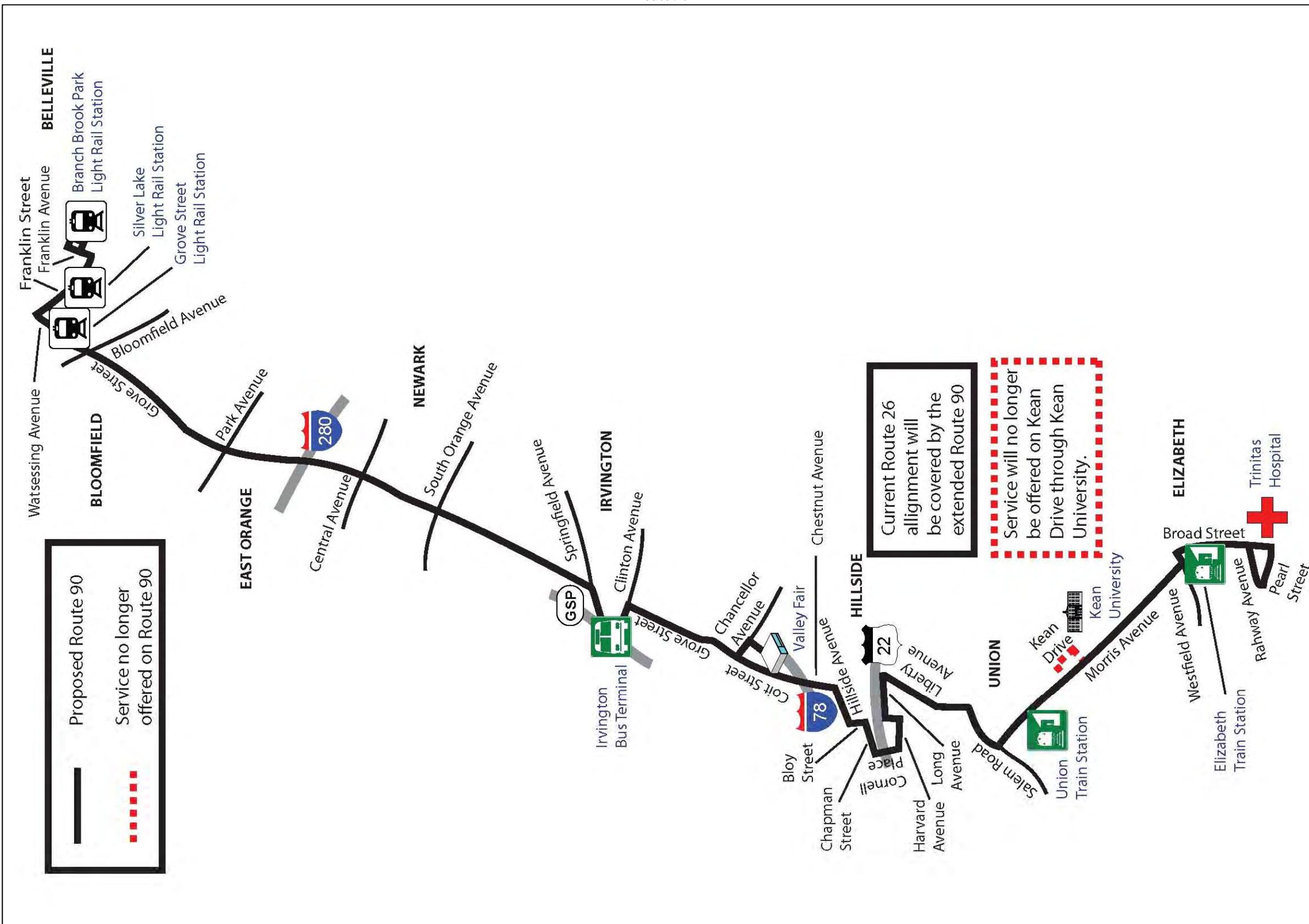
### ***Restructured Route 90 Elizabeth to Bloomfield***

- The proposed **Route 90** will be extended past its current southern terminus of Valley Fair in Irvington by following the current Route 26 alignment from the intersection of Chancellor Avenue and Coit Street to the Broad Street Elizabeth Station.
- This extended Route 90 will provide better connections to Elizabeth and create a more complete circumferential cross-town service.
- The northern terminus for this route will continue to be the Branch Brook Park Station; consideration was given to rerouting the northern portion of the route to cover a portion of the Route 93's alignment, however it was decided that this should not be pursued.
- The extension of the Route 90 will require additional resources, which could be provided by the elimination of the Route 26.

### ***Route 26 – Proposed for Elimination***

- Route 26 would be eliminated with its resources potentially going to the extended Route 90.

Route 90



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## Route 92

### ***Extended Route 92 – Branch Brook Park Station to Irvington Bus Terminal***

- The proposed Route 92 will continue to operate along the same routing between the Branch Brook Park Station and the South Orange Station, including the Sunday only routing that employs Bay Avenue, Hoover Avenue, Joralemon Street and Franklin Avenue between Branch Brook Park and Bloomfield.
- The southern portion of the route will be extended to the Irvington Bus Terminal via Henry Street, Lincoln Avenue, Central Avenue, Scotland Road, South Orange Avenue, Walton Avenue, Maplewood Avenue (with service to the Maplewood Station), Baker Street, Valley Street, Tuscan Road and Springfield Avenue.

## Routes 95 & 98

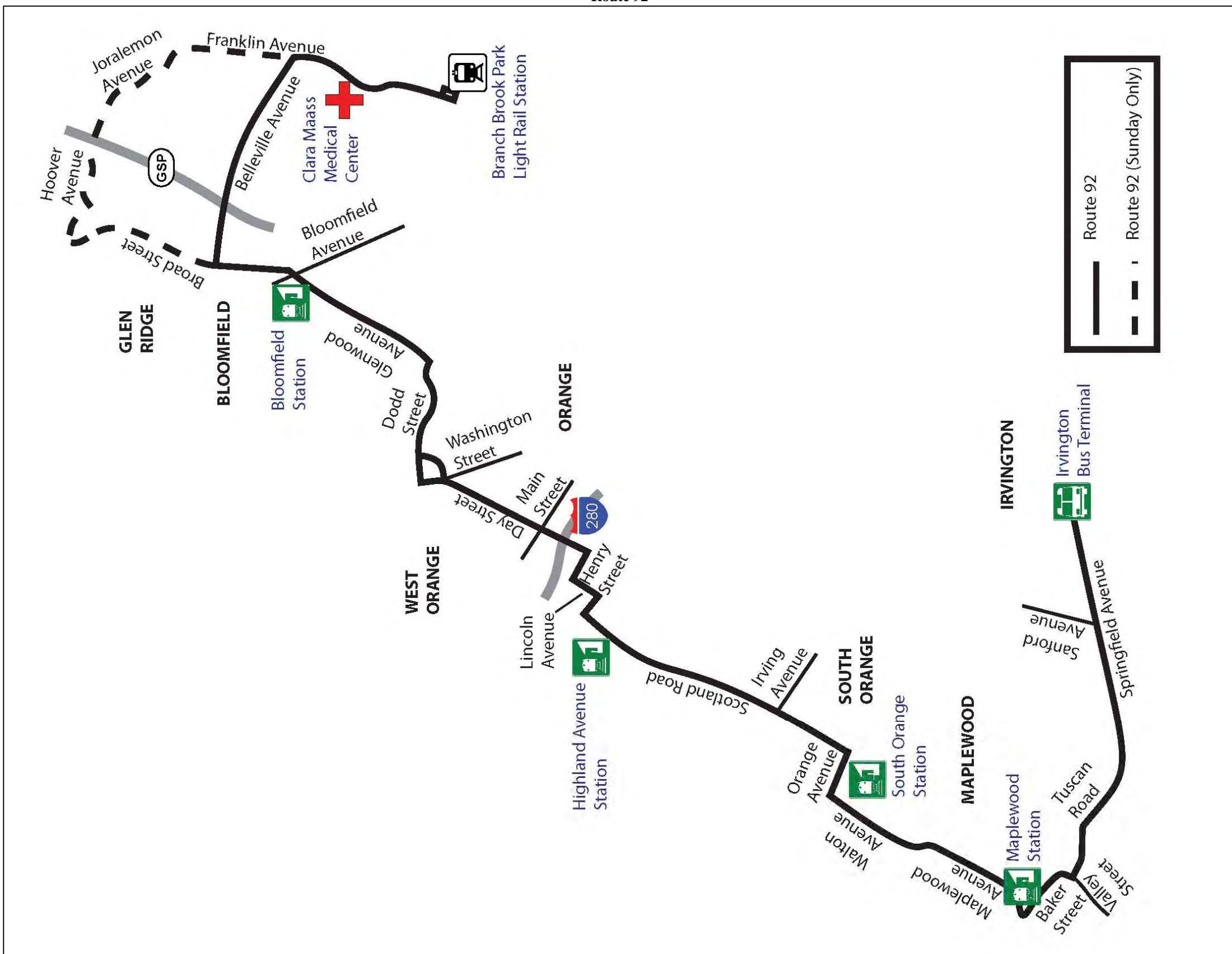
### ***New Route 95 - Wayne Transit Center to Summit Railroad Station***

- A new suburban crosstown route, **Route 95**, would operate between the Wayne Transit Center and the Summit Railroad Station. Southbound service on Route 95 would start at the Wayne Transit Center, serve the Willowbrook Mall and Park & Ride, then travel south on Passaic Avenue, serve the Essex Mall via Bloomfield Avenue, Kirkpatrick Lane, and Clinton Road, then south on Passaic Avenue, west on Eagle Rock Road, south on Eisenhower Parkway, south on Beaufort Avenue, south on Eisenhower Parkway, south on Northfield Road, south on JFK Parkway, south on East Hobart Gap Road, south on White Oak Ridge Road, south on Hobart Gap Road, west on State Route 124 (Morris and Essex Turnpike), south on Summit Avenue, west on Springfield Avenue, south on Maple Street, east on Union Place, north on Summit Avenue and terminate at the Summit Railroad Station. Northbound trips would follow the same alignment.
- On peak period trips, Route 95 would serve a loop of Fairfield Avenue, Fairfield Place, and Fairfield Crescent back to Fairfield Avenue southbound to Passaic Avenue where the route would resume the alignment described above.

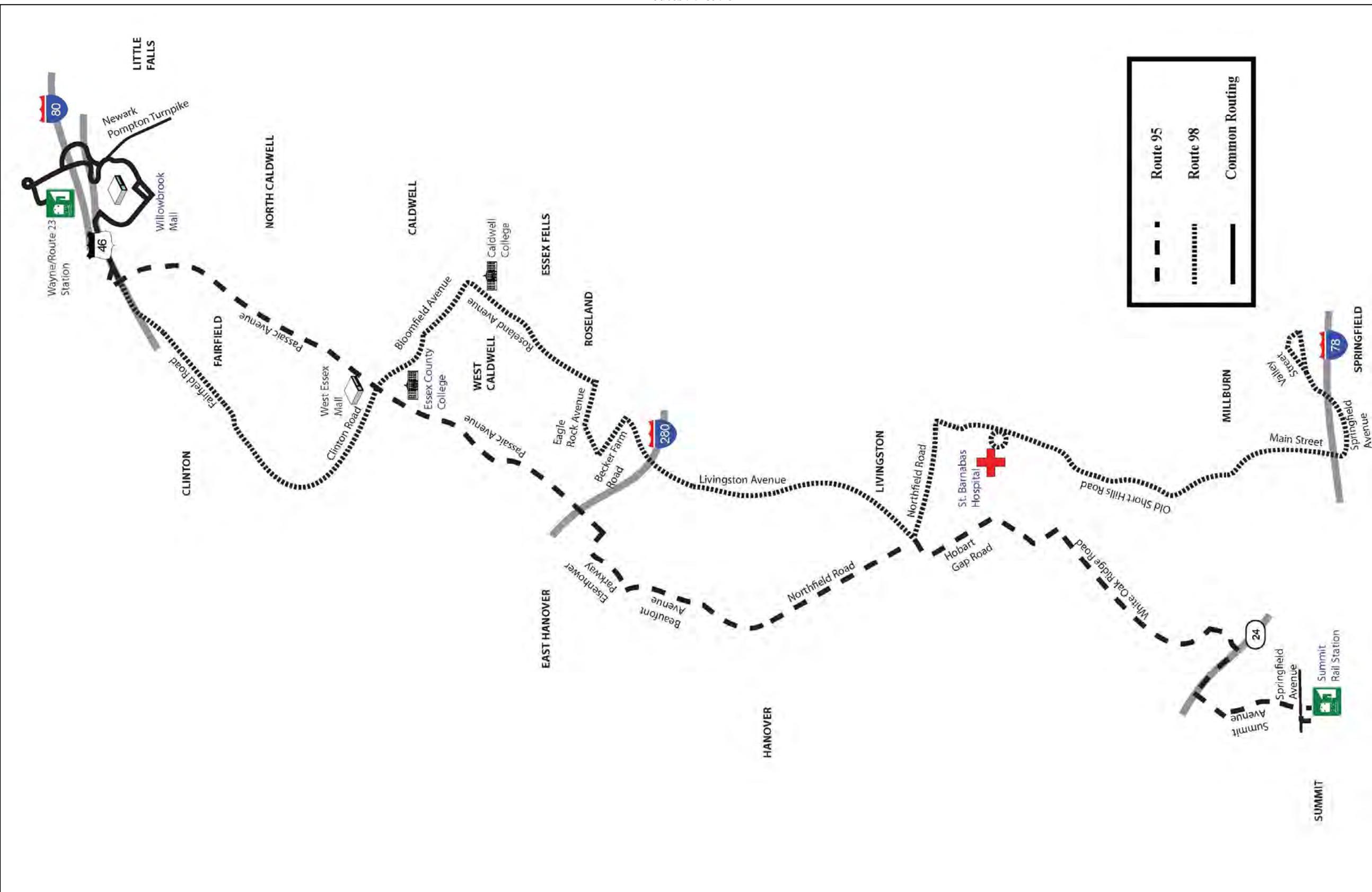
### ***New Route 98 - Maplewood to Wayne Transit Center***

- A second suburban crosstown route, **Route 98**, would operate between the Maplewood Loop and the Wayne Transit Center.
- Northbound service on Route 98 would start at the Maplewood Loop, then travel west on Milburn Avenue, west on the Essex/Milburn couplet through Milburn, north on Main Street, north on Old Short Hills Road, enter the St. Barnabas Hospital complex, then north on Old Short Hills Road, north on Cedar Street, west on Northfield Road, north on Livingston Avenue, west on Becker Farm Road, north on Eagle Rock Avenue, north on Roseland Avenue, west on Bloomfield Avenue, west on Clinton Road, north on US Highway 46, north on Fairfield Road, north on US Highway 46, serve the Willowbrook Mall and Park & Ride, then north on Route 23 to the Wayne Transit Center.
- Southbound trips would follow the northbound alignment in the opposite direction.

Route 92



Routes 95 & 98



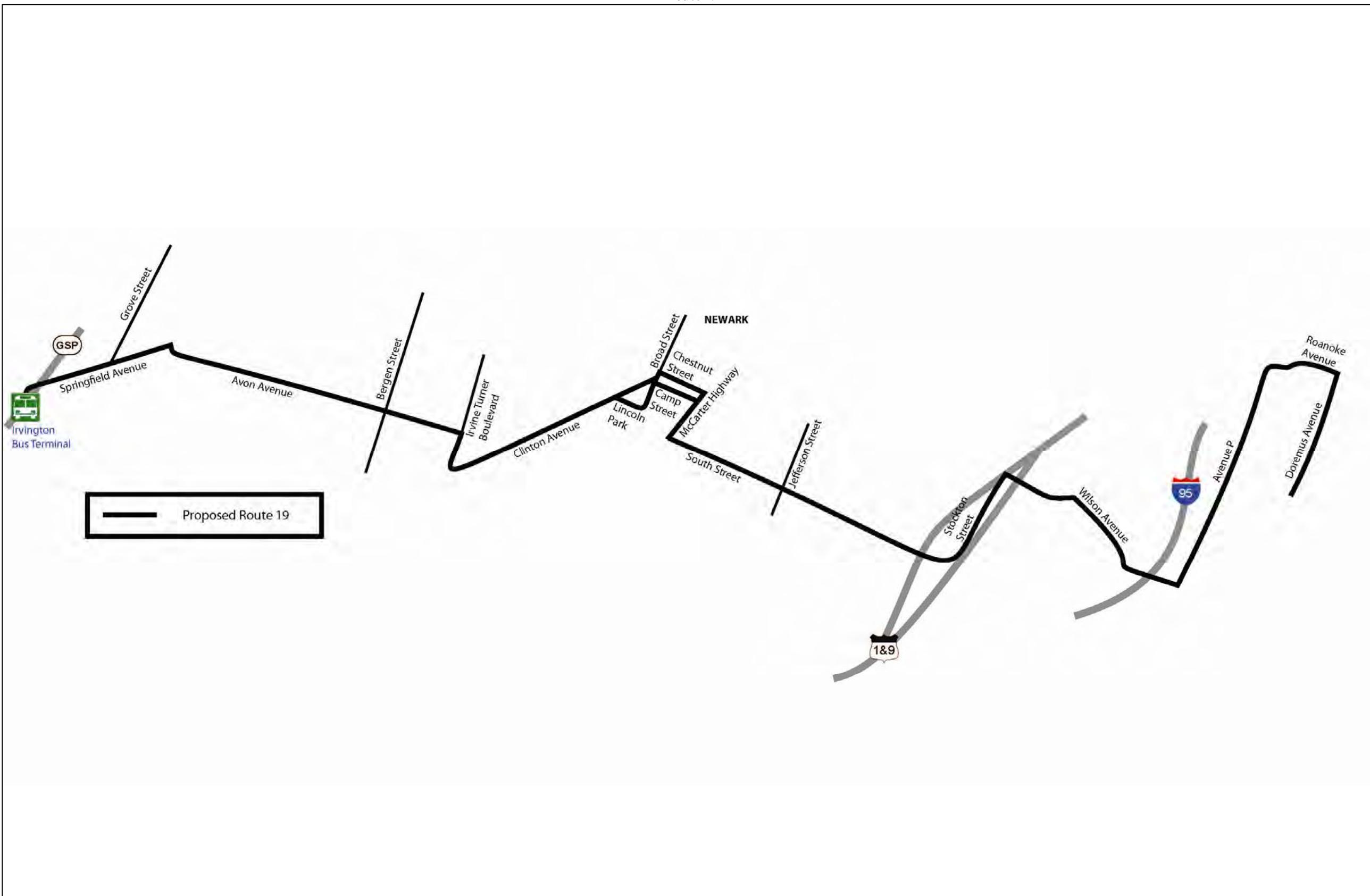
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## Route 19

### ***New Route 19 – Irvington Bus Terminal to Newark Port Support Area***

- A new route, **Route 19**, would connect the Irvington Bus Terminal with the Newark Port Support Area.
- Route 19 would begin at the Irvington Bus Terminal and travel via Springfield Avenue, Avon Avenue, Irvine Turner Boulevard, Clinton Avenue, Lincoln Park, Broad Street, Camp Street, Mulberry Street, McCarter Parkway, South Street, Stockton Street, Wilson Avenue, Avenue P, Roanoke Avenue, and Doremus Avenue to the Essex County Correctional Facility where the route would terminate and layover.
- Westbound trips would begin at the Correction Facility and travel via Doremus Avenue, Roanoke Avenue, Avenue P, Wilson Avenue, Stockton Street, South Street, McCarter Parkway, Chestnut Street, Broad Street, Lincoln Park, Clinton Avenue, Avon Avenue, and Springfield Avenue to the Irvington Bus Terminal.
- This proposal will depend on street improvements to the Newark Port Support Area.

Route 19





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## **Newark Liberty International Airport/Ports Newark & Elizabeth**

### **Routes 40, 18 & 33**

#### **Restructured Route 40 – North Arlington go Jersey Gardens via Downtown Newark & Airport**

See description on page 196 and map on page 197

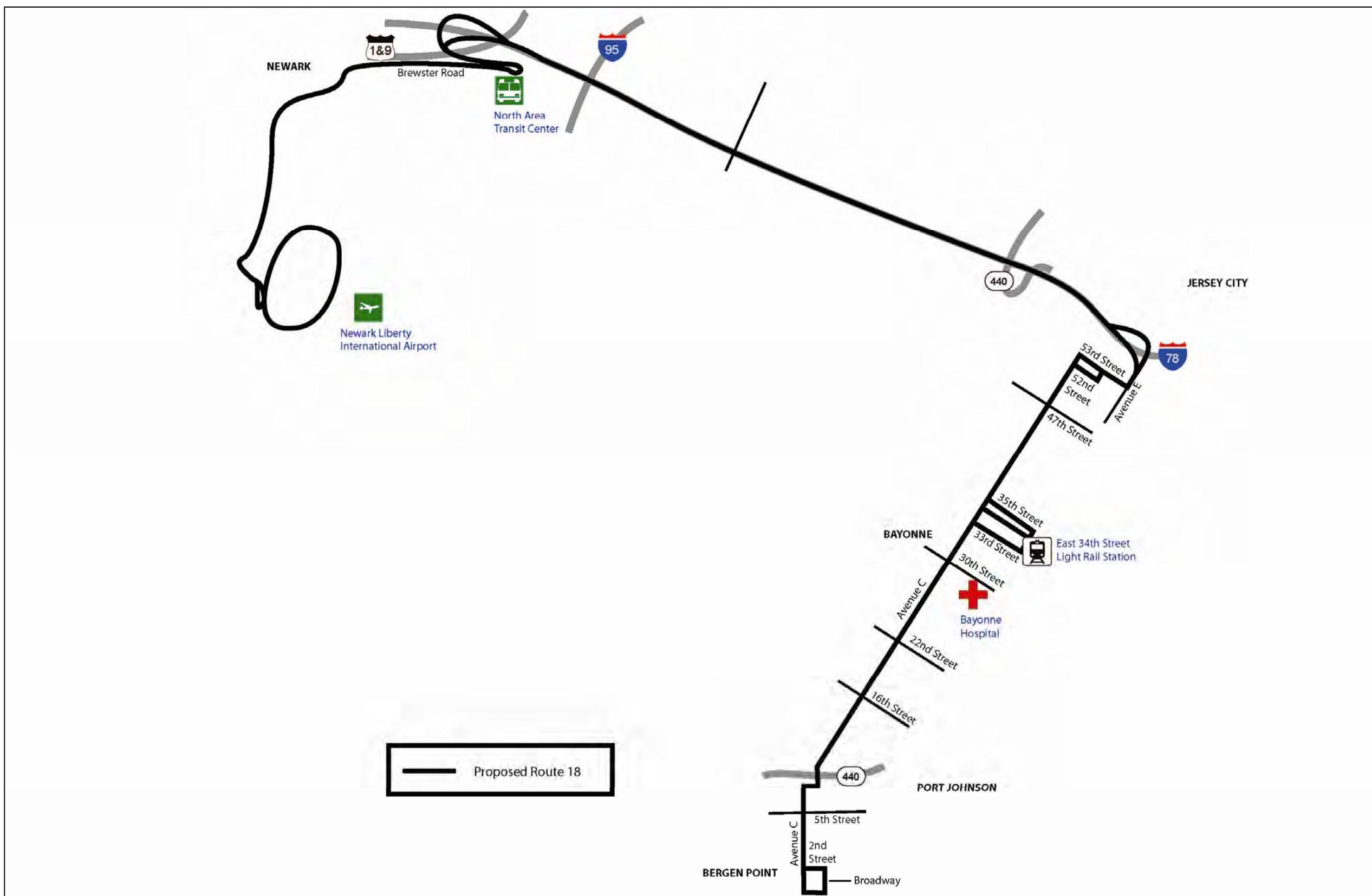
#### **New Route 18 - Bayonne to Newark Airport/Jersey Gardens**

- A new bus, **Route 18**, will begin in southern Bayonne at 1<sup>st</sup> Street and Avenue C, 33<sup>rd</sup> Street, Avenue E, serve the 34<sup>th</sup> Street HBLR Station (which will allow for transfers to and from the MTA NYCT S89), then Avenue E, 34<sup>th</sup> Street, Avenue C, 53<sup>rd</sup> Street, then Interstate 78 (New Jersey Turnpike Hudson County Extension), then serve the North Area Transit Center, Brewster Road, then the Newark Liberty International Central Terminal Area (Terminals A, B, and C) via the HOV roadway, then return to Terminal A courtyard where the route will terminate and layover.
- Eastbound trips will follow the same alignment in the opposite direction through the Interstate 78 tolls and will access Avenue C via 53<sup>rd</sup> Street, Broadway and 52<sup>nd</sup> Street, and then take Avenue C to the 35<sup>th</sup> Street intersection, where the route will travel 35<sup>th</sup> Street, Avenue E, 34<sup>th</sup> Street, then Avenue C, 2<sup>nd</sup> Street, Broadway, and 1<sup>st</sup> Street, where the route will terminate and layover.
- Potential future extensions of this route include any new South Area Transit Center as well as the Jersey Gardens Mall.

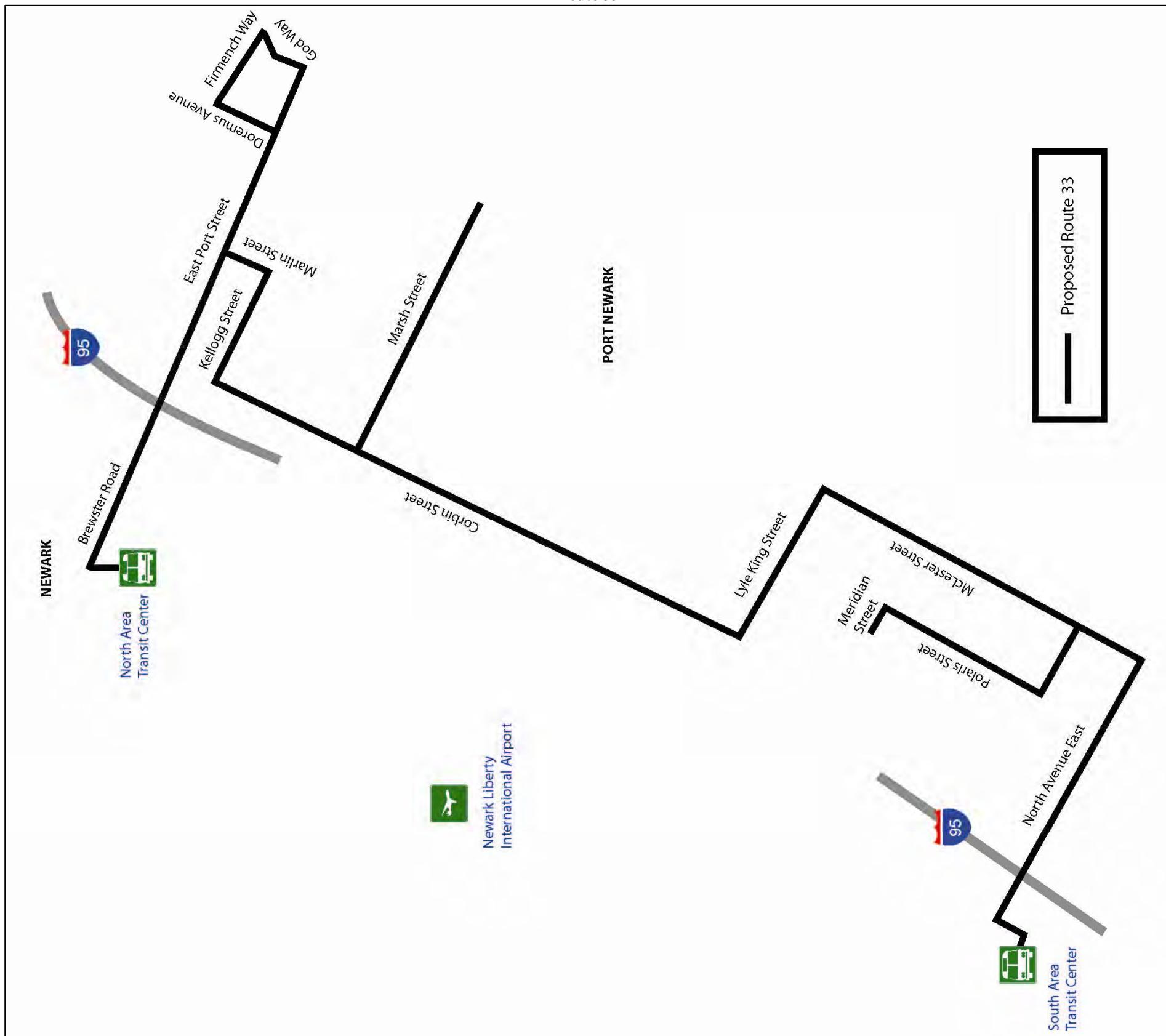
#### **New Route 33 - Newark and Elizabeth Ports to Newark Airport's North & South Area Transit Centers**

- **Route 33** is a new route that would offer service within the Newark and Elizabeth Ports, and would serve both the North Area Transit Center and the South Area Transit Center at Newark Liberty International Airport.

Route 18



**Route 33**



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## Routes 37 & 107

### ***Restructured Route 37 – Ivy Hill to Bergenline Avenue HBLR Station***

- **Route 37** would operate between Ivy Hill and the Bergenline Avenue HBLR Station in Union City via the Irvington Bus Terminal, Newark Liberty International Airport's Central Terminal Area HOV roadway, the North Area Transit Center and Union City.
- Route 37 would always serve Union City in both directions of travel and becomes the primary mode of transit between the Airport and Union City.
- Eastbound trips would begin at Ivy Hill Loop and travel via Mount Vernon Place, Manor Drive, Irvington Avenue, Clinton Avenue, through the Irvington Bus Terminal, then Springfield Avenue, Grove Street, Lyons Avenue, Elizabeth Avenue, Meeker Avenue, Haynes Avenue, Routes 1 & 9, then Brewster Road to the Newark Airport North Area Transit Center, to the Central Terminal area HOV roadway, then Port Road to Interstate 78, then Interstate 78 to the New Jersey Turnpike, then Route 495 to the 30<sup>th</sup> Street exit, John F. Kennedy Boulevard West, 49<sup>th</sup> Street, and Bergenline Avenue to the Bergenline Avenue HBLR station where the route would terminate and layover.
- Westbound trips would leave the leave the Bergenline Avenue HBLR station and travel 49<sup>th</sup> Street, Bergenline Avenue, 39<sup>th</sup> Street, and John F. Kennedy Boulevard West to Route 495 from where the route would follow the same alignment as eastbound trips in the opposite direction.

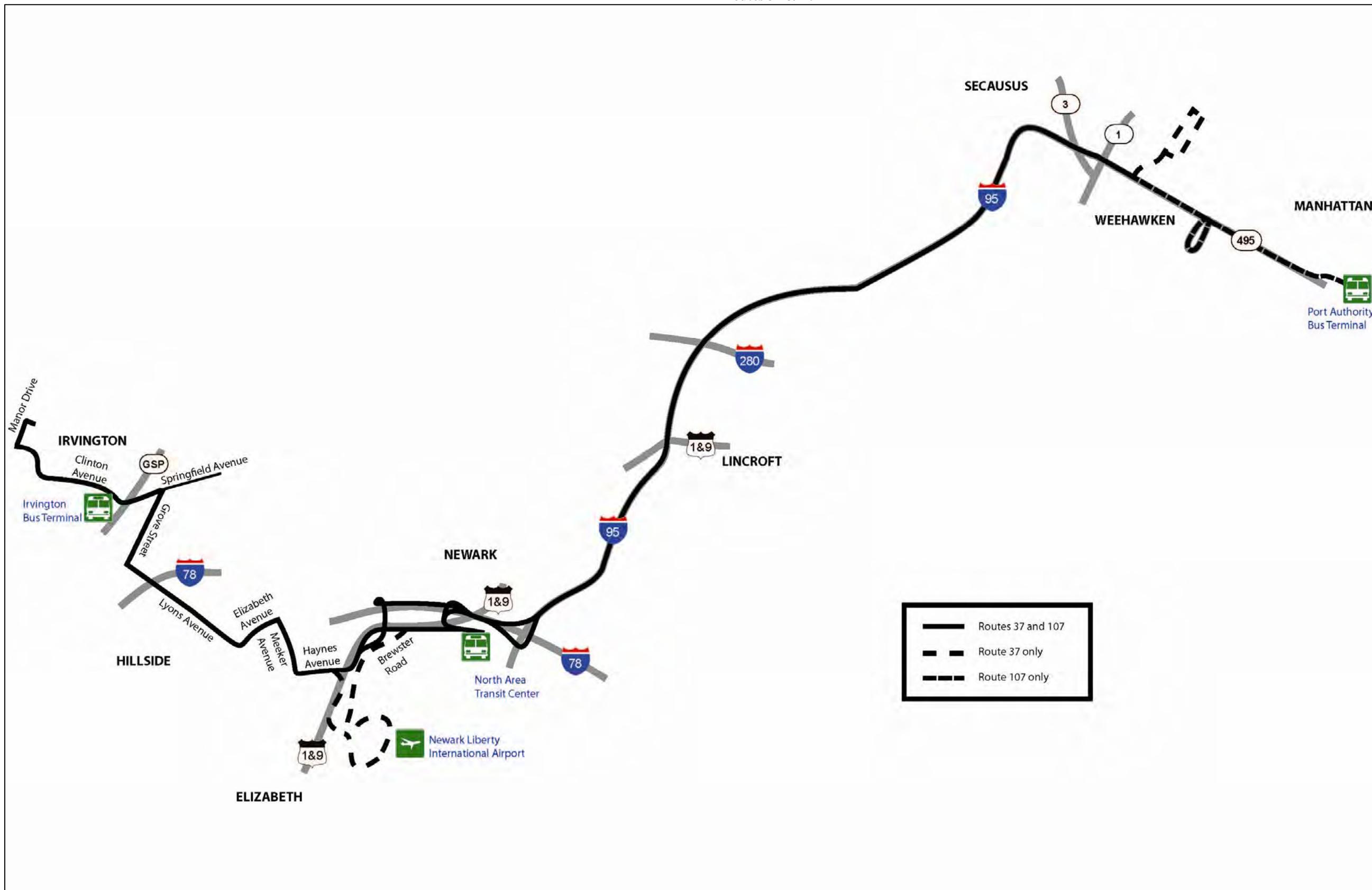
### ***Restructured Route 107 – Ivy Hill Loop to PABT via Irvington Bus Terminal***

- The **Route 107** would begin at the Ivy Hill Loop and follow the current alignment of Route 107 to the Irvington Bus Terminal; from there the route would travel via Lyons Avenue, Elizabeth Avenue, Meeker Avenue, Haynes Avenue, then the Routes 1 & 9 local lanes, Brewster Road, then serve the North Area Transit Center, then operate express service into the Port Authority Bus Terminal in New York City via Interstate 78, the New Jersey Turnpike, Route 495, and the Lincoln Tunnel.
- Route 107 would not serve the Airport Central Terminal Area or Union City. This proposal provides express service between the Lyons Avenue corridor and New York City.

### ***Route 107X – Ivy Hill to PABT Express***

- Route 107X would continue to offer peak period express service between the Ivy Hill Loop and the Port Authority Bus Terminal.
- Route 107X would begin at the Ivy Hill Loop and follow the current alignment of Route 107 to the Irvington Bus Terminal. From there, Route 107X would travel via Springfield Avenue, Eastern Parkway, the Garden State Parkway, Interstate 280, the New Jersey Turnpike, Route 495, and the Lincoln Tunnel and into the Port Authority Bus Terminal.
- Outbound trips would begin at the Port Authority Bus Terminal and follow the same alignment to the Garden State Parkway, from which, Route 107X would exit at Myrtle Avenue, then travel via Oraton Avenue, Western Parkway, Maple Avenue, and Springfield Avenue to the Irvington Bus Terminal, from where the route would follow the same alignment as inbound trips to the Ivy Hill Loop.

Routes 37 & 107



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## Routes 62, 806, 807, 808 & 809

### ***Restructure Route 62 - Newark-Penn Station to Elizabeth Railroad Station via Newark Airport***

- The proposed **Route 62** would offer service from Newark Penn Station, through Newark International Airport's Central Area Terminal and to the Elizabeth Railroad Station hub via US Route 1-9, and Jersey Avenue.
- The proposed Route 62 would then follow its current alignment between the Elizabeth Railroad Station hub and Rahway, where the service would terminate. A proper layover location will be needed near the Rahway Station which will also allow for intermodal connections.
- The other areas currently served by the Route 62 will be offered by new bus routes 806, 807, 808 and 809.

### ***New Route 806 - Rahway to Metropark***

- The proposed **Route 806** would operate between Rahway and Metropark via Carteret, Port Reading, Sewaren and Woodbridge via the current alignment of the Route 62 service in this area.
- There would be one variation that offers service to West Carteret via Rahway Avenue, Homestead Avenue, Blair Road, Milk Street/Bryla Street and Minue Street, where the variation would return to the base route on Roosevelt Avenue.
- A proper layover location will be needed near the Rahway Station which will also allow for intermodal connections.

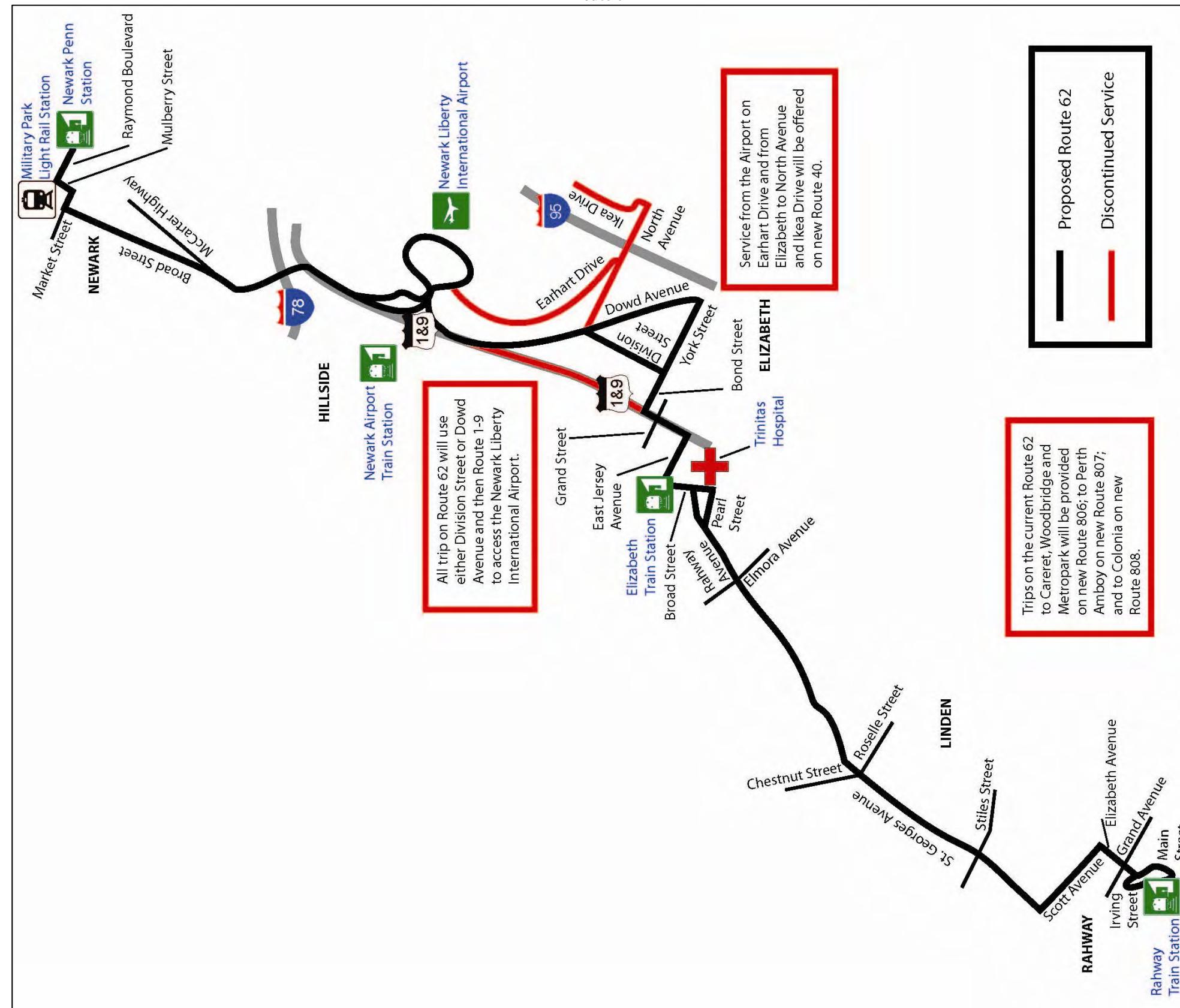
### ***New Route 807 - Rahway to Woodbridge-Perth Amboy***

- The proposed **Route 807** would operate from Rahway through downtown Woodbridge and to Perth Amboy. The route would operate from Rahway via Central Avenue, St. George Avenue through Hazelton and then Amboy Avenue, Hall Avenue and State Street before using Market Street, Herbert Street and Smith Avenue in Perth Amboy to turn around.
- A proper layover location will be needed near the Rahway Station which will also allow for intermodal connections.

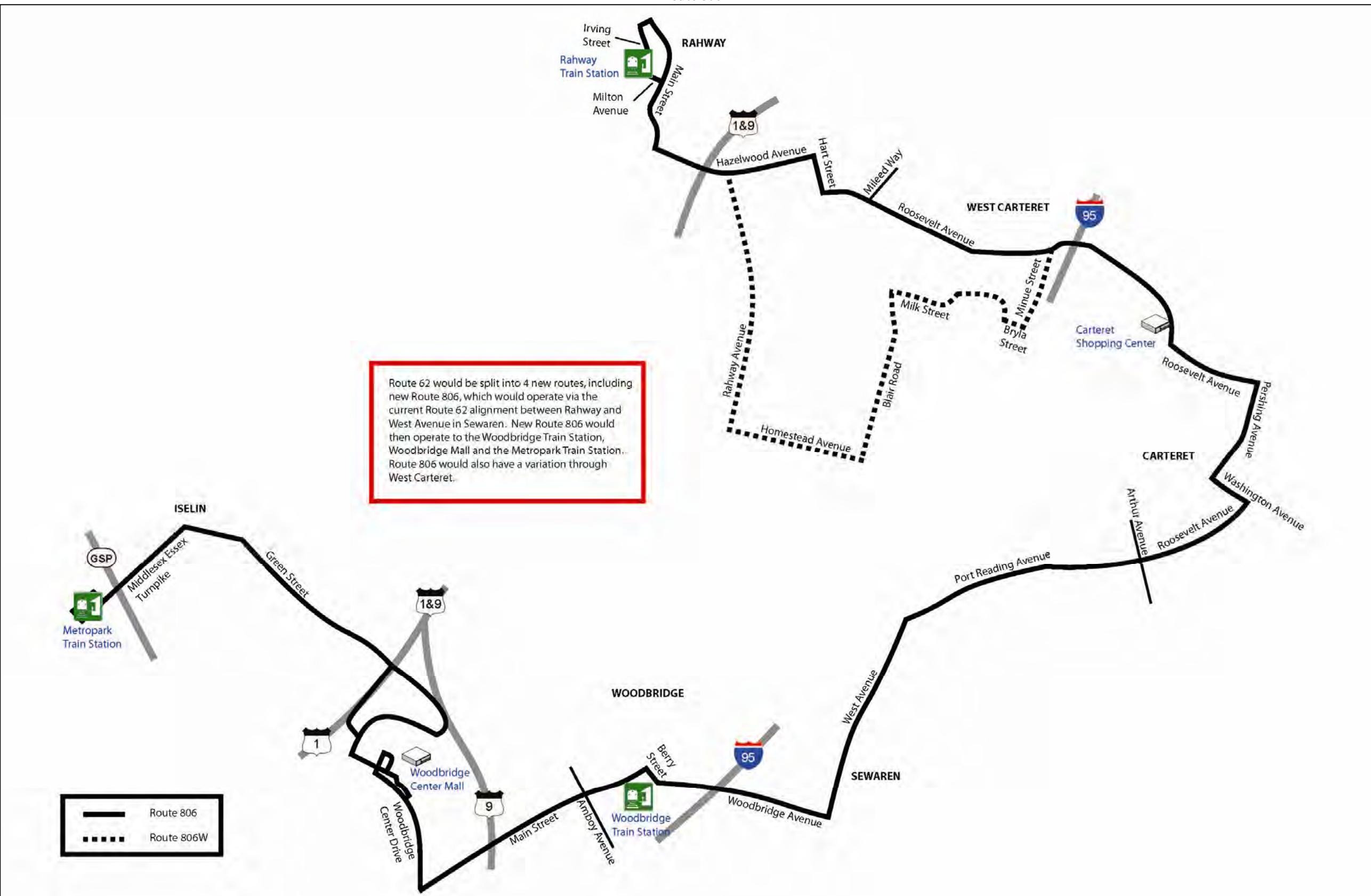
### ***New Route 808 – Rahway to Woodbridge Center Mall***

- The proposed **Route 808** would operate from Rahway to the Woodbridge Center Mall via Colonia, New Dover and Iselin. The route would utilize West Milton Avenue and Jaques Avenue, Inman Avenue, Grove Avenue, Old Tree Road, Wood Avenue, Thomall Street/Middlesex-Essex Turnpike Road and Gills Lane to access the Woodbridge Center Mall.
- A proper layover location will be needed near the Rahway Station which will also allow for intermodal connections.

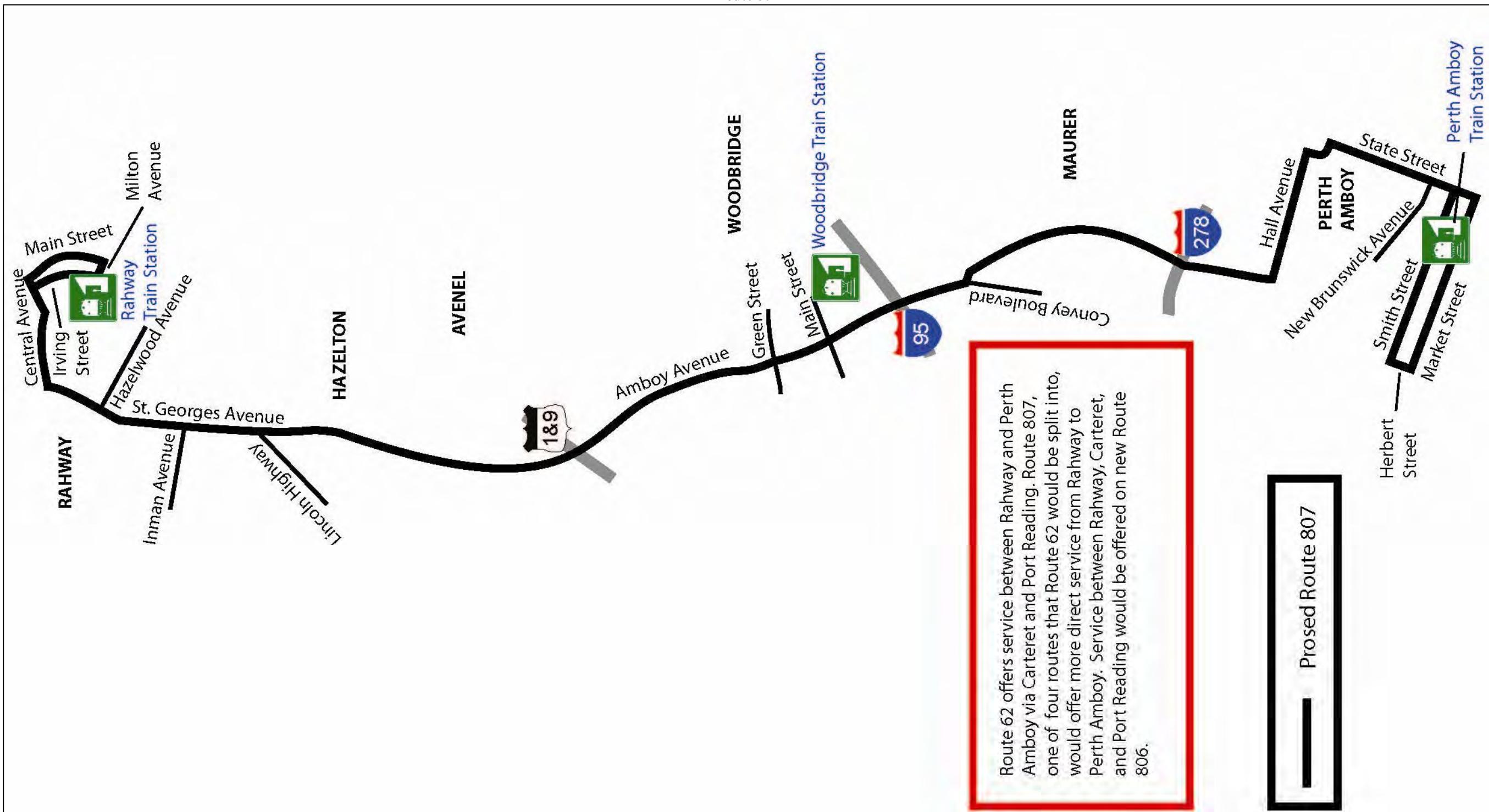
Route 62



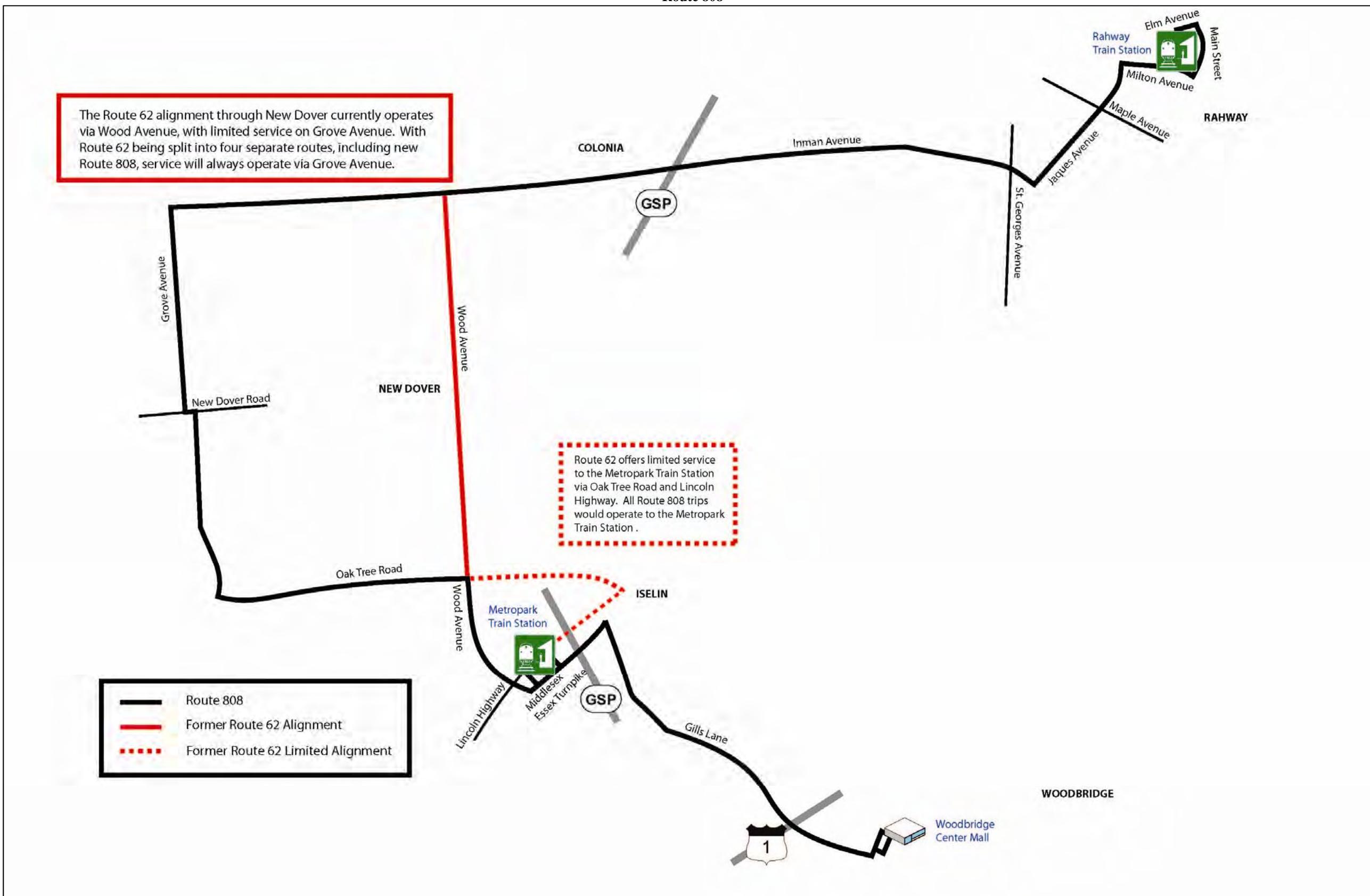
Route 806



Route 807



Route 808

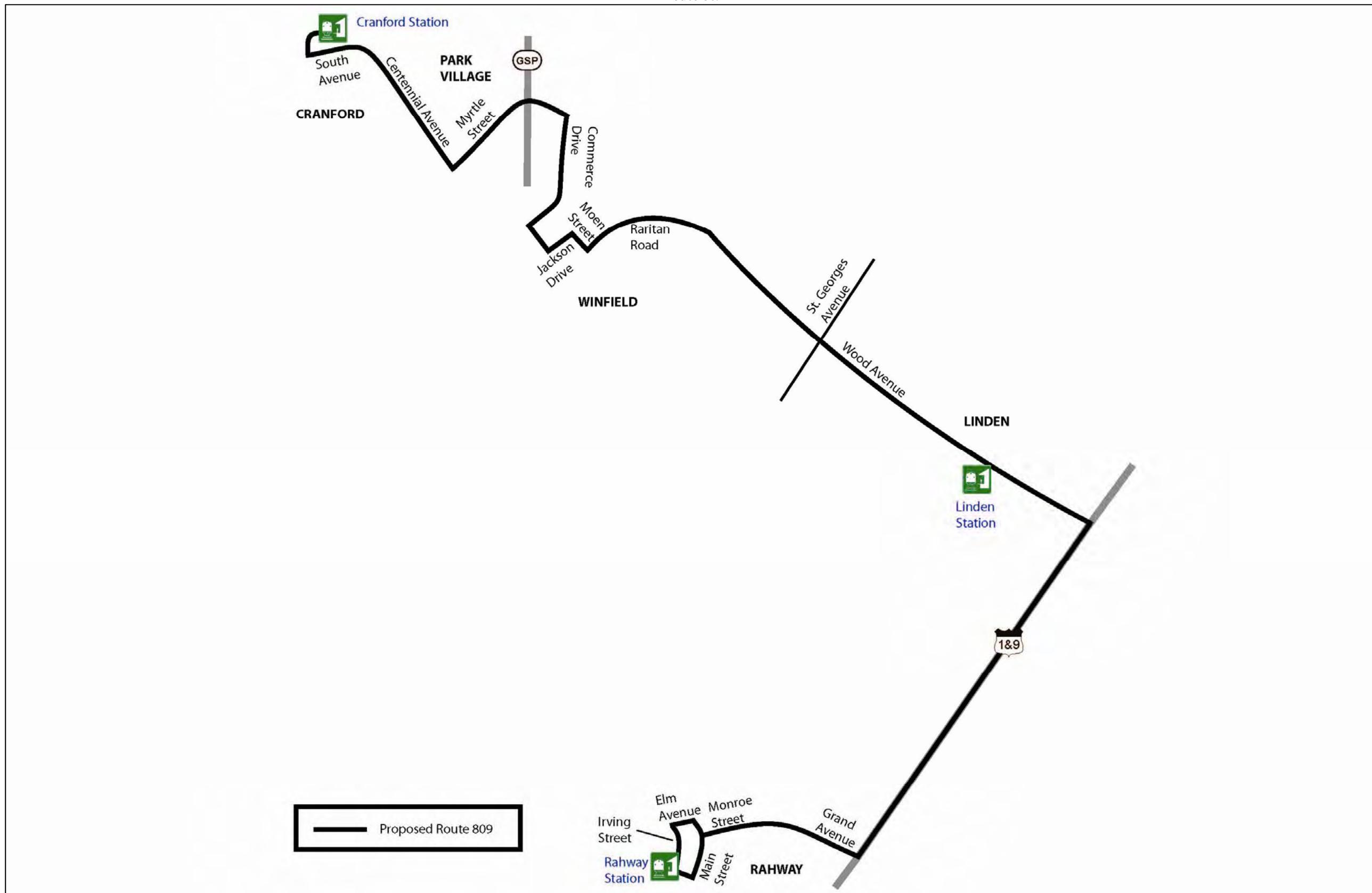


**New Route 809 - Rahway to Cranford via Aviation Plaza/Linden Plaza**

- The proposed **Route 809** would offer service between Cranford and Rahway via Aviation Plaza/Linden Plaza. The route would begin service at the Cranford Station and then would operate on North Avenue, Walnut Avenue and South Avenue, followed by a right onto Centennial Avenue. The vehicle would then turn left onto Myrtle Street and offer service through the business park via Commerce Drive, Jackson Drive and Moen Street. The vehicle would then turn left onto Raritan Road, which then merges into Wood Avenue. The bus would continue on Wood Avenue through Linden to U.S. Route 1-9, where it would turn right to serve Aviation Plaza and Linden Plaza. The Route would then continue on U.S. Route 1-9 and turn right onto East Grand Avenue followed by a left onto Monroe Street. The Route will then follow the one way loop created by Main Street, Elm Avenue, Irving Street, Milton Avenue and Main Street.
- A proper layover location will be needed near the Rahway Station which will also allow for intermodal connections.

Greater Newark Bus System Study

Route 809



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## Route 17

### ***New Route 17 – Journal Square to Newark Airport’s Central Terminal Area and North Area Transit Center***

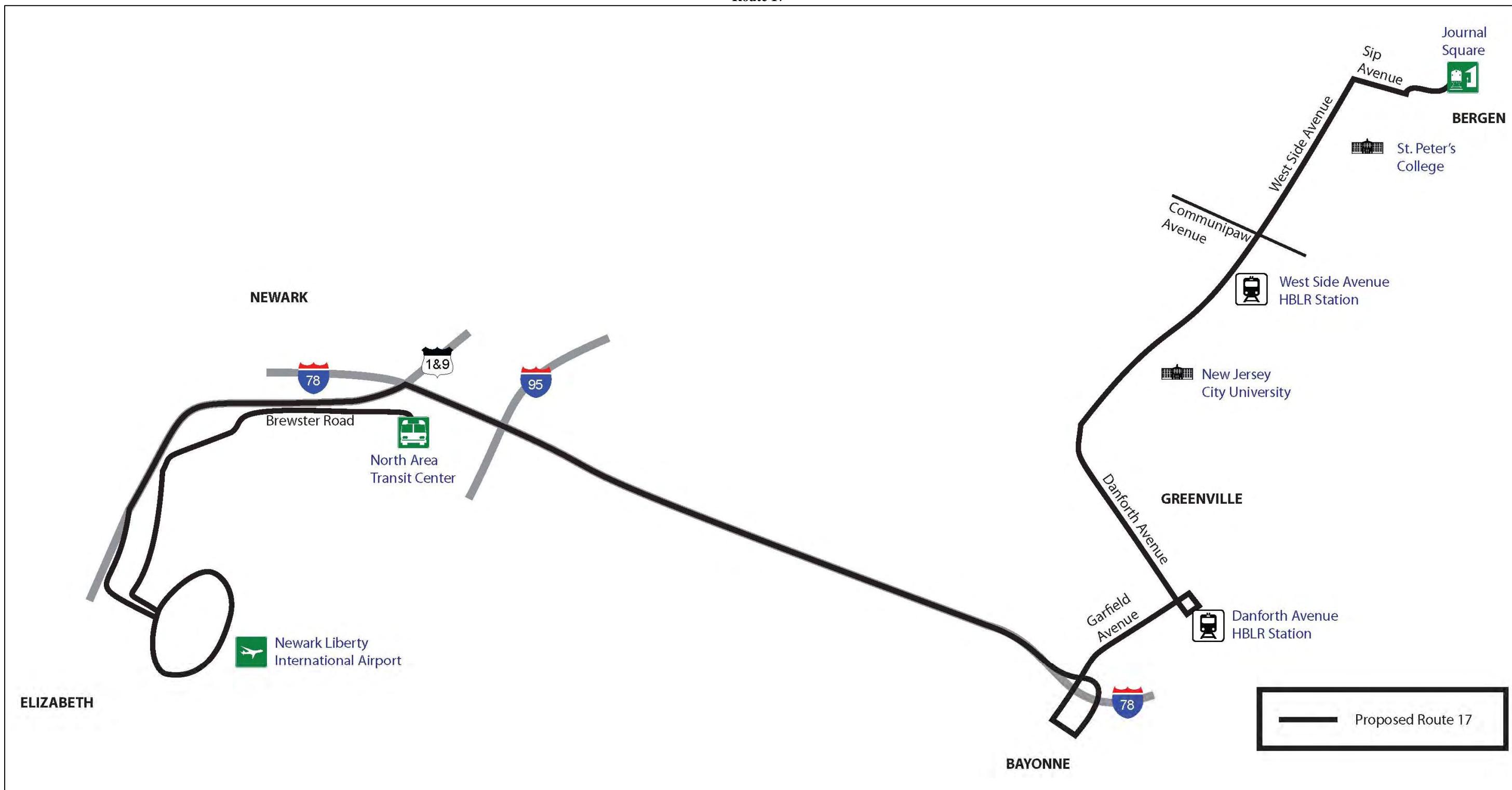
- **Route 17** is a new route which would operate local service in Hudson County, and would begin at Journal Square and travel via Sip Avenue, West Side Avenue and Danforth Avenue to serve the Hudson-Bergen Light Rail Transit station at Danforth Avenue. The route would then continue to operate via Princeton Avenue, Cator Avenue and Garfield Avenue and enter Interstate 78 (the New Jersey Turnpike Hudson County Extension) at Exit 14A via East 53<sup>rd</sup> Street. The new route would then travel via Interstate 78 and U.S. Routes 1 and 9 to serve the Newark Liberty International Airport Central Terminal Area (Terminals A, B, and C) via the HOV roadway, then travel via Brewster Road to the Airport North Area Transit Center where the route would terminate.
- Return trips would leave the North Area and again serve the Central Terminal Area and continue along the same alignment in the opposite direction.

## Route 38

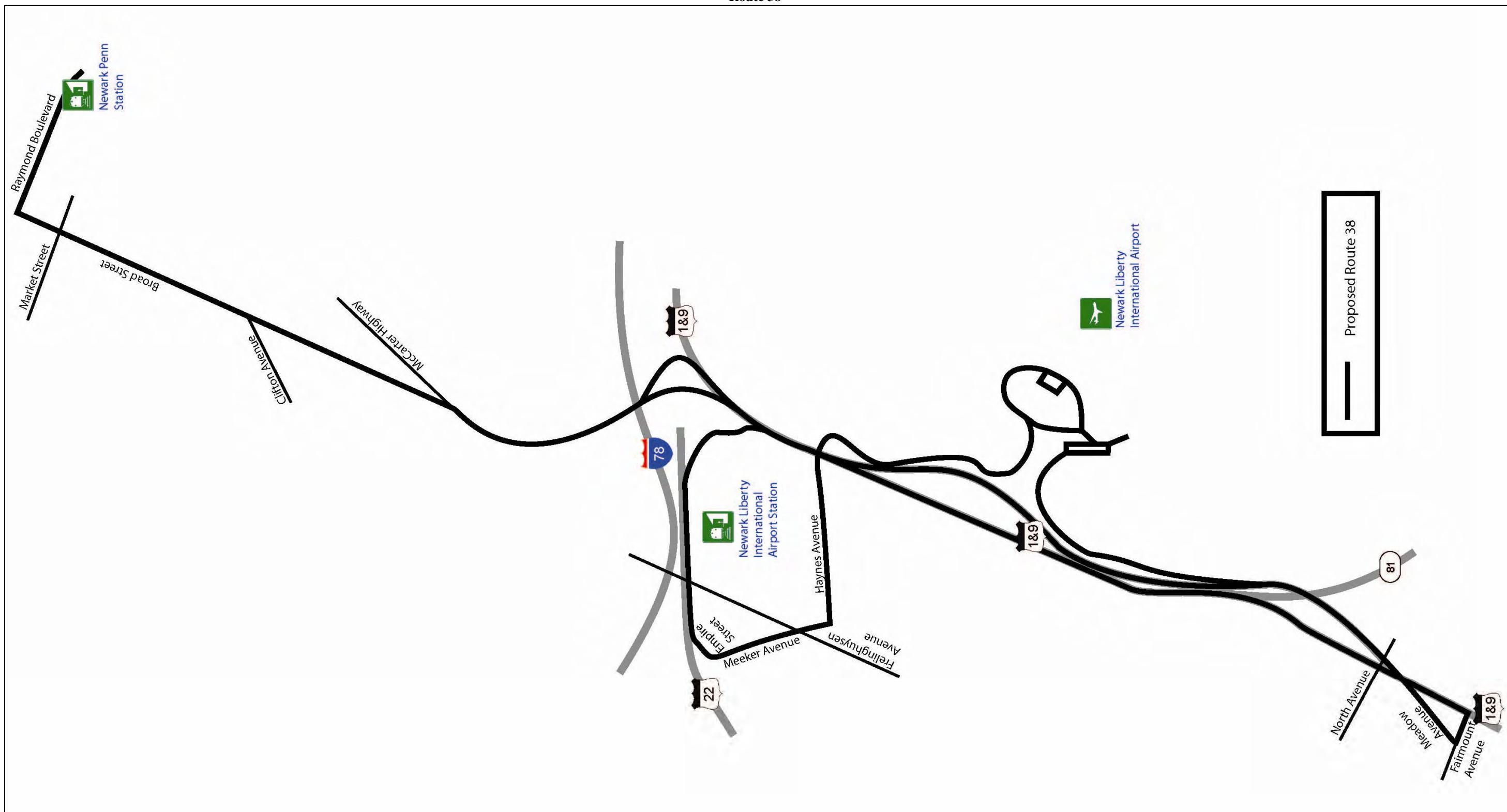
### ***New Route 38 – Newark-Penn Station to Marriott Hotel at Newark Airport***

- A new bus route, **Route 38**, will be created and will operate from Newark Penn Station, through the intersection of Broad and Market Streets, and utilize the McCarter Highway (State Route 21) to access the local lanes of U.S. Routes 1 and 9. These lanes become Spring Street and Route 38 will then operate to a turnaround via Meadow Street and Fairmount Avenue to return to northbound U.S. Routes 1 and 9. It will then continue north on the local roadway of U.S. Routes 1 and 9 and serve the Airport’s Marriott Hotel. Route 38 will then take layover in the Terminal A bus courtyard.
- The return trip of Route 38 will again serve the Airport Marriott Hotel before returning to southbound U.S. Routes 1 and 9 via the Haynes Avenue Bridge to serve all the various hotels for the inbound trip returning to Newark. It will then again utilize the turnaround via Meadow Street and Fairmount Avenue to return to northbound U.S. Routes 1 and 9, from which it will return to Newark Penn Station via the McCarter Highway and Broad Street.
- The route alignment of Route 38 was designed to provide passengers working in the various hotels located along the west side of the airport along U.S. Routes 1 and 9 with a relatively direct bus route that will serve the hotels and return to Newark, as well as provide a service between downtown Newark and the Airport Marriott Hotel, which will no longer be served by Route 62. These hotels are located along large, “channelized” limited access roadways to which it is very difficult to provide bus service.
- In the long term, Route 38 could serve the Newark Liberty International Airport Rail Station, if permitted to do so by the Port Authority.

**Route 17**



Route 38



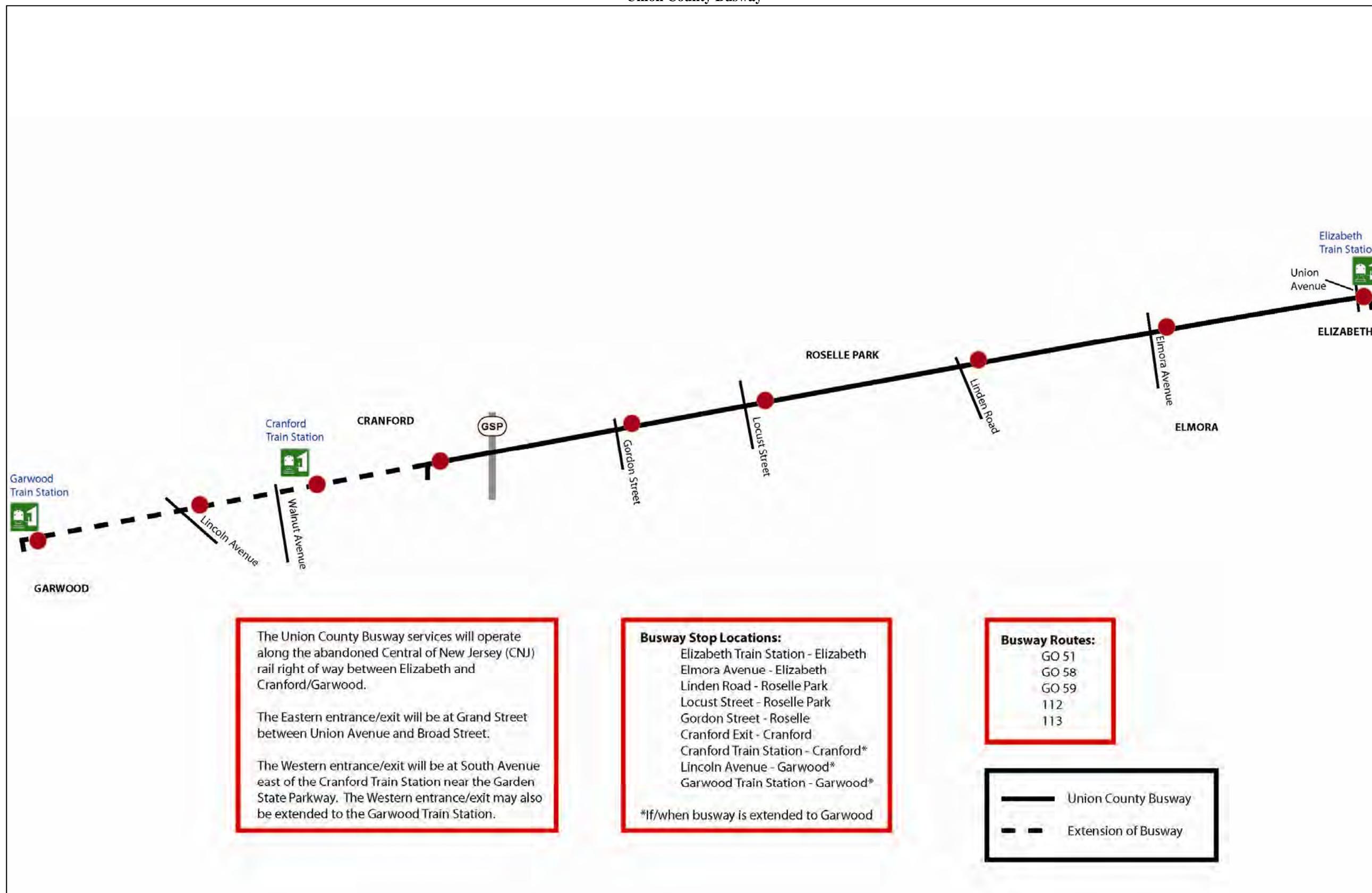
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## **Union County**

### **Union County Busway**

- A second overall recommendation for NJ TRANSIT bus service in Union County would be the creation of a Busway between the center of Elizabeth and Cranford along the abandoned Central of New Jersey (CNJ) rail right of way. The separated Busway along the right of way would end at sites east of Cranford near the Garden State Parkway. Busway service would then continue along South Avenue to the Cranford Railroad Station. It would be necessary to facilitate a movement from the westbound Busway to South Avenue. Potential Busway stations include:
  - Elizabeth RR Station (CNJ Terminal) - Elizabeth
  - Elmora Avenue - Elizabeth
  - Linden Road - Roselle Park
  - Locust Street - Roselle Park
  - Gordon Street - Roselle
  - East of Cranford Railroad Station, near Garden State Parkway (either on grade or on South Avenue) - Cranford
- Further vetting is necessary to finalize these stop locations. Busway stations will have enhanced passenger amenities such as enclosed shelters, electronic public information such as real time information signs and service information kiosks, ticket vending machines, and bike racks. At this point, there are four potential routes that would operate on this bus only corridor: a new GO 51, GO 58, GO 59, Route 112, and Route 113. For the remainder of this memo, this proposed Busway will be referred to as the Union County Busway.
- An alternative alignment for the Union County Busway would be to extend the Busway along the CNJ right of way as far west as the Garwood Railroad Station. Under this alternative, extension of the Busway could be completed in conjunction with redevelopment efforts in Garwood center. Redevelopment plans call for a Transit Oriented Development (TOD) at the Garwood Station which would include structured parking. A BRT station and terminal location could be incorporated into this structure.
- If the Garwood extension were pursued, BRT service would include additional stops at:
  - Cranford Railroad Station - Cranford
  - Lincoln Avenue - Garwood
  - Garwood Railroad Station - Garwood
- It should also be noted that if the Garwood extension is implemented, any plans should continue to include access and egress points to and from the Busway at the location near the Garden State Parkway east of Cranford. This will allow for more flexibility in using the Busway to serve various Union County destinations and communities.

**Union County Busway**



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## GO Bus 59

### **GO Bus 59**

See page 223 for description of the proposed service and page 224 for the map.

## Routes 54 & 112

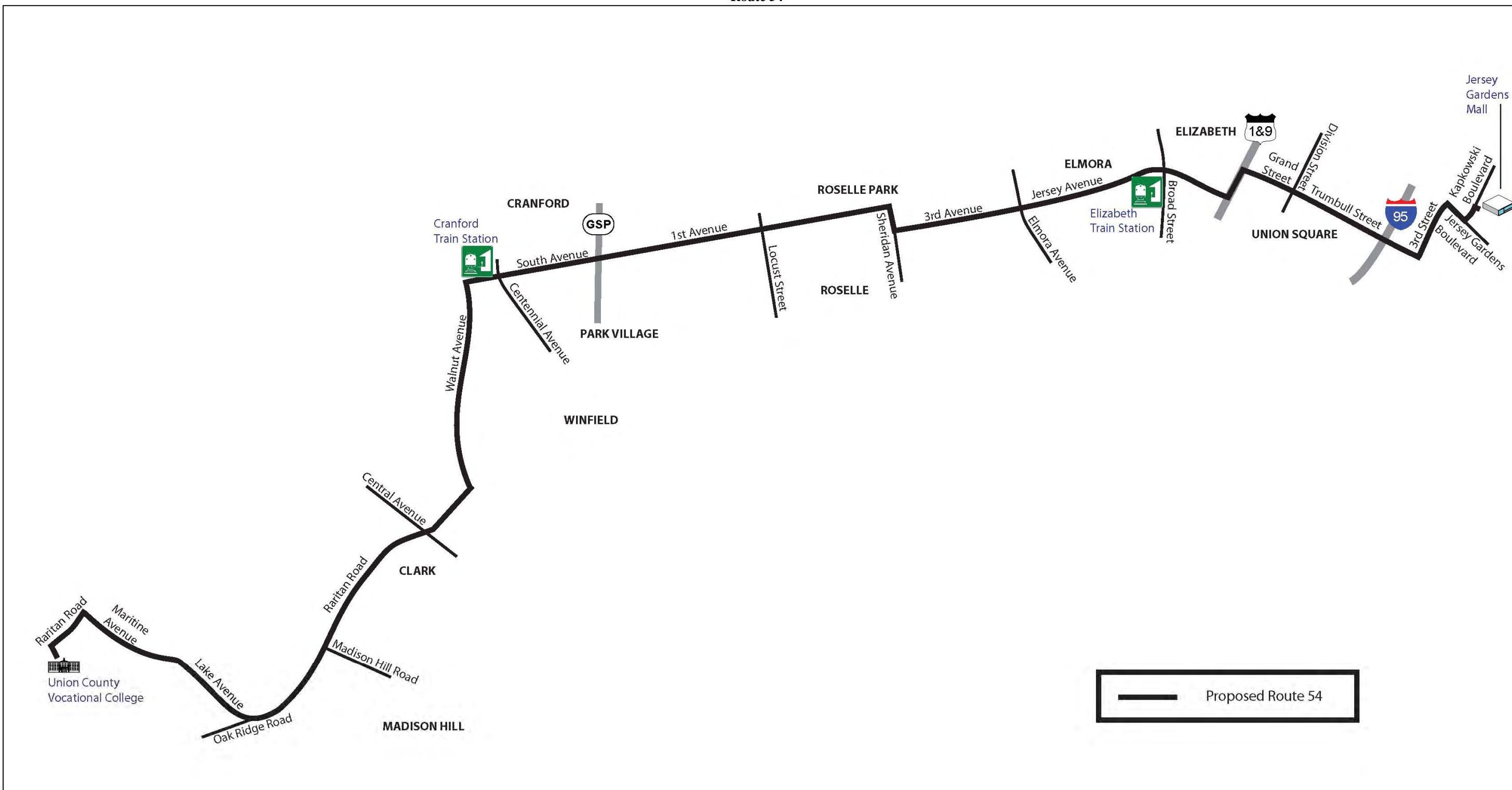
### **New Route 54 – Cranford to Elizabeth**

- The proposed **Route 54** would function as the local route along the Route 59 corridor between Cranford and Elizabeth once the Union County Busway is completed and the GO 59 is implemented.
- The route would operate in the same fashion as the current Route 59 between Jersey Gardens and Cranford. In Cranford, the route would turn left onto Walnut Avenue and pick up the Route 112's alignment from Walnut Avenue at Raritan Road to the Union County Technical College, where Route 54 would terminate and lay over.
- The proposal for Route 54, as well as the subsequent changes to the Route 112 that are affected by the Route 54, should not be implemented until the GO 59 is operating and has been analyzed.

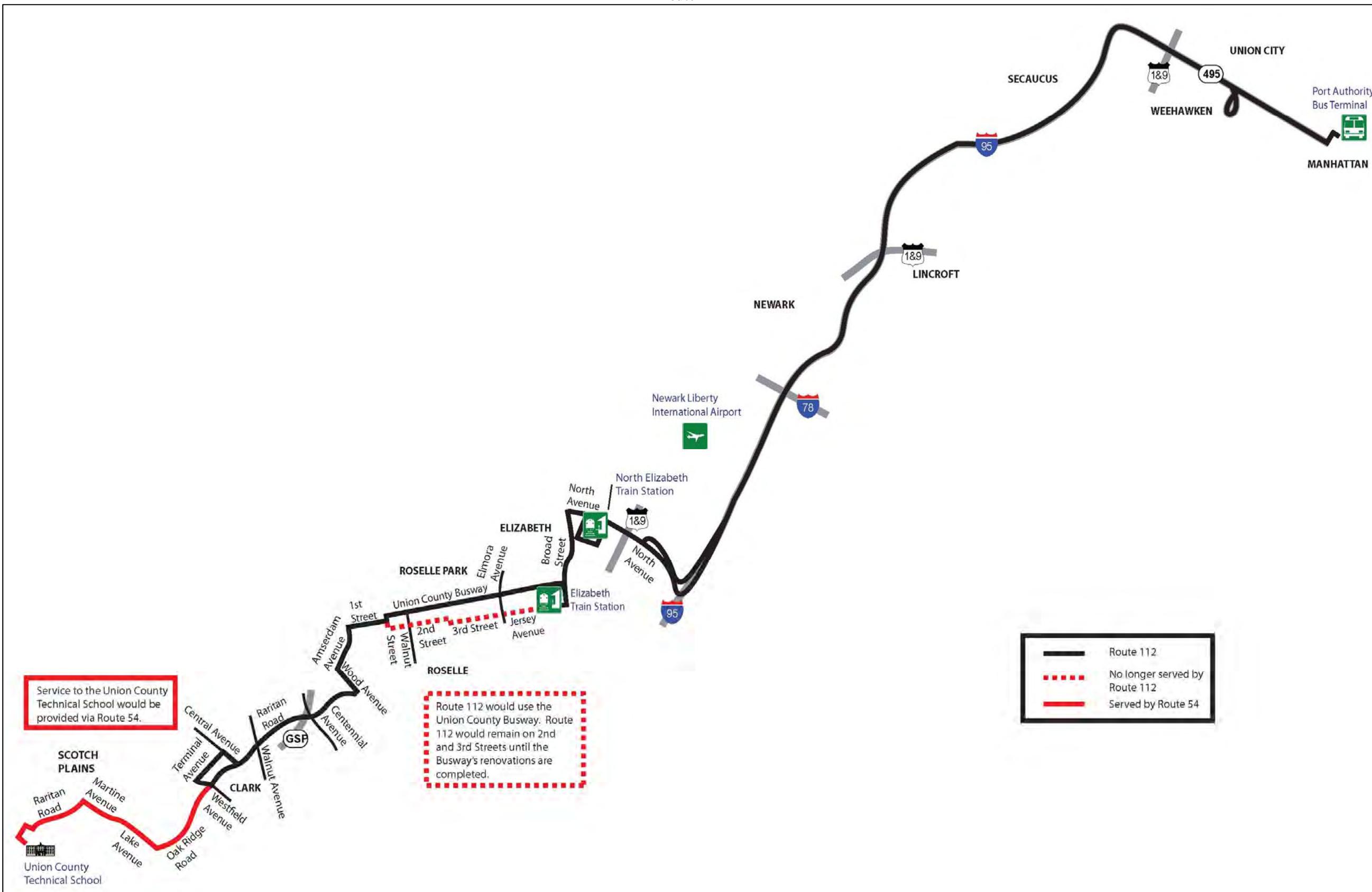
### **Restructured Route 112 – PABT to Scotch Plains via the Union County Busway**

- The proposed **Route 112** would operate in the same fashion as it currently does between the Port Authority Bus Terminal in New York City to Elizabeth. In Elizabeth the vehicle would enter the Union County Busway instead of operating on the local streets as it currently does. The vehicle would exit the Union County Busway in Roselle Park, possibly at Locust Street, and continue as it currently operates.
- The proposal for the changes to the Route 112 would not go into effect until the Union County Busway services begin operation.
- Once Route 54 is implemented, Route 112 would longer provide service in Clark, with Route 54 picking up the routing between Clark and the Union County Technical College.
- Also, another option for the Route 112 would be for the service to use the Garden State Parkway and Route 78 to get to the Port Authority Bus Terminal, becoming an express service to New York City.
- Additionally, the Route 112 should operate behind the Route 59 so that local riders can ride on the local service, while persons looking to get to the PABT would be on the Route 112.
- Some Route 112 vehicles become quite overcrowded due to passengers who are getting on the Route 112 and using it as a local service.

Route 54



Route 112



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## Routes 94 & 50

### ***Restructured Route 94 – Bloomfield to Union***

See page 214 for description of the revised service and page 215 for the map.

### ***New Route 50 – Irvington Bus Terminal to Linden Station***

See page 214 for description of the proposed service and page 216 for the map.

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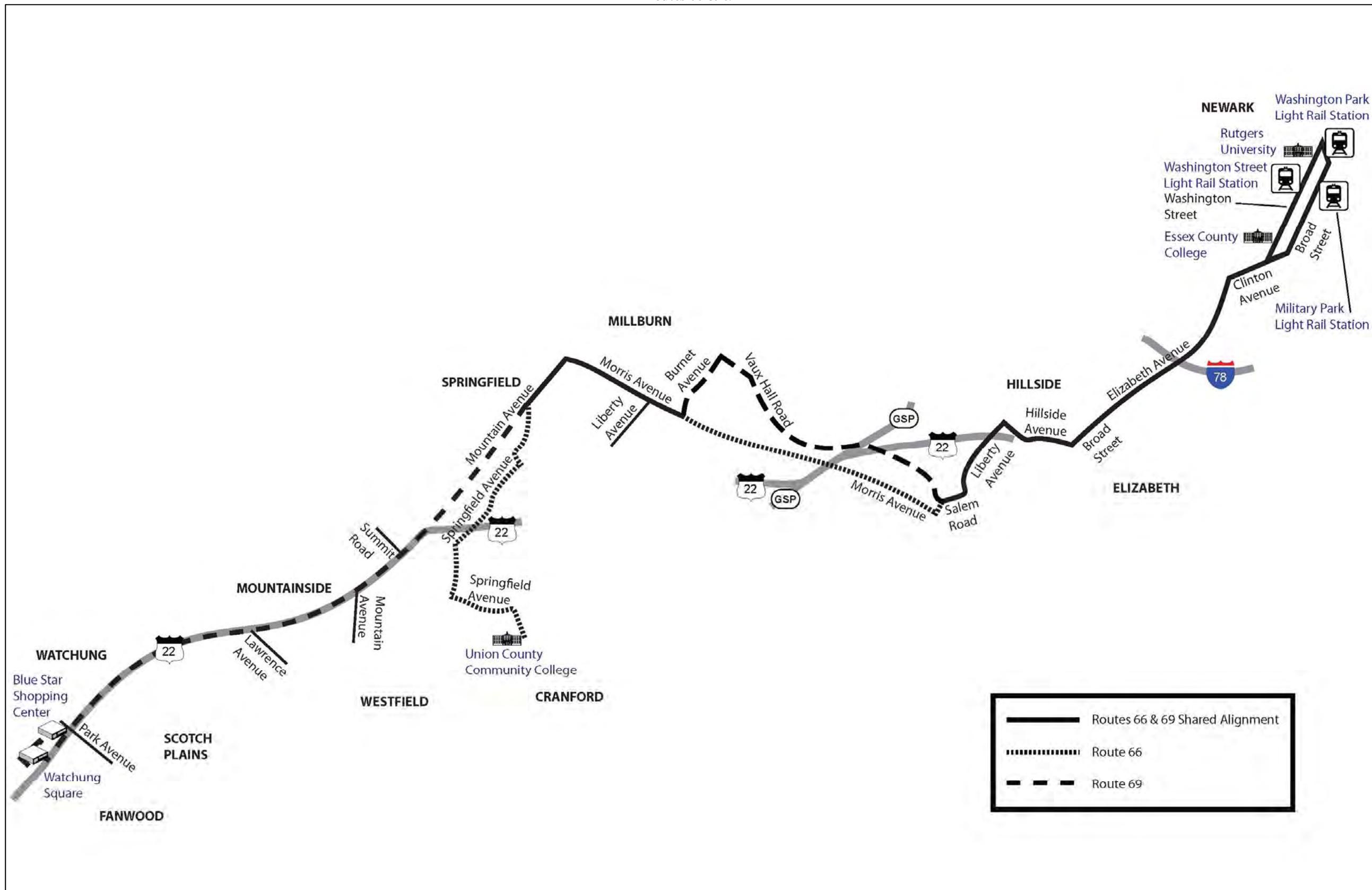
## Routes 66 & 69

### ***Restructured Route 66 – Newark to Watchung Square***

### ***New Route 69 – Newark to Union County College***

- **Route 66** currently offers service between Cranford and Newark with two variations, one operating on Morris Avenue and the other service Vaux Hall Road, with both variations offering service to either the Union County Community College or Plainfield and beyond, depending on the time of day.
- In order to properly serve both markets, the current Route 66 will be split into two routes, the new Route 66 and a new **Route 69**.
- Both services will continue to operate to Newark as the current Route 66 operates.
- The Route 66 would then continue to offer service only along Morris Avenue, then serve Echo Plaza and Mountainside and end its route in Watchung Square.
- The new Route 69 would operate via Vaux Hall Road, then return to Morris Avenue and cease its service at Union County College.
- Additionally, the current 66X service would be eliminated.

**Routes 66 & 69**



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## Routes 56 & 57

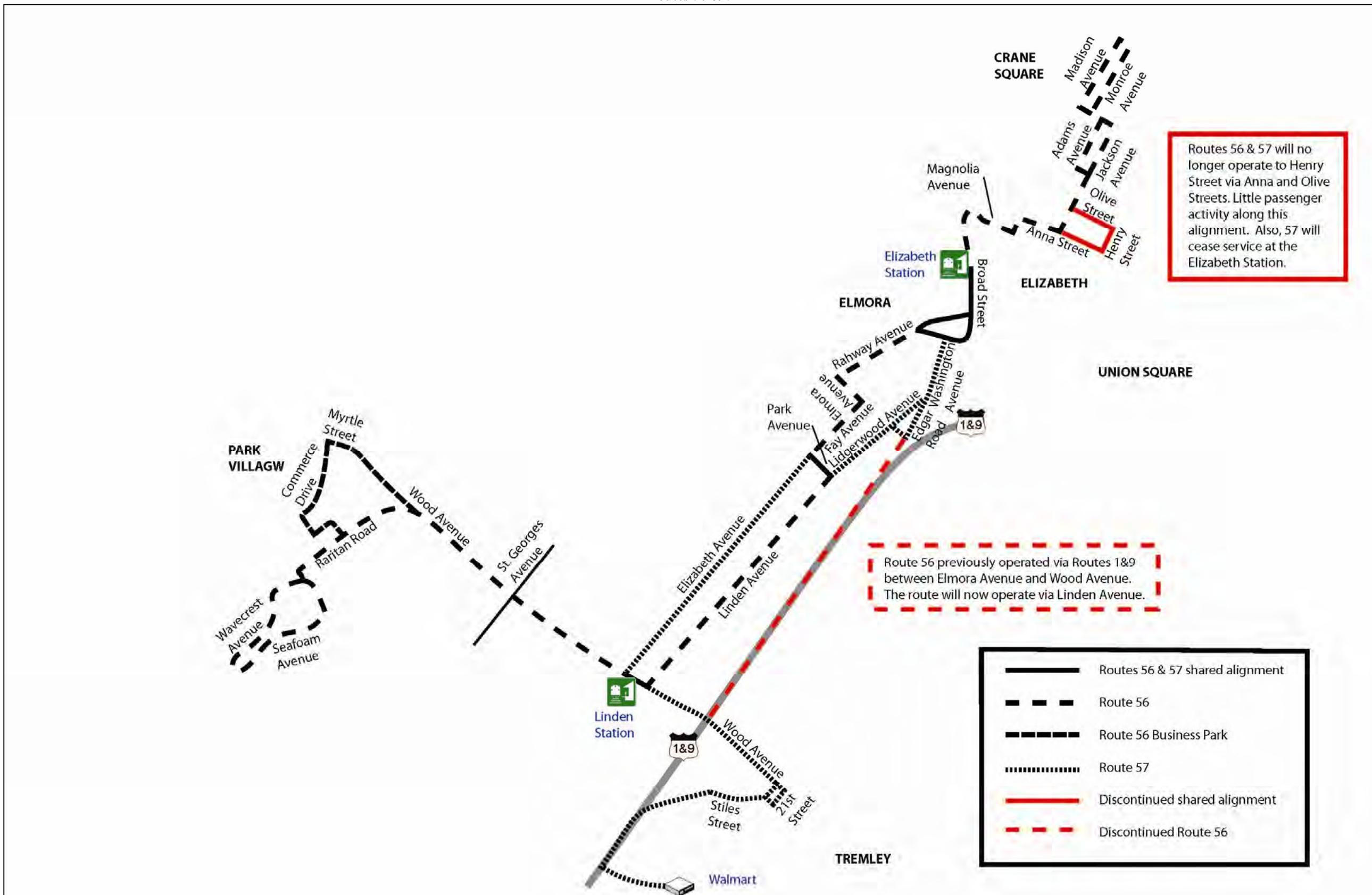
### ***Restructured Route 56 – North Elizabeth to Winfield***

- The **Route 56** would offer service between North Elizabeth and Winfield. The route begins in North Elizabeth on Madison Avenue at Virginia Street – as it does today – and operates to the Elizabeth Railroad Station hub via North Avenue, Adams Avenue, Fairmount Avenue, Jackson Avenue, Anna Street, Jefferson Avenue, Magnolia Avenue and Broad Street.
- Currently, service is offered east of Route 1-9 via Olive Street, Henry and Anna Street; however, service to this area is now be part of the proposal for the Route 62, which would operate through this area via Division Street, as well as Dowd Street on some trips.
- From the Elizabeth Railroad Station hub, the route would continue south on Broad Street and then operate on Rahway Avenue, South Elmora Avenue, Elizabeth Avenue, Park Avenue and East Linden Avenue into Linden. The route would then operate as it currently does into Winfield via Wood Avenue and would continue to offer service to the Cranford Business Park during the peak period in the peak direction with a slight modification – from Commerce Drive, the service would turn left onto Jackson Street and right onto Moen Street. This would permit the vehicle to turn onto Raritan Road at a traffic light, while also allowing further access into the business park.
- In future phases, Route 56 could be extended north to McClellan Street then to the Airport Rail Station if buses are accommodated in the redevelopment design.
- Other potential northern termini include extending Route 56 north to McClellan Street and Frelinghuysen Avenue to any new retail developments along Frelinghuysen.

### ***Restructured Route 57 – Elizabeth to Aviation Plaza/Linden Plaza***

- The **Route 57** would begin its service in Elizabeth at the Elizabeth Railroad Station hub. From the transit hub the route would take Broad Street to Rahway Avenue and then Pearl Street to access Washington Avenue, Lidgerwood Avenue and Linden Avenue. The service would then use Park Avenue to get to Elizabeth Avenue and then Wood Avenue to return to the east side of the train tracks. From Wood Avenue, the route would use the 20<sup>th</sup> Street/21<sup>st</sup> Street couplet which would grant access to Aviation Plaza and all of its shopping destinations (permission must be granted by Aviation Plaza's ownership in order for the buses to serve through this location. If permission is not granted, Aviation Plaza would be served via US Route 1-9). From Aviation Plaza the service would operate south on US Route 1-9 to Linden Plaza, as well as to the Juvenile Detention Center.

Routes 56 & 57



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## Route 52

### ***Restructured Route 52 – Elizabeth to Springfield via Morris Avenue***

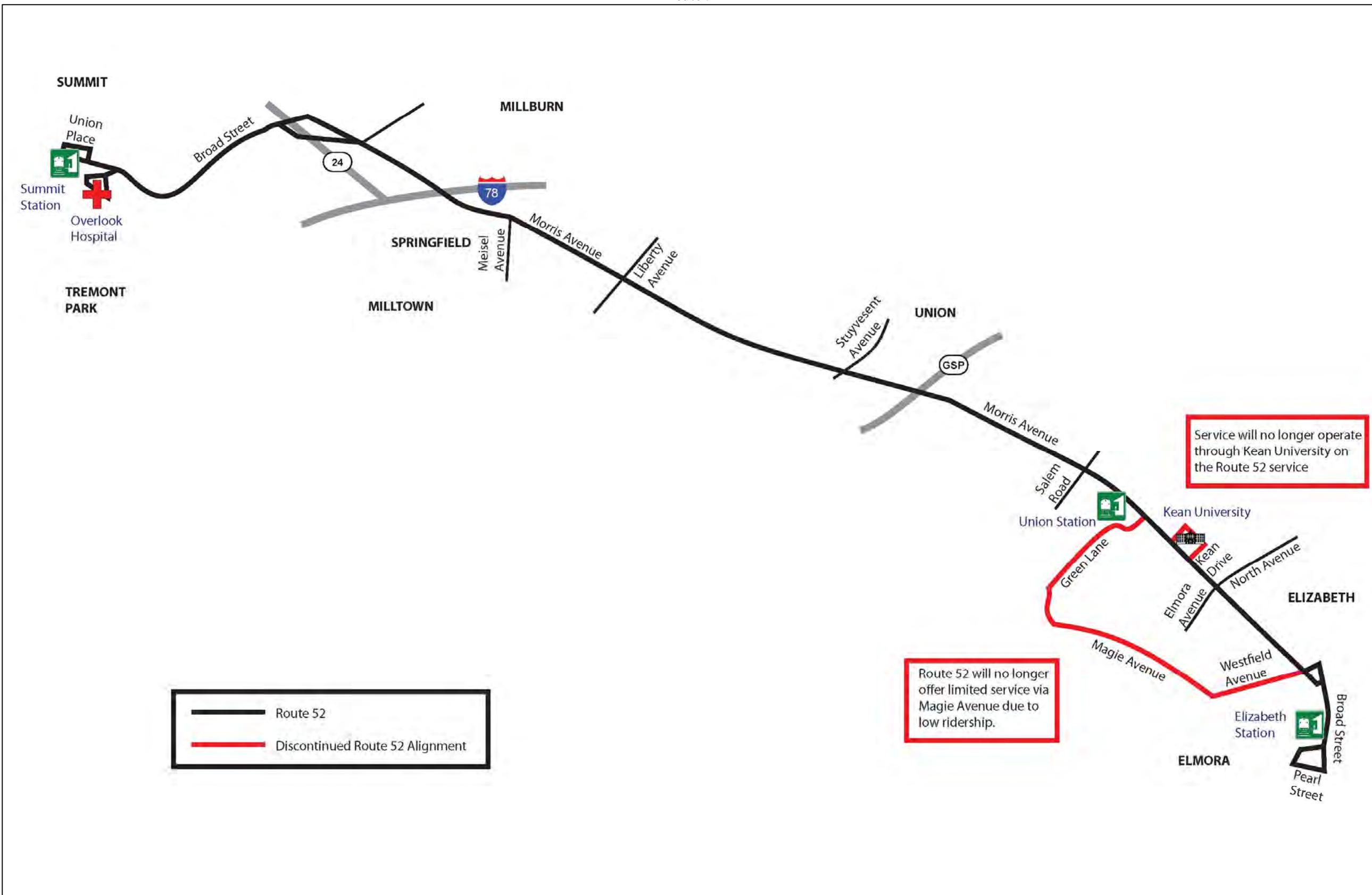
- The current Route 52 offers service between Elizabeth and Springfield, mainly via Morris Avenue, with one peak period, peak direction deviation to Magie Avenue at Browning Avenue.
- The proposed Route 52 would offer service between Elizabeth and Summit, again using Morris Avenue for a majority of the trip.
- In Summit, the route would offer service to Overlook Hospital and the Summit train station via Broad Street. This route would create a connection between Overlook Hospital in Summit and Trinitas Hospital in Elizabeth.
- The proposed route would no longer operate any service to Magie Avenue.

## Route 53

### ***New Route 53 – Jersey Gardens to Arnett Street***

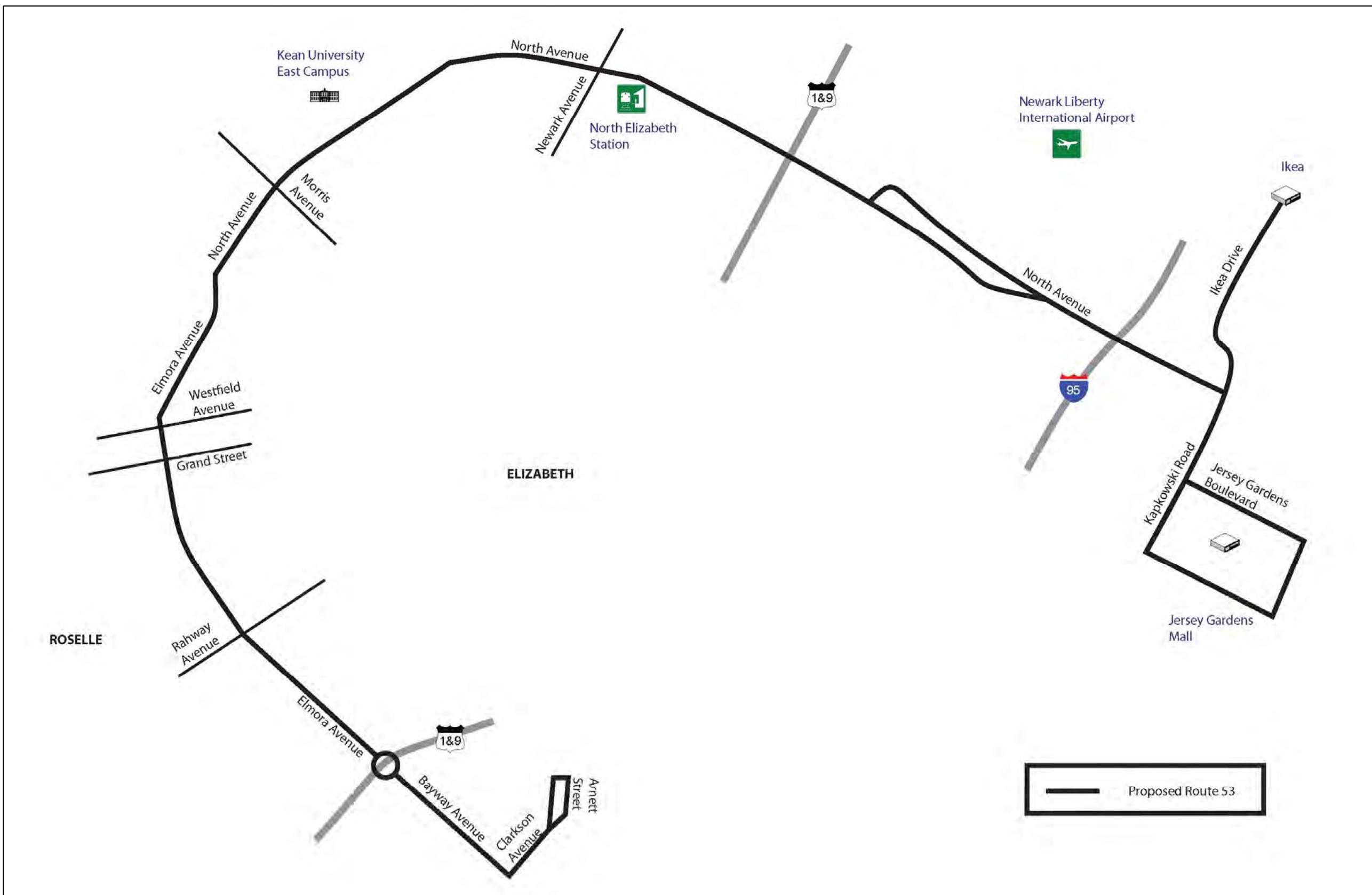
- The proposed Route 53 would offer continuous crosstown service between the Jersey Gardens Mall/Ikea and Arnett Street via North Avenue/Elmora Avenue/Bayway Avenue.
- This route would offer service on a busy corridor and would allow for transfers to all of the services that come through Elizabeth.

Route 52



Greater Newark Bus System Study

Route 53



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## **Suburban Essex County**

### **GO Bus 28 & Route 28**

#### ***Go Bus 28 – Liberty Corridor BRT***

See pages 217-218 for the description of this proposed service and page 219 for the map.

#### ***Restructure Route 28 – Newark to Willowbrook Mall/Wayne Transit Center***

See page 220 for the description of this revised service and page 221 for the map.

### **Routes 71, 73 45 & 46**

- The downtown Newark routing of **Routes 71, 73, 45 and 46** will be as follows: inbound: exit I-280 via Exit 13, then 1st Street, West Market Street, Market Street, Mulberry Street, and Raymond Boulevard to Newark Penn Station; and outbound: routes will leave Penn Station, travel via Raymond Boulevard, Mulberry Street, Market Street, West Market Street, and 1<sup>st</sup> Street to I-280.
- Between Newark Penn Station and the Erie Loop on-street stop, Routes 71, 73, 45 and 46 will operate through downtown Newark to the I-280 entrance at 1<sup>st</sup> Street as described above, and will then travel via I-280 to exit 11B, Freeway Drive West, then Day Street and Main Street to serve the Erie Loop (on-street), from where these routes will follow the alignments described below. Inbound, from the Erie Loop (on-street) to Newark Penn Station, these routes will operate via Main Street, Day Street and Freeway Drive East to I-280.
- Passengers currently boarding these routes along Main Street in Orange would be required to use Route 21 to and from the Main Street at Day Street stop or the Erie Loop on street stop to access these routes. Ride checks suggest that this may be as high as 1,000 weekday passengers. The benefit to these and other riders is the extension of these routes to new work locations and destinations in outlying areas as well as reduced travel time through less circuitous routes and more use of express routing along I-280. In addition, this proposed change addresses comments from NJ TRANSIT drivers who reported that the policy of no outbound discharging before Main Street at Day Street is difficult to enforce and often disregarded or misunderstood by the passengers. In addition, the proposed alignment establishes a service model for NJ TRANSIT based on the premise that bus routes that are primarily meant to serve outlying employment and residential areas would not have extensive local routings in the core area.
- When the Orange Street Light Rail Station Transit Center is developed, Routes 71, 73, 45 and 46 could potentially terminate there, requiring passengers to use the Newark Light Rail to finish their trips into Newark.

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**Restructured Route 71 – Newark-Penn Station to the Essex Mall**

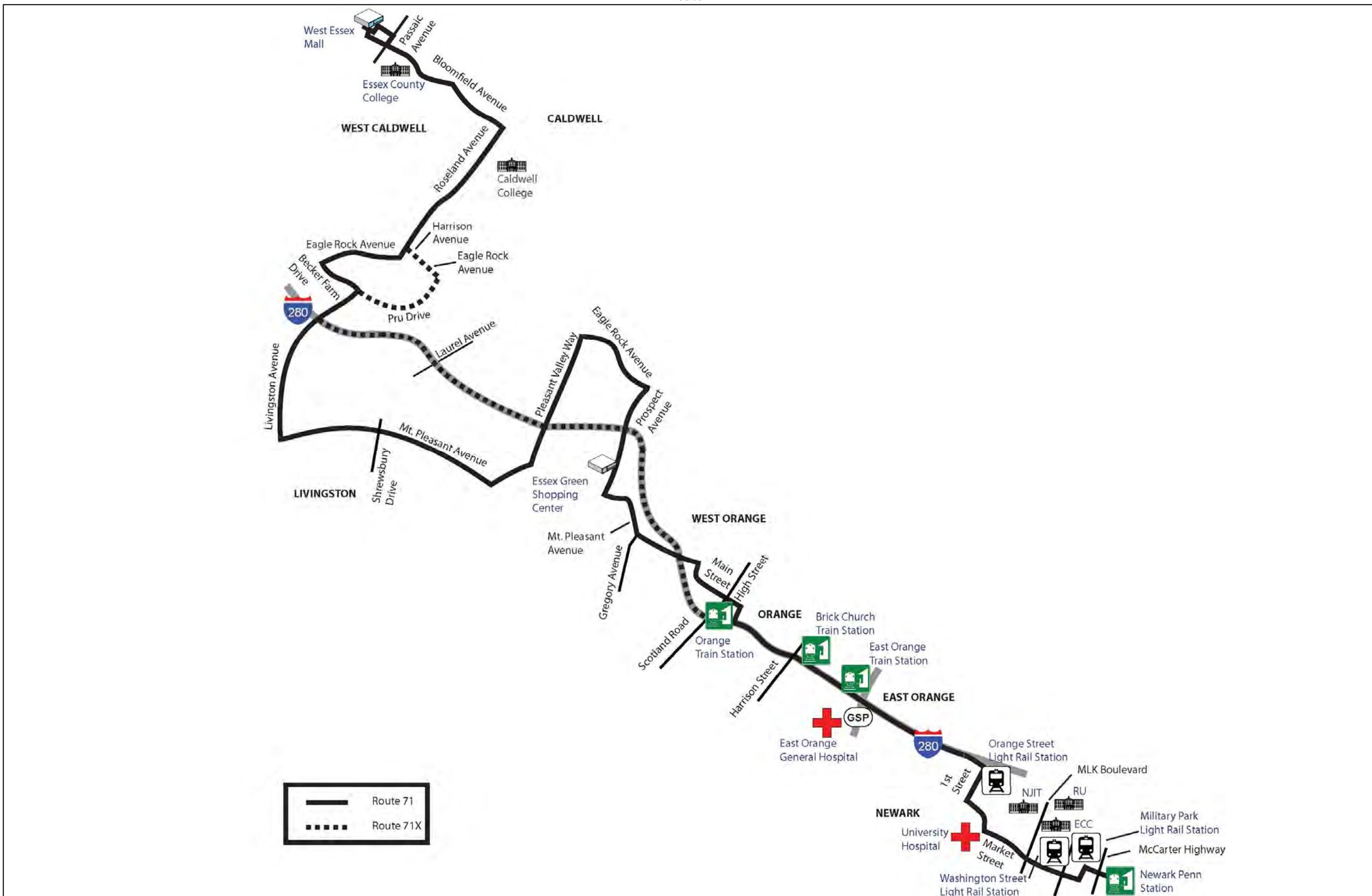
- From the Erie Loop (on street), westbound trips on the base **Route 71** would follow Mt. Pleasant Avenue, Prospect Avenue, Eagle Rock Avenue, Pleasant Valley Way, Mt. Pleasant Avenue, then Livingston Avenue, Becker Farm Road, Eagle Rock Road, Roseland Avenue, and Bloomfield Avenue to the Essex Mall. Eastbound trips would follow the same alignment in the opposite direction.
- One variation of Route 71 would be the **Route 71X**. Westbound, Route 71X would operate the same downtown Newark routing and stop pattern as Route 71 to the Erie Loop. From the Erie Loop, Route 71X would operate express via I-280 to Exit 5B, then travel via Livingston Road, serve the Prudential Campus directly via Prudential Drive, then back to Eagle Rock Road, Harrison Avenue, Roseland Avenue, and Bloomfield Avenue to Essex Mall. The same routing would be followed in the eastbound direction. Route 71X will provide peak period, peak direction service. In the initial phase of implementation, 71X would only operate in the peak flow direction. In later phases of implementation, 71X could provide peak period, bi-directional service to address the needs of both reverse commuters and traditional commuters into downtown Newark.
- Until Route 95 and Route 98 are implemented, a second variation of the base Route 71 would serve the Fairfield loop. This variation would operate the base Route 71 routing as far west as the Essex Mall. From there, this variation would serve the Fairfield loop along the same routing currently followed. Trips serving Fairfield would be designated **Route 71F**. With the implementation of Route 95 and Route 98, passengers traveling to the Fairfield loop could transfer to Route 95 or Route 98 at Essex Mall. Ride checks suggest that this represents approximately 45 weekday passengers.

**Restructured Route 73 – Newark-Penn Station to St. Barnabas Medical Center/Livingston Mall/Algonquin Parkway**

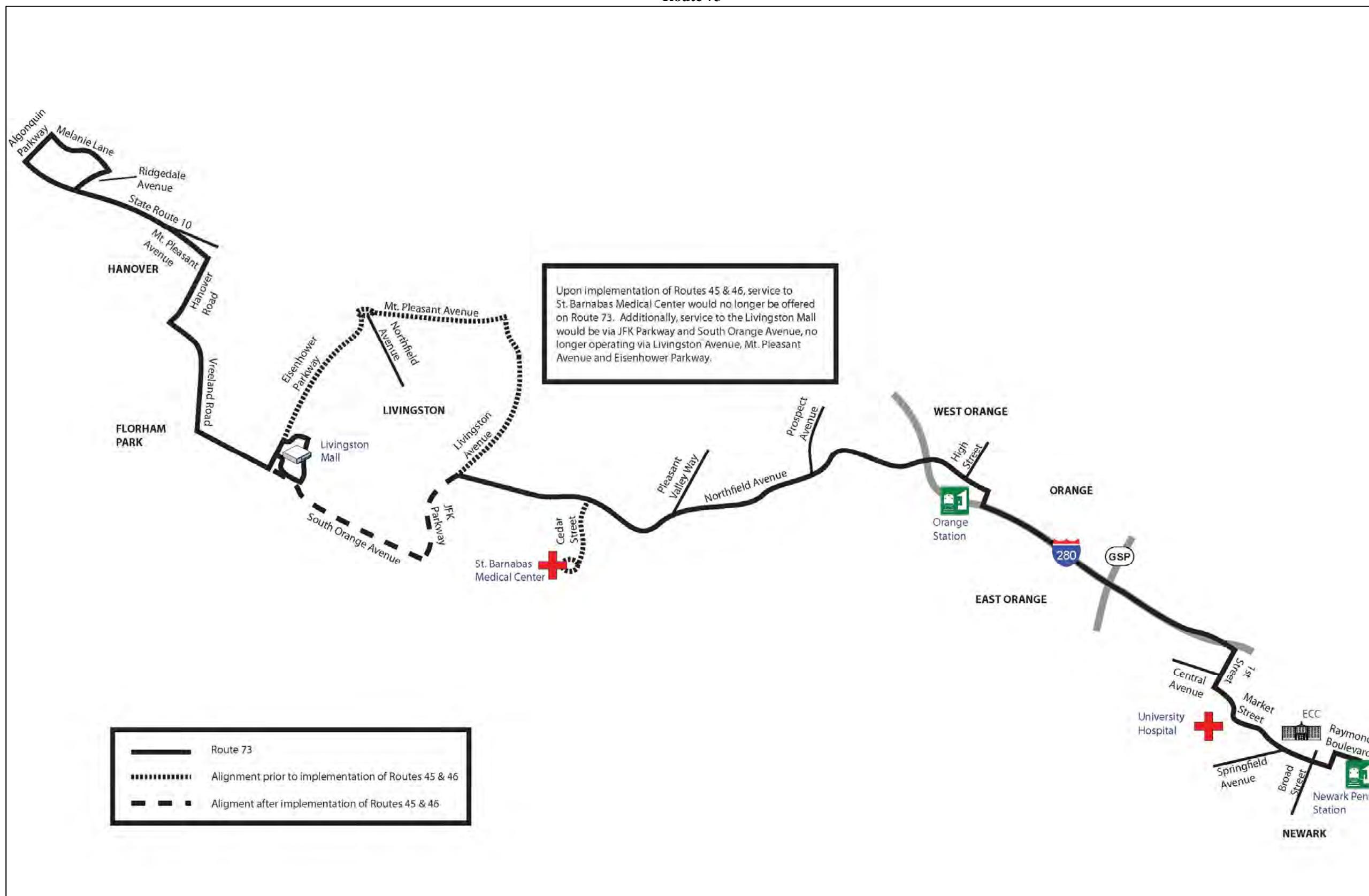
- From the Erie Loop (on-street), new **Route 73** will operate via Main Street to Northfield Avenue. The route will divert from Northfield Avenue to the Saint Barnabas Hospital via Old Short Hills Road serving the hospital directly, and will then return to Northfield Avenue after serving the hospital. Once returned to Northfield Avenue, the route will continue westward to Livingston Avenue where it will use Livingston Avenue, Mount Pleasant Avenue and Eisenhower Parkway to the Livingston Mall and the Livingston Mall Park & Ride. From there, the route will travel via South Orange Avenue to Vreeland Road, Hanover Road, and Mount Pleasant Avenue. The route will then serve Ridgedale Avenue, Melanie Drive and Algonquin Parkway where the route will terminate. Route 73 will then use Algonquin Parkway to return to Route 10 and to begin eastbound service.
- Eastbound service will operate in the same alignment as westbound service in the opposite direction.

Greater Newark Bus System Study

Route 71



Route 73



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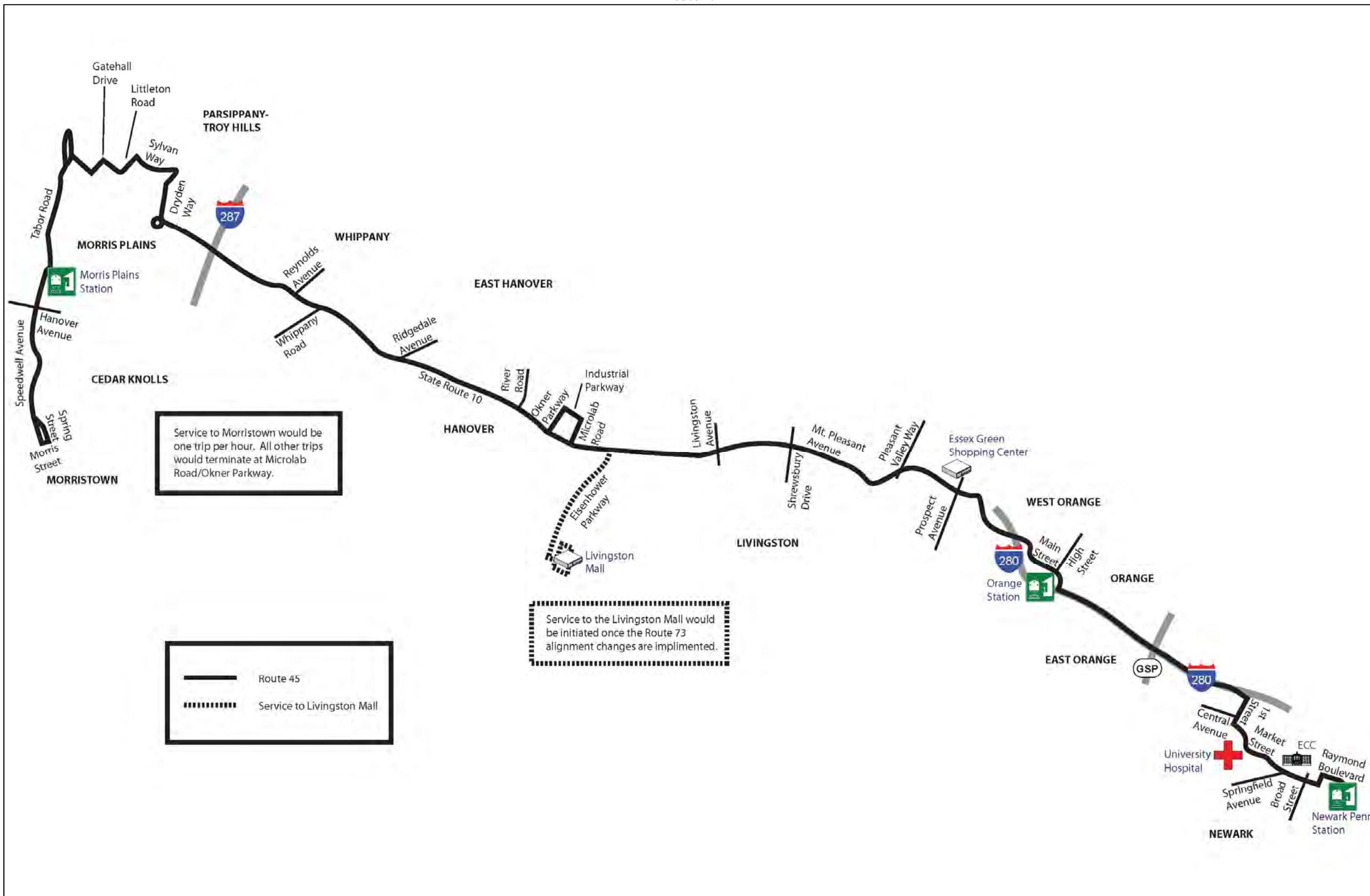
**New Route 45 – Newark-Penn Station to Morristown via State Route 10**

- From the Erie Loop (on-street), westbound trips on the new **Route 45** would travel via Main Street, then Mount Pleasant Avenue to Dryden Way. The route will then operate via Dryden Way, Sylvan Way and US-202 to Gatehall Drive where the service will then return to Mount Pleasant Avenue. From there, the route will head west to Tabor Road, and Speedwell Avenue into Morristown. The route will then operate a loop on Spring Street, Morris Street and return to Speedwell Avenue.
- 45 would directly serve the Microlab Road/Okner Parkway loop but would not directly serve Melanie Lane and Algonquin Parkway. Melanie Lane and Algonquin Parkway would be served by Route 73 (described below).
- The return trip from Morristown will operate via Speedwell Avenue and Tabor Road to access Mount Pleasant Avenue. The route will use the jug handle at US-202 to gain access to Gatehall Drive. From there, the route will operate along the same alignment as the westbound trips in the opposite direction.
- All trips would serve Microlab Road/Okner Parkway with service being extended beyond Microlab Road/Okner Parkway to Morristown every 60 minutes.
- Upon implementation of alignment changes to 73, the trips that would end at Microlab Road/Okner Parkway in the initial phase would instead be extended east on Route 10 to Eisenhower Parkway, then south on Eisenhower Parkway to Livingston Mall where the route would terminate, with some trips extending to the Livingston Mall Park & Ride.

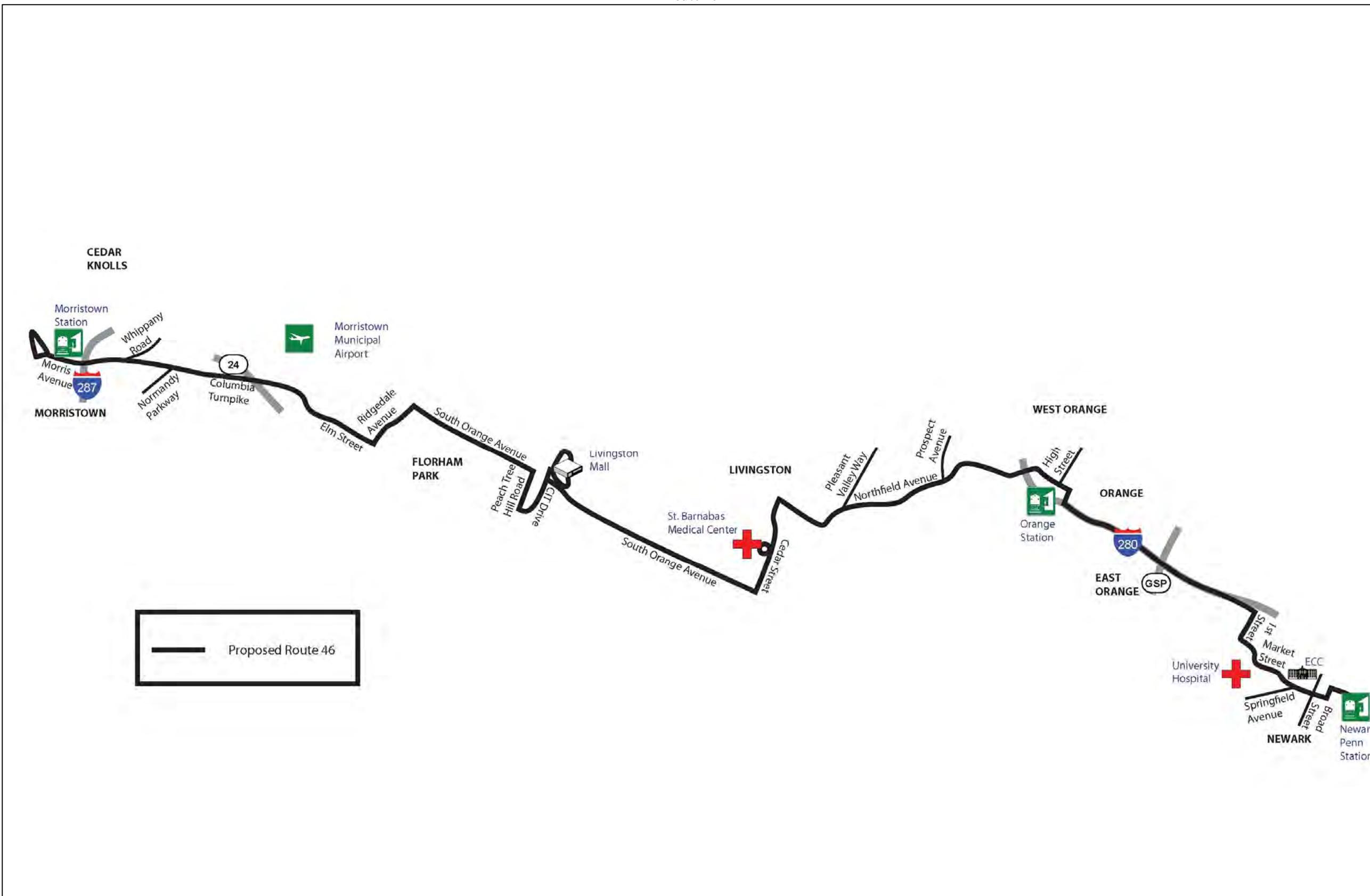
**New Route 46 – Newark-Penn Station to Morristown via South Orange Avenue**

- From the Erie Loop (on street), the proposed new **Route 46** will operate via Main Street to Northfield Avenue, then Old Short Hills Road, serve the Saint Barnabas Hospital directly, then continue southward on Old Short Hills Road, then South Orange Avenue to the Livingston Mall and the Livingston Mall Park & Ride, then CIT Drive and Peach Tree Hill Road before continuing westward on South Orange Avenue and Columbia Turnpike to downtown Morristown where the route would terminate on Speedwell Avenue.
- Eastbound service would operate along the same alignment in the opposite direction.
- Upon implementation of Route 46 and Route 98, Route 73 would no longer have to serve St. Barnabas Hospital.
- In addition, upon implementation of Routes 46 and 98, Route 73 would operate along the alignment described above as far west as Northfield Road and Livingston Avenue/JFK Parkway (without serving St. Barnabas Hospital), from there, 73 would travel JFK Parkway and South Orange Avenue to the Livingston Mall, from where the route would resume the alignment described above. This modification would result in passengers along Livingston Avenue having to transfer from Route 98 to 73 in Northfield center for access to Livingston Mall, and from Route 98 to 45 at Livingston Avenue at Mt. Pleasant Avenue for access to destinations along Route 10 west of Livingston Avenue. Ride checks suggest this may represent as many as 70 daily passengers. This modification would also require the extension of 45 trips along Eisenhower Parkway to the Livingston Mall.

Route 45



**Route 46**



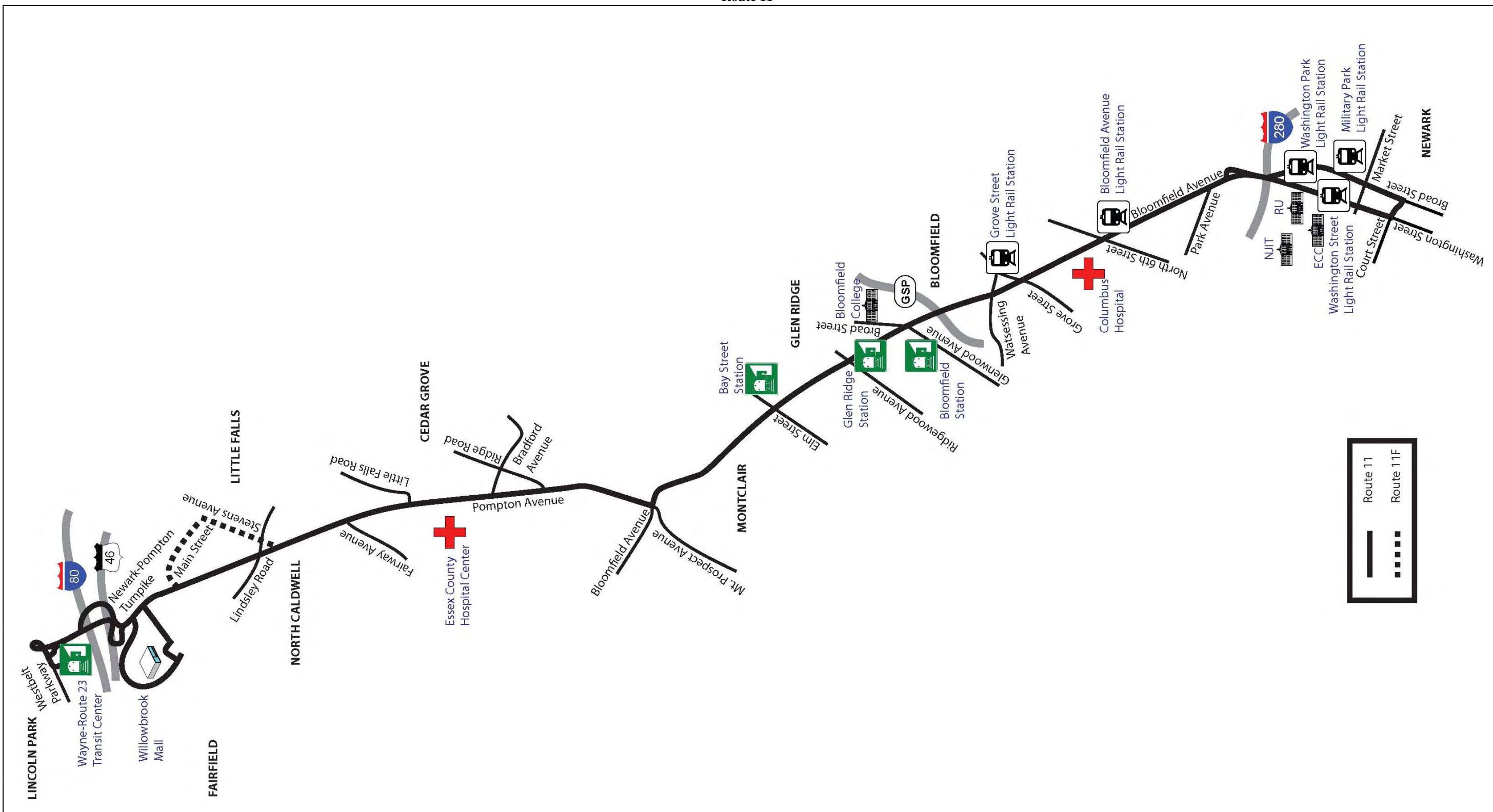
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## Route 11

### ***Restructured Route 11 – Newark to Willowbrook Mall/Wayne Transit Center***

- The base **Route 11** service will operate between downtown Newark and the Wayne/Route 23 Transit Center via the Willowbrook Mall. The extension to the Wayne/Route 23 Transit Center will operate all day to allow for transfers not only to NJ TRANSIT rail services but also to the other NJ TRANSIT bus routes serving the new facility. This extension also addresses issues with buses laying over at the Willowbrook Mall.
- The designation of the “11S” variation, which does not operate via downtown Little Falls, will be eliminated; downtown Little Falls will only be served once per hour and the variation will instead be designated as “**Route 11F**”. All other trips will follow the current 11S route alignment along State Route 23. Ride checks showed that passenger activity in downtown Little Falls could be served by hourly service; ridership patterns also show that the demand that does exist is spread throughout the day. For these reasons, it is recommended that Route 11F be operated throughout the day on weekdays, Saturdays, and Sundays with the last inbound trip in the evening serving Little Falls.
- Service will be operated to Newark Penn Station on weekday evenings, Saturday evenings, and Sundays as is currently done. Consideration should be given to having all trips on Saturday operate to and from Newark Penn Station. For the purpose of passenger communication, inbound trips on this variation will be designated as **Route 11P**.

Route 11



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## Routes 76 & 16

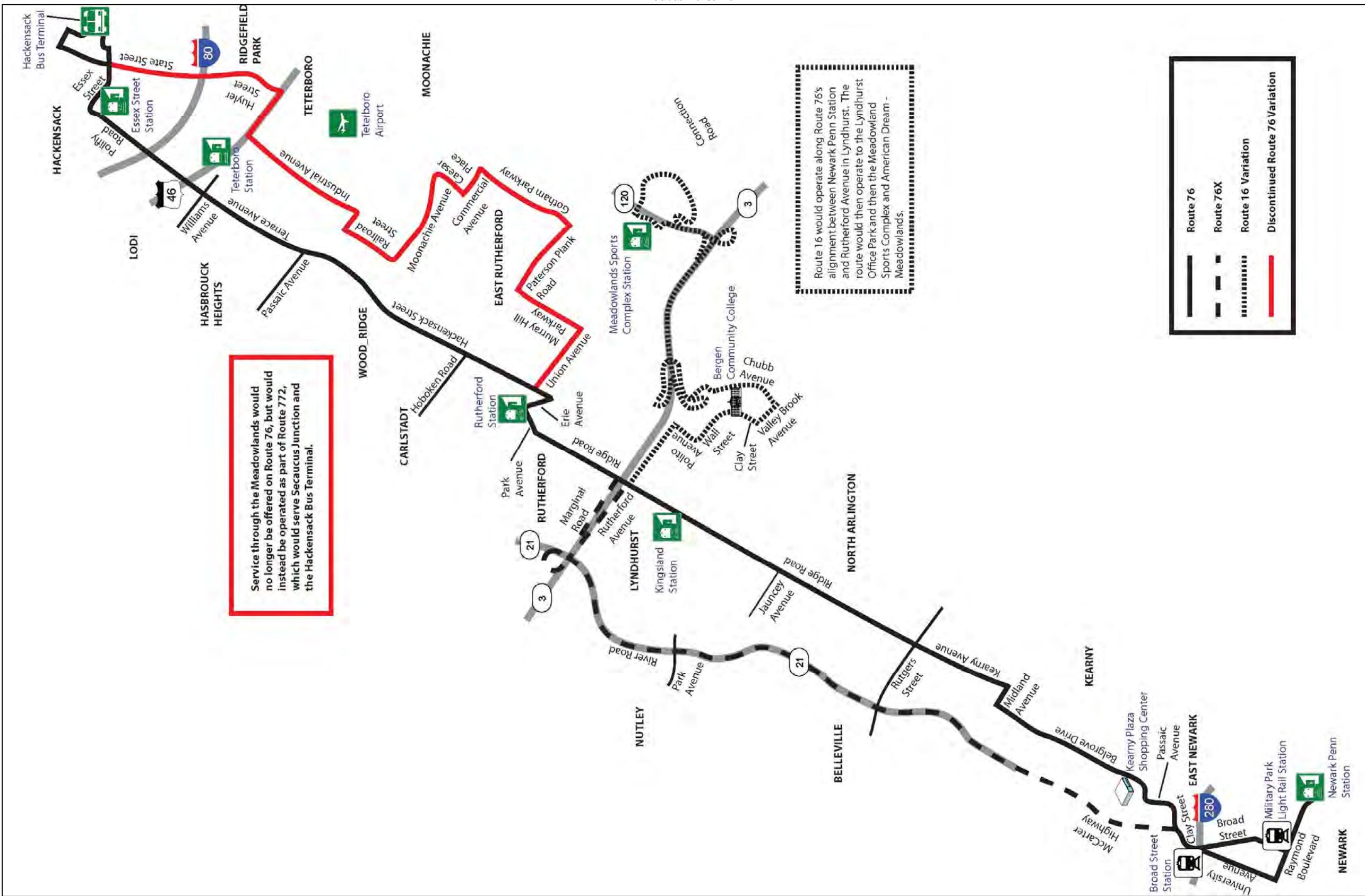
### ***Restructured Route 76 – Newark-Penn Station to Hackensack Bus Transfer Center***

- The base **Route 76** service will operate between Newark Penn Station and the Hackensack Bus Transfer Center. The base route will operate simply as Route 76 and the “L” designation will not be used.
- The express service will continue to be operated as “**Route 76X**”. These trips will also be realigned to serve the Park & Ride lot located at the intersection of Route 21 and Route 3 when it opens.
- The variation via the Meadowlands will be eliminated and replaced with service on Route 772; Route 772 will serve the Hackensack Bus Transfer during the peak periods. Passengers traveling from Newark will take NJ TRANSIT rail service from Newark Penn Station to the Secaucus Junction station, where they could connect with Route 772. Results of the origin/destination survey show that this change will affect approximately 40 passengers (one-way) daily.
- Due to the ridership pattern observed through the ride checks, it is recommended that Route 76 be operated with suburban transit buses.

### ***New Route 16 – Newark to American Dream – Meadowlands***

- The current “76P” service to the Lyndhurst Office Park will be operated under a new route number – **Route 16**.
- Route 16 will act as the primary downtown Newark – American Dream - Meadowlands route via Ridge Road and Rutherford Avenue, then right on Polito Avenue, left on Wall Street West, right on Clay Avenue, left on Valley Brook Avenue, left on Chubb Avenue, right on Wall Street West, left onto Ward Memorial Highway, onto State Route 3 eastbound and to the Meadowlands exit so the route may terminate at American Dream - Meadowlands. This will continue to serve the Lyndhurst Office Park and will also serve the Kingsland Railroad Station.
- If development at the site that was to be the EnCap development progresses, Route 16 will be used to serve that site via Valley Brook Avenue and could use the proposed rail station along the Main Line as a turnaround location.
- Finally, as Schuyler Avenue in Kearny is developed, service could be provided on either the Route 16 or Route 76.
- Initial implementation of Route 16 will need to have the earliest trips arrive at American Dream - Meadowlands at 9:00 AM (the facility is scheduled to open at 10:00 AM) with service past midnight to accommodate patrons and employees of the entertainment venues. This span will operate Monday through Saturday. The minimum Sunday span would be scheduled in a way for the earliest trip to arrive at American Dream - Meadowlands by 11:00 AM (one hour prior to the 12:00 PM opening) with the last trip leaving American Dream - Meadowlands at 6:30 PM.
- In the initial phase of implementation, Sunday service on Route 16 should be provided over a span which complies with the service guidelines (8:00 AM – 7:00 PM). Later service may be needed to serve the employees and patrons of the entertainment venues in later phases if demand warrants.

Routes 76 & 16



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## Routes 29 & 79

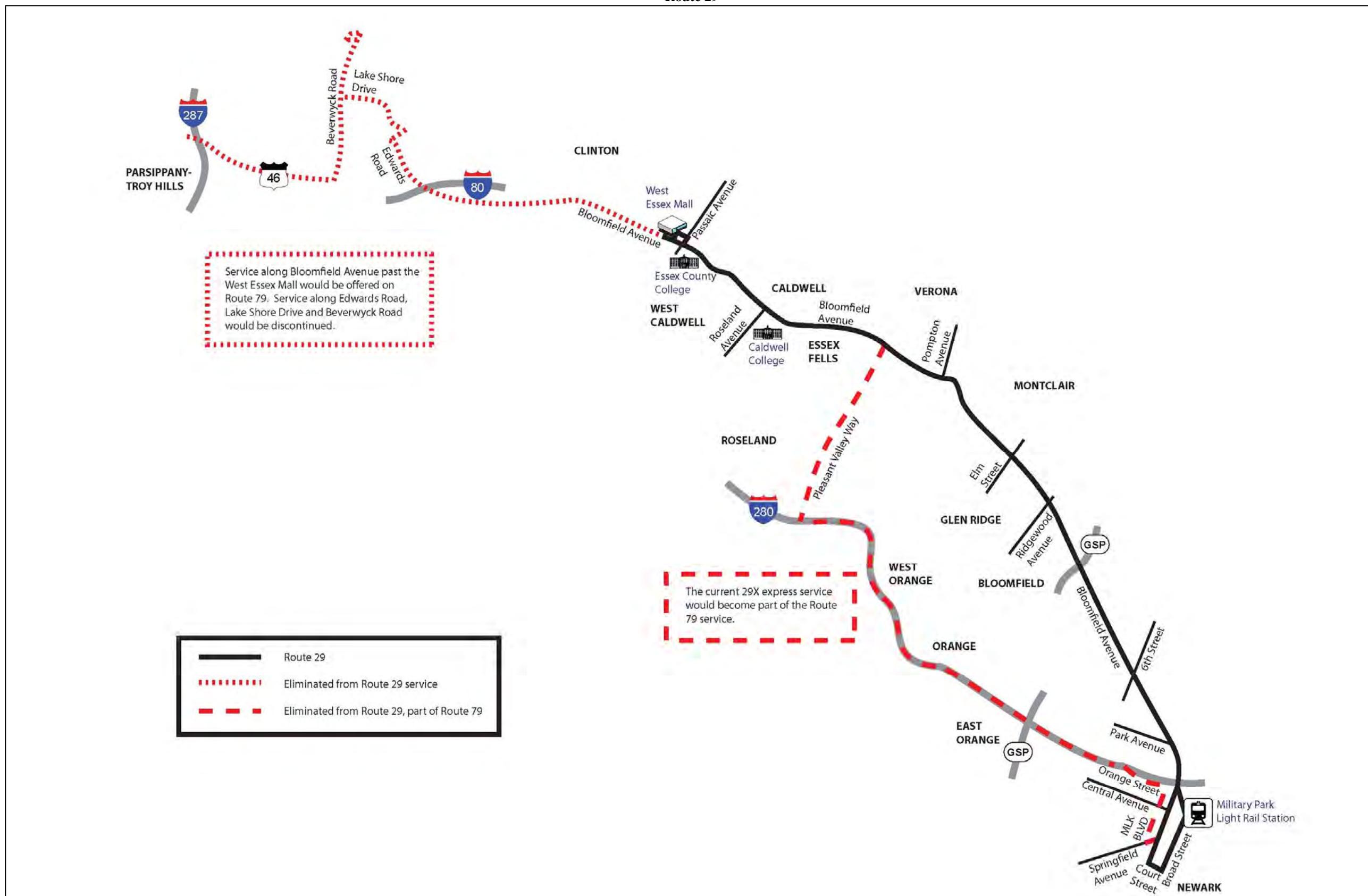
### ***Restructured Route 29 – Newark to Essex Mall***

- The base **Route 29** will continue to operate to the Essex Mall. Midday and weekend frequency on this Route 29 base route will be enhanced to hourly service. The downtown Newark terminal for all Route 29 service will be via Broad, Hill and Washington Streets, except after 7:00PM when they will end at Newark Penn Station.
- Service will be operated to Newark Penn Station on weekday evenings, Saturday evenings, and Sundays as is currently done. Consideration should be given to having all trips on Saturday operate to and from Newark Penn Station.
- The current “Parsippany Express” service will be operated as part of Route 79. As part of this change, service to Knoll Road will be eliminated.

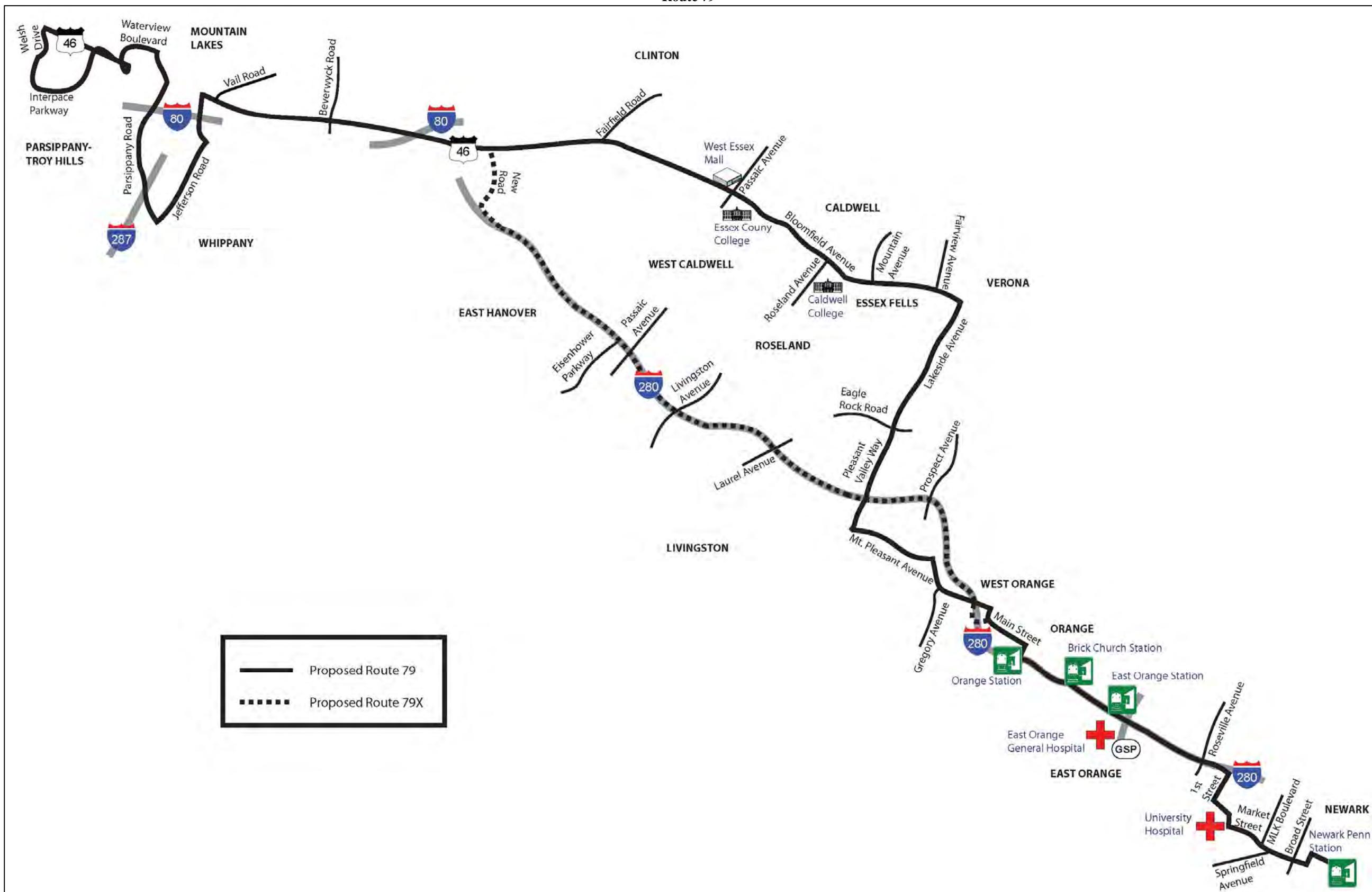
### ***Restructured Route 79 – Newark to Parsippany-Troy Hills***

- The downtown Newark routing of **Routes 79** will be as follows: inbound: exit I-280 via Exit 13, then 1st Street, West Market Street, Market Street, Mulberry Street, and Raymond Boulevard to Newark Penn Station; and outbound: routes will leave Penn Station, travel via Raymond Boulevard, Mulberry Street, Market Street, West Market Street, and 1<sup>st</sup> Street to I-280. This is the same routing as Routes 71, 73, 45 and 46.
- Between Newark Penn Station and the Erie Loop on-street stop, Routes 71, 73, 79, 45, and 46 will operate through downtown Newark to the I-280 entrance at 1<sup>st</sup> Street as described above, and will then travel via I-280 to exit 11B, Freeway Drive West, then Day Street and Main Street to serve the Erie Loop (on-street), from where these routes will follow the alignments described below. Inbound, from the Erie Loop (on-street) to Newark Penn Station, these routes will operate via Main Street, Day Street and Freeway Drive East to I-280.
- When the Orange Street Light Rail Station Transit Center is developed, Route 79 could potentially terminate there, requiring passengers to use the Newark Light Rail to finish their trips into Newark.
- From the Erie Loop, Route 79 will operate via Main Street, Mt. Pleasant Avenue, Pleasant Valley Way, Lakeside Avenue, Bloomfield Avenue, then US 46, Smith Road, Jefferson Road, Parsippany Road, US 202, Waterview Road, US 46, Cherry Hill Road, Interpace Parkway, and Walsh Drive before returning to US-46 for return service. Route 79 will operate on an hourly basis throughout the service day.
- One variation of the Route 79 will be the **Route 79X**. Route 79X will operate the same routing as Route 79 as far as the Erie Loop (outbound), then will travel via I-280 to New Road, then New Road to US 46, from where the route will follow the same alignment as base Route 79 to Parsippany. The route will follow the same alignment in the inbound (eastbound) direction. Route 79X will be a peak period only, bi-directional service.
- Route 79 and Route 79X would serve the Park & Ride on Waterview Boulevard near the I-287 and I-80 interchange. This would allow Route 79 and Route 79X to address the needs of both reverse commuters and traditional commuters into downtown Newark.
- The day exceptions operated Monday through Thursday on Route 79 would be maintained between the inner terminal and Parsippany (cost estimates, provided separately, do not include these day exceptions)
- In a later phase of implementation, service would be provided on Saturday.

**Route 29**



Route 79



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## Routes 65 & 820

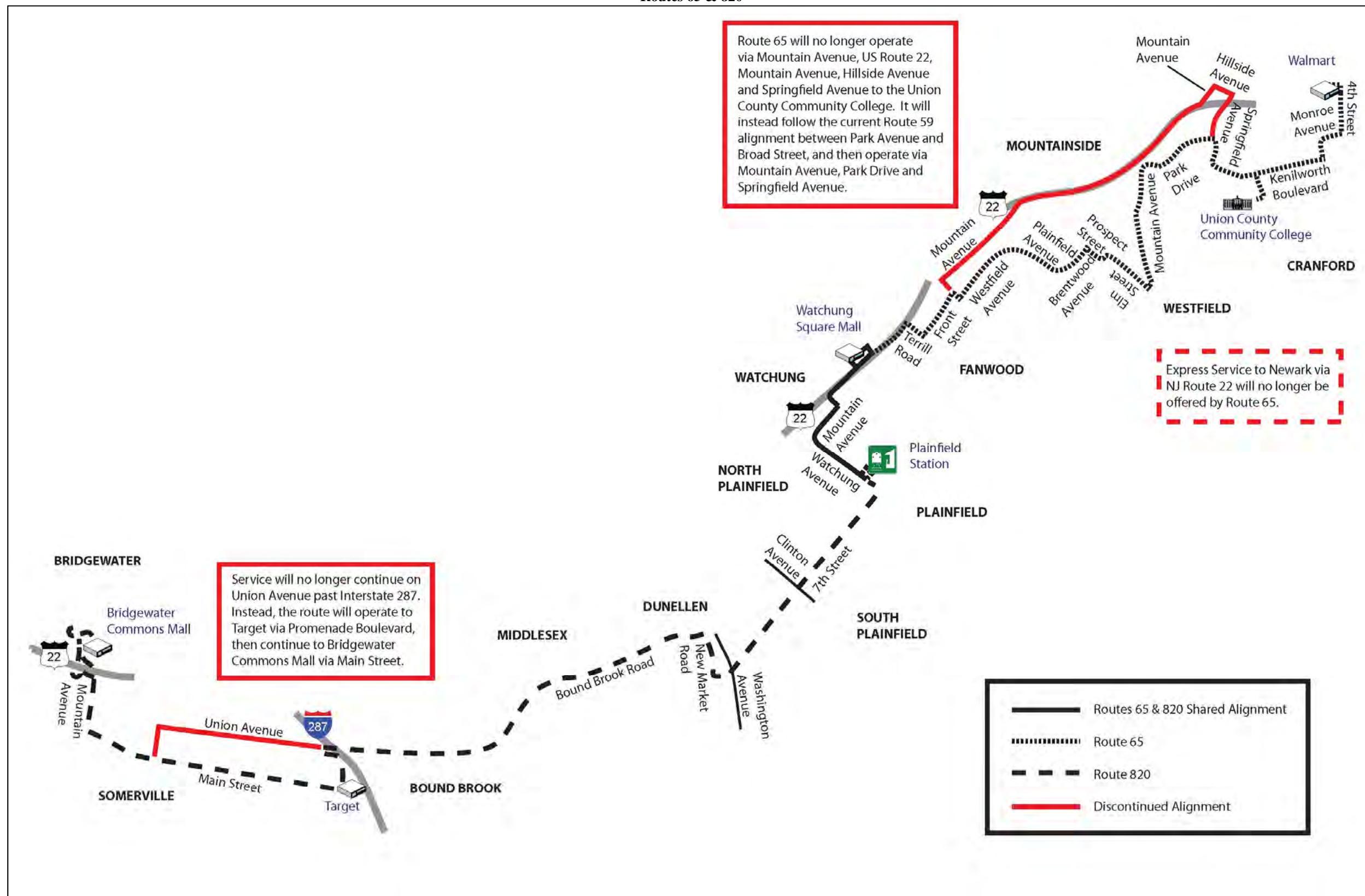
### ***Restructured Route 65 – Plainfield Railroad Station to Kenilworth-Wal-Mart***

- The proposed **Route 65** would begin at the Plainfield Railroad Station and travel 4<sup>th</sup> Street, Park Avenue and Somerset Street then Mountain Avenue, and North Drive where the vehicle would access U.S. Route 22 to operate to Watchung Square. Route 65 would enter Watchung Square via the western entrance, circulate through the property then return to U.S. Route 22 via the eastern entrance and continue operating northeast on Route 22 to Terrill Road, from where the route would operate on Front Street, Park Avenue, Westfield Avenue, Plainfield Avenue, Brightwood Avenue, Prospect Street, Newton Place and Elm Street to access Broad Street in Westfield. From Broad Street, the route would operate Mountainside via Mountain Avenue and then travel through Echo Lake Park on Park Avenue. The route would exit the park and operate southbound on Springfield Avenue to offer service to the Union County College, creating a new connection from the south to this campus. From the college, the route would travel north on Springfield Avenue, then Kenilworth Boulevard, 8<sup>th</sup> Street, Monroe Avenue, and 14<sup>th</sup> Street to the Wal-Mart along Route 22 where Route 65 would terminate.
- Permission would need to be acquired from the shopping center management to gain access to the property and layover.
- Westbound service would follow the same alignment in the opposite direction with the exception of downtown Plainfield where Route 65 would operate via Park Avenue, North Avenue, Watchung Avenue and 4<sup>th</sup> Street to the Plainfield Railroad Station where the route would terminate.

### ***New Route 820 – Bridgewater Commons to Plainfield/Watchung Square***

- The proposed **Route 820** would operate along its current alignment between Bridgewater Commons and Plainfield, with the exception of the bus remaining on East Main Street in Somerville to Promenade Boulevard, where the vehicle will serve Target. From Target, the bus will continue on Promenade Boulevard heading to Union Avenue, where it will follow the current alignment. From West 7<sup>th</sup> Street in Plainfield, the route would operate Park Avenue and Somerset Street then Mountain Avenue, and North Drive where the vehicle would access U.S. Route 22 to operate to Watchung Square. Route 820 would enter Watchung Square via the easternmost entrance, circulate through the property and terminate at the bus cutaway at the western end of the property.
- Permission would need to be acquired from Watchung Square management before service could enter or layover on the property.
- Westbound service would follow the same alignment in the opposite direction.
- Additionally, the Route 65/820 services should always operate in front of the Route 114 service so that patrons taking local trips will use the appropriate service (i.e., the Route 65 service).
- Also, all trips on Route 114 should serve as far west as Dunellen with only peak period trips extending to Somerville.
- Route 114 service should terminate at the Somerville Railroad Station, so the Route 114 should no longer operate to Bridgewater Commons.

**Routes 65 & 820**



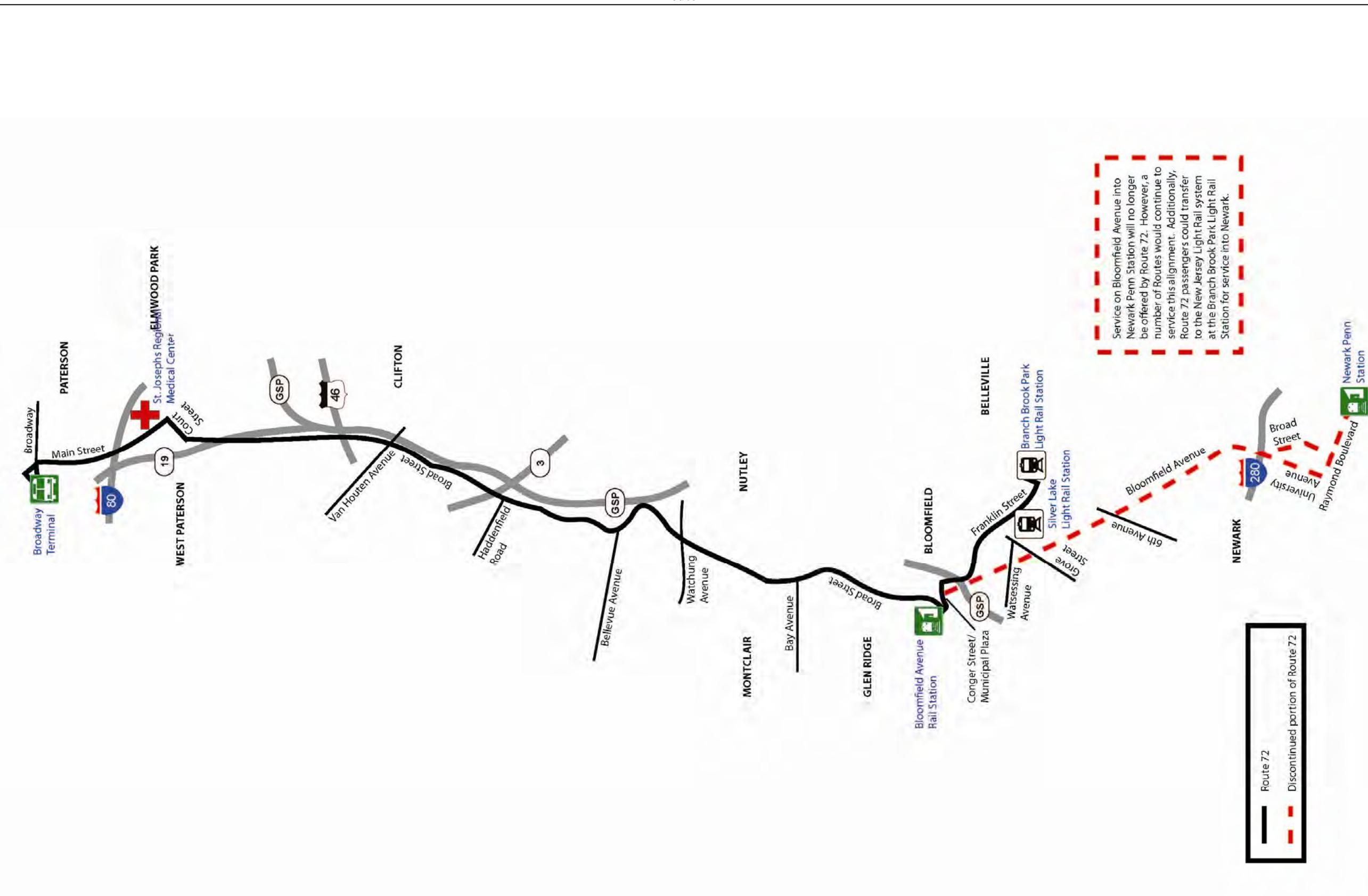
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## Route 72

### **Restructured Route 72 – Branch Brook Park Light Rail Station to Paterson-Broadway Terminal**

- The southern terminal of **Route 72** will be the Branch Brook Park Station of the Newark Light Rail system.
- The southbound route alignment will follow Broad Street, Glenwood Avenue, Conger Street, Municipal Plaza, Franklin Street, Franklin Avenue, Ropes Place and North 5<sup>th</sup> Street to the Branch Brook Park Light Rail Station.
- Northbound trips will leave the Branch Brook Park Light Rail Station via North 5<sup>th</sup> Street and Anthony Street to return to Franklin Avenue and then follow the same route alignment in the opposite direction. This alignment will also serve the Bloomfield NJ TRANSIT commuter rail station.
- The southbound stop for the Bloomfield NJ TRANSIT commuter rail station will be the current bus stop on Conger at Glenwood Avenue.
- The northbound stop for the commuter rail station will be a new bus stop on Glenwood Avenue north of Conger Street.
- There is currently no legal parking on the south side of Glenwood Avenue for approximately 80' after the intersection with Conger Street.

Route 72



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## Routes 812 & 816

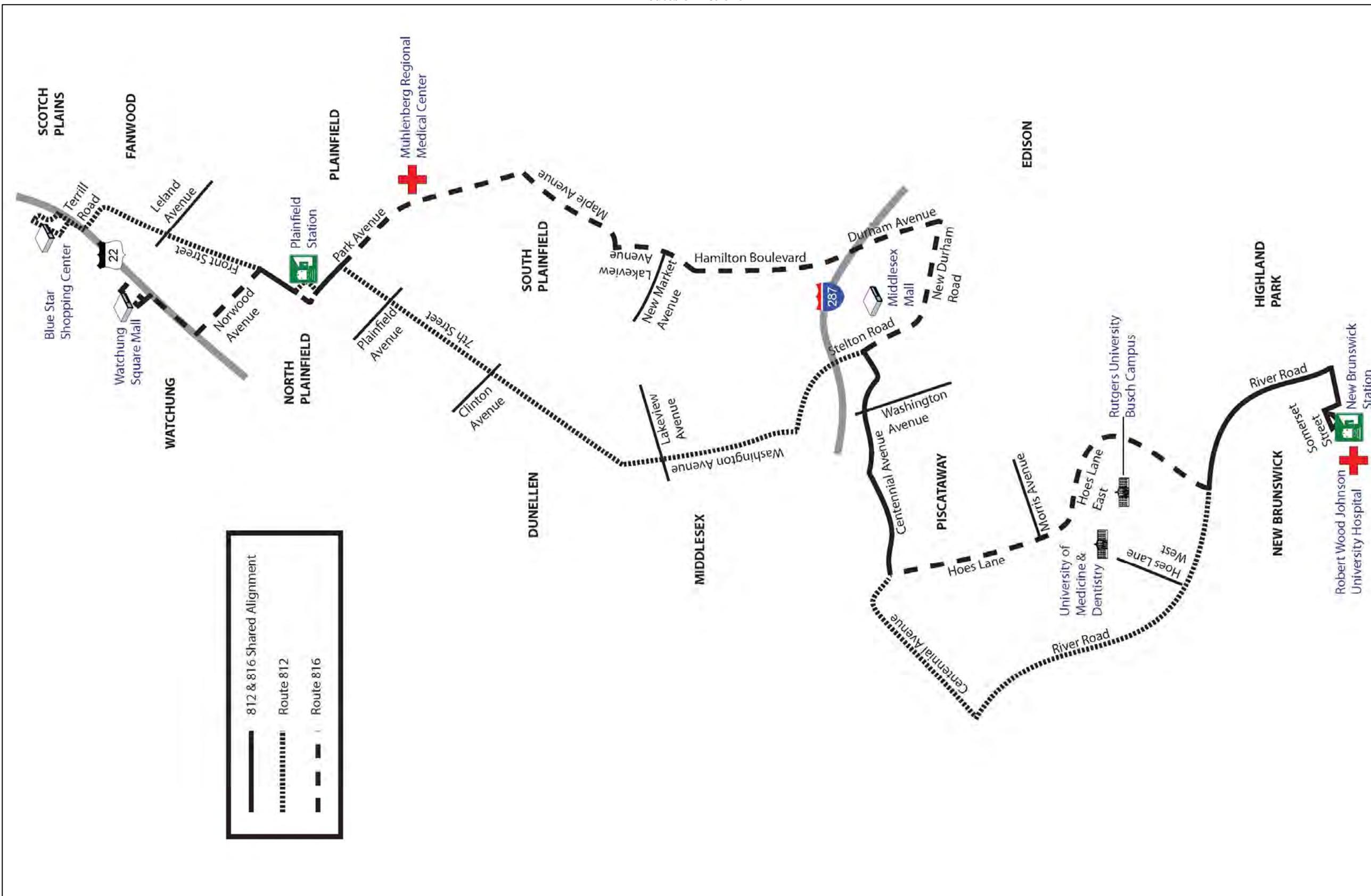
### **New Route 812 – Rutgers University/New Brunswick Station to Scotch Plains-Blue Star Shopping Center**

- The proposed Route 812 route would offer service between Rutgers University and the New Brunswick Station, and the Blue Star Shopping Center in Scotch Plains.
- The route would begin at Rutgers University and the New Brunswick Railroad Station and operate via Somerset Street to George Street, where the vehicle would turn right, followed by a left onto State Route 27/Albany Street and another left onto River Road. The vehicle would operate via River Road to Centennial Avenue, Knightsbridge Road, Behmer Road, Randolphville Road and Corporate Place North to Centennial Avenue from where it would operate to the Middlesex Mall. The vehicle would then operate via Shelton Road to South Washington Avenue and then to West 7<sup>th</sup> Street, where it would turn right, offering service through Plainfield. The vehicle would turn left onto Park Avenue and right onto North Avenue, where it would serve the Plainfield Station. The route would then operate to the Blue Star Shopping Center via East Front Street, Terrill Road (where it would offer service to the Sears) and State Route 22.
- This route should be operated with 30 foot vehicles.

### **New Route 816 – New Brunswick to Watchung-Watchung Square**

- The proposed new Route 816 would also operate between New Brunswick and Watchung.
- The Route 809 would begin its service at Rutgers University and the New Brunswick Station and operate through Piscataway via Somerset Street, George Street, Albany Street, River Road and Hoes Lane. Route 816 would also travel Sidney Road to the Piscataway Municipal Complex and then return to Hoes Lane, traveling Hoes Lane to Centennial Avenue. Upon reaching Centennial Avenue, the vehicle would turn right and operate to the Middlesex Mall. From the Mall, the service would operate via Shelton Road to New Durham Road where it will turn left. The vehicle would then turn left onto Durham Avenue followed by a right onto Hamilton Boulevard to South Plainfield. The vehicle would then turn right onto Maple Street followed by a left onto Park Avenue for service through Plainfield. The vehicle would remain on Park Avenue until East Front Street, where it will turn right, followed by a left onto Northwood Drive to enter Route 22. The vehicle will then operate to, and layover at, Watchung Square.
- This route should be operated with 30 foot vehicles.

Routes 812 & 816



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## Routes 47X & 48X

- Between Newark Penn Station and I-280, **Route 47X** and **Route 48X** would operate through downtown Newark on a limited stop basis. The downtown Newark alignment of each of these routes would be as follows: inbound trips would exit I-280 via Exit 13, then travel via 1<sup>st</sup> Street, Orange Street, Martin Luther King Boulevard, University Avenue and Raymond Boulevard to Newark Penn Station. The routes would operate on a limited stop basis in downtown Newark and would only make the following inbound stops:
  - Orange Street Light Rail Station
  - Orange Street at University Avenue (Broad Street Station)
  - University Avenue at Central Avenue
  - University Avenue at Warren Street
  - Raymond Boulevard at Broad Street
  - Newark Penn Station
- The outbound routing would leave Newark Penn Station, travel via Raymond Boulevard, Park Place, Central Avenue, Martin Luther King Boulevard, and Orange Street to I-280. Along this outbound routing, the routes would only make the following stops:
  - Newark Penn Station
  - Raymond Boulevard at Broad Street
  - Central Avenue at Broad Street
  - Central Avenue at University/Martin Luther King Boulevard
  - Martin Luther King Boulevard at Orange Street
  - Orange Street Light Rail Station
- Routes 47 and 48 could be operated with cruiser type vehicles.

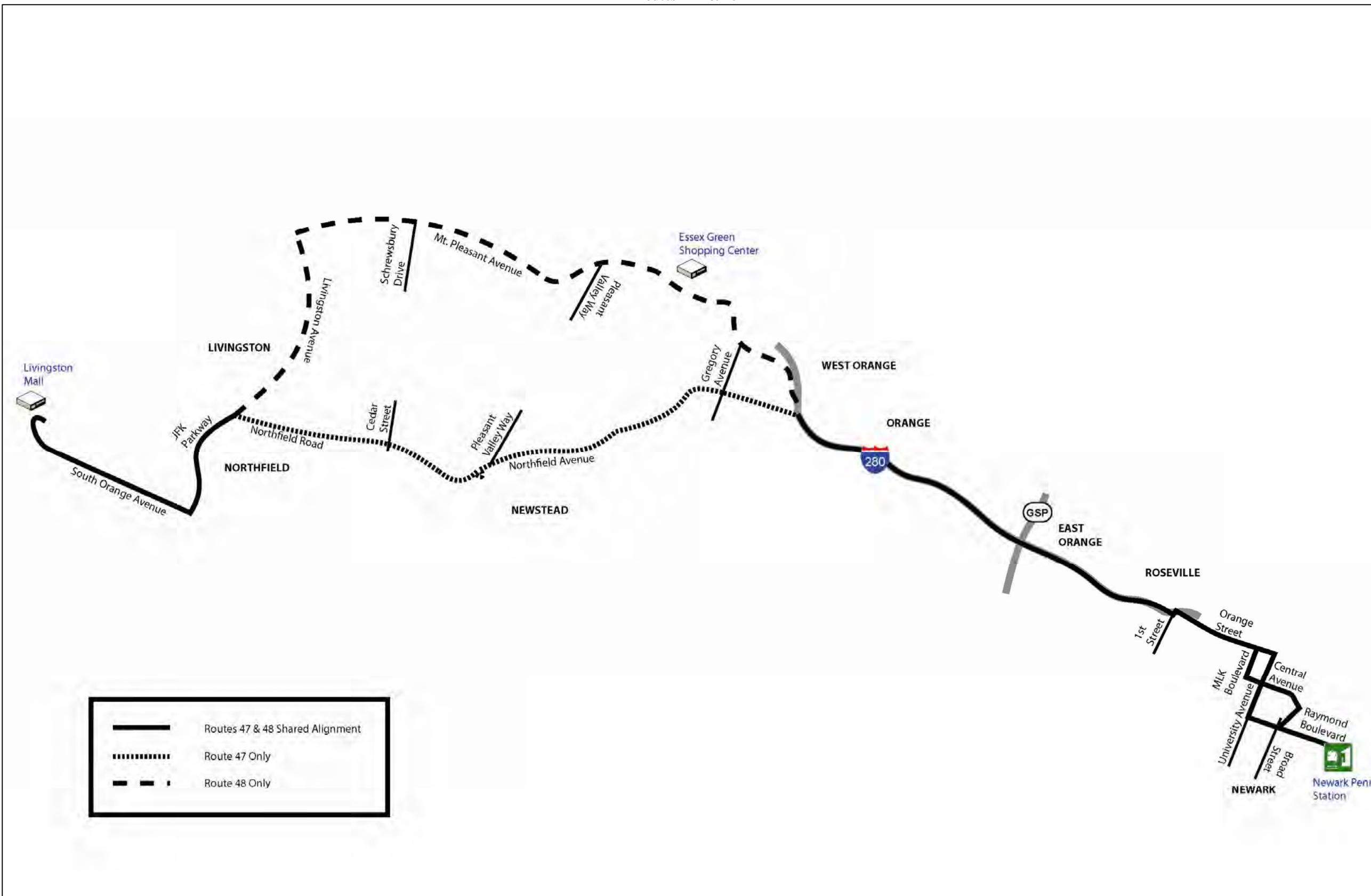
***New Route 47X – Newark-Penn Station to Livingston Mall via Mt. Pleasant Avenue***

- **Route 47X** would be implemented to serve the Newark commuter market from the central Essex/ southern Livingston area. The route would begin at the Livingston Mall Park & Ride, then travel via South Orange Avenue, JFK Parkway, and Northfield Road to I-280 serving the South Mountain Park & Ride, then I-280 to Exit 14. Outside of downtown Newark, this route would operate local west of the South Mountain Park & Ride. This route would operate as a peak period, peak direction route only (i.e., eastbound in the AM peak and westbound in the PM peak).

***New Route 48X – Newark-Penn Station to Livingston Mall via Northfield Avenue***

- **Route 48X** would be implemented to serve the Newark commuter market from the central Essex/northern Livingston area. The route would begin at the Livingston Mall Park & Ride, then travel via JFK Parkway and Livingston Avenue, then Route 10 (Mount Pleasant Avenue) to I-280 (via Brennan Drive); then I-280 to Exit 14. Outside of downtown Newark, this route would operate local west of I-280. This route would operate as a peak period, peak direction route only (i.e., eastbound in the AM peak and westbound in the PM peak).

Routes 47X & 48X



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## Coach USA Services

### **GO Bus 24 & Route 24**

#### ***GO Bus 24 – Frelinghuysen Corridor BRT***

- Coach USA's Routes 24A and 24B will both operate as **GO BUS 24** while operating on Frelinghuysen Avenue, Broad Street and Central Avenue, and will follow similar stop increments as all of the GO Bus services.

#### ***Restructured COACH USA Route 24 – Elizabeth to Newark***

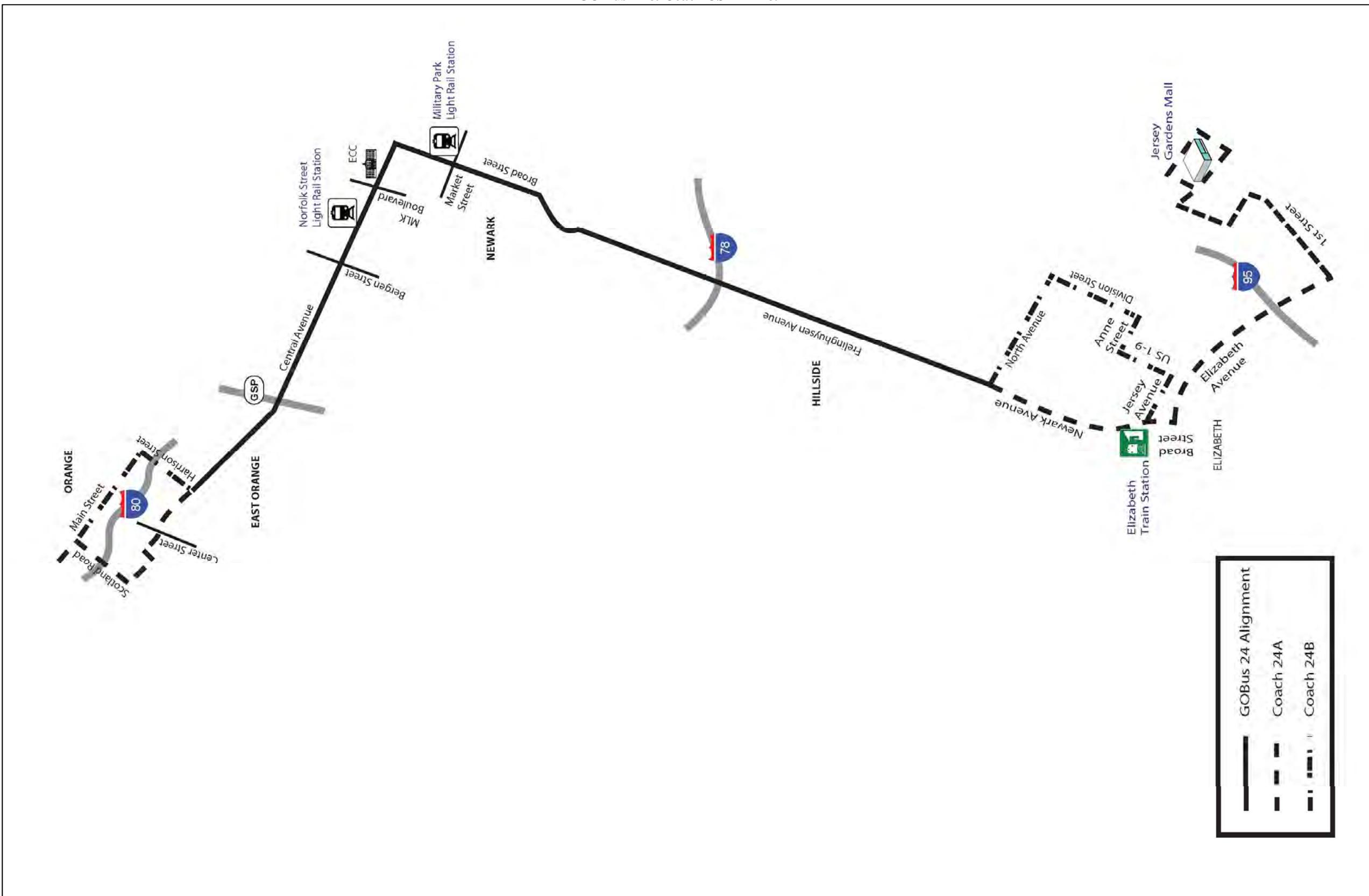
- Coach USA's **Route 24A** will no longer serve the Route 24B alignment along East Jersey Street and 3<sup>rd</sup> Street. However, Route 24A will continue to operate and will instead be realigned to serve Elizabeth Avenue, 1<sup>st</sup> Street and Trumbull Street bi-directionally.
- **Route 24B** (which will continue to operate its current frequency of service) will travel via Frelinghuysen Avenue, Newark Avenue, North Avenue, Dowd Avenue, Division Street, Anna Street, Henry Street, Bond Street, U.S. Routes 1 and 9, East Jersey Street and Broad Street to the Elizabeth Rail Station on NJ TRANSIT's Northeast Corridor Line. This route re-alignment replaces a portion of the Route 62 which is proposed to be discontinued.
- Both variations of Route 24 will continue to serve the intersection of Broad and Market Streets in downtown Newark.

### **Route 12**

#### ***Route 12 – Proposed for elimination***

- This route would be eliminated.

GO Bus 24 & Coach USA 24A & 24B



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## GO Bus 44

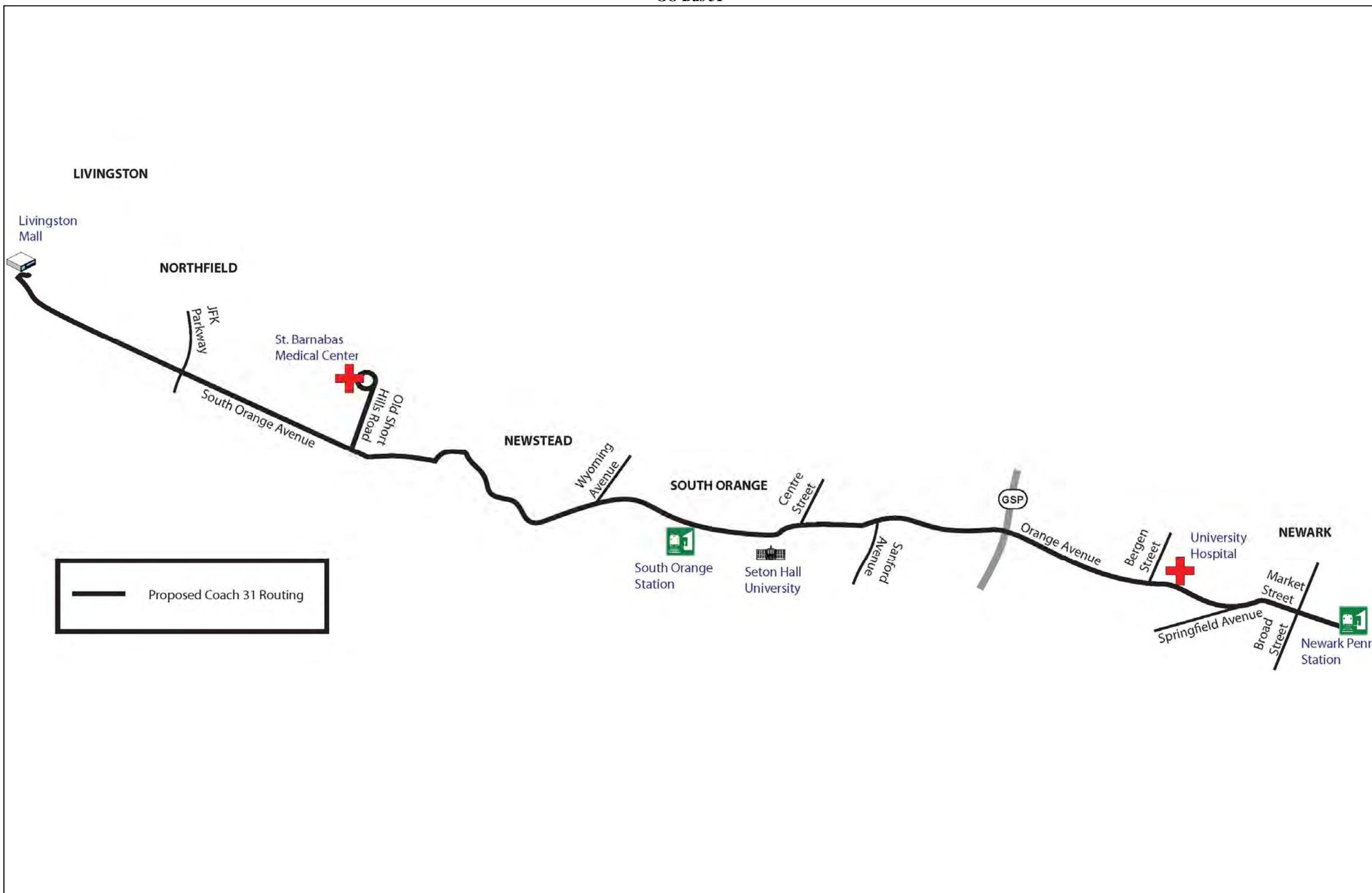
### **New GO Bus 44 – Central Avenue Corridor BRT**

- Consideration should be given to create a GO Bus corridor on Central Avenue, with either the Coach USA Route 24 or Route 44 offering this limited stop type service.

### **New GO Bus 31 – South Orange Avenue Corridor BRT**

- The Coach USA Route 31 will continue to follow its current alignment; however, the route will not offer service to the Maplewood Loop as it does today. The service will now operate on a limited stop basis from the Livingston Mall into Newark. The suggested limited stops are:
  - Livingston Mall
  - South Orange Avenue at White Oak Ridge Road
  - South Orange Avenue at Old Short Hills Road/St. Barnabas Hospital
  - South Orange Avenue at Wyoming Avenue
  - South Orange Avenue at Valley Street/Scotland Road (South Orange Station)
  - South Orange Avenue at Ward Place/University Court (Seton Hall University)
  - South Orange Avenue at Dover Street
  - South Orange Avenue at Stuyvesant Avenue
  - South Orange Avenue at West End Avenue
  - South Orange Avenue at Grove Street
  - South Orange Avenue at 10<sup>th</sup>/11<sup>th</sup> Street
  - South Orange Avenue at Irvine Turner Boulevard
  - Springfield Avenue at Martin Luther King Jr. Boulevard
  - Market Street at Washington Street
  - Market Street at Broad Street
  - Market Street at Mulberry Street
  - Newark Penn Station

**GO Bus 31**



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## **New York Based Services**

### **Routes 37, 107 & 107X**

#### ***Restructured Route 37 – Ivy Hill to Bergenline Avenue HBLR Station***

See description of service on page 243 and map on page 244.

#### ***Restructured Route 107 – Ivy Hill Loop to PABT via Irvington Bus Terminal***

See description of service on page 243 and map on page 244.

#### ***Route 107X – Ivy Hill to PABT Express***

See page 243 for description of service.

### **Route 108**

#### ***Restructured Route 108 – Newark to PABT via Union City***

- **Route 108** will connect downtown Newark with the Port Authority Bus Terminal in New York City via Union City and the Ironbound.
- Three inbound AM peak trips and three outbound PM peak trips will be designated as 108X.
- All Saturday, Sunday and Holiday trips will serve Union City.
- As the Orange Street Transit Center is completed, Route 108 will be extended there. At that time, Route 108X trips will serve the Colonnade with all other trips serving the Orange Street Transit Center.

### **Route 101**

#### ***New Route 101 – South Orange Rail Station to PABT***

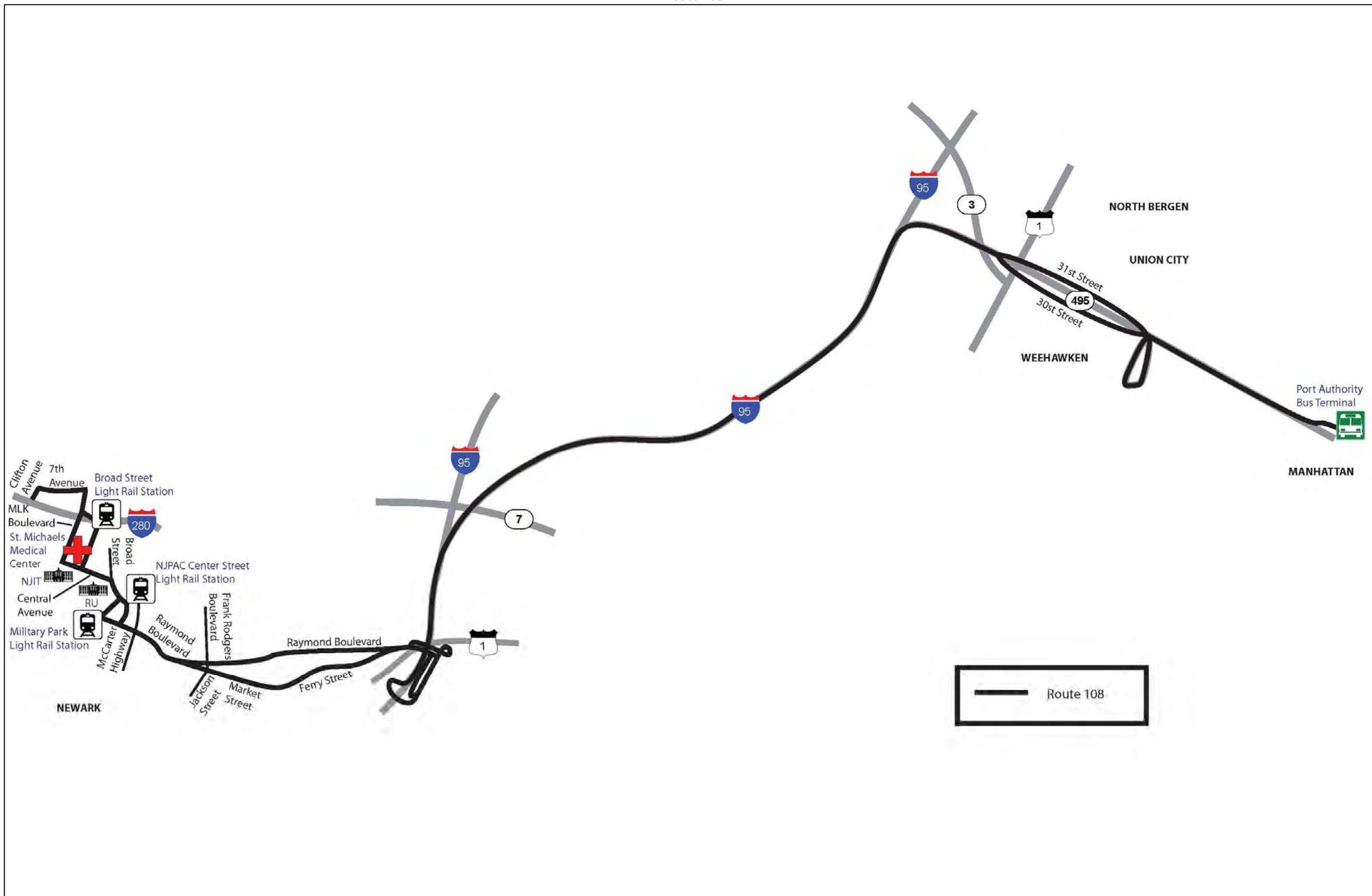
- The newly designated **Route 101** would begin at the South Orange Rail Station on NJ TRANSIT's Morris and Essex Lines. From there, it would travel via 3<sup>rd</sup> Street, Prospect Street, South Orange Street, Valley Street, Vaux Hall Road, Springfield Avenue, serve the Irvington Bus Terminal, then Springfield Avenue and Eastern Parkway to the Garden State Parkway, then Interstate 280 and the New Jersey Turnpike to the Port Authority Bus Terminal in New York City, following the current express alignment of Route 107. Westbound trips would leave the Port Authority Bus Terminal and travel via the New Jersey Turnpike, Interstate 280, and the Garden State Parkway, exit at Myrtle Avenue, then travel via Oraton Avenue, Western Parkway, North Maple Avenue, Springfield Avenue, serve the Irvington Bus Terminal, then Springfield Avenue, Vaux Hall Road, Valley Street, 3<sup>rd</sup> Street, Prospect Street, South Orange Avenue, Valley Street, 2<sup>nd</sup> Street, and Sloan Street to the South Orange Rail Station where the route would terminate. Another possibility for this route would be to begin at the Ivy Hill Loop and operate westbound to South Orange where it would assume the routing described above.
- In future phases, Route 101 could serve the Livingston Mall Park& Ride via South Orange Avenue, or extend to Florham Park which would allow Route 70 to terminate all trips at the Livingston Mall. This proposal would provide new reverse commuter service

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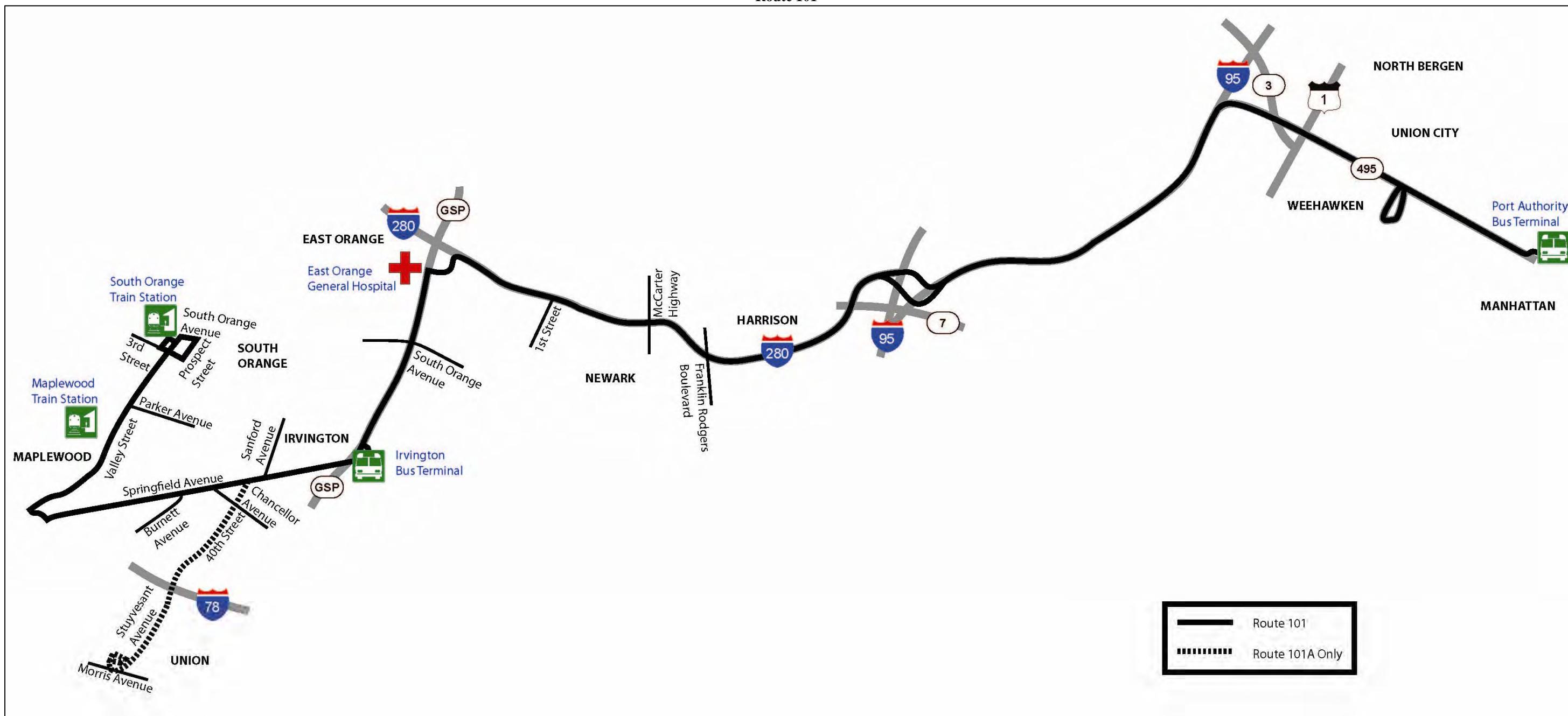
between Irvington, Florham Park and the Livingston Mall, as well as additional commuter service from the Livingston Mall Park & Ride lot to New York City.

- These proposals eliminate the unique weekend service where Route 107 trips serve South Orange via Ivy Hill, thus reducing overall travel times.
- One variation would be **Route 101A** which would provide service between downtown Union and the Port Authority Bus Terminal in New York. Route 101A would begin on Stowe Street in downtown Union and travel via Stowe Street, Emerson Avenue, Pine Avenue, Morris Avenue, Stuyvesant Avenue, 40<sup>th</sup> Street, Springfield Avenue, serve the Irvington Bus Terminal, Springfield Avenue, Eastern Parkway, the Garden State Parkway, Interstate 280, the New Jersey Turnpike, Route 495, and the Lincoln Tunnel and into the Port Authority Bus Terminal. Outbound trips would begin at the Port Authority Bus Terminal and follow the same alignment to the Garden State Parkway, from which, Route 101A would exit at Myrtle Avenue, then travel via Oraton Avenue, Western Parkway, Maple Avenue, and Springfield Avenue to the Irvington Bus Terminal, from where the route would follow the same alignment as inbound trips to the center of Union.

**Route 108**



Route 101



## Appendix N – Cost Comparison of Actual NJ Transit Expenses vs. GNBSS Proposed Expenses

| GF<br>Route #                          | Now Proposed<br>as NJ Transit<br>Route # | GNBSS Proposed Expenses |          |        |         | Adjusted for DH<br>and Annual Cost | Annual Cost<br>Adjusted<br>Pay/Platform |  |  |
|--|--|-------------------------|----------|--------|---------|------------------------------------|---|--|--|
|  |  | Vehicle Hours           |          |        |         |                                    |   |  |  |
|  |  | Weekday                 | Saturday | Sunday | Annual  |                                    |   |  |  |
| <b>Downtown Newark - Airport/Ports</b> |  |                         |          |        |         |                                    |   |  |  |
| 1                                      | 1  | 299                     | 169      | 111    | 91,318  | \$7,315,445                        | \$8,046,989                             |  |  |
| 3                                      | 3  | 106                     | 67       | 48     | 33,171  | \$2,657,289                        | \$2,923,018                             |  |  |
| 11                                     | 11                                       | 104                     | 98       | 58     | 34,880  | \$2,794,237                        | \$3,073,660                             |  |  |
| 13                                     | 13                                       | 156                     | 108      | 92     | 50,784  | \$4,068,326                        | \$4,475,159                             |  |  |
| 15                                     | 15                                       | 149                     | 95       | 92     | 48,260  | \$3,866,069                        | \$4,252,675                             |  |  |
| 16                                     | 16                                       | 67                      | 53       | 33     | 21,599  | \$1,730,256                        | \$1,903,281                             |  |  |
| A5                                     | 18                                       | 99                      | 99       | 99     | 36,135  | \$2,894,775                        | \$3,184,252                             |  |  |
| 25                                     | 25                                       | 368                     | 212      | 212    | 117,224 | \$9,390,795                        | \$10,329,874                            |  |  |
| 27                                     | 27                                       | 218                     | 179      | 125    | 72,199  | \$5,783,842                        | \$6,362,226                             |  |  |
| 28                                     | 28                                       | 107                     | 84       | 56     | 34,936  | \$2,798,703                        | \$3,078,573                             |  |  |
| 29                                     | 29                                       | 72                      | 60       | 51     | 24,282  | \$1,945,191                        | \$2,139,710                             |  |  |
| 34                                     | 34                                       | 133                     | 75       | 52     | 40,776  | \$3,266,565                        | \$3,593,222                             |  |  |
| 35                                     | 35                                       | 106                     | 81       | 67     | 35,086  | \$2,810,739                        | \$3,091,813                             |  |  |
| 36                                     | 36                                       | 251                     | 176      | 170    | 83,017  | \$6,650,492                        | \$7,315,541                             |  |  |
| 37                                     | 37                                       | 156                     | 140      | 140    | 55,053  | \$4,410,256                        | \$4,851,281                             |  |  |
| 38                                     | 38                                       | 59                      | 54       | 54     | 20,985  | \$1,681,108                        | \$1,849,219                             |  |  |
| 40                                     | 40                                       | 160                     | 124      | 60     | 50,728  | \$4,063,820                        | \$4,470,202                             |  |  |
| 41                                     | 41                                       | 148                     | 113      | 99     | 49,176  | \$3,939,449                        | \$4,333,394                             |  |  |
| 43                                     | 43                                       | 38                      | 38       | 22     | 12,942  | \$1,036,784                        | \$1,140,462                             |  |  |
| 70                                     | 70                                       | 167                     | 121      | 113    | 55,405  | \$4,438,495                        | \$4,882,344                             |  |  |
| 72                                     | 72                                       | 64                      | 35       | 34     | 20,112  | \$1,611,172                        | \$1,772,290                             |  |  |
| 76                                     | 76                                       | 85                      | 40       | 33     | 25,614  | \$2,051,938                        | \$2,257,131                             |  |  |
| 78                                     | 78                                       | 0                       | 0        | 0      | 0       | \$0                                | \$0                                     |  |  |
| 101                                    | 101                                      | 168                     | 66       | 56     | 49,491  | \$3,964,724                        | \$4,361,196                             |  |  |
| 107                                    | 107                                      | 117                     | 111      | 56     | 38,673  | \$3,098,054                        | \$3,407,859                             |  |  |
| 108                                    | 108                                      | 79                      | 37       | 37     | 24,160  | \$1,935,458                        | \$2,129,003                             |  |  |
| GO 1                                   | GO1                                      | 30                      | 0        | 0      | 7,650   | \$612,842                          | \$674,126                               |  |  |
| GO 25                                  | GO25                                     | 15                      | 0        | 0      | 3,825   | \$306,421                          | \$337,063                               |  |  |
| GO 28                                  | GO28                                     | 296                     | 271      | 271    | 105,290 | \$8,434,782                        | \$9,278,260                             |  |  |
| SNCT-1                                 | 19                                       | 50                      | 40       | 40     | 17,150  | \$1,373,887                        | \$1,511,275                             |  |  |
| <b>Orange-Western Essex</b>            |  |                         |          |        |         |                                    |   |  |  |
| 21                                     | 21                                       | 0                       | 0        | 0      | 0       | 0                                  | 0                                       |  |  |
| WE-1                                   | 45                                       | 94                      | 72       | 68     | 31,658  | \$2,536,122                        | \$2,789,735                             |  |  |
| WE-3                                   | 46                                       | 53                      | 45       | 36     | 17,943  | \$1,437,414                        | \$1,581,155                             |  |  |
| 71                                     | 71                                       | 94                      | 72       | 51     | 30,672  | \$2,457,134                        | \$2,702,847                             |  |  |
| WE-2                                   | 73                                       | 104                     | 93       | 84     | 36,101  | \$2,892,011                        | \$3,181,212                             |  |  |
| 79                                     | 79                                       | 108                     | 60       | 42     | 33,096  | \$2,651,321                        | \$2,916,453                             |  |  |
| 95                                     | 95                                       | 63                      | 42       | 33     | 20,163  | \$1,615,258                        | \$1,776,784                             |  |  |
| 98                                     | 98                                       | 84                      | 56       | 44     | 26,884  | \$2,153,677                        | \$2,369,045                             |  |  |
| LCX-1                                  | 47X                                      | 25                      | 0        | 0      | 6,375   | \$510,701                          | \$561,771                               |  |  |
| LCX-2                                  | 48X                                      | 25                      | 0        | 0      | 6,375   | \$510,701                          | \$561,771                               |  |  |
| <b>Union County</b>                    |  |                         |          |        |         |                                    |   |  |  |
| UC1                                    | 49                                       | 50                      | 36       | 32     | 16,478  | \$1,320,053                        | \$1,452,058                             |  |  |
| 52                                     | 52                                       | 96                      | 87       | 42     | 31,313  | \$2,508,444                        | \$2,759,289                             |  |  |
| E-Xtown                                | 53                                       | 50                      | 36       | 32     | 16,478  | \$1,320,053                        | \$1,452,058                             |  |  |
| UC2                                    | 54                                       | 75                      | 54       | 48     | 24,717  | \$1,980,079                        | \$2,178,087                             |  |  |
| 55                                     | 55                                       | 75                      | 83       | 32     | 25,271  | \$2,024,460                        | \$2,226,906                             |  |  |
| 56                                     | 56                                       | 176                     | 72       | 64     | 52,209  | \$4,182,423                        | \$4,600,665                             |  |  |
| 57                                     | 57                                       | 40                      | 36       | 32     | 13,928  | \$1,115,772                        | \$1,227,349                             |  |  |
| 58                                     | 58                                       | 45                      | 36       | 32     | 15,203  | \$1,217,912                        | \$1,339,704                             |  |  |
| 59                                     | 59                                       | 150                     | 164      | 75     | 50,946  | \$4,081,244                        | \$4,489,368                             |  |  |
| 62                                     | 62                                       | 331                     | 318      | 218    | 113,556 | \$9,096,971                        | \$10,006,668                            |  |  |
| 65                                     | 65                                       | 100                     | 72       | 64     | 32,956  | \$2,640,105                        | \$2,904,116                             |  |  |
| 66                                     | 66                                       | 60                      | 48       | 48     | 20,580  | \$1,648,664                        | \$1,813,530                             |  |  |
| 69                                     | 69                                       | 109                     | 48       | 48     | 32,948  | \$2,639,424                        | \$2,903,367                             |  |  |
| 112                                    | 112                                      | 91                      | 72       | 64     | 30,661  | \$2,456,253                        | \$2,701,878                             |  |  |
| MX-1                                   | 806                                      | 75                      | 54       | 48     | 24,717  | \$1,980,079                        | \$2,178,087                             |  |  |
| MX-2                                   | 807                                      | 40                      | 36       | 32     | 13,928  | \$1,115,772                        | \$1,227,349                             |  |  |
| MX-3                                   | 808                                      | 52                      | 36       | 32     | 16,861  | \$1,350,695                        | \$1,485,764                             |  |  |
| MX-4                                   | 809                                      | 50                      | 36       | 32     | 16,478  | \$1,320,053                        | \$1,452,058                             |  |  |
| 807                                    | 812                                      | 75                      | 54       | 48     | 24,717  | \$1,980,079                        | \$2,178,087                             |  |  |
| 809                                    | 816                                      | 75                      | 54       | 48     | 24,717  | \$1,980,079                        | \$2,178,087                             |  |  |
| UCB1                                   | GO51                                     | 72                      | 53       | 32     | 22,946  | \$1,838,204                        | \$2,022,024                             |  |  |
| GO 59                                  | GO59                                     | 133                     | 134      | 48     | 43,641  | \$3,496,081                        | \$3,845,689                             |  |  |
| <b>Crosstown</b>                       |  |                         |          |        |         |                                    |   |  |  |
| 5                                      | 5  | 38                      | 28       | 17     | 12,106  | \$969,812                          | \$1,066,793                             |  |  |
| 50                                     | 90                                       | 71                      | 58       | 32     | 22,977  | \$1,840,687                        | \$2,024,756                             |  |  |
| 90                                     | 90                                       | 120                     | 77       | 70     | 38,664  | \$3,097,373                        | \$3,407,110                             |  |  |
| 91                                     | 91                                       | 53                      | 46       | 32     | 17,737  | \$1,420,911                        | \$1,563,002                             |  |  |
| 92                                     | 92                                       | 126                     | 90       | 57     | 40,116  | \$3,213,693                        | \$3,535,062                             |  |  |
| 94                                     | 94                                       | 277                     | 168      | 102    | 85,287  | \$6,832,342                        | \$7,515,576                             |  |  |
| 96                                     | 96                                       | 57                      | 36       | 32     | 18,263  | \$1,463,049                        | \$1,609,354                             |  |  |
| 97                                     | 97                                       | 0                       | 0        | 0      | 0       | \$0                                | \$0                                     |  |  |
| 99                                     | 99                                       | 158                     | 84       | 79     | 49,113  | \$3,934,402                        | \$4,327,843                             |  |  |

**NJ Transit FY10 Actual Expenses**

| <b>NJT Route</b>                      | <b>FY2010 YTD Expenses</b> | <b>FY2010 YTD Hours</b> | <b>FY2010 Peak Buses</b> |
|---------------------------------------|----------------------------|-------------------------|--------------------------|
| 1                                     | \$11,461,732.00            | 102,108                 | 29                       |
| 5                                     | \$1,909,974.00             | 17,868                  | 5                        |
| 11-28-29-79                           | \$12,762,369.00            | 120,157                 | 39                       |
| 13                                    | \$10,580,050.00            | 93,002                  | 24                       |
| 21                                    | \$6,886,216.00             | 65,336                  | 16                       |
| 25                                    | \$9,486,410.00             | 84,297                  | 23                       |
| 250 (GO25)                            | \$626,390.00               | 5,016                   | 4                        |
| 258 (GO28)                            | \$4,883,854.00             | 46,511                  | 13                       |
| 26                                    | \$1,405,879.00             | 12,419                  | 5                        |
| 27                                    | \$8,652,030.00             | 80,683                  | 21                       |
| 30                                    | \$2,750,093.00             | 23,669                  | 6                        |
| 34                                    | \$7,127,180.00             | 67,256                  | 20                       |
| 37                                    | \$2,065,518.00             | 18,605                  | 5                        |
| 39                                    | \$5,636,308.00             | 49,972                  | 14                       |
| 40                                    | \$3,279,881.00             | 28,078                  | 8                        |
| 41                                    | \$2,905,056.00             | 27,579                  | 10                       |
| 42                                    | \$338,828.00               | 2,841                   | 2                        |
| 43                                    | \$288,908.00               | 2,632                   | 1                        |
| 52                                    | \$1,371,796.00             | 12,269                  | 4                        |
| 56-57                                 | \$2,034,690.00             | 18,688                  | 6                        |
| 58                                    | \$1,502,635.00             | 13,851                  | 4                        |
| 59                                    | \$5,865,162.00             | 54,361                  | 14                       |
| 62                                    | \$9,863,037.00             | 91,556                  | 16                       |
| 65-66                                 | \$4,931,380.00             | 45,165                  | 16                       |
| 70                                    | \$6,828,796.00             | 61,048                  | 17                       |
| 71                                    | \$3,923,550.00             | 36,853                  | 13                       |
| 72                                    | \$3,570,856.00             | 32,447                  | 9                        |
| 73                                    | \$5,261,116.00             | 49,209                  | 17                       |
| 76                                    | \$5,540,134.00             | 46,731                  | 18                       |
| 78                                    | \$1,234,709.00             | 9,782                   | 6                        |
| 90                                    | \$2,512,858.00             | 22,707                  | 6                        |
| 92-93                                 | \$2,924,919.00             | 28,250                  | 7                        |
| 94                                    | \$9,574,424.00             | 91,773                  | 27                       |
| 96                                    | \$972,550.00               | 9,123                   | 4                        |
| 97                                    | \$495,282.00               | 4,645                   | 2                        |
| 99                                    | \$4,833,958.00             | 41,945                  | 12                       |
| 107                                   | \$6,339,412.00             | 54,446                  | 17                       |
| 108                                   | \$2,276,193.00             | 19,488                  | 5                        |
| 112                                   | \$3,712,322.00             | 33,148                  | 10                       |
| <b>Break Outs for Combined Routes</b> |                            |                         |                          |
| 11                                    | \$3,822,080.00             | 35,982                  | 12                       |
| 28                                    | \$3,059,348.00             | 28,982                  | 8                        |
| 29                                    | \$4,762,888.00             | 45,044                  | 13                       |
| 79                                    | \$1,118,053.00             | 10,149                  | 6                        |
| 56                                    | \$1,299,104.00             | 11,932                  | 4                        |
| 57                                    | \$735,586.00               | 6,756                   | 2                        |
| 65                                    | \$1,148,468.00             | 10,374                  | 5                        |
| 66                                    | \$3,782,912.00             | 34,791                  | 11                       |
| 92                                    | \$2,291,467.00             | 22,234                  | 5                        |
| 93                                    | \$633,452.00               | 6,016                   | 2                        |