



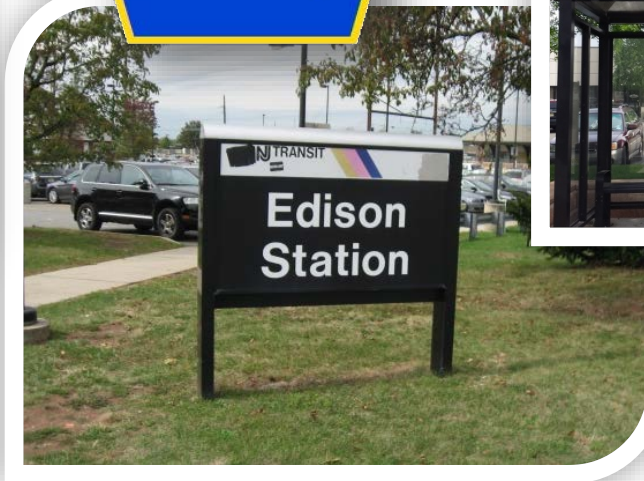
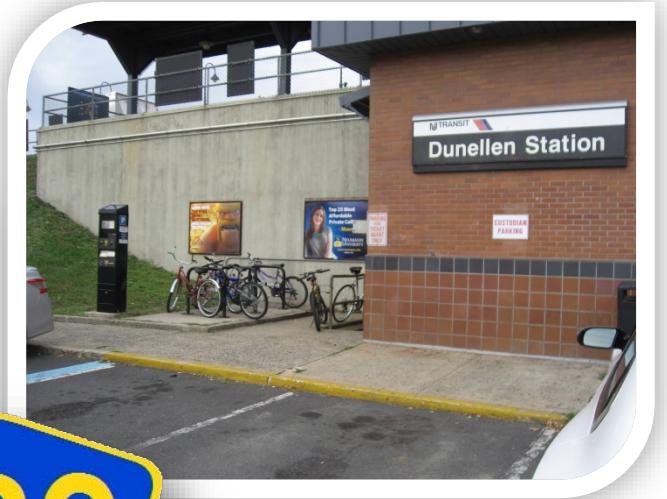
# ROUTE 529 CORRIDOR STUDY

## February 2019

Prepared by:  
Middlesex County Department of Infrastructure Management  
Office of Planning  
Division of Transportation







# Middlesex County Route 529 Corridor Study

February 2019



**Prepared by:**  
Middlesex County  
Department of Infrastructure Management  
Office of Planning  
Division of Transportation  
September 2016, final edits to February 2019





# Middlesex County Route 529 Corridor Study: Improving Transit Services and Bicycle – Pedestrian Access in the County Route 529 Corridor

**February 2019**

**Under the Direction of:**

**Middlesex County Department of Infrastructure Management**

Khalid Anjum, Department Head

**Office of Planning**

George M. Ververides, P.P., A.I.C.P., Director

Louie Greenwell, G.I.S.P., C.F.M., Director of Comprehensive Planning

**Division of Transportation Staff:**

\*Anthony Gambilonghi, P.P., A.I.C.P., Supervising Planner, Transportation (Project Manager)\*

\*Ryan W. Rapp, P.P., A.I.C.P., Principal Planner (co-author)\*

Bruce McCracken, Principal Planner, Transportation

\*Kae Yamane, NJTPA Intern / Research Associate (co-author, former employee)\*

\*Jeanine Kopeck-Zanghi, NJTPA Intern (former position) / Geographic Information Specialist 3 (co-author)\*

Danielle Britton, Keyboarding Clerk II

\*Asterisks denote technical staff members assigned with the preparation of this report.\*



*The preparation of this report has been financed in part by the U.S. Department of Transportation, North Jersey Transportation Planning Authority, Inc., Federal Transit Administration and the Federal Highway Administration. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or its use thereof.*

# County Route 529 Corridor Steering Committee

## Middlesex County Department of Infrastructure Management

Khalid Anjum, Department Head

## Middlesex County Office of Planning

George M. Ververides, P.P., A.I.C.P., Director

Anthony Gambilonghi, P.P., A.I.C.P., Supervisor, Transportation

Mirah Becker, P.P., A.I.C.P., Supervisor, Comprehensive Planning and the Environment

Stanley Olszewski, Supervisor, Land Development Review (current employee, former position)

Alexander Zakrewsky, Principal Planner, Spatial Data Services (current employee, former position)

## Middlesex County Office of Engineering

Richard Wallner, County Engineer

Sima Alimokhtaryvaig, Principal Engineering Aide

## Middlesex County Department of Community Services

Gerry MacKenzie, Department Head

Laila Caune, Director, Office of Aging and Disabled Services

Phil Sheridan, County Division Head, Manager of Middlesex County Area Transit (MCAT) [former employee]

## Middlesex County Department of Business Development & Education

Kathaleen Shaw, Department Head

Carla Cefalo, Economic Development Representative

## Middlesex County Improvement Authority

Denise Nickel, Senior Project Manager (former position)

## Middlesex County Transportation Coordinating Committee

Paul Larrousse, Chairman

Tom Vigna, Vice Chairman

## Keep Middlesex Moving

William Neary, Executive Director

Morteza Ansari, Program Manager

## North Jersey Transportation Planning Authority

Zenobia Fields, Director, Department of Planning

Lois Goldman, Director, Regional Planning

Blythe Eaman, Principal Planner

Doug Greenfeld, Manager, Subregional Studies

## New Jersey Transit

Thomas Clark, Regional Manager

Alan Maiman, Deputy General Manager of Bus Service Planning

R.J. Palladino, Assistant Director

Chris Sandiford, Senior Service Planner

Mike Viscardi, Manager Project Development

## New Jersey Department of Transportation

Uzoma Anukwe, MPO Liaison

Monica Etz, Project Manager

Danielle Graves, Project Manager

William Riviere, Principal Planner

Raymond Tomczak, Regional Manager, Community and Constituent Relations (former position)

**Union County Department of Economic Development**

Liza Betz, P.P., A.I.C.P., Principal Transportation Planning Manager

**Somerset County Planning Department**

Walter Lane, Supervisor, Transportation Planner

**Rutgers, the State University of New Jersey**

Jennifer Stuart, Assistant Director of University Planning and Development

Jack Molenaar, Director of Transportation Services

Charles Brown, MPA, Senior Research Specialist

**New Jersey Travel Independence Program**

Karen Alexander, Managing Director

**New Jersey Bike & Walk Coalition**

Cyndi Steiner, Executive Director

**East Coast Greenway Alliance & Central Jersey Bicycle Club**

Mike and Anne Kruimer

**RideWise Transportation Management Association**

Donna Allison, Executive Director

**Borough of Dunellen**

Mayor Robert Seader

**Township of Edison**

Mayor Thomas Lankey

Chris Mazauskas, Energy Program Coordinator

**Township of Green Brook**

Mayor Patrick Boccio

**Borough of Highland Park**

Mayor Gayle Brill-Mittler

**Borough of Middlesex**

Mayor Ronald Dobies

**Borough of North Plainfield**

Mayor Michael Giordano Jr.

**Township of Piscataway**

Mayor Brian C. Wahler

**City of Plainfield**

Mayor Adrian O. Mapp

**Borough of South Plainfield**

Mayor Matthew Anesh



# Table of Contents

---

<b>1.0</b>	<b>INTRODUCTION .....</b>	<b>1</b>
1.1	CONTEXT AND TIMELINE .....	1
1.2	PURPOSE AND SCOPE .....	2
1.3	STEERING COMMITTEE AND PUBLIC OUTREACH .....	5
<b>2.0</b>	<b>STUDY AREA DESCRIPTION .....</b>	<b>6</b>
2.1	GENERAL GEOGRAPHIC SETTING .....	6
2.2	ROADWAY NETWORK.....	6
2.3	TRANSIT SYSTEM OVERVIEW .....	7
2.4	SUBAREAS .....	7
<b>3.0</b>	<b>SUMMARY OF FINDINGS .....</b>	<b>10</b>
3.1	DEMOGRAPHIC HIGHLIGHTS .....	10
3.2	LAND USE.....	13
3.2.1	<i>High Activity Areas</i> .....	13
3.3	TRANSIT SERVICE .....	14
3.4	BICYCLE AND PEDESTRIAN INFRASTRUCTURE.....	14
<b>4.0</b>	<b>RECOMMENDATIONS .....</b>	<b>20</b>
4.1	BASIS FOR RECOMMENDATIONS.....	21
4.2	TRANSIT SYSTEM/FACILITY RECOMMENDATIONS.....	23
4.3	BICYCLE NETWORK RECOMMENDATIONS .....	28
4.4	SIDEWALK RECOMMENDATIONS.....	31
4.5	MUNICIPAL COMPLETE STREETS POLICIES .....	33
<b>5.0</b>	<b>DEMOGRAPHIC PROFILE.....</b>	<b>34</b>
5.1	GENERAL DEMOGRAPHIC CHARACTERISTICS .....	34
5.1.1	<i>Total Population</i> .....	34
5.1.2	<i>Population Density</i> .....	37
5.1.3	<i>Age Characteristics</i> .....	39
5.2	HOUSING STOCK CHARACTERISTICS.....	42
5.2.1	<i>Type of Housing Unit (detached, attached, mobile home etc.)</i> .....	42
5.2.2	<i>Tenure (owner vs. renter)</i> .....	44
5.2.3	<i>Vehicle Availability</i> .....	44
5.3	HOUSEHOLD CHARACTERISTICS .....	48
5.3.1	<i>Households by Type</i> .....	48
5.3.2	<i>Household Size</i> .....	49
5.3.3	<i>Family vs Nonfamily</i> .....	50
5.3.4	<i>Median Household Income</i> .....	51
5.3.5	<i>Households by Income</i> .....	53
5.4	ENVIRONMENTAL JUSTICE AND TRADITIONALLY DISADVANTAGED POPULATIONS .....	54
5.4.1	<i>Race and Ethnicity</i> .....	54
5.4.2	<i>Households by Poverty Status</i> .....	56
<b>6.0</b>	<b>EMPLOYMENT PROFILE .....</b>	<b>59</b>
6.1	EMPLOYED RESIDENT LABOR FORCE.....	59
6.1.1	<i>Top Industries</i> .....	59
6.1.2	<i>Employed Labor Force by Age</i> .....	61

6.1.3	<i>Employed Labor Force by Earnings</i> .....	61
6.1.4	<i>Employed Labor Force by Race and Ethnicity</i> .....	61
6.1.5	<i>Employed Labor Force by Educational Attainment</i> .....	62
6.2	WORKERS EMPLOYED IN THE STUDY AREA .....	63
6.2.1	<i>Top Industries</i> .....	63
6.2.2	<i>Primary Jobs by Worker Age</i> .....	65
6.2.3	<i>Primary Jobs by Earnings</i> .....	65
6.2.4	<i>Primary Jobs by Worker Race and Ethnicity</i> .....	65
6.2.5	<i>Primary Jobs by Educational Attainment</i> .....	66
<b>7.0</b>	<b>WORK COMMUTE TRAVEL BEHAVIOR</b> .....	<b>67</b>
7.1	JOURNEY TO WORK .....	68
7.2	INFLOW/OUTFLOW OF PRIMARY JOBS .....	74
7.3	COMMUTE SHED ANALYSIS (HOME TO WORK) .....	76
7.4	LABOR SHED ANALYSIS (WORK TO HOME) .....	78
7.5	PAIRED ANALYSIS .....	80
<b>8.0</b>	<b>TRANSIT NEEDS ASSESSMENT</b> .....	<b>85</b>
8.1	EXISTING RAIL SERVICE .....	85
8.1.1	<i>Northeast Corridor (Edison Station)</i> .....	85
8.1.2	<i>Raritan Valley Line (Dunellen Station)</i> .....	89
8.2	EXISTING BUS SERVICES .....	92
8.2.1	<i>New Jersey Transit</i> .....	92
8.2.2	<i>Suburban Transit</i> .....	97
8.2.3	<i>Rutgers University Intercampus</i> .....	98
8.3	DISCONTINUED BUS SERVICES .....	101
8.3.1	<i>Suburban</i> .....	101
8.3.2	<i>New Jersey Transit</i> .....	101
8.3.3	<i>Edison Light Transit (to Edison Station)</i> .....	102
8.4	BUS STOP INVENTORY .....	103
8.5	NEW JERSEY TRANSIT'S TRANSIT SCORE .....	105
8.6	TRANSIT NEEDS ASSESSMENT .....	108
<b>9.0</b>	<b>BICYCLE AND PEDESTRIAN NEEDS ASSESSMENT</b> .....	<b>110</b>
9.1	SIDEWALKS INVENTORY .....	110
9.2	SHOULDERS INVENTORY .....	113
9.3	BIKEWAY INVENTORY .....	116
9.4	INVENTORY OF PEDESTRIAN FACILITIES AT SIGNALIZED INTERSECTIONS .....	118
9.5	IDENTIFICATION OF GAPS IN THE EXISTING BICYCLE AND PEDESTRIAN INFRASTRUCTURE NETWORK .....	119
9.5.1	<i>Sidewalks</i> .....	119
9.5.2	<i>Bike Route Network</i> .....	120
9.5.3	<i>Signalized Intersections</i> .....	121
<b>10.0</b>	<b>ZONING, LAND USE AND DEVELOPMENT PATTERNS AND TRENDS</b> .....	<b>127</b>
10.1	ZONING .....	127
10.2	LAND USE .....	130
10.2.1	<i>Major trip generators/attractors</i> .....	138
10.3	MAJOR DEVELOPMENT ACTIVITY, APPROVALS AND PROPOSALS .....	139

# Index of Tables

---

Table 5—1: Percentage of Population Belonging to a Racial Minority Group: CR 529 Corridor Study Area, Counties, and State (2010, 2015, 2020) .....	36
Table 5—2: Population Density in CR 529 Corridor Study Area, Counties, and State (2015).....	37
Table 5—3: Median Age: CR 529 Corridor Study Area, County, and State (2015) .....	39
Table 5—4: Age Cohorts for CR 529 Corridor Study Area (2015) .....	40
Table 5—5: Housing Units by Residential Structure Type, CR 529 Corridor Study Area and State (ACS 2008–2012).....	42
Table 5—6: Housing Units by Tenure in CR 529 Corridor Study Area and NJ (ACS 2008–2012) .....	44
Table 5—7: Vehicle Availability in CR 529 Corridor Study Area, by Tenure (ACS 2008–2012).....	45
Table 5—8: Households by Type in CR 529 Corridor Study Area and NJ (2010) .....	48
Table 5—9: Family Households by Size in CR 529 Corridor Study Area and NJ (2010) .....	49
Table 5—10: Nonfamily Households by Size in CR 529 Corridor Study Area and NJ (2010) .....	49
Table 5—11: Population by Relationship and Household Type in CR 529 Corridor Study Area and NJ (2010) .....	50
Table 5—12: Household Income in CR 529 Corridor Study Area and NJ (ACS 2008–2012) .....	51
Table 5—13: Households by Income in CR 529 Corridor Study Area and NJ (ACS 2008–2012) .....	53
Table 5—14: Race and Ethnicity in CR 529 Corridor Study Area (2010, 2015, 2020).....	54
Table 5—15: Diversity Index: CR 529 Corridor Study Area, Counties, NJ, and Nation (2015).....	55
Table 5—16: Percent of Population Asian Alone: CR 529 Corridor Study Area, Counties, and State (2010, 2015, 2020).....	55
Table 5—17: Percent of Total Households with an Income in the Past 12 Months Below Poverty Level (ACS 2008–2012): Study Area vs. Other Geographies .....	56
Table 5—18: Households by Poverty Status in CR 529 Corridor Study Area and NJ (ACS 2008–2012) .....	57
Table 6—1: Top 5 Industries of the Employed Labor Force, Ranked by Number of Primary Jobs, CR 529 Corridor Study Area & Subareas (2011) .....	60
Table 6—2: Employed Resident Labor Force in the CR 529 Corridor Study Area by Age (2011) .....	61
Table 6—3: Earnings of Workers Residing in the CR 529 Corridor Study Area (2011) .....	61
Table 6—4: Race of Workers Residing in CR 529 Corridor Study Area (2011).....	62
Table 6—5: Ethnicity of Workers Residing in CR 529 Corridor Study Area (2011) .....	62
Table 6—6: Educational Attainment of Workers Residing in the CR 529 Corridor Study Area (2011).....	62
Table 6—7: Top 5 Industries Ranked by Number of Primary Jobs in the CR 529 Corridor Study Area & Subareas (2011) .....	64
Table 6—8: Age of Workers Employed in CR 529 Corridor Study Area (2011).....	65
Table 6—9: Earnings of Workers Employed in the CR 529 Corridor Study Area (2011).....	65
Table 6—10: Race of Workers Employed in CR 529 Corridor Study Area (2011) .....	66
Table 6—11: Ethnicity of Workers Employed in CR 529 Corridor Study Area (2011).....	66
Table 6—12: Educational Attainment of Workers Residing in CR 529 Corridor Study Area (2011).....	66
Table 7—1: Workers by Means of Transportation to Work in CR 529 Corridor Study Area and NJ (2008–2012).....	69

Table 8—1: Number of Public Bus Stops in the CR 529 Corridor Study Area, by Service Provider  
and Bus Line ..... 103

Table 8—2: Public Bus Stops in the CR 529 Corridor Study Area, by Bus Shelter Type ..... 103

Table 8—3: Number of Public Bus Stops by Bus Shelter Type and Common Line/Route  
Destination..... 104

Table 9—1: Bi-directional Miles of Roadway Centerline by Detailed Sidewalk Classification..... 110

Table 9—2: Bi-directional Miles of Roadway Centerline by Detailed Shoulder Classification ..... 113

Table 9—3: Bi-directional Miles of Roadway Centerline by Detailed Bikeway Classification ..... 116

Table 9—4: Summary of Signalized Intersection Inventory by Jurisdiction and Traffic Control  
Type..... 118

Table 9—5: Signalized Intersections by the Number of Missing Marked Crosswalks ..... 121

Table 9—6: Signalized Intersections by the Number of Missing Pedestrian Ramps ..... 121

Table 9—7: Signalized Intersections by the Number of Missing Pedestrian Signal Heads..... 122

Table 9—8: Signalized Intersections by Presence of Pedestrian Countdown Timers..... 122

Table 10—1: Acreage Summations of Zoning by CR 529 Subareas (South, Central and North) ..... 128

Table 10—2: Summary of Detailed Land Use by Subarea within the Study Area ..... 133

Table 10—3: Major Developments Proposed, Approved and/or Constructed Since 2008..... 139



# Index of Figures

---

Figure 1—1: Project Timeline .....	1
Figure 5—1: Population Growth Trends in CR 529 Corridor Study Area (2000 to 2020) .....	34
Figure 5—2: Forecasted Annual Population Growth Rates Comparison (2015 to 2020) .....	35
Figure 5—4: Age Cohorts for CR 529 Corridor Study Area, Middlesex County, and State (2015).....	39
Figure 5—5: Number and Percent of Housing Units by Residential Structure, CR 529 Corridor Study Area (ACS 2008–2012) .....	42
Figure 5—6: Vehicle Availability in CR 529 Corridor Study Area, Occupied Housing Units (ACS 2008–2012) .....	45
Figure 6—1: Primary Jobs of CR 529 Corridor Study Area Residents, by Industry Groupings (2011) .....	59
Figure 6—2: Primary Jobs located in the CR 529 Corridor Study Area, by Industry Groupings (2011) .....	63
Figure 7—1: Means of Transportation to Work in CR 529 Corridor Study Area (2008–2012).....	68
Figure 7—2: Bus versus Rail in CR 529 Corridor Study Area and NJ (ACS 2008–2012).....	69
Figure 7—3: Workers (who did not work from home) by Travel Time to Work in CR 529 Corridor Study Area and NJ (2008–2012).....	73
Figure 7—4: Inflow/Outflow Primary Job Counts in the CR 529 Corridor Study Area (2011) .....	74
Figure 7—5: Inflow/Outflow Primary Job Counts in the CR 529 Corridor South Subarea (2011) .....	74
Figure 7—6: Inflow/Outflow Primary Job Counts in the CR 529 Corridor Central Subarea (2011).....	75
Figure 7—7: Inflow/Outflow Primary Job Counts in the CR 529 Corridor North Subarea (2011) .....	75
Figure 7—8: Top 20 Work Locations by Municipality for Workers Who Lived in the CR 529 Corridor Study Area, Primary Jobs (2011).....	76
Figure 7—9: Top 20 Home Locations by Municipality for Workers who were employed in the CR 529 Corridor Study Area, Primary Jobs (2011).....	78
Figure 8—1: Oblique Aerial View of Edison Station.....	86
Figure 8—2: Oblique Aerial View of Dunellen Station.....	90
Figure 8—3: Transit Score Formula and Score Categories of the DVRPC Protocol .....	105
Figure 9—1: Sidewalks Inventory Summation Chart .....	111
Figure 9—2: Shoulders Inventory Summation Chart .....	114
Figure 10—1: Detailed Zoning Acreage Pie Chart Summary, CR 529 Corridor Study Area .....	127
Figure 10—2: Composite Land Use Parcel Acreage in the South Subarea .....	131
Figure 10—3: Composite Land Use Parcel Acreage in the Central Subarea .....	131
Figure 10—4: Composite Land Use Parcel Acreage in the North Subarea .....	132
Figure 10—5: Composite Land Use Parcel Acreage in the CR 529 Corridor Study Area.....	132

# Index of Map Figures

---

Map 1—1: Regional Street Map Surrounding the CR 529 Corridor .....	3
Map 2—1: CR 529 Corridor Study Area Boundary and Municipalities .....	8
Map 2—2: Subareas of the County Route 529 Corridor Study Area .....	9
Map 4—1: Proposed 812 Bus Line Concept – From US 22 at West End Ave to Edison Train Station .....	24
Map 4—2: Proposed 812 Bus Line Concept – From Edison Train Station to US 22 at West End Ave .....	25
Map 4—3: Proposed 816 Bus Line Concept – To Centennial Square (1327 Centennial Ave, Piscataway) From 1066-1080 US Route 1 (Edison Glen/Prince Street) .....	26
Map 4—4: Proposed 816 Bus Line Concept – To 1066-1080 US Route 1 (Edison Glen/Prince Street) From Centennial Square (1327 Centennial Ave, Piscataway) .....	27
Map 4—5: Proposed Bike Route Facilities .....	29
Map 4—6: Future Bike Route Network .....	30
Map 4—7: Proposed New Sidewalks .....	32
Map 5—1: Total Population and Population Density by Census Block Group .....	38
Map 5—2: Total Population and Percent Population Age 65 and Over by Census Block Group .....	41
Map 5—3: Number and Percent Total of Multifamily Housing Units by Census Block Group .....	43
Map 5—4: Total and Percentage of Total Occupied Housing Units with No Vehicle Available .....	46
Map 5—5: Vehicles per Occupied Housing Unit by Census Tract .....	47
Map 5—6: Median Household Income by Census Block Group .....	52
Map 5—7: Total and Percentage of Households with an Income Below Poverty Level .....	58
Map 7—1: Total and Percentage of Worker Using Public Transportation to Work .....	70
Map 7—2: Total and Percentage of Workers Commuting to Work by Walking or Biking .....	72
Map 7—3: Density of Work Locations for Workers who live in the CR 529 Corridor, Primary Jobs (2011) .....	77
Map 7—4: Density of Home Locations for Workers who are employed in the CR 529 Corridor, Primary Jobs (2011) .....	79
Map 7—5: Density of Primary Jobs for Workers who live in the CR 529 Corridor Study Area and are Employed in the CR 529 Corridor Study Area (2011) .....	81
Map 7—6: Density of Primary Jobs for Workers who live in the North Subarea and are Employed in the CR 529 Corridor Study Area (2011) .....	82
Map 7—7: Density of Primary Jobs for Workers who live in the Central Subarea and are Employed in the CR 529 Corridor Study Area (2011) .....	83
Map 7—8: Density of Primary Jobs for Workers who live in the South Subarea and are Employed in the CR 529 Corridor Study Area (2011) .....	84
Map 8—1: New Jersey Transit Bus Lines and Rutgers Livingston Campus Bus Stops .....	100
Map 8—2: 2010 Transit Score by Traffic Analysis Zone .....	106
Map 8—3: 2040 Transit Score by Traffic Analysis Zone .....	107
Map 9—1: Sidewalks Inventory Map .....	112
Map 9—2: Shoulders Inventory Map .....	115
Map 9—3: Bikeway Inventory Map .....	117
Map 9—4: Signalized Intersections by the Number of Missing Marked Crosswalks .....	123
Map 9—5: Signalized Intersections by the Number of Missing Pedestrian Ramps .....	124

Map 9—6: Signalized Intersections by the Number of Missing Pedestrian Signal Heads .....	125
Map 9—7: Signalized Intersections by Presence of Pedestrian Countdown Timers .....	126
Map 10—1: Detailed Zoning Map .....	129
Map 10—2: Detailed Land Use by Tax Parcel Assessment Data, Regional View .....	134
Map 10—3: Detailed Land Use by Tax Parcel Assessment Data, Southern Detail .....	135
Map 10—4: Detailed Land Use by Tax Parcel Assessment Data, Central Detail .....	136
Map 10—5: Detailed Land Use by Tax Parcel Assessment Data, Northern Detail .....	137

## Appendices

---

### *Appendix A – Meeting Highlights*

*Steering Committee Meeting (November 13, 2014), Public Open House Meeting (June 15, 2015), Steering Committee Meeting (December 3, 2015), Public Open House Meeting (March 7, 2016), Steering Committee Meeting (April 11, 2016)*

### *Appendix B – Bus Stop Inventory*

### *Appendix C – Signalized Intersection Inventory*

### *Appendix D – Selected Maps in 11 x 17 Inches (Tabloid) Page Size Format*



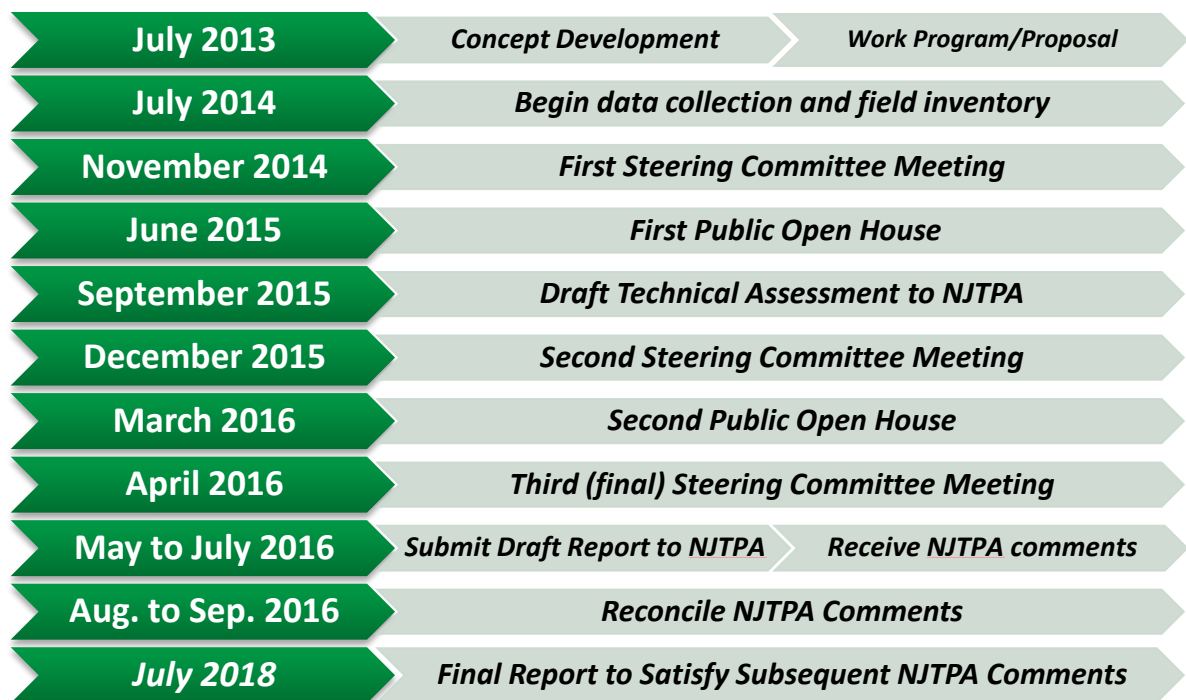
## 1.0 Introduction

### 1.1 Context and Timeline

The preparation of this report was prepared with grant funding support from the North Jersey Transportation Planning Authority (NJTPA) through its Subregional Studies Program (SSP) for transportation planning studies. The SSP provides two-year grants on a competitive basis to the 13 counties and two cities represented by the NJTPA Board-known as *subregions*. The studies funded through this program are intended to develop recommendations for transportation improvements and concepts for projects that are consistent with the NJTPA's Regional Transportation Plan.<sup>1</sup> This planning study serves to inform NJTPA's planning activities and decision-making by offering a local perspective from one of its member subregions, Middlesex County.

The initial concept of pursuing the preparation of this study was conceived in 2013 by Middlesex County Transportation Planning Staff. The purpose and scope of this study was further developed and finalized through collaboration with staff of the NJTPA. The study was initiated in July of 2014 and completed in July of 2016. Reconciliation of NJTPA comments was completed in 2016 and final publication occurred in 2018 (see below).

Figure 1—1: Project Timeline



<sup>1</sup> North Jersey Transportation Planning Authority web site. *Subregional Studies Program*. n.d. <http://www.njtpa.org/planning/subregional-planning/studies.aspx> (accessed August 2016)

## 1.2 Purpose and Scope

The purpose of the County Route 529 Corridor Study is to develop recommendations for improving bicycle, pedestrian and transit accommodations and intermodal mobility along the corridor to serve points of attraction along the corridor and in nearby areas now and into the future. The scope of the study includes an examination of demographic characteristics, existing land uses, existing bicycle and pedestrian facilities along major roadways, anticipated future growth in the corridor, a review of transit expansion need, and feedback from a steering committee and public open house meetings.

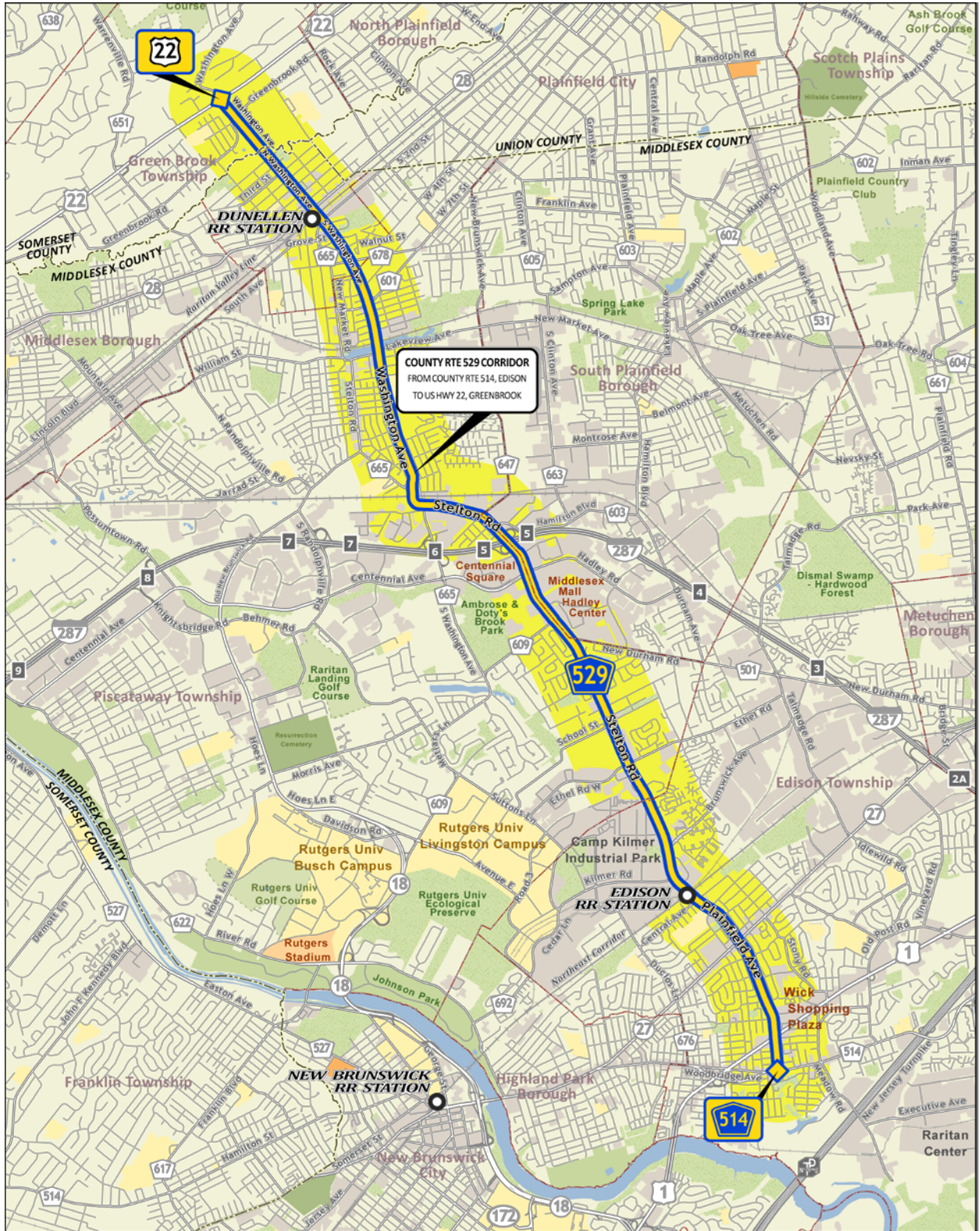
This study is intended to promote the *Middlesex County Complete Streets Policy*, which was adopted by a resolution of the Middlesex County Board of Chosen Freeholders on July 19, 2012. This policy supports complete streets design practices, acknowledging the needs of all users including pedestrians, bicyclists, motorists, and transit users of all ages and abilities in the design, construction and maintenance of all roadways in Middlesex County.

The County Route 529 (CR 529) Corridor Study Area (“Study Area”) contains opportunities of intermodal mobility among two passenger rail stations, a diverse residential housing stock, a dynamic regional employment base, a variety of retail sales and services, several educational institutions and various recreational facilities. The Route 529 Corridor is also host to the Rutgers University Livingston Campus which has recently undergone significant redevelopment and is poised to attract greater volumes of trips throughout the study area.

*The goal of this study is to discover locations where it is warranted to expand the service coverage area of the existing bus system and to develop a fully-connected network of pedestrian and bicycle facilities that are supported by emerging land use development activities and demographic characteristics of the corridor.*



Map 1—1: Regional Street Map Surrounding the CR 529 Corridor





# Public comments regarding bicycle accommodations

## Bicycle Dunellen Recommendations

Union / Somerset / Middlesex + Bridge After Sandy → pushed over to Jefferson Ave. from Washington. Bikes use Jefferson. Got to a crossing with cars + bikes. Turn bridge on Jefferson into a pedestrian overpass so that bikes + pedestrians safe. Recommend NO bike path along North Ave. path was relocated over + can bike ride along one of the existing streets for 2 blocks in from North Ave. South West Corner of Green Ave / Madison / Mountville Terrace - large property - Green Ave - can create a few path concept. Numerous historical sites. Major bike - Vaile Ave - along - Rockledge / Green / Rockledge. Another on Green Ave Rd - path partly museum along Bow Brook. South Avenue very dangerous. Runs thru 3 towns. Although less dangerous than Bow Brook Rd. I'd bike 100% on South Avenue + bike lanes than at + could bike over to North Washington Avenue. I made it at Dunellen TS.

next to Dunellen TS the spine of North - South Avenue. Go into Gedenbrook + advantage of parks, high school + day park, lots children / teens / high school + train station.

2

• Try to connect existing parks + cultural + comm. facilities/resources with bicycle path plans!

• Overlay parks + recreation + housing + community facilities + cut (not layers) to base map. Decisions on bike paths should be prioritized. Also emphasize locations to train stations so people can bike to train stations.

### Edison Train Station

- bike connection along Kilmer to Livingston  
- bike connection to dense residential communities/villages north + south of train station

Provide bike connections for workers along the corridor (ie. mall, targets, etc.)

WOODBRIDGE AVE <sup>intersects w/ CR 28</sup>  
→ CONNECTION TO MIDDLESEX GREENWAY / East Coast Greenway  
WOODBRIDGE ↔ EDISON ↔ METUCHEN

→ bike CONNECTION CONNECTING TRAIN STATIONS  
Dunellen + Edison + Perth Amboy  
Raritan NEC Chemical Corridor Line

Bike Plan was completed for Edison in 1995  
- the bike facilities lack intersection interconnectivity  
- Rec: color-coded bike lanes - GREEN

→ include Rutgers Bike Share to Edison Train Station  
- include bike racks along corridor  
- included in developer site plans

From the first public meeting held on June 15, 2015



### 1.3 Steering Committee and Public Outreach

A Steering Committee was established to assist in gaining a broad-based understanding of conditions in the study area (individual members of the Steering Committee members are listed on the pages immediately preceding the table of contents). A total of three Steering Committee meetings were conducted and centered on sharing knowledge and ideas to expand the transportation network and intermodal mobility.

The kick-off meeting of the steering committee was held on November 13, 2014; this first meeting introduced the extent of the study area and the goal of the study. Preliminary results of the field inventory of bicycle, pedestrian and transit facilities and services of the corridor were also presented. The second steering committee meeting was held on December 3, 2015; which discussed public feedback from the public open house meeting held on June 15, 2015 (see below) and discussed ideas to address the needs of the community it serves. The final steering committee meeting was held on April 11, 2016; which a presentation of the recommendations contained in this report and provided one more opportunity for additional comments and recommendations from the steering committee.

Stakeholders and members of the public were also invited to attend two public open house meetings: one held on June 15, 2015; and another on March 7, 2016. There were 27 participants from the two open house meetings from a variety of potential partners such as Triple C Housing, Everest Institute (professional trade school), East Coast Greenway Alliance, Keep Middlesex Moving (KMM), representatives from the respective municipalities within the corridor, North Jersey Transportation Planning Authority (NJTPA) and New Jersey Transit (NJT).

The members of the Steering Committee, stakeholders and members of the public helped shape the framework of the recommendations and identified ultimate needs with respect to improving bicycle, pedestrian and public transit mobility in the study area.

Detailed meeting highlights for the three Steering Committee and two Public Open House meetings are included as Appendix A of this report.



## 2.0 Study Area Description

### 2.1 General Geographic Setting

The County Route 529 Corridor Study Area (“Study Area”) is centered along approximately 8.6 miles of County Route 529 (“CR 529”), south to north from Woodbridge Avenue (County Route 514 “CR514”) in Edison Township (Middlesex County) to US Route 22 in Green Brook Township (Somerset County). The extent of the Study Area encompasses an area of approximately 21 square miles, and includes nine municipalities in three counties: Dunellen Borough, Edison Township, Highland Park Borough, Middlesex Borough, Piscataway Township, and South Plainfield Borough in Middlesex County; Green Brook Township and North Plainfield Borough in Somerset County; and the City of Plainfield in Union County. From south to north through the Study Area, CR-529 is identified by street name as Plainfield Avenue, Stelton Road, Washington Avenue, South Washington Avenue and North Washington Avenue.

The Study Area corridor extends roughly 1- to 2-miles to the east and west of CR 529, with major roadways serving as the easterly and westerly boundaries of the Study Area. NJ Route 18 forms a portion of the westerly boundary of the Study Area and the Study Area is bisected by many regionally significant high-volume highway corridors including Interstate 287, US Route 1, US Route 22, NJ Route 27 and NJ Route 28.

Map 1—1: Regional Street Map Surrounding the CR 529 Corridor on page 3 highlights the extent of the CR-529 corridor within the context of the surrounding roadway network. Map 2—1: CR 529 Corridor Study Area Boundary and Municipalities on page 8 depicts the Study Area boundary and the municipalities included in the Study Area.

Notable points of interest within the Study Area include the Wick Shopping Plaza, the Edison Train Station, Camp Kilmer Industrial Park, Rutgers University Livingston Campus, Middlesex Mall, Hadley Center, Ambrose Doty’s Brook Park, Centennial Square (shopping center), the Dunellen and Edison train stations, numerous schools, and post offices.

### 2.2 Roadway Network

Interstate 287 (I-287) runs east-west roughly midway through the Study Area. There are four interchanges of I-287 within the Study Area, including: Exit 4 at New Durham Avenue, South Plainfield; Exit 5 at Stelton Road (CR-529), Piscataway; Exit 6 at South Washington Avenue, Piscataway; and, Exit 7 at South Randolphville Road, Piscataway.

Along US Route 1 (US-1), the Study Area corridor extends from Woodbridge Ave (CR-514) to Old Post Road (Edison) and along US Route 22 (US-22) it extends from Warrenton Road (CR-651) in Green Brook to Rock Avenue in North Plainfield. State highways and county roads that are found in the Study Area include NJ routes

27 and 28 (NJ-27 & NJ-28), CR-501 (New Durham Road), CR-601 (West 7th Street), CR-607 (Lincoln Blvd/S. Lincoln Ave), CR-609 (Metlars Lane), CR-647 (New Brunswick Avenue), CR-663 (Clinton Avenue), CR-665 (Stelton Road/South Washington Avenue), CR-678 (Walnut Street), and CR-692 (Cedar Lane).

Other major roads include Hoes Lane (Piscataway), Suttons Lane (Piscataway), Old New Brunswick Road (Piscataway), Centennial Ave (Piscataway), Lakeview Avenue (Piscataway), William Street (Piscataway), Hadley Road (South Plainfield), Ethel Road (Edison/Piscataway), Kilmer Road (Edison), Talmadge Road (Edison), and Old Post Road (Edison).

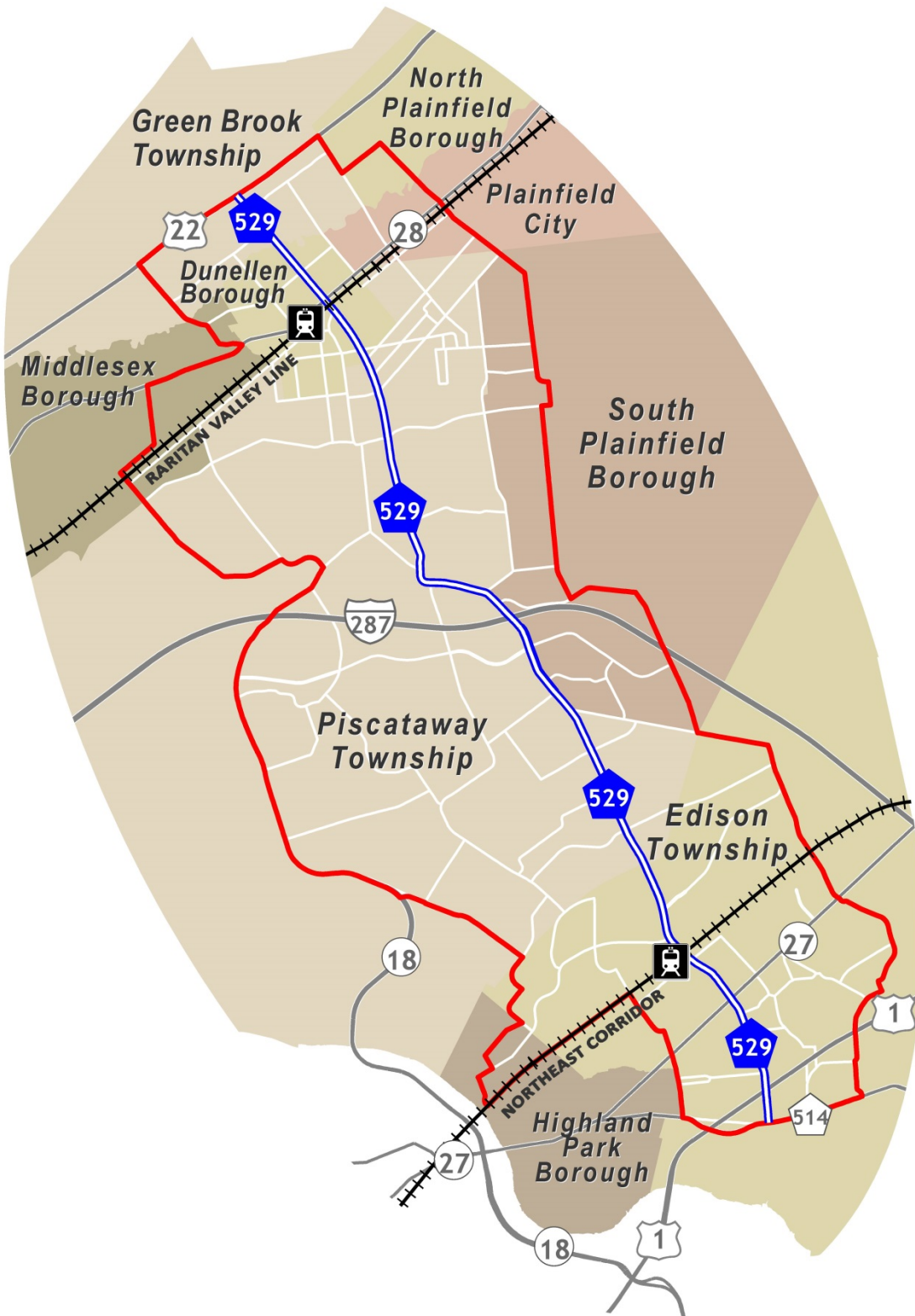
## **2.3 Transit System Overview**

Two New Jersey Transit train stations and several bus lines serve the Study Area. The Edison train station is located towards the southern end of the Study Area and provides access to the Northeast Corridor Line with service between Trenton and New York Penn Station. Dunellen train station towards the northern end of the Study Area provides access to the Raritan Valley Line with service between High Bridge and Newark Penn Station, with direct service to New York Penn Station on midday weekdays. Bus service access in the Study Area includes a total of 108 bus stops, served by nine New Jersey Transit Bus Lines (numbers 59, 65, 66, 113, 114, 117, 810, 814, and 819), daily Atlantic City Service from Coach USA/Suburban Transit, and several Rutgers University Intercampus buses to Livingston Campus (B, LX, REXL, Weekend, and Summer routes). A more in-depth description of the existing transit facilities and services in the Study Area is found in Section 8.0 Transit Needs Assessment of this report, beginning on page 85.

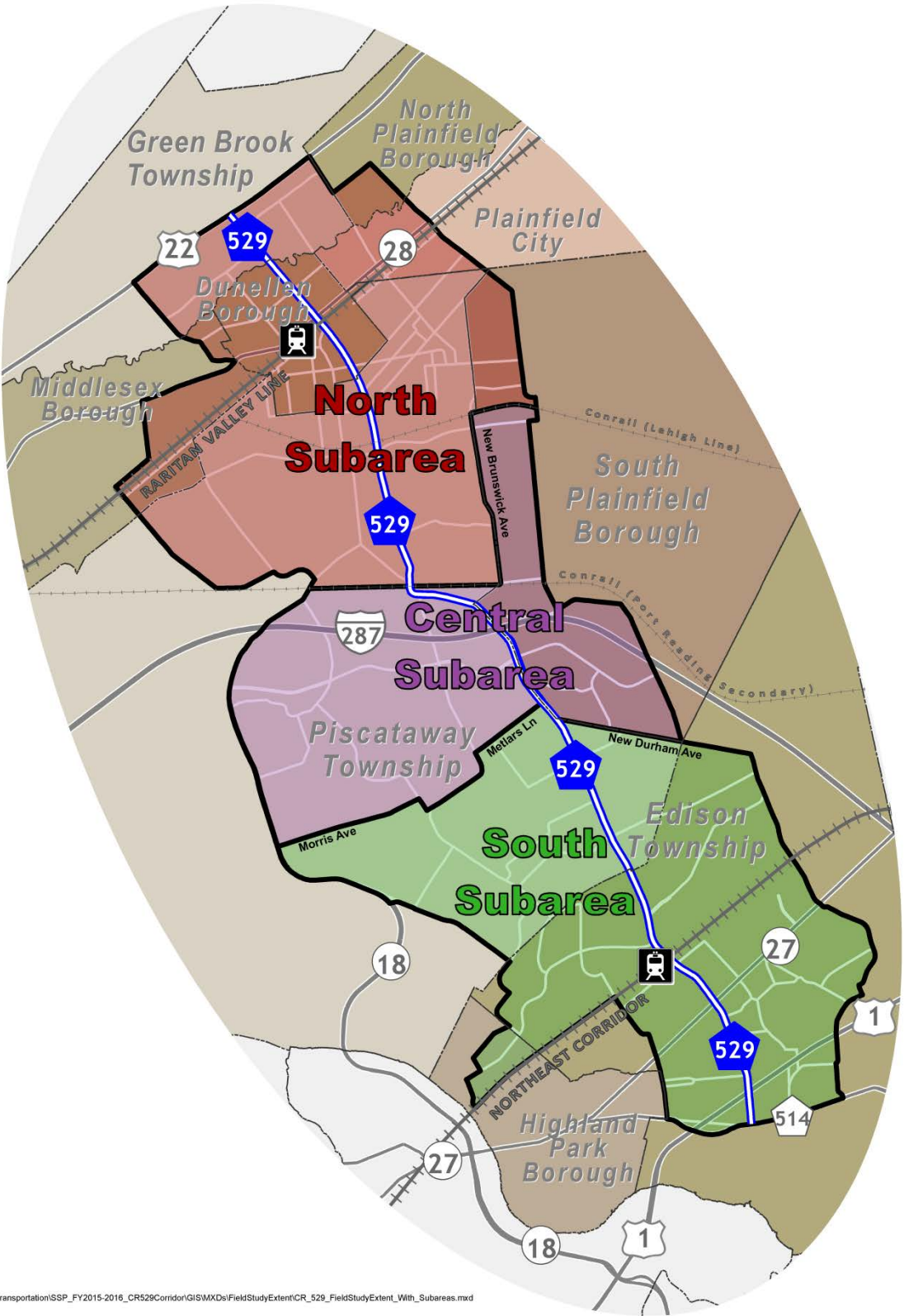
## **2.4 Subareas**

Map 2—2: Subareas of the County Route 529 Corridor Study Area on page 9 illustrates the boundaries of the three subareas within the Study Area, which have been used as the geographic unit of analysis for employment characteristics, commutation patterns, zoning and land use within respective sections of this report. Subareas were drawn to be coincident with tract boundaries of the US Census Bureau. The South Subarea is generally bisected by the Northeast Corridor commuter rail line and is situated south of Morris Avenue, Metlars Lane and New Durham Avenue. The Central Subarea generally consists of the I-287 corridor including the entirety of South Plainfield that intersects the Study Area. The North Subarea consists of the area north of the I-287 corridor and is generally bisected by NJ-28 and the Raritan Valley rail line.

Map 2—1: CR 529 Corridor Study Area Boundary and Municipalities



Map 2—2: Subareas of the County Route 529 Corridor Study Area



\\mcplanning\transportation\SSP\_FY2015-2016\_CR529Corridor\GIS\MXDs\FieldStudyExtent\CR\_529\_FieldStudyExtent\_With\_Subareas.mxd



## 3.0 Summary of Findings

### 3.1 Demographic Highlights

#### *People*

According to U.S. Census Bureau data and data published by Environmental Systems Research Institute, Inc. (“Esri”), the Study Area had a total population of 81,586 in 2010 that is expected to grow to 88,300 by 2020. The Study Area also has an overall younger population compared to the Tri-County area (Middlesex, Somerset, and Union counties) and New Jersey. The 2015 median age of the Study Area was estimated to be 36.9 years old, which is younger than both the Tri-County area and the State’s 2015 median age forecasts of 38.9 and 39.7, respectively.

The Study Area is relatively densely populated, with an overall population density of 4,084 persons per square mile in 2015. This is significantly higher than the statewide density of 1,213 persons per square mile. This is worth noting, as this means that the Study Area figure exceeds the average density in the nation’s most densely populated State. Compared to the Tri-county area, the Study Area is also more densely populated than both Middlesex and Somerset counties. Neighboring Union county, however, has a slightly higher population density than the Study Area, at 5,345 persons per square mile.

The population of the Study Area has a relatively high degree of racial diversity and can also be characterized as a “Minority Majority” where persons belonging to a racial minority group collectively represent more than 50% of the population. In 2000, the Census reported that 55% of the Study Area’s population was a minority and forecasts for the year 2020 indicate that the minority share of the population will surpass 63% of the population, which is ahead of the long-term nationwide trend of an increasing representation by minority persons and a corresponding decreasing share of non-minority persons (White alone).

#### *Households/Housing Characteristics*

Corresponding to anticipated population growth, the total number of households, families, and housing units in the Study Area are also expected to grow at a strong pace between 2010 and 2020. The US Decennial Census reported a total of about 27,000 households in the Study Area in 2010, a number that is forecasted to grow by an additional 2,000 households for a total of 29,000 households by 2020. <sup>2</sup>

According to the US Census American Community Survey (2008-2012), it is estimated that there were about 1,200 occupied housing units with no vehicle available; with 859 renter-occupied units and 370 owner-occupied units reported as having no vehicle available. According to this same data source (2008-2012), there

---

<sup>2</sup> Esri forecasts for 2015 and 2020 based on 2010 US Decennial Census.

were 7,388 multi-family dwelling units in the Study Area representing a 26.4% share of the housing stock, compared to a 26.5% share for the entirety of New Jersey

See Section 5.2 Housing Stock Characteristics beginning on page 42 and Section 5.3 Household Characteristics beginning on page 48 for additional details about housing units and households in the Study Area.

### *Environmental Justice*

Environmental Justice (EJ) in transportation planning can be characterized as the fair distribution of transportation benefits and burdens among all people. NJTPA-funded planning studies must be consistent with federal regulations concerning Environmental Justice, including consistency with Title VI of the 1964 Civil Rights Act and Executive Order 12898. Environmental justice requirements include identifying and addressing disproportionately high and adverse effects of proposed decisions (i.e., programs, policies, activities) on minority populations and low-income populations in order to achieve an equitable distribution of benefits and burdens.

One of the principal purposes of conducting this study is to address the mobility needs of low-income and minority populations that live or work in the Study Area. The transportation modes targeted for improvements in this study are public transit services (and linkages to those services) and bicycle and pedestrian access and mobility (and accommodations that facilitate or enhance the ability to travel by walking or cycling). Improving level of service for these particular modes tends to support the transportation needs of low-income and minority population groups in the Study Area that do not own or have access to automobiles.

The Federal Highway Administration (FHWA) definition of minority in the context of EJ is the following: “Black or African American, Hispanic, Asian American, American Indian/Alaskan Native, and Native Hawaiian or Pacific Islander.” An assessment of the Study Area revealed a relatively high degree of racial and ethnic diversity, and a particularly noteworthy high share of Asian population. According to the “Diversity Index”, which measures the probability that two people from the same area will be from different racial or ethnic groups, the Study Area’s diversity index of 78.1 indicates a relatively greater amount of racial diversity compared to the Tri-county area, the State, and the Nation.

During 2008–2012, the poverty rate for the households living in the Study Area was 6.5%, which was lower than the State rate of 9.6%. The Study Area’s poverty rate is also lower than Middlesex and Union Counties, but higher than Somerset County. On a municipal level, the Study Area has a lower poverty rate than Dunellen Borough, Highland Park Borough, North Plainfield Borough, and Plainfield City. It has a higher poverty rate than Edison Township, Middlesex Borough, Piscataway Township, South Plainfield Borough, and Green Brook Township.

### ***Labor Force and Work Force***

According to Longitudinal Employer-Household Dynamics (LEHD) data, there were 47,964 primary jobs<sup>3</sup> in the Study Area in 2011 with 4,532 of these workers (about 9.4%) reported as living and working at a primary job located in the Study Area. The net inflow of workers in the entire Study Area as a whole was approximately +9,300 workers; with the greatest net inflow of workers located in the Central Sub-area where there is a concentration of commercial industrial land uses centered around the confluence of Interstate 287 and County Route 529 (see Map 10—4: Detailed Land Use by Tax Parcel Assessment Data, Central Detail on page 136).

There were 43,432 people who commuted from a place of residence outside of the Study Area to a primary job located in the Study Area. Conversely, there were 34,069 residents of the Study Area who were employed in a primary job outside of the Study Area.

The top 4 industries of the work force in the Study Areas (i.e. jobs in the Study Area) were administration & support, manufacturing, wholesale trade and retail trade. About 28% of the workers employed in the Study Area (primary jobs) were identified as belonging to a minority population group and 14.1% were Hispanic or Latino.

The top 4 industries of the labor force in the Study Area (i.e. employed residents living in the Study Area) were health care, professional services, retail trade and manufacturing. About 43% of the labor force in the Study Area was identified as belonging to a minority population group and 12.3% were Hispanic or Latino.

### ***Commuting Patterns***

According to American Community Survey 5-Year data (2008-2012), approximately nine percent (9.0%) of the commuters who lived in the Study Area, used public transportation to travel to work (3,716 out of 41,316 commuters). The same public transit share figure for New Jersey was 10.7%. A total of 3,484 workers in the Study Area commuted by bus or rail; only 19% of the Study Area transit riders commuted to work by bus compared to a statewide figure of 71% of transit riders that commuted to work by bus. An estimated total of 978 commuters were reported as either walking (713 workers) or biking (265) to work; as a group representing 2.5% of all commuters.

See Section 7.0 Work Commute Travel Behavior beginning on page 67 for further details and explanation of data sources.

---

<sup>3</sup> "Primary jobs" are defined as the job that provides the most earnings for each worker.



## 3.2 Land Use

### 3.2.1 High Activity Areas

Numerous areas of trip generation (origins) and trip attractors (destinations) are found throughout the corridor with high concentrations of trip activity as listed below, sorted generally from south to north.

#### *South Subarea*

- Route 1 commercial corridor from Woodbridge Avenue to I-287 (Edison)
- Route 27 commercial corridor from Highland Park to I-287 (Edison)
- Edison Train Station (Edison)
- Multi-family complexes on Cedar Lane in Highland Park Borough (near Johnson Park, County Park).
- Talmadge Road industrial area (Edison)
- Camp Kilmer industrial park (Edison & Piscataway)
- Various multi-family complexes situated between Camp Kilmer industrial park and the Talmadge Road industrial area (Edison)
- Livingston Campus of Rutgers University (Piscataway)

#### *Central Subarea*

- Hadley Center mall (South Plainfield)
- Middlesex Mall (South Plainfield)
- Centennial Square mall, Centennial Ave (Piscataway)
- Piscataway Towne Center, Centennial Ave & South Washington Ave (Piscataway)
- Hadley Road-Centennial Avenue industrial/commercial corridor (South Plainfield & Piscataway)
- Hamilton Boulevard-South Clinton Avenue industrial area (South Plainfield)

#### *North Subarea*

- Aspen Court - Princeton Gardens - Pleasant View Gardens apartment complexes along New Brunswick Avenue (Piscataway)
- Tanglewood Terrace, Carlton Club and Ridgedale Gardens apartment complexes on Old New Brunswick Road (Piscataway)
- South Avenue industrial corridor (Middlesex Borough)
- Dunellen Train Station
- Route 28 commercial corridor (Middlesex, Dunellen, and Plainfield)
- Route 22 commercial corridor (Green Brook and North Plainfield)

### 3.3 Transit Service

Existing bus service was found to be more available towards the northern end of the Study Area, and except for the local NJT 819 bus line serving a small part of the central area (South Plainfield and Piscataway), the bus service largely consists of peak period commuter bus lines into Newark, NJ and Manhattan. Local NJT 810 and NJT 814 bus lines run through the southern end of the Study Area along State Route 27 and County Route 514, respectively, and as “through-routes” they hardly serve to offer any internal origins and destination pairs for the benefit of people that live in the CR 529 corridor. Three Rutgers campus buses line operate offer service to/from New Brunswick Campuses, including a connection to New Brunswick station but lack any connectivity to the very proximate Edison Rail Station or to the surrounding communities. Furthermore, the Edison Rail is the only station with all day frequent service on the Northeast Corridor Line that is NOT provided with connecting local bus service commensurate to the level of service and ridership at that rail station.

### 3.4 Bicycle and Pedestrian Infrastructure

A detailed inventory of sidewalks and shoulders was created with a windshield survey of 201 “directional” miles<sup>4</sup> of major roads within the Study Area. Information collected on sidewalks includes identification of sidewalk material, approximate width, presence of “Class 1” bike paths, and identification of worn paths on segments with no sidewalk. Information collected on shoulders include approximate width, presence of dedicated “Class 2” bike lanes, and identification of segments with no shoulder present but were marked as “Class 3” bike routes (i.e. shared-lane-arrow pavement markings known as “sharrows” or share-the-road signage posted along the side of the road).

Sidewalks were present on about 56% (113 miles) of the overall mileage inventoried (201 miles). The remaining 88 miles (44%) of road frontage did not have sidewalks, of which more than 3 (three) miles were specifically identified as having roadside worn pedestrian paths, a key indication that a sidewalk is warranted.

A photo inventory of pedestrian facilities at 112 signalized intersections was also taken. For each leg of every intersection, an inventory was taken on the presence and/or absence of crosswalks, depressed curbing or ramps at corners, pedestrian signal heads, and general comments. Of all the 112 signalized intersections inventoried in the Study Area, 88% had no more than two missing crosswalks. The remaining 12% had three or four missing crosswalks.

The shoulders inventory and the companion sidewalk inventory enabled the identification of more than 21 miles of road frontage having a formal bicycle accommodation present, in the form of a dedicated roadside path (“side path”), a marked bike lane in the shoulder area of the road or a marked share-road bike route.

---

<sup>4</sup> “Directional miles” means along the road frontage in both direction of the road; or simply both sides of the road. A 10-mile stretch of road would have 20 directional miles.



Bus stop on Route 529 between Metlars Ln and Hadley Rd, serving Middlesex Mall and Hadley Center; no shelter and no sidewalk; worn pedestrian paths are present (August 21, 2014; IMG\_2764)



Bus stop on Hadley Road serving surrounding commercial land uses; no sidewalk and no shelter (September 4, 2014; IMG\_2982)





Worn path along curb on South Washington Ave northbound on approach to I-287 overpass, Piscataway  
(August 28, 2015, 000157\_6.JPG)



Pedestrian traveling southbound on South Washington Ave at I-287 overpass, Piscataway  
sidewalk ends at this location, see worn path in top photo, also no crosswalk (August 28, 2015, 000169\_6.JPG)



Cyclist traveling northbound on Rock Ave just north of Greenbrook Road, North Plainfield (September 9, 2014; IMG\_3294)



"Bike Route" running on Old Post Road at the Boulevard of the Eagles, Edison (July 23, 2014; IMG\_0114)





Bike lockers behind dumpsters at Edison Station; bike lockers at capacity with a waiting list (October 10, 2014; IMG\_3370)



Bike racks and "overflow" bicycle parking on New York-bound side of Edison Station (October 10, 2014; IMG\_3372)



Underutilized bike racks obstructed by a guard rail at Edison Station (October 10, 2014; IMG\_3374)



Bike rack utilization on eastbound side of Dunellen Station (October 10, 2014; IMG\_3380)



## 4.0 Recommendations

Our recommendations identify conceptual fixed-route bus & shuttle services and a comprehensive series of bicycle and pedestrian facility improvements that create much-needed inter-modal linkages to the Northeast Corridor and Raritan Valley commuter rail lines at the Edison and Dunellen train stations. The recommendations also identify ways of improving service levels and safety for transit-riders, cyclists and pedestrians when traveling between nearby local points of attraction within the corridor. The principal goal for implementing these recommendations is to increase overall mobility between origins and destinations in the Study Area, which may tend to stimulate economic opportunities within the Corridor and throughout the region especially for those who do not own automobiles or have limited access to automobile use.



The last four taxis of a long taxi queue at Edison Station; more than 10 taxis were observed on multiple occasions, Edison Station has no connecting public bus service; residents, workers and employees who don't own an automobile rely on taxi service (October 10, 2014; IMG\_3377)



## 4.1 Basis for Recommendations

### *Category 1: An existing condition in the Study Area is in need of enhancement*

There is evidence of an improvement or strategy that is required to address an immediate need to enhance or support an existing service, utility or transportation characteristic. For example, the transit- and bicycling-related recommendation to expand sheltered and secured bicycle parking/accommodations at the Edison and Dunellen train stations (see photos on pages 88 and 91 in this report)

### *Category 2: Steering Committee and Public Outreach*

Recommendations that are based on or an adaptation of comments and requests solicited received from the membership of the Steering Committee or through the Public Open House Meetings. For example, transit-related request and appeal by low income and individuals living in transitional housing and/or affordable housing with limited mobility options to initiate shuttle services from their apartment complex to the Edison train station and shopping/activity centers in study area proximity.<sup>5</sup>

### *Category 3: Supportive of the adopted Middlesex County Transportation Plan*

The improvement or strategy directly supports and complies with the adopted Middlesex County Transportation Plan, especially regarding system network connectivity. For example, the transit system recommendation for the development of public private partnerships towards the provision of shuttle bus services between residential and transit / shopping facilities within and outside the study area. Or, the proposed Complete Bicycle Network proposal that continuous network connections be provided between major parks and recreational facilities that currently have bicycle paths such as linking the Middlesex Greenway trail head in Metuchen to the bicycle path system in Middlesex County's Johnson Park (which also connects to the D&R Canal State Park bike path that is part of the East Coast Greenway extending from Florida to Maine).

### *Category 4: Field Observation*

Recommendations that are based on observations of physical conditions and/or activities made during the field inventory task of this study and other prior field condition assessments. For example, the sidewalk related recommendations to construct sidewalks along intermittent gaps on both sides of Route 1 from Woodbridge Avenue to Old Post Road in Edison that were noted during a field inspection of sidewalk facilities along major roads in the study area. Or, sidewalk related recommendations along Plainfield Avenue from the Edison train station to Ethel Road that were also observed during a prior NJTPA sponsored walkability workshop for the area near the Edison Train Station some 10+ years ago (discontinuous sidewalk condition is ongoing as of the data of this report).

---

<sup>5</sup> This request was from persons in attendance at the March 7, 2016 Public Open House Meeting.

### *Category 5: Data-driven*

Improvement/strategy is based on or supported by findings of data presented in the Study. For example, a transit system related recommendation to extend existing New Jersey Transit bus services to improve access and connections to local and regional jobs and other facilities is supported by demographic characteristics such as population density, the presence of a sizable number of zero-car households, the current levels of transit usage, commutation distance and origin-destination patterns.

## 4.2 Transit System/Facility Recommendations

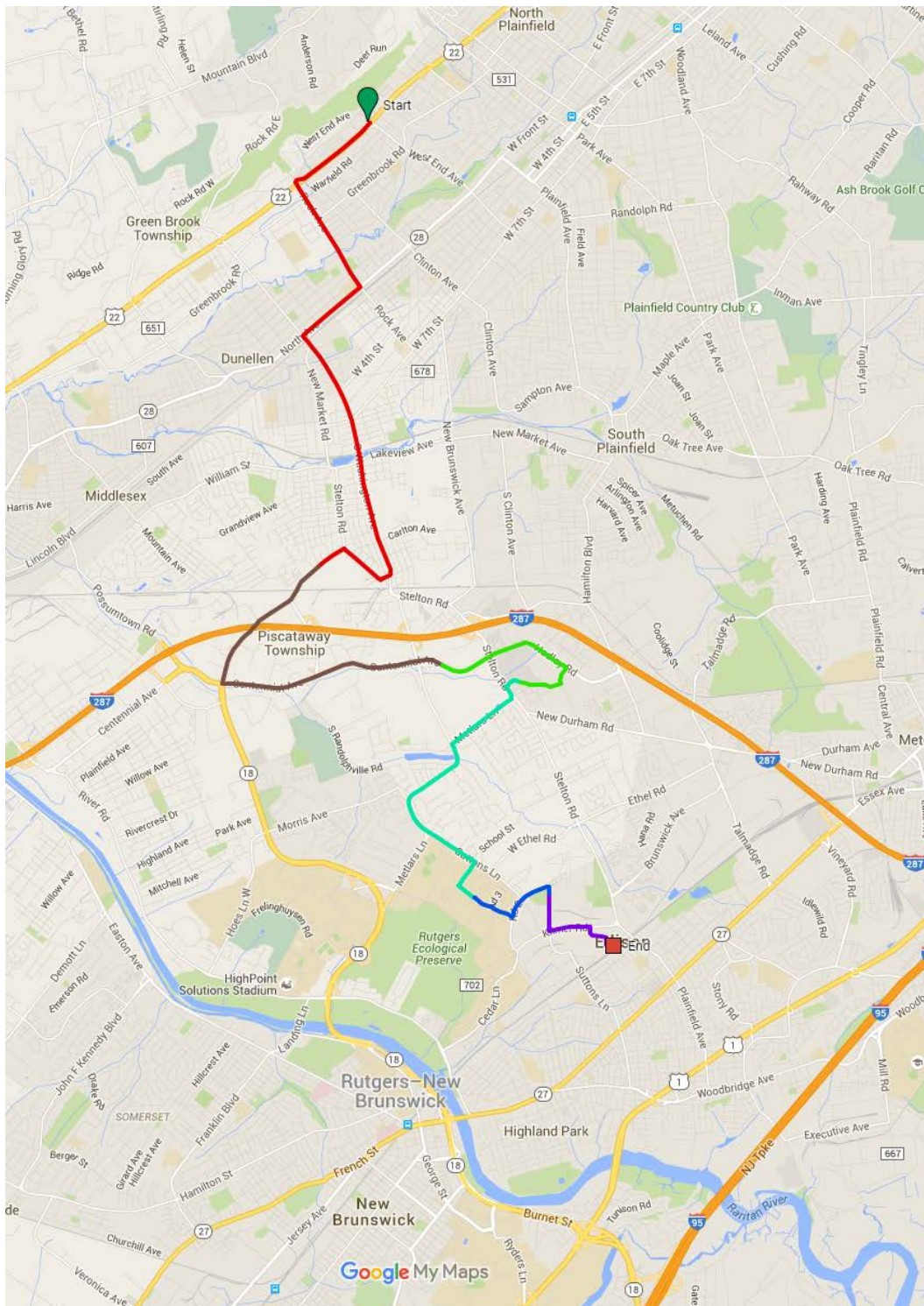
There are nine New Jersey Transit bus lines that service the Study Area, with six lines primarily oriented towards peak period services to either New York and Newark and running along Routes 22 and 28. The other 3 New Jersey Transit bus lines are local “800-series” routes. The 810 (New Brunswick to Woodbridge Center) and the 814 (North Brunswick to Middlesex County College) cut across corridor offering service to a very limited portion of the most southerly end of the Study Area. The 819 provides service at Hadley Center Mall/Middlesex Mall to areas outside of the Study Area (Plainfield and Metuchen). There are no connecting local bus services at either Edison or Dunellen station. The Rutgers University Intercampus bus system operates in the Study Area, but service does not extend to any origins or destinations outside of the Livingston Campus.

All of the 108 active bus stops located in the Study Area were inventoried. Only 13 out of 108 the bus stops were observed to have a shelter present; the remaining 95 bus stops had no shelter present.

- Expand fixed route shuttle services to the Edison Train Station, Dunellen Train Station, points to connecting bus routes, and activity centers in the study area proximity to provide low income and individuals with limited transportation options the ability to access local and regional destination points to jobs, shopping, medical, social and recreational activities.
- Extend and/or expand existing local New Jersey Transit bus services to provide service between major points of origins and destinations within and along the Route 529 Corridor (see proposed route concepts).
- Consider an expansion of the existing Rutgers University bus system to include a shuttle service to the Edison Train Station that could serve potential trips from Rutgers students and faculty.
- Initiate TMA assisted carpools from common points of origins to common points of destinations such as Rutgers University and Middlesex County College, Train Stations, Sutton – Kilmer Industrial Park, Centennial Avenue Employment centers, Middlesex Mall / Hadley Center / Centennial Square, major bus stops to New York and other regional points.
- Among the implementation alternatives consider development of public – private partnerships including New Jersey Transit, County, Municipalities, Rutgers University, Residential Apartment Agencies, social service agencies and private developers as contributors towards the provision of shuttle services.

## Map 4—1: Proposed 812 Bus Line Concept – From US 22 at West End Ave to Edison Train Station

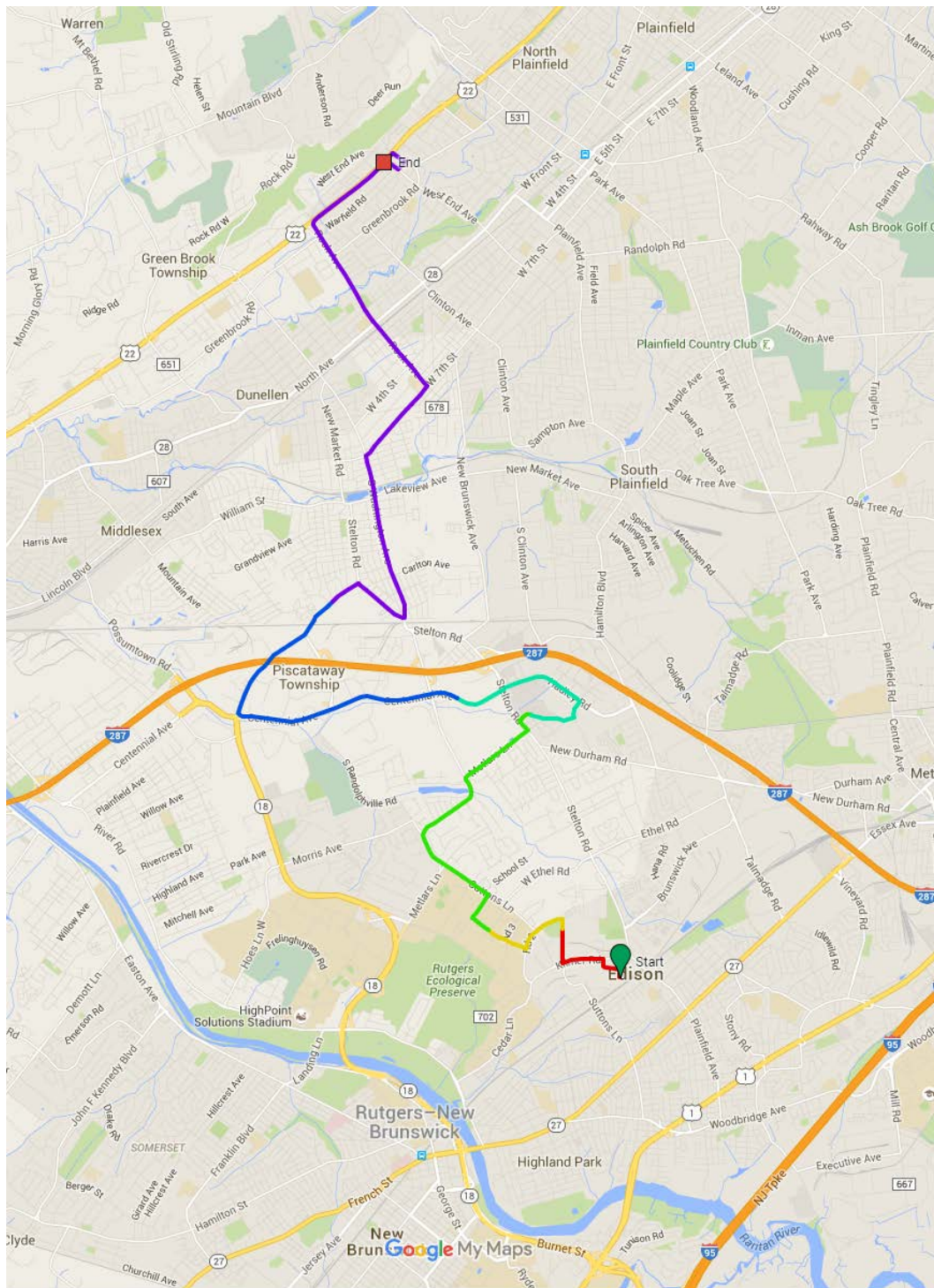
14.8 miles; two vehicles; approximate 1-hour headways





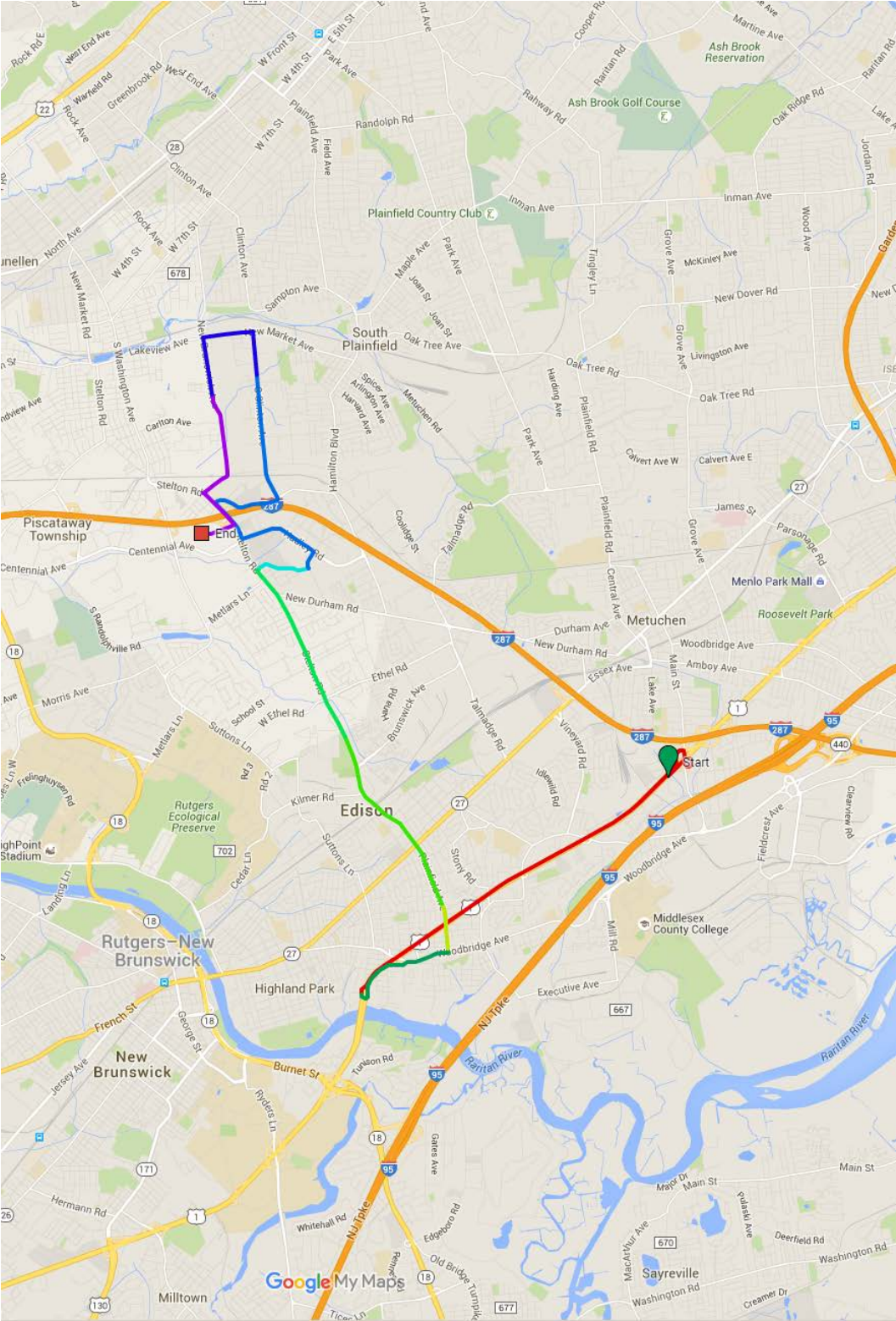
## Map 4—2: Proposed 812 Bus Line Concept – From Edison Train Station to US 22 at West End Ave

15.2 miles; approximate 1-hour headways



**Map 4—3: Proposed 816 Bus Line Concept – To Centennial Square (1327 Centennial Ave, Piscataway)  
From 1066-1080 US Route 1 (Edison Glen/Prince Street)**

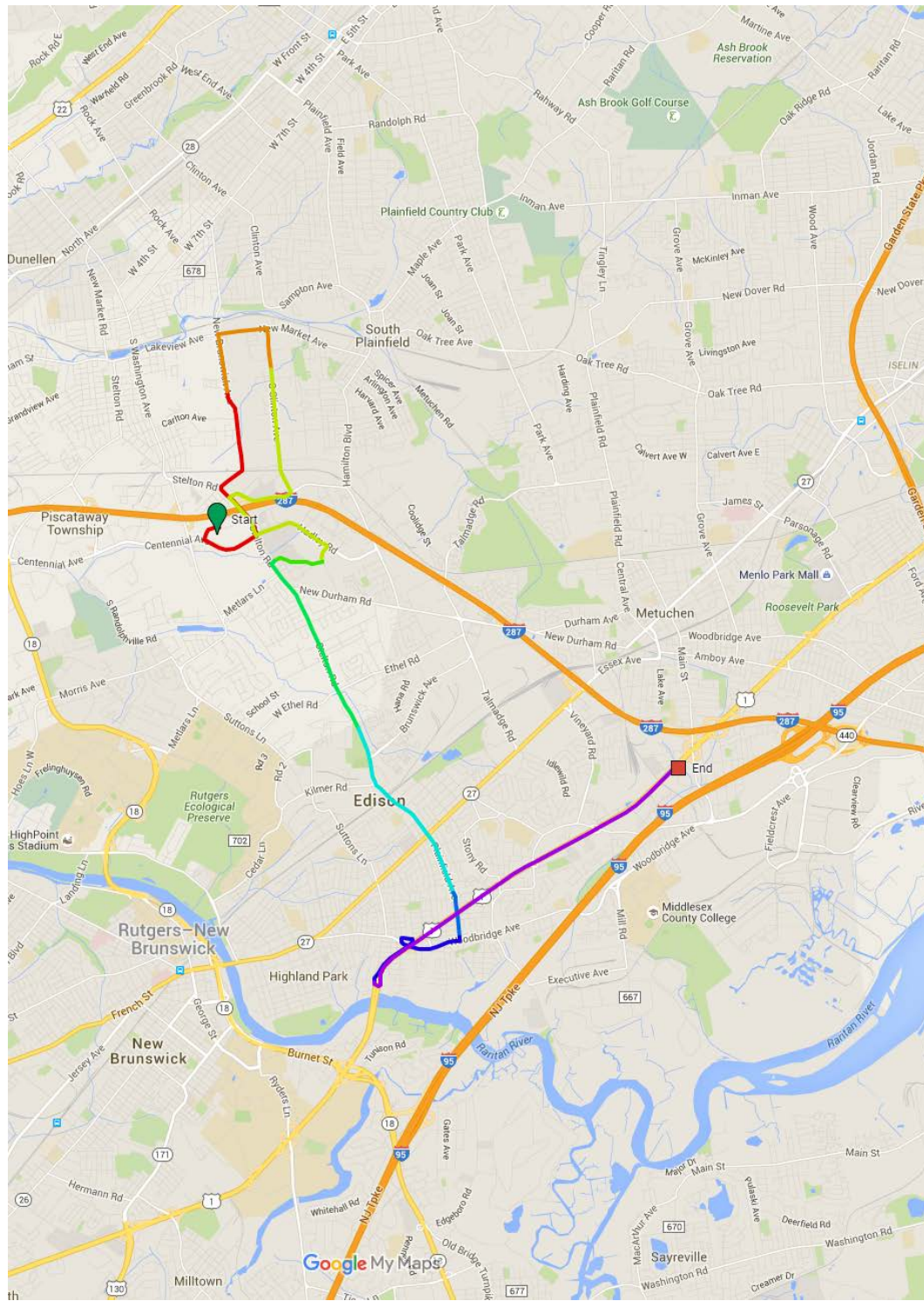
15.6 miles; two vehicles; approximate 1-hour headways





**Map 4—4: Proposed 816 Bus Line Concept – To 1066-1080 US Route 1 (Edison Glen/Prince Street)  
From Centennial Square (1327 Centennial Ave, Piscataway)**

15.6 miles; two vehicles; approximate 1-hour headways



### 4.3 Bicycle Network Recommendations

Existing bike routes, totaling over 21 miles, were found to be fairly *disconnected* throughout the County Route 529 Corridor Study Area as discretely shown and classified on Map 9—3: Bikeway Inventory Map on page 117 (and shown as “existing bike route facilities” on Map 4—5: Proposed Bike Route Facilities, page 29). Most of these existing bike routes, which include separated bike paths, marked bike lanes, and shared bike lanes (roads marked as bike routes but where cyclist must share the road with motor vehicles), were found towards the southern half of the Study Area, south of I-287. A smaller number of bike routes are present towards the northern half of the Study Area, mostly in the neighborhood around Arbor Intermediate School situated southeast of the Dunellen Train Station.

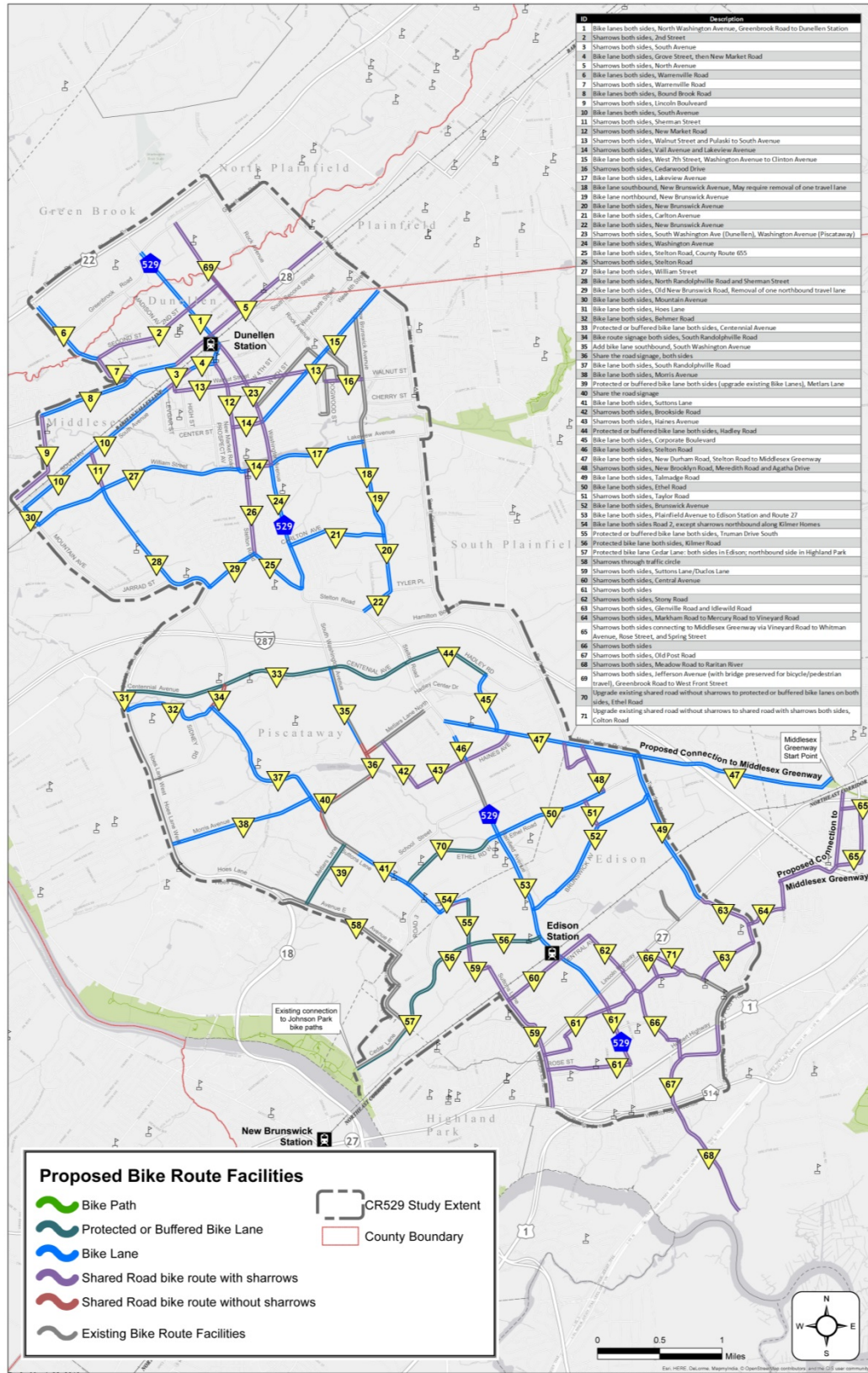
To improve bicycle mobility in the Study Area, the network connectivity of existing bike route facilities was comprehensively evaluated for the potential to implement network improvements that will create attractive low-stress linkages, especially along the numerous primary travel routes throughout the County Route 529 Corridor Study Area. The individual bikeway proposals illustrated on Map 4—5: Proposed Bike Route Facilities (on page 29) were developed through the consideration of several factors including public feedback from open house meetings, on-the-ground knowledge of the area, existing land use and development trends, and proximity to major trip attractors and generators in and around the corridor. The principal goal is to create a *complete* bicycle network as is illustrated on Map 4—6: Future Bike Route Network, page 30.

- Bicycle access needs to be provided between the Edison Train Station and the Rutgers Livingston Campus with safer routes and expanded bicycle parking facilities that are sheltered.
- Bicycle facility network connections should be provided between major parks and recreational facilities that currently have bicycle paths, such as: the Middlesex Greenway, Johnson Park, and Roosevelt Park and the D & R Canal State Park (i.e. the tow path).
- Encourage retail facilities at major shopping centers to provide more bicycle friendly parking accommodations.
- Expand sheltered and secured bicycle parking/accommodations at the Edison and Dunellen Train stations.
- Expand the Rutgers Bike Share Program along points within the Route 529 Study Area such as the Edison Train Station, Middlesex Mall/Hadley Center, Centennial Ave retail centers and the Wick Plaza shopping center, to expand connections to transit and provide first and last mile linkages. (The Rutgers Bike Share Program is still in the planning stages at the time of this report).



## Map 4—5: Proposed Bike Route Facilities

This map is also provided in Appendix D in a higher resolution 11 x 17 inches (tabloid) page size format



### Map 4—6: Future Bike Route Network

*This map is also provided in Appendix D in a higher resolution 11 x 17 inches (tabloid) page size format*





## 4.4 Sidewalk Recommendations

Sidewalks were found to be largely continuous along road frontages; however, notable locations within the sidewalk network were found to be incomplete and/or disconnected. In developing recommendations for constructing sidewalk connections, several considerations were taken into account including public feedback from open house meetings, on-the-ground knowledge of the area, land use, and proximity to major trip attractors and generators. Only “major roadways” (exclusive of I-287) were included in the study and were considered for sidewalk proposals.<sup>6</sup> The following Map 4—7: Proposed New Sidewalks on the following page 32 identifies specific locations where sidewalks were deemed to be warranted based on existing conditions.



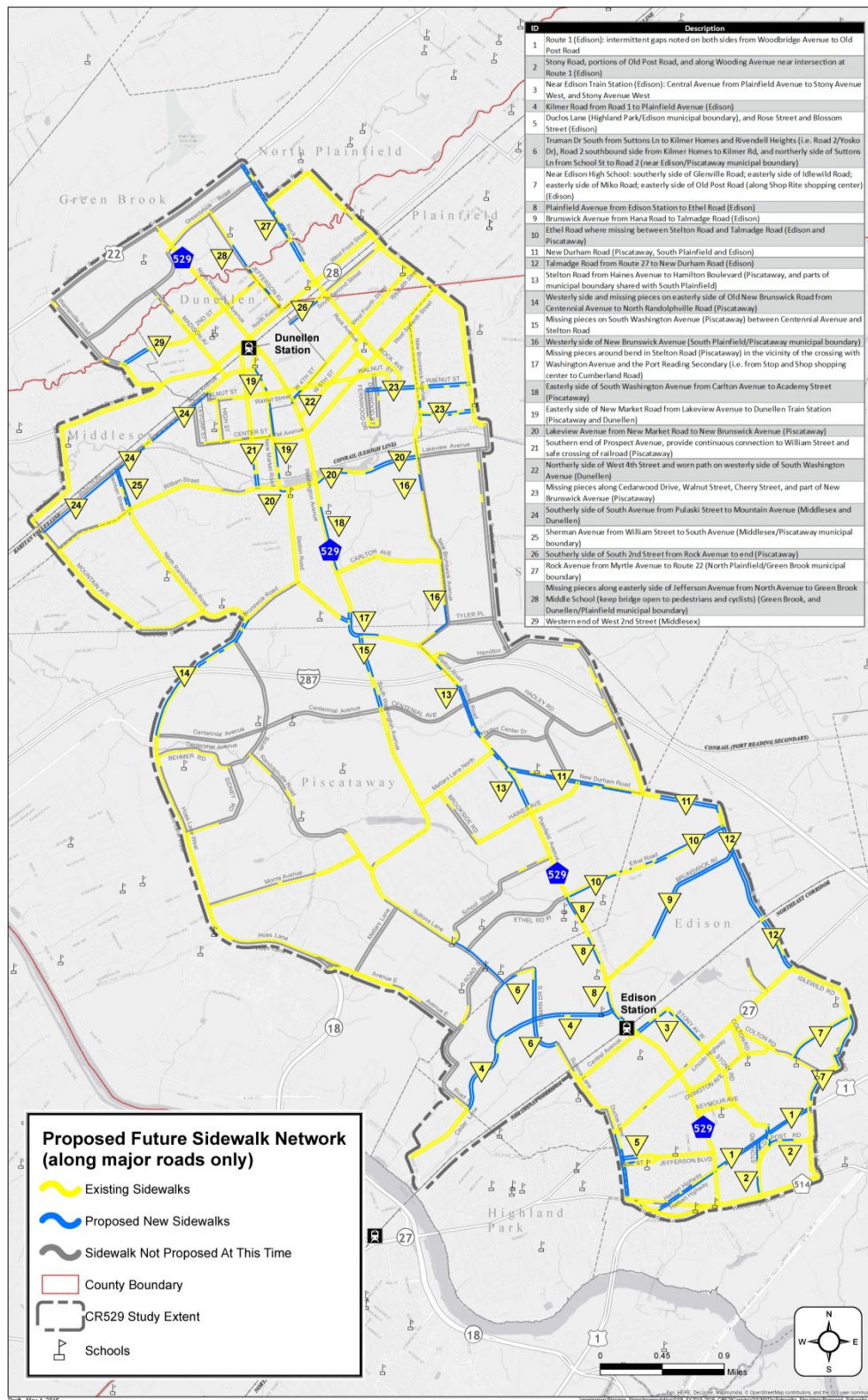
Worn pedestrian path; apparent absence of needed sidewalk on Old New Brunswick Rd at South Randolphville Rd; see recommendation #14 on page 32, Map 4—7: Proposed New Sidewalks (September 10, 2015, IMG\_3045)

---

<sup>6</sup> “Major Roads” are those roads having a function greater than a local neighborhood street.

### Map 4—7: Proposed New Sidewalks

*This map is also provided in Appendix D in a higher resolution 11 x 17 inches (tabloid) page size format*



## 4.5 Municipal Complete Streets Policies

### *Recommendation*

Highland Park was noted as the only municipality of the nine municipalities in the Study Area to have adopted a complete streets policy.<sup>7</sup> And, only a very limited portion of Highland Park (Cedar Lane/Rive Road area) was included in the Study Area. It is recommended that all other municipalities in the Study Area consider formally adopting a Complete Street policy (or some other similar implementing mechanism) as a commitment to investing in a complete and connected bicycle and pedestrian networks as integral components of the overall transportation system.

#### *What is a Complete Streets Policy?*

A “complete street” is a street that accommodates the needs all road users regardless of age, ability or mode of transportation, including, pedestrians, bicyclists and transit passengers. A “complete streets policy” is an official directive of a government or one of its agencies (or department etc.) acknowledging that all streets under its purview should be planned, designed, operated and maintained as complete street. Generally, these policies are most often adopted, in the case of local governments, as either a resolution or ordinance, but may be set forth in other forms of adoption depending on the context and applicability; for example, policies, plans, design guidelines or executive orders could be the mechanism for implementing complete streets.

Absent the existence of complete street policy, transportation mode of choice tends to be limited to motorized vehicles by continually making walking, bicycling, and taking public transportation inconvenient, unattractive, unsafe, or in some cases virtually impossible. Essentially, a complete street policy aims to ensure that all users of a roadway, not just drivers of motorized vehicles, are provided with equitable transportation options.

The New Jersey Department of Transportation (“NJDOT”) adopted a complete street approved on December 3, 2009. The United States Secretary of Transportation signed an official policy of the United States Department of Transportation (“USDOT”) that requires the incorporation of safe and convenient walking and bicycling facilities into transportation projects (signed on March 11, 2010). The Board of Chosen Freeholders of Middlesex County adopted a resolution on July 19, 2012 supporting Complete Streets Design on all Middlesex County roadways encouraging Middlesex County municipalities to complete streets design goals in municipal projects.

<sup>7</sup> New Jersey Bicycle & Pedestrian Resource Center. *New Jersey Complete Streets Policy Atlas*, <http://njbikeped.org/services/nj-complete-streets-policy-atlas/>, last updated August 1, 2016; retrieved September 16, 2016.

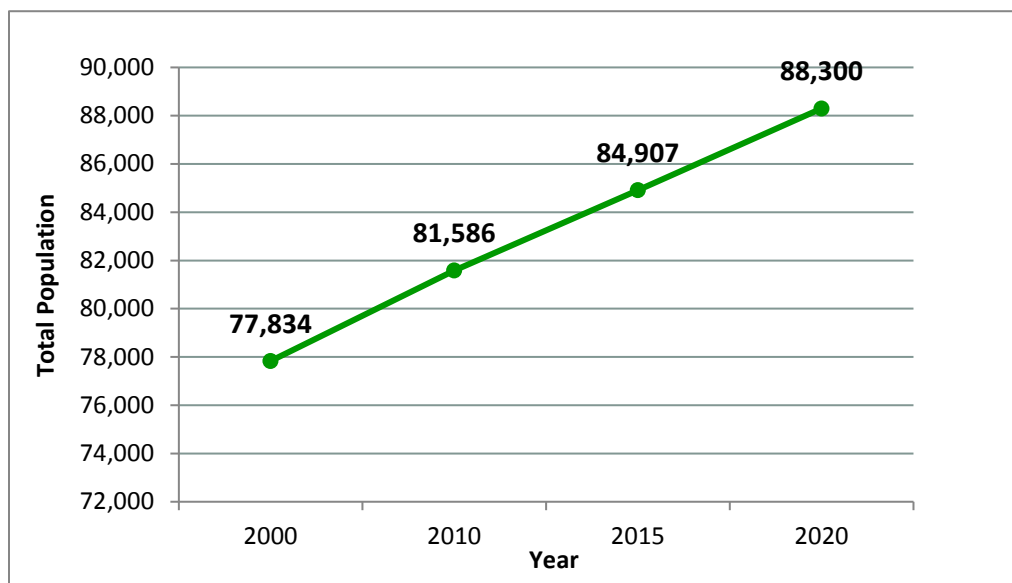
## 5.0 Demographic Profile

### 5.1 General Demographic Characteristics

#### 5.1.1 Total Population

In 2000, the total population of the CR 529 Corridor Study Area (“Study Area”) was 77,834. By 2010 the Study Area’s population grew by 4.8%, increasing to 81,586. By 2015, the total population of the Study Area is estimated to be 84,907 and is expected to reach 88,300 by 2020. This is a total forecasted population growth of 8.2% in the decade between 2010 and 2020.

**Figure 5—1: Population Growth Trends in CR 529 Corridor Study Area (2000 to 2020)**

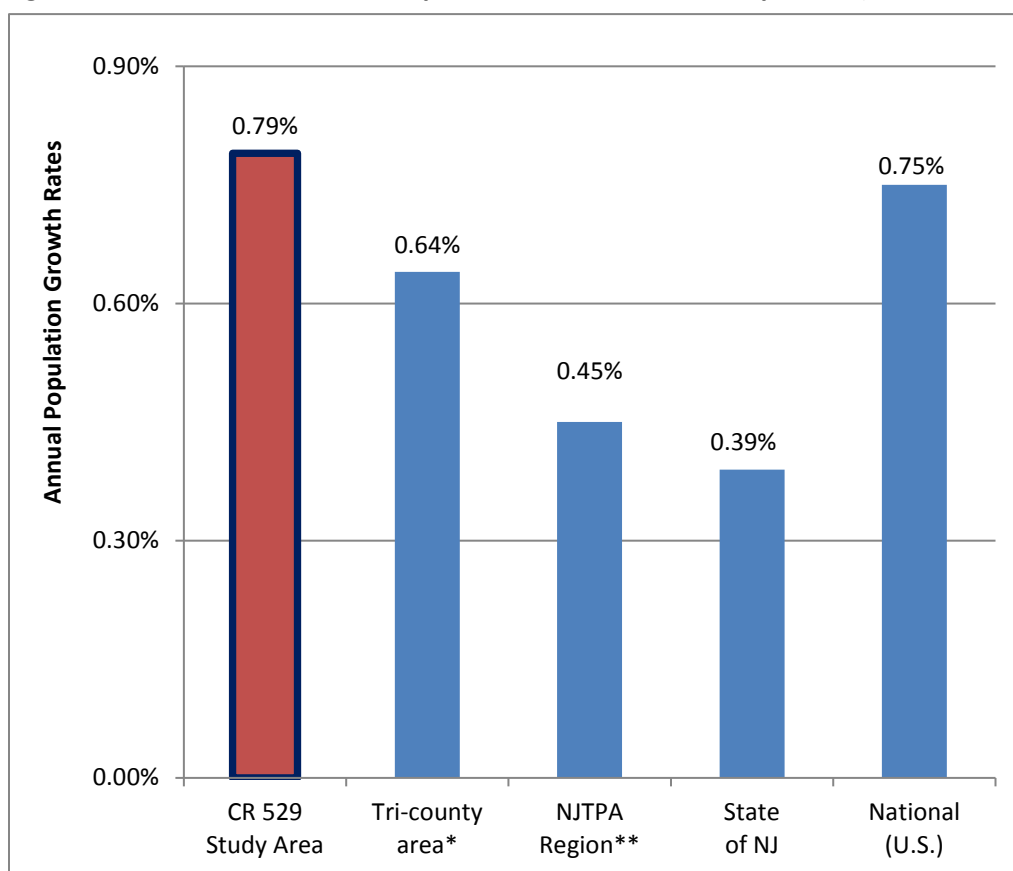


Source: U.S. Census Bureau, Census 2000 and 2010 Summary File 1. Esri converted Census 2000 data into 2010 geography. Esri forecasts for 2015 and 2020.



Between 2015 and 2020, the Study Area is forecasted to have an annual population growth rate of 0.79%, which is marginally higher than the national average of 0.75%. The forecasted rate of population growth in the Study Area is notably higher than both the NJTPA Region and the state of New Jersey, with forecasted annual population growth rates of 0.45% and 0.39%, respectively. The forecasted population growth rate in the Study Area is slightly higher than forecasted for the combined Tri-county area (Middlesex, Somerset, and Union counties), which is forecasted to grow at a rate of 0.64%.

**Figure 5—2: Forecasted Annual Population Growth Rates Comparison (2015 to 2020)**



Source: Esri forecasts for 2015 and 2020. \*Tri-county area is Middlesex, Somerset, and Union counties.

\*\*NJTPA Region is the 13-county region of the North Jersey Transportation Planning Authority



Compared to both the Tri-county area and the State, the population of the Study Area has a relatively higher percentage of racial minorities. Although White alone makes up the majority of both the Tri-county area and State populations, residents of the Study Area that identify themselves as belonging to at least one racial minority group collectively represent the majority of its total population, thus creating a “Minority Majority.”

The Study Area is shifting at a steady pace towards an even more-pronounced “Minority Majority”, while neither the Tri-county area nor the State (or any of the individual counties in the Tri-county area) is forecasted to achieve “Minority Majority” status by the year 2020. The percentage of persons living in the Study Area and belonging to a racial minority group is expected to realize a significant near-term increase between 2010 and 2020, from 55.0% to 63.1% of the total population. For more specific detail by racial minority population groupings of the US Census see Section 5.4.1 Race and Ethnicity beginning on page 54.

**Table 5—1: Percentage of Population Belonging to a Racial Minority Group: CR 529 Corridor Study Area, Counties, and State (2010, 2015, 2020)**

Geography	Census 2010	2015 Forecast	2020 Forecast
<b>CR 529 Corridor Study Area</b>	<b>55.0%</b>	<b>59.2%</b>	<b>63.1%</b>
Middlesex County	41.4%	45.4%	49.3%
Somerset County	29.9%	33.7%	37.8%
Union County	38.7%	40.9%	42.8%
Tri-county*	38.3%	41.7%	45.0%
New Jersey	31.4%	33.6%	35.8%

Source: U.S. Census Bureau, Census 2010 Summary File 1. Esri forecasts for 2015 and 2020.

\*Tri-county area is Middlesex, Somerset, and Union counties.

### 5.1.2 Population Density

The Study Area has an overall population density of 4,084 persons per square mile, which is significantly higher than the statewide density of 1,213 persons per square mile. The Statewide population density provides important context in that the Study Area figure exceeds the average density in the nation's most densely populated State. Compared to the Tri-county area, the Study Area is also more densely populated than both Middlesex and Somerset counties. Neighboring Union county, however, has a higher population density of 5,345 persons per square mile.

**Table 5—2: Population Density in CR 529 Corridor Study Area, Counties, and State (2015)**

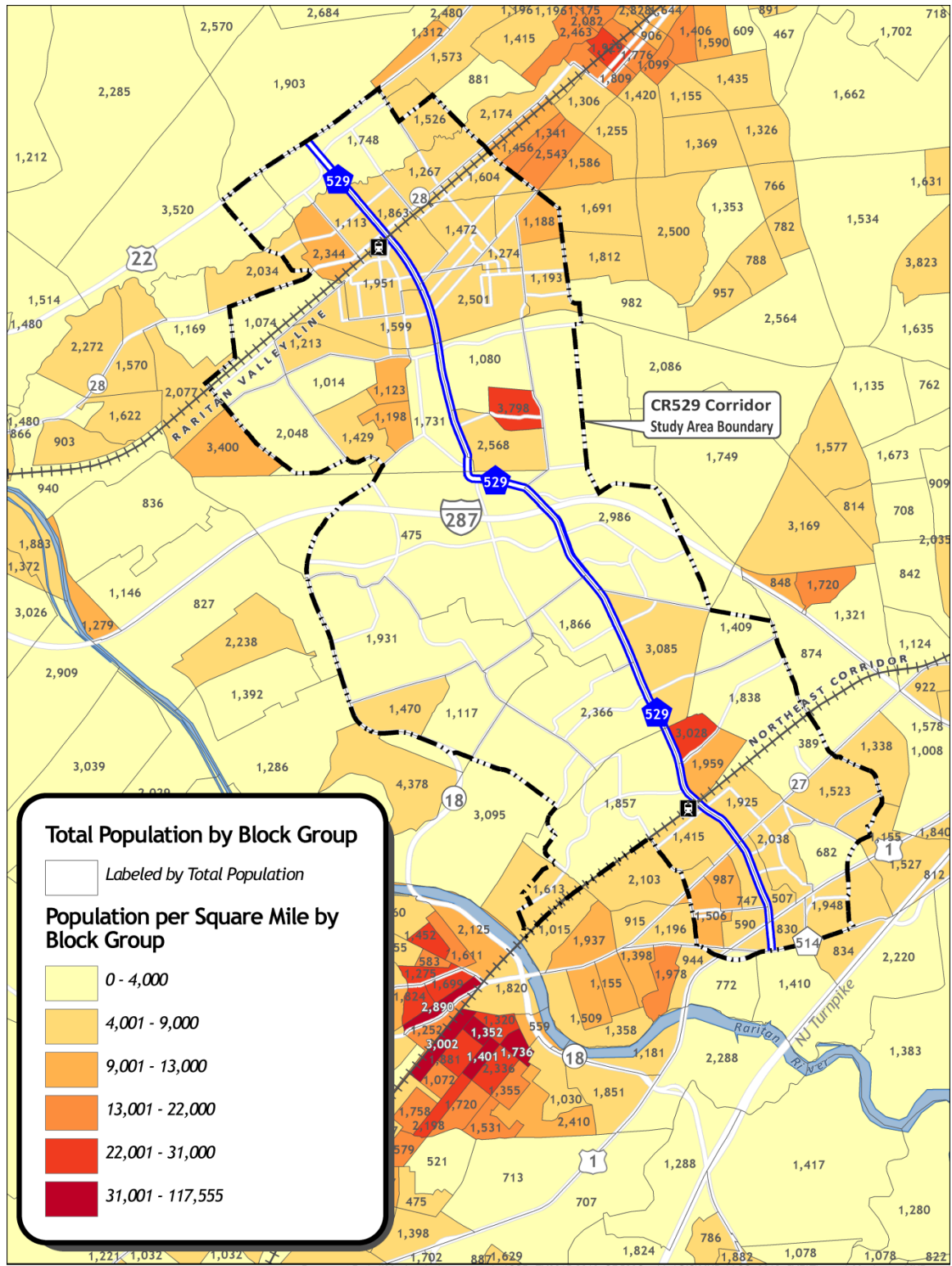
Geography	Land Area (sq. mi.)	2015 Population	2015 Population per sq. mi.
<i>CR 529 Corridor Study Area</i>	<i>20.79</i>	<i>84,907</i>	<i>4,084</i>
Middlesex County	308.97	831,395	2,691
Somerset County	301.77	334,511	1,108
Union County	102.86	549,736	5,345
Tri-county	734.39	1,715,642	2,336
New Jersey	7,354.70	8,918,440	1,213

Sources: Esri forecasts for year 2015 population. Land Area as per US Census Tiger Line files (2012).

The following map illustrates total population and population density by block group. In the map, any block group classified higher than the first category, greater than 4,000 persons per square mile, illustrates areas within the Study Area that have population density that are more than three times higher than the State average of 1,213 persons per square mile. According to the block group level US Census American Community Survey (ACS) data, the Study Area corridor has a population density ranging from a low of 161 to a high of 27,000 persons per square mile (ACS 5-year, 2008–2012). The highest densities appear to be concentrated around two developments in the Corridor, Pleasant View Gardens on Carlton Avenue (Piscataway) situated in the northern half of the Study Area between Interstate Highway 287 and the Dunellen Train Station and Edison Manor Townhomes situated roughly ¼-mile east of Plainfield Avenue (CR-529) located on Brunswick Avenue, which is about ½-mile north of the Edison Train Station.

## Map 5—1: Total Population and Population Density by Census Block Group

Source: U.S. Census, 2008–2012 American Community Survey Estimates.



### 5.1.3 Age Characteristics

The Study Area has an overall younger population compared to both Middlesex County and New Jersey. In 2015, the median age of the Study Area is forecasted to be 36.9 years old, which is less than both the County's and the State's median age forecasts of 38.1 and 39.7, respectively.

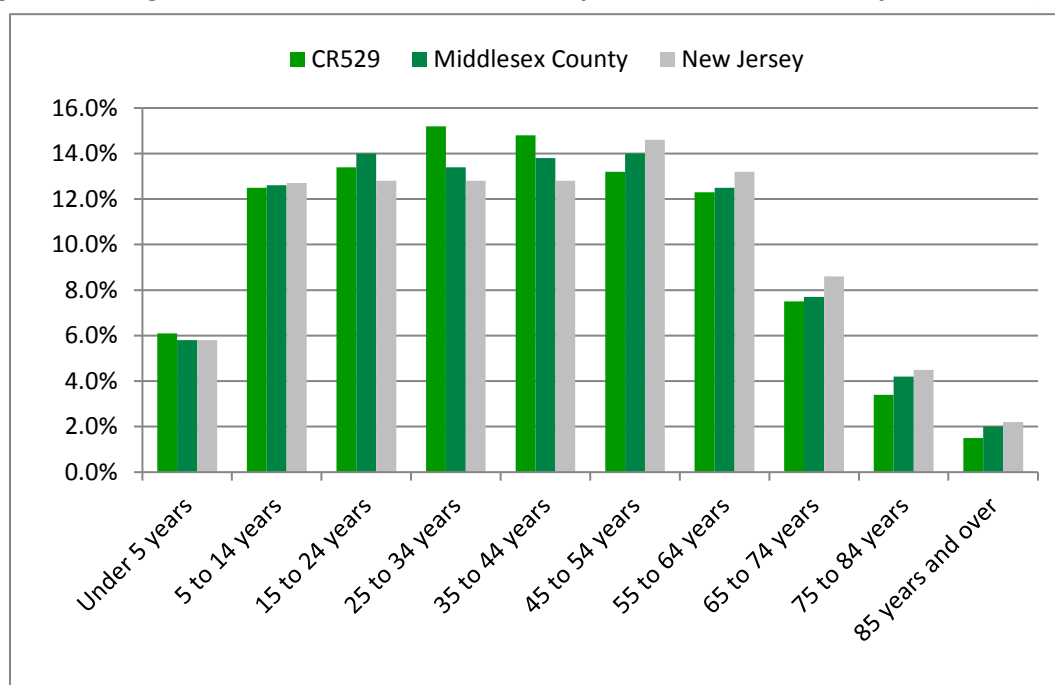
**Table 5—3: Median Age: CR 529 Corridor Study Area, County, and State (2015)**

Geography	Median Age
CR 529 Study Area	36.9
Middlesex County	38.1
New Jersey	39.7

Source: Esri forecasts for 2015.

In the Study Area, 25- to 44-year-olds make up the highest percentage of the population, making up 30.0% of its total population of 84,907. This is higher in comparison to both Middlesex County and New Jersey, where 25- to 44-year-olds make up 27.2% and 25.6% of the population, respectively.

**Figure 5—3: Age Cohorts for CR 529 Corridor Study Area, Middlesex County, and State (2015)**



Source: Esri forecasts for 2015.

**Table 5—4: Age Cohorts for CR 529 Corridor Study Area (2015)**

	Population	Percent
<b>Total</b>	<b>84,907</b>	<b>100.0%</b>
Under 5 years	5,184	6.1%
5 to 14 years	10,604	12.5%
15 to 24 years	11,356	13.4%
25 to 34 years	12,876	15.2%
35 to 44 years	12,587	14.8%
45 to 54 years	11,246	13.2%
55 to 64 years	10,463	12.3%
65 to 74 years	6,350	7.5%
75 to 84 years	2,929	3.4%
85 years and over	1,312	1.5%

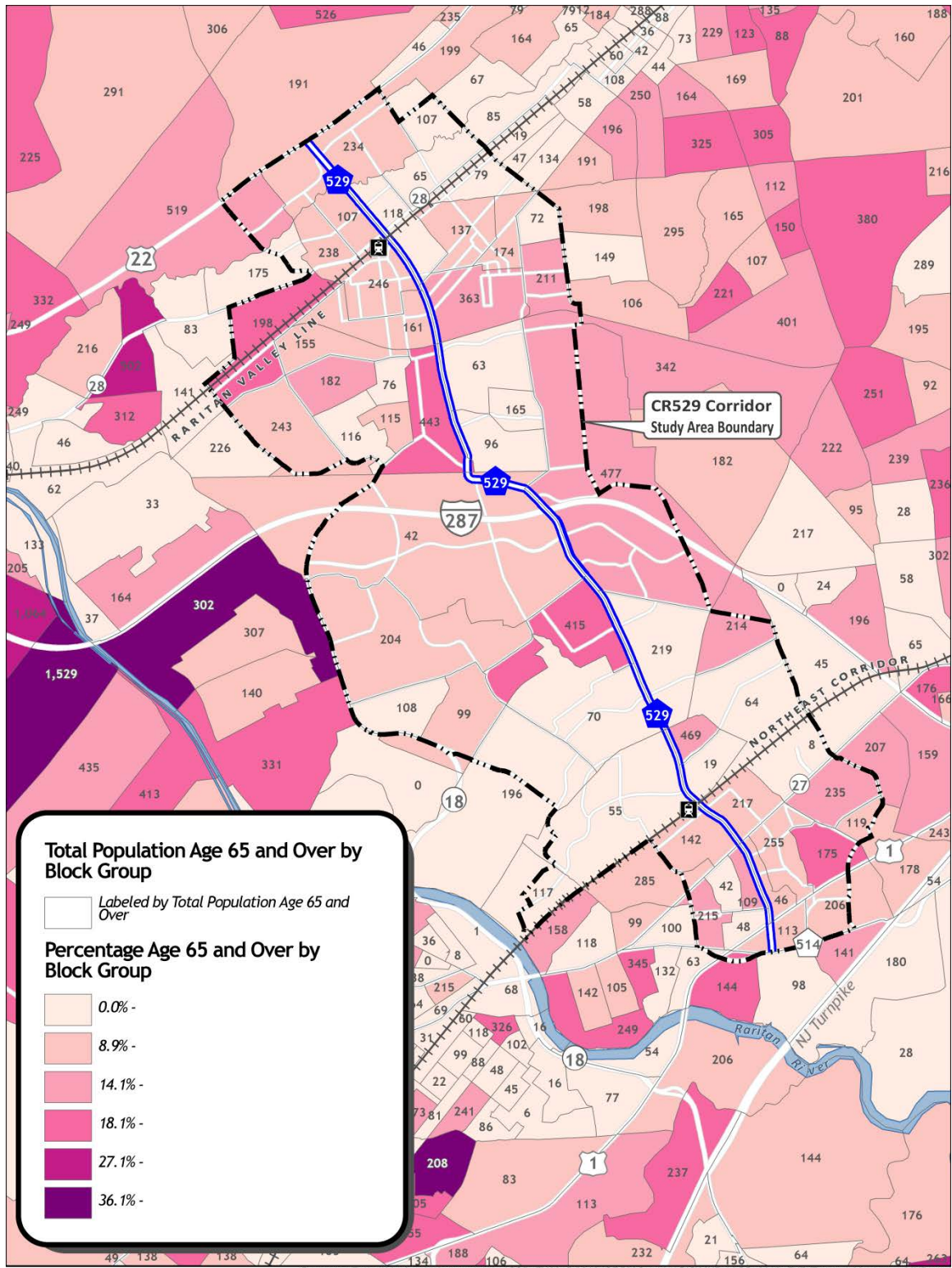
Source: Esri forecasts for 2015.

The following map illustrates the concentrations of population 65 years old and over by block group within the Study Area. As the map depicts, no block group within the Study Area has a higher percentage of people over 65 years of age than 27%. The overall percentage of population 65 years old and over in the Study Area is 12.4%, which is lower than in both Middlesex County (13.9%) and New Jersey (15.3%).



**Map 5—2: Total Population and Percent Population Age 65 and Over by Census Block Group**

Source: U.S. Census, 2008–2012 American Community Survey Estimates.



## 5.2 Housing Stock Characteristics

### 5.2.1 Type of Housing Unit (detached, attached, mobile home etc.)

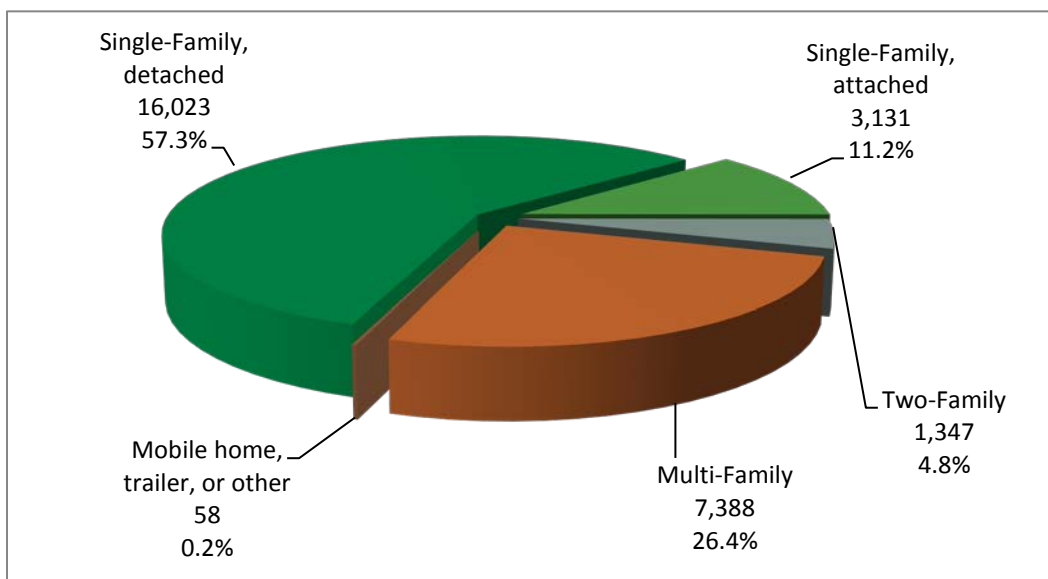
During 2008–2012, single-family dwellings (detached and attached) comprised 68.5% of the total housing stock of the Study Area. This is higher compared to the State percentage of 63.1%. Multi-family dwellings accounted for 26.4% in the Study Area, which is close to New Jersey's 26.5%. Two-family dwellings were 4.8% of the Study Area's total housing stock, which is lower than New Jersey's 9.5%.

**Table 5—5: Housing Units by Residential Structure Type, CR 529 Corridor Study Area and State (ACS 2008–2012)**

Residential Structure Type	CR 529		New Jersey	
	HUs	Percent	HUs	Percent
<b>Total Housing Units</b>	<b>27,946</b>	<b>100.0%</b>	<b>3,555,864</b>	<b>100.0%</b>
Single-Family, detached	16,023	57.3%	1,915,906	53.9%
Single-Family, attached	3,131	11.2%	326,457	9.2%
Two-Family	1,347	4.8%	336,231	9.5%
Multi-Family	7,388	26.4%	941,005	26.5%
Mobile home, trailer, or other	58	0.2%	36,265	1.0%

Source: U.S. Census, 2008–2012 American Community Survey Estimates.

**Figure 5—4: Number and Percent of Housing Units by Residential Structure, CR 529 Corridor Study Area (ACS 2008–2012)**

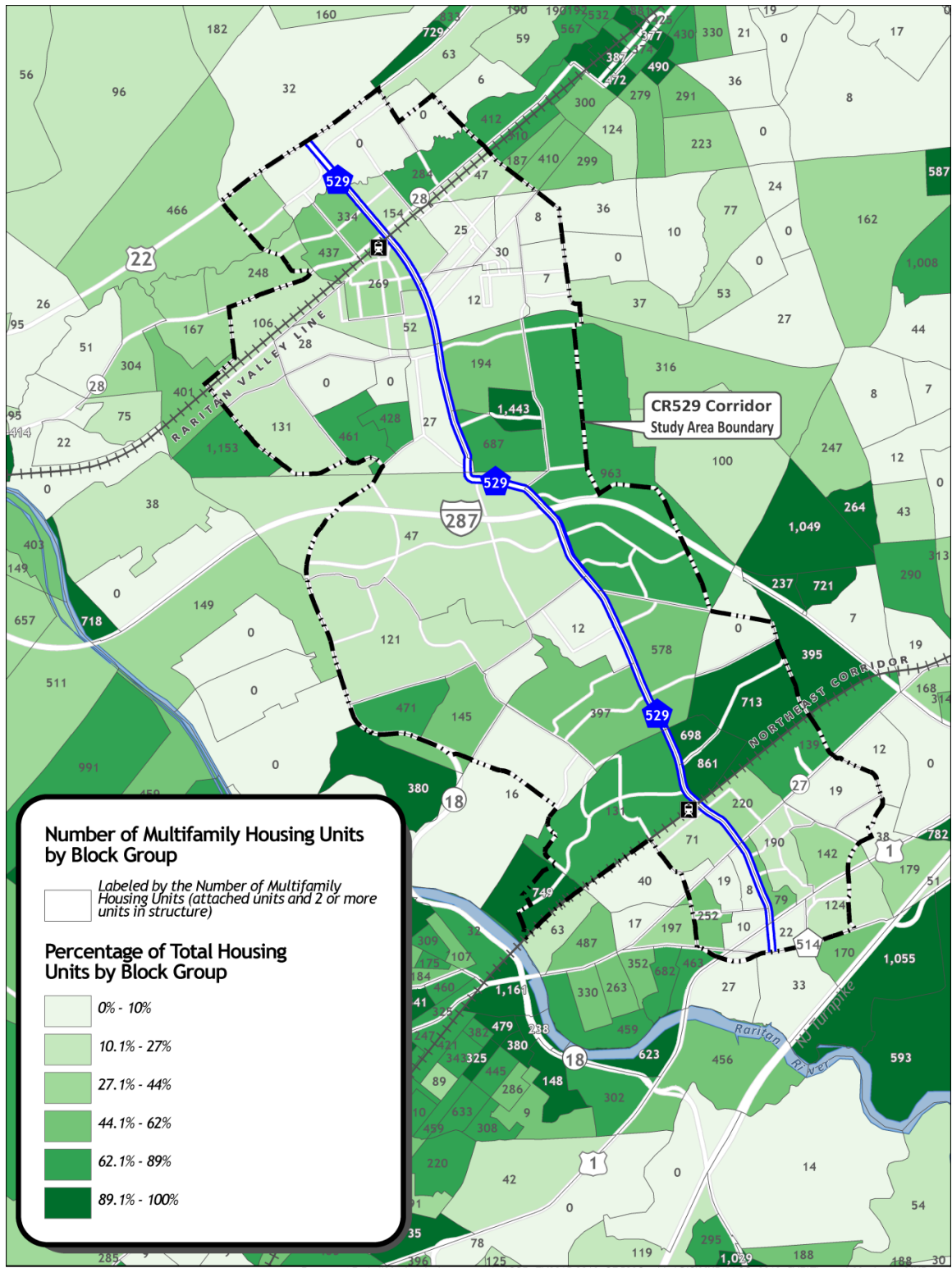


Source: U.S. Census, 2008–2012 American Community Survey Estimates.

The following map illustrates a concentration of multi-family housing near the Edison Train station area, including Edison Manor and the Pleasant View Gardens development north of Interstate Highway 287.

### Map 5—3: Number and Percent Total of Multifamily Housing Units by Census Block Group

Source: U.S. Census, 2008–2012 American Community Survey Estimates.



### 5.2.2 Tenure (owner vs. renter)

In the Study Area, 96.1% of total housing units are occupied, while 89.6% are occupied in the State. In the Study Area, 62.9% of housing units are owner-occupied. This is slightly higher than the 59.3% of households Statewide that are owner-occupied. About one third of the Study Area's total housing units are renter-occupied (33.1%), which is only slightly higher than for New Jersey (30.3%). Only 3.9% of housing units, a total of 1,103 housing units, in the Study Area are vacant, while 10.4% of New Jersey's housing units, or 368,986 units, are neither owner- nor renter-occupied.

**Table 5—6: Housing Units by Tenure in CR 529 Corridor Study Area and NJ (ACS 2008–2012)**

Tenure	CR 529		New Jersey	
	HUs	Percent	HUs	Percent
<b>Total</b>	<b>27,946</b>	<b>100.0%</b>	<b>3,555,864</b>	<b>100.0%</b>
Owner-Occupied	17,583	62.9%	2,108,166	59.3%
Renter-Occupied	9,260	33.1%	1,078,712	30.3%
Vacant	1,103	3.9%	368,986	10.4%

Source: U.S. Census, 2008–2012 American Community Survey Estimates.

### 5.2.3 Vehicle Availability

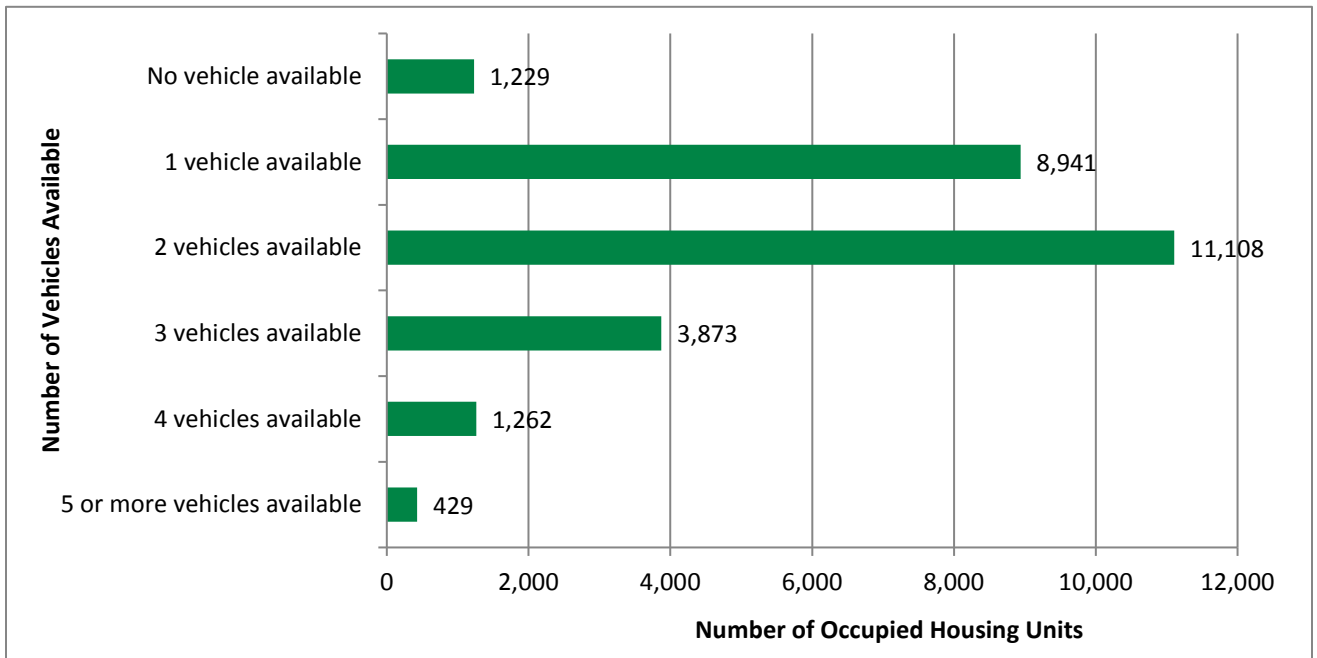
During 2008–2012, 95.4% of all occupied housing units in the Study Area had at least one vehicle available, leaving 4.6% of housing units, or 1,229 housing units out of a total occupied housing stock of 26,842 housing units, with no vehicle available (see Table 5-5 on page 45). An estimated 8,941 occupied housing units (33.3% of the total occupied housing units) had one vehicle available and an estimated 11,108 occupied housing units had two vehicles available (41.4% of the total occupied housing units).

Owner-occupied housing units in the Study Area predominately had two vehicles available (8,249 of the owner-occupied housing units, 30.7%), while the renter-occupied housing units predominately had one vehicle available (4,872 of the renter-occupied housing units, 18.2%).

The map on page 46, Map 5—4: Total and Percentage of Total Occupied Housing Units with No Vehicle Available, shows block groups in the Study Area that had a greater number of housing units with no vehicle available during 2008–2012. Housing units with no vehicle available appear to be more concentrated around each of the rail stations in the Study Area, Dunellen station to the north, and Edison Station to the South. The map on page 47, Map 5—5: Vehicles per Occupied Housing Unit by Census Tract, shows vehicles per occupied housing unit by census tract, and also shows a higher concentration of vehicles away from the two stations.



**Figure 5—5: Vehicle Availability in CR 529 Corridor Study Area, Occupied Housing Units (ACS 2008–2012)**



Source: U.S. Census, 2008–2012 American Community Survey Estimates.

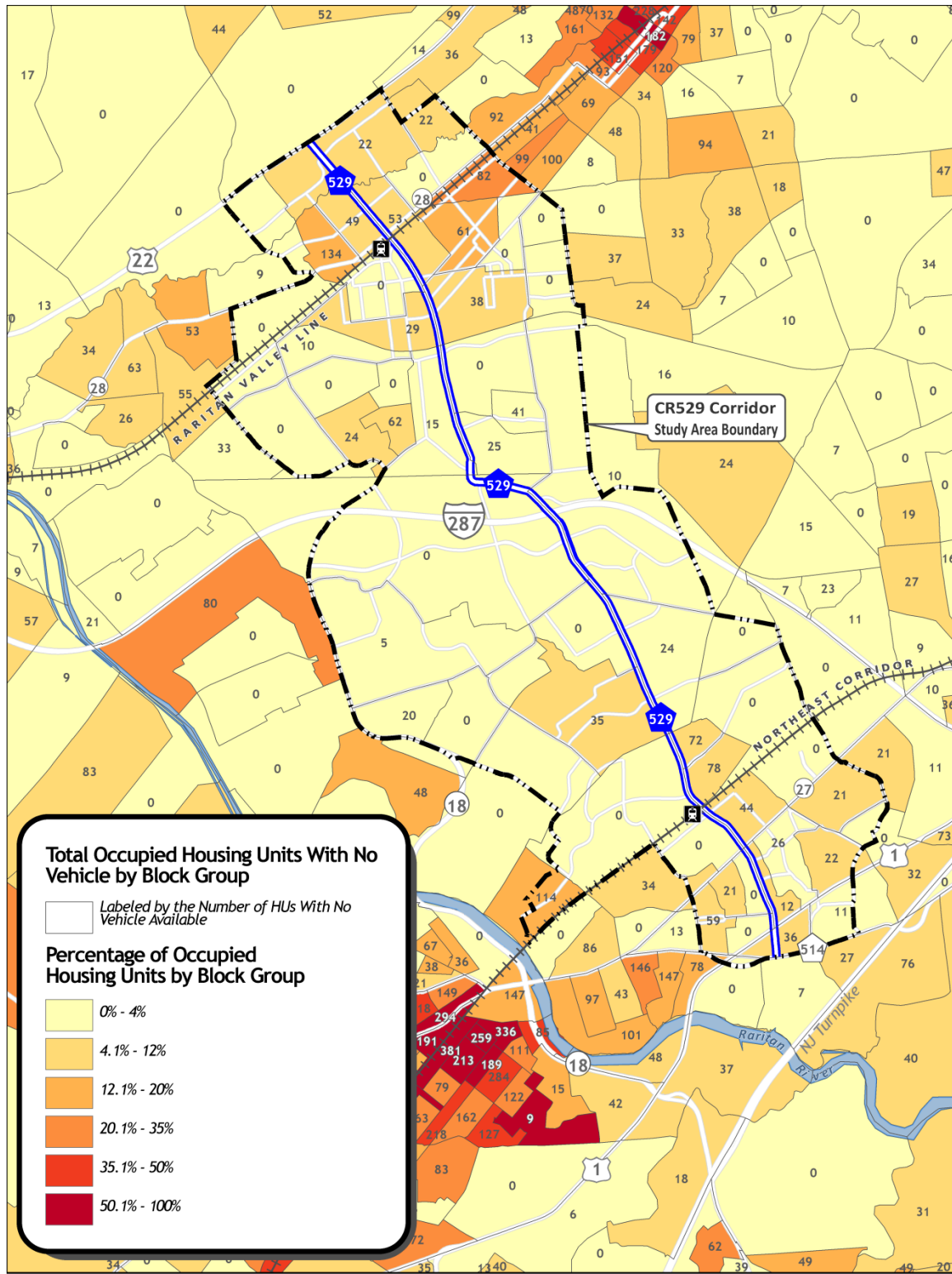
**Table 5—7: Vehicle Availability in CR 529 Corridor Study Area, by Tenure (ACS 2008–2012)**

	Occupied Housing Units	Percent by Tenure	Percent Total
<b>Total Occupied Housing Units</b>	<b>26,842</b>	<b>----</b>	<b>100.0%</b>
<b><i>Owner-Occupied</i></b>	<b>17,583</b>	<b>100.0%</b>	<b>65.5%</b>
No vehicle available	370	2.1%	1.4%
1 vehicle available	4,069	23.1%	15.2%
2 vehicles available	8,249	46.9%	30.7%
3 vehicles available	3,298	18.8%	12.3%
4 vehicles available	1,183	6.7%	4.4%
5 or more vehicles available	414	2.4%	1.5%
<b><i>Renter-Occupied</i></b>	<b>9,259</b>	<b>100.0%</b>	<b>34.5%</b>
No vehicle available	859	9.3%	3.2%
1 vehicle available	4,872	52.6%	18.2%
2 vehicles available	2,859	30.9%	10.7%
3 vehicles available	575	6.2%	2.1%
4 vehicles available	79	0.9%	0.3%
5 or more vehicles available	15	0.2%	0.1%

Source: U.S. Census, 2008–2012 American Community Survey Estimates.

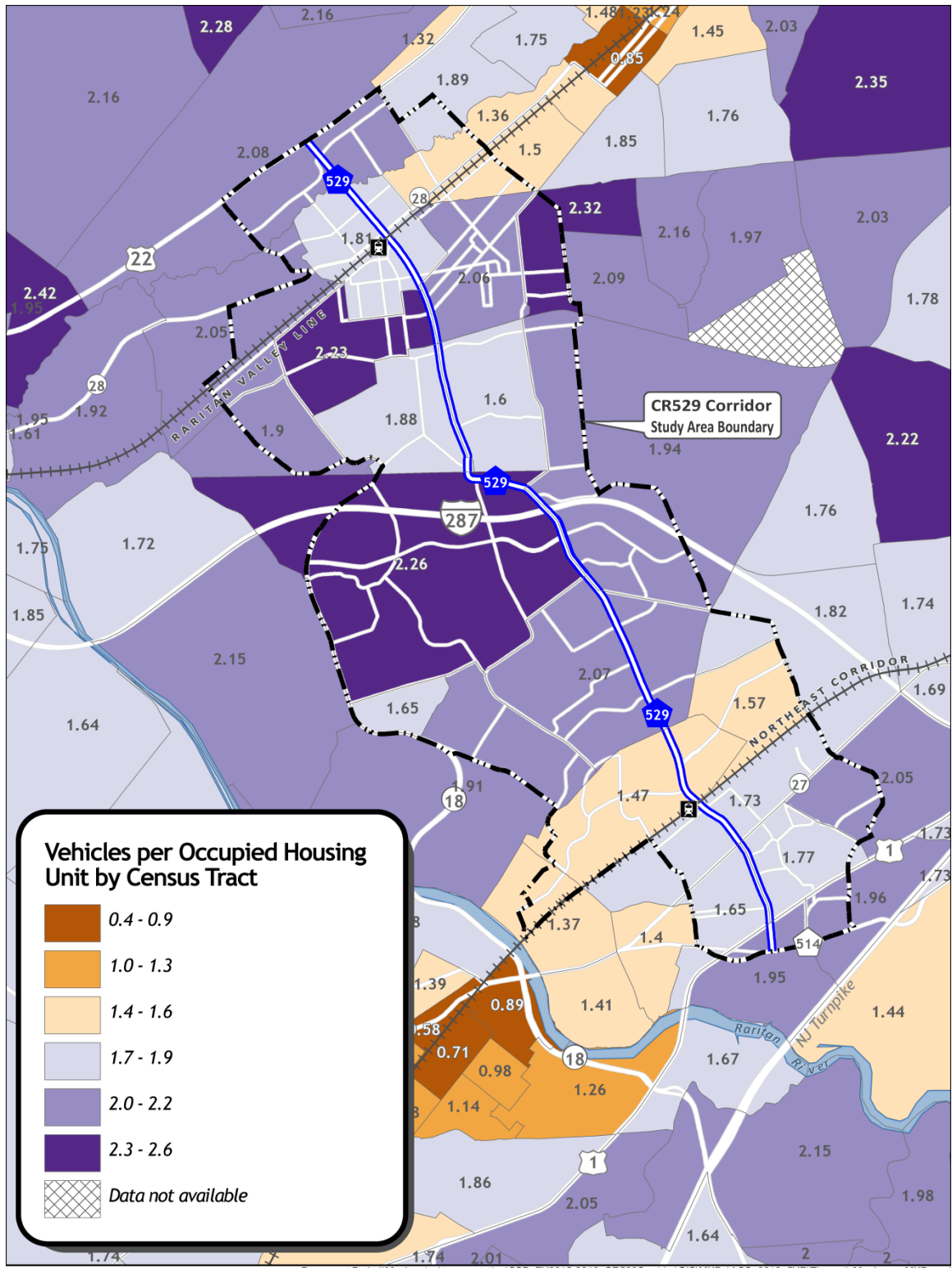
**Map 5—4: Total and Percentage of Total Occupied Housing Units with No Vehicle Available**

Source: U.S. Census, 2008–2012 American Community Survey Estimates.



## Map 5—5: Vehicles per Occupied Housing Unit by Census Tract

Source: U.S. Census, 2008–2012 American Community Survey Estimates.



## 5.3 Household Characteristics

### 5.3.1 Households by Type

According to the 2010 Census, the vast majority of households in the Study Area consisted of two or more people (81.1%). Households with two or more people also made up the majority of households in the State, although a comparatively smaller percentage than the Study Area, at 74.8%. A total of 10,447 households, or 38.8% of 26,944 total households, in the Study Area had children. This is higher compared to the State, of which 35.0% of households had children. The Study Area also has a higher percentage of multigenerational households than the State, with 7.2% of households being multigenerational in the Study Area, and 5.0% in New Jersey.

**Table 5—8: Households by Type in CR 529 Corridor Study Area and NJ (2010)**

	CR 529		New Jersey	
	Households	Percent	Households	Percent
<b>Total</b>	<b>26,944</b>	<b>100.0%</b>	<b>3,214,360</b>	<b>100.0%</b>
Households with 1 Person	5,099	18.9%	811,221	25.2%
Households with 2+ People	21,845	81.1%	2,403,139	74.8%
Family Households	20,319	75.4%	2,226,606	69.3%
Husband-wife Families	15,695	58.3%	1,643,377	51.1%
With Own Children	7,629	28.3%	748,765	23.3%
Other Family (No Spouse Present)	4,624	17.2%	583,229	18.1%
With Own Children	1,811	6.7%	276,759	8.6%
Nonfamily Households	1,526	5.7%	176,533	5.5%
All Households with Children	10,447	38.8%	1,126,325	35.0%
Multigenerational Households	1,953	7.2%	159,323	5.0%
Unmarried Partner Households	1,351	5.0%	190,283	5.9%
Male-female	1,145	4.3%	166,171	5.2%
Same-sex	206	8.0%	24,112	0.8%
Average Household Size	2.92	N/A	2.68	N/A

Source: 2010 U.S. Census.



### 5.3.2 Household Size

According to the 2010 Census, the average family household size in the Study Area was 3.35 persons. This is higher in comparison to New Jersey, which had an average family household size of 3.22 persons. In nonfamily households in the Study Area, the average nonfamily size is 1.34 persons, while in the State it is 1.23 persons. A majority of nonfamily households in the Study Area consist of one person (77.0%), which is also true of the State (82.1%).

**Table 5—9: Family Households by Size in CR 529 Corridor Study Area and NJ (2010)**

	CR 529		New Jersey	
	Households	Percent	Households	Percent
<b>Total</b>	<b>20,318</b>	<b>100.0%</b>	<b>2,226,606</b>	<b>100.0%</b>
2 People	6,437	31.7%	812,884	36.5%
3 People	5,436	26.8%	539,679	24.2%
4 People	4,757	23.4%	498,316	22.4%
5 People	2,058	10.1%	228,492	10.3%
6 People	892	4.4%	86,142	3.9%
7+ People	738	3.6%	61,093	2.7%
Average Family Size	3.35	N/A	3.22	N/A

Source: 2010 U.S. Census.

**Table 5—10: Nonfamily Households by Size in CR 529 Corridor Study Area and NJ (2010)**

	CR 529		New Jersey	
	Households	Percent	Households	Percent
<b>Total</b>	<b>6,625</b>	<b>100.0%</b>	<b>987,754</b>	<b>100.0%</b>
1 Person	5,099	77.0%	811,221	82.1%
2 People	1,127	17.0%	144,798	14.7%
3 People	234	3.5%	18,350	1.9%
4 People	103	1.6%	7,791	0.8%
5 People	39	0.6%	3,235	0.3%
6 People	13	0.2%	1,302	0.1%
7+ People	10	0.2%	1,057	0.1%
Average Nonfamily Size	1.34	N/A	1.23	N/A

Source: 2010 U.S. Census.

### 5.3.3 Family vs Nonfamily

According to the 2010 Census, 96.5% of the Study Area's total population lived in households, which is lower in comparison to New Jersey where 97.9% of the total State population lived in households. Within family households, almost one third consist of children (32.3%), about a quarter consist of the householder (25.0%), and slightly less consist of a spouse (19.3%). These percentages are also relatively consistent with the State. Nonfamily households make up 10.9% of households in the Study Area, while they make up 13.9% of households in New Jersey.

**Table 5—11: Population by Relationship and Household Type in CR 529 Corridor Study Area and NJ (2010)**

	CR 529		New Jersey	
	Population	Percent	Population	Percent
<b>Total</b>	<b>81,586</b>	<b>100.0%</b>	<b>8,791,894</b>	<b>100.0%</b>
In Households	78,737	96.5%	8,605,018	97.9%
In Family Households	69,840	85.6%	7,385,307	84.0%
Householder	20,356	25.0%	2,226,606	25.3%
Spouse	15,722	19.3%	1,643,377	18.7%
Child	26,346	32.3%	2,852,111	32.4%
Other relative	5,640	6.9%	455,944	5.2%
Nonrelative	1,775	2.2%	207,269	2.4%
In Nonfamily Households	8,898	10.9%	1,219,711	13.9%
In Group Quarters	2,849	3.5%	186,876	2.1%
Institutionalized Population	551	0.7%	100,621	1.1%
Noninstitutionalized Population	2,298	2.8%	86,255	1.0%

Source: 2010 U.S. Census.

### 5.3.4 Median Household Income

The estimated median household income for the Study Area during 2008–2012 was \$82,409, which was 15% higher than the New Jersey median of \$71,637. The estimated per capita income for the State however was 13.1% higher than the Study Area, with \$35,928 per capita for New Jersey and \$31,768 for the Study Area.

**Table 5—12: Household Income in CR 529 Corridor Study Area and NJ (ACS 2008–2012)**

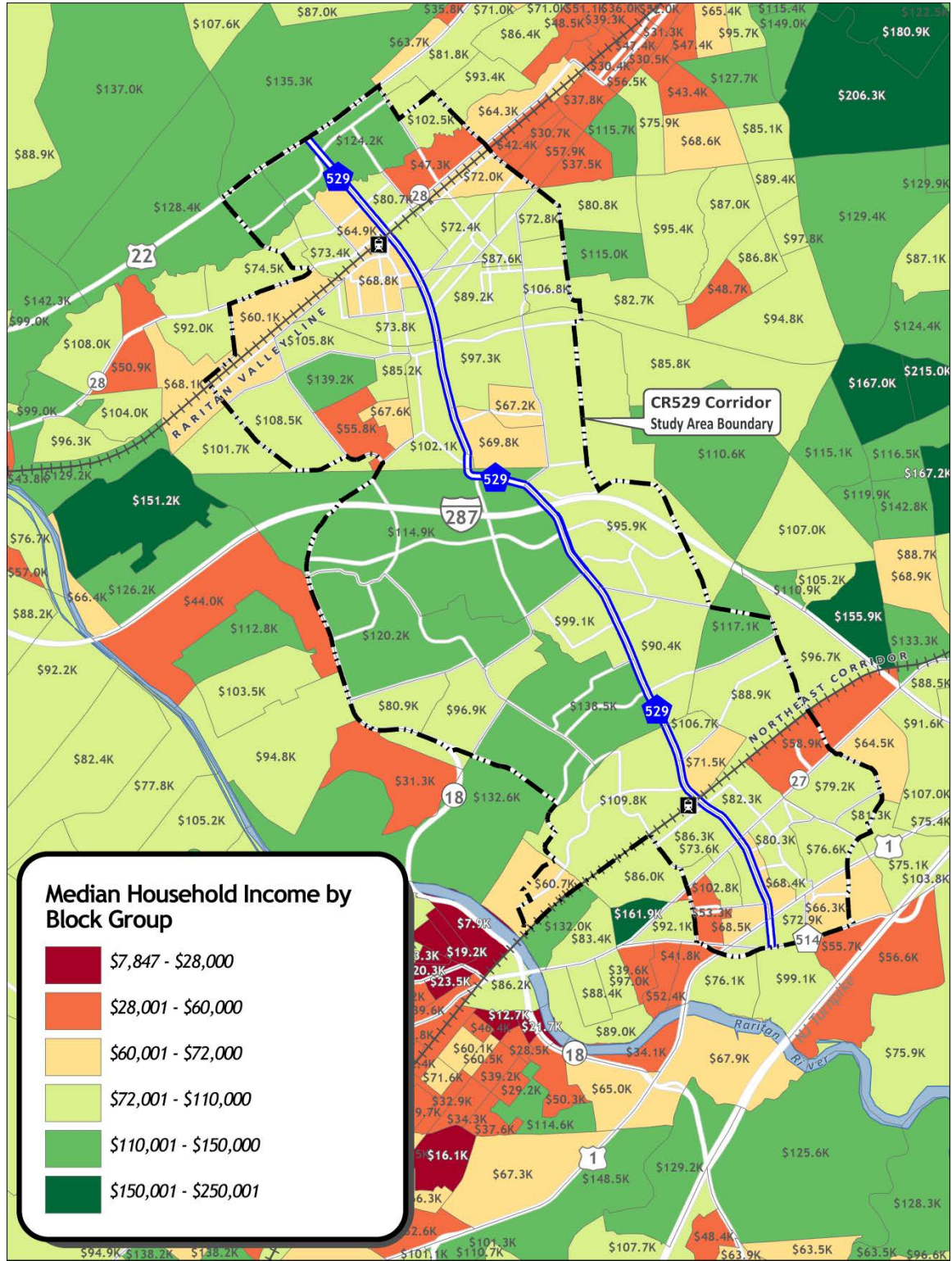
	<b>CR 529</b>	<b>New Jersey</b>
Median Household Income	\$82,409	\$71,637
Average Household Income	\$94,430	\$96,602
Per Capita Income	\$31,768	\$35,928

Source: U.S. Census, 2008–2012 American Community Survey Estimates.

The following map illustrates median household income by block group within the Study Area during 2008–2012.

## Map 5—6: Median Household Income by Census Block Group

Source: U.S. Census, 2008–2012 American Community Survey Estimates.





### 5.3.5 Households by Income

It is estimated that the highest percentage of households earned between \$75,000 and \$99,999 in the Study Area. This is also true of the State, where 13.1% of households earned within this income category (compared to 16.8% in the Study Area). The second highest category for both the Study Area and the State is between \$100,000 and \$124,999.

**Table 5—13: Households by Income in CR 529 Corridor Study Area and NJ (ACS 2008–2012)**

	CR 529		New Jersey	
	Households	Percent	Households	Percent
<b>Total</b>	<b>26,842</b>	<b>100.0%</b>	<b>3,186,878</b>	<b>100.0%</b>
Less than \$10,000	888	3.3%	168,154	5.3%
\$10,000 to \$14,999	617	2.3%	121,629	3.8%
\$15,000 to \$19,999	590	2.2%	127,897	4.0%
\$20,000 to \$24,999	641	2.4%	124,285	3.9%
\$25,000 to \$29,999	881	3.3%	128,350	4.0%
\$30,000 to \$34,999	760	2.8%	124,881	3.9%
\$35,000 to \$39,999	515	1.9%	115,131	3.6%
\$40,000 to \$44,999	824	3.1%	117,590	3.7%
\$45,000 to \$49,999	713	2.7%	108,229	3.4%
\$50,000 to \$59,999	2,246	8.4%	223,223	7.0%
\$60,000 to \$74,999	3,095	11.5%	297,722	9.3%
\$75,000 to \$99,999	4,500	16.8%	416,217	13.1%
\$100,000 to \$124,999	3,886	14.5%	327,655	10.3%
\$125,000 to \$149,999	2,459	9.2%	228,585	7.2%
\$150,000 to \$199,999	2,673	10.0%	267,652	8.4%
\$200,000 or more	1,557	5.8%	289,678	9.1%

Source: U.S. Census, 2008–2012 American Community Survey Estimates.

## 5.4 Environmental Justice and Traditionally Disadvantaged Populations

Environmental Justice (EJ) in transportation has been defined as the fair distribution of transportation benefits and burdens among all people. Since transit services and bicycling and pedestrian mobility are most relied upon by lower income and mobility disadvantaged individuals, this Study places an inherent emphasis in improving the level of mobility through multi modal options for Environmental Justice (EJ) populations. The study seeks to provide desirable linkages between points of origins and destinations by train, bus, bicycling and walking accommodations where possible in addition to access by the private automobile.

### 5.4.1 Race and Ethnicity

Consideration of race and ethnicity within the Study Area is an important component of corridor analysis. The Study Area has a relatively high degree of racial and ethnic diversity, and a particularly notable high share of Asian population, as can be seen in the table below.

**Table 5—14: Race and Ethnicity in CR 529 Corridor Study Area (2010, 2015, 2020)**

Race or Ethnicity	Census 2010		2015 Forecast		2020 Forecast	
	Population	Percent	Population	Percent	Population	Percent
White Alone	36,731	45.0%	34,624	40.8%	32,552	36.9%
Black Alone	13,519	16.6%	14,741	17.4%	15,657	17.7%
American Indian Alone	255	0.3%	271	0.3%	291	0.3%
Asian Alone	24,282	29.8%	27,329	32.2%	30,751	34.8%
Pacific Islander Alone	24	0.0%	25	0.0%	25	0.0%
Some Other Race Alone	4,181	5.1%	4,942	5.8%	5,727	6.5%
Two or More Races	2,594	3.2%	2,976	3.5%	3,297	3.7%
Hispanic Origin (Any Race)	11,638	14.3%	13,686	16.1%	15,885	18.0%

Source: U.S. Census Bureau, Census 2010 Summary File 1. Esri forecasts for 2015 and 2020.

The "Diversity Index" measures the probability that two people from the same area will be from different race or ethnic groups.<sup>8</sup> With a diversity index of 78.1 when compared to the Tri-county area, the State, and the Nation, the Study Area exhibits the highest diversity index.

**Table 5—15: Diversity Index: CR 529 Corridor Study Area, Counties, NJ, and Nation (2015)**

Geography	Diversity Index
CR 529 Corridor Study Area	78.1
Middlesex County	75.3
Somerset County	64.4
Union County	77.0
Tri-county	74.9
New Jersey (entire state)	68.1
Nation (entire USA)	63.0

Source: Esri forecasts for 2015.

The Study Area has a relatively high percentage of Asian population, compared to the Tri-County area and State. After White alone, Asian alone comprise the second highest percentage of the Study Area's total population. The percentage of Asian population is also expected to increase in 2015 and 2020, not only in the Study Area but also across the Tri-county area and State.

**Table 5—16: Percent of Population Asian Alone: CR 529 Corridor Study Area, Counties, and State (2010, 2015, 2020)**

Geography	Census 2010	2015 Forecast	2020 Forecast
<b>CR 529 Corridor Study Area</b>	<b>29.8%</b>	<b>32.2%</b>	<b>34.8%</b>
Middlesex County	21.4%	23.6%	26.1%
Somerset County	14.1%	16.4%	18.9%
Union County	4.6%	5.2%	5.7%
Tri-county	14.6%	16.3%	18.2%
New Jersey	8.3%	9.3%	10.4%

Source: U.S. Census Bureau, Census 2010 Summary File 1. Esri forecasts for 2015 and 2020.

<sup>8</sup> A metric reported by the US Census Bureau, the Diversity Index is a measure of the likelihood that two persons chosen at random from the same area, belong to different race or ethnic groups. The index ranges from 0 (no diversity) to 100 (complete diversity). The diversity score for the entire United States in 2010 was 60, which means there was a 60 percent probability that two people randomly chosen from the U.S. population would belong to different race or ethnic groups.

## 5.4.2 Households by Poverty Status

During 2008–2012, the poverty rate for the households living in the Study Area was 6.5%, which was lower than the State rate of 9.6%. The Study Area’s poverty rate is also lower than Middlesex and Union Counties, but higher than Somerset County. On a municipal level, the Study Area has a lower poverty rate than Dunellen Borough, Highland Park Borough, North Plainfield Borough, and Plainfield City. It has a higher poverty rate than Edison Township, Middlesex Borough, Piscataway Township, South Plainfield Borough, and Green Brook Township.

**Table 5—17: Percent of Total Households with an Income in the Past 12 Months Below Poverty Level (ACS 2008–2012): Study Area vs. Other Geographies**

Geographic Area	Percent of Total Households Below Poverty Level
CR 529 Corridor Study Area	6.5%
New Jersey	9.6%
Middlesex County	7.4%
Somerset County	4.4%
Union County	10.4%
Dunellen Borough	10.7%
Edison Township	5.8%
Highland Park Borough	9.3%
Middlesex Borough	3.0%
Piscataway Township	4.7%
South Plainfield Borough	4.4%
Green Brook Township	1.1%
North Plainfield Borough	8.3%
Plainfield City	16.9%

Source: U.S. Census, 2008–2012 American Community Survey Estimates.

The highest percentage of households living below poverty level in both the Study Area and State were families with a female householder with no husband present. In contrast, for households with an income at or above poverty level, the highest percentage consisted of married couple family households.



**Table 5—18: Households by Poverty Status in CR 529 Corridor Study Area and NJ (ACS 2008–2012)**

Poverty Status	CR 529		New Jersey	
	Households	Percent	Households	Percent
<b>Total</b>	<b>26,842</b>	<b>100.0%</b>	<b>3,186,878</b>	<b>100.0%</b>
Income in the past 12 months below poverty level	1,746	6.5%	306,986	9.6%
Married-couple family	399	1.5%	53,161	1.7%
Other family - male householder (no wife present)	142	0.5%	15,902	0.5%
Other family - female householder (no husband present)	440	1.6%	94,492	3.0%
Nonfamily household - male householder	364	1.4%	53,545	1.7%
Nonfamily household - female householder	401	1.5%	89,886	2.8%
Income in the past 12 months at or above poverty level	25,097	93.5%	2,879,892	90.4%
Married-couple family	15,013	55.9%	1,581,527	49.6%
Other family - male householder (no wife present)	1,230	4.6%	133,341	4.2%
Other family - female householder (no husband present)	3,192	11.9%	327,107	10.3%
Nonfamily household - male householder	2,856	10.6%	375,132	11.8%
Nonfamily household - female householder	2,805	10.5%	462,785	14.5%

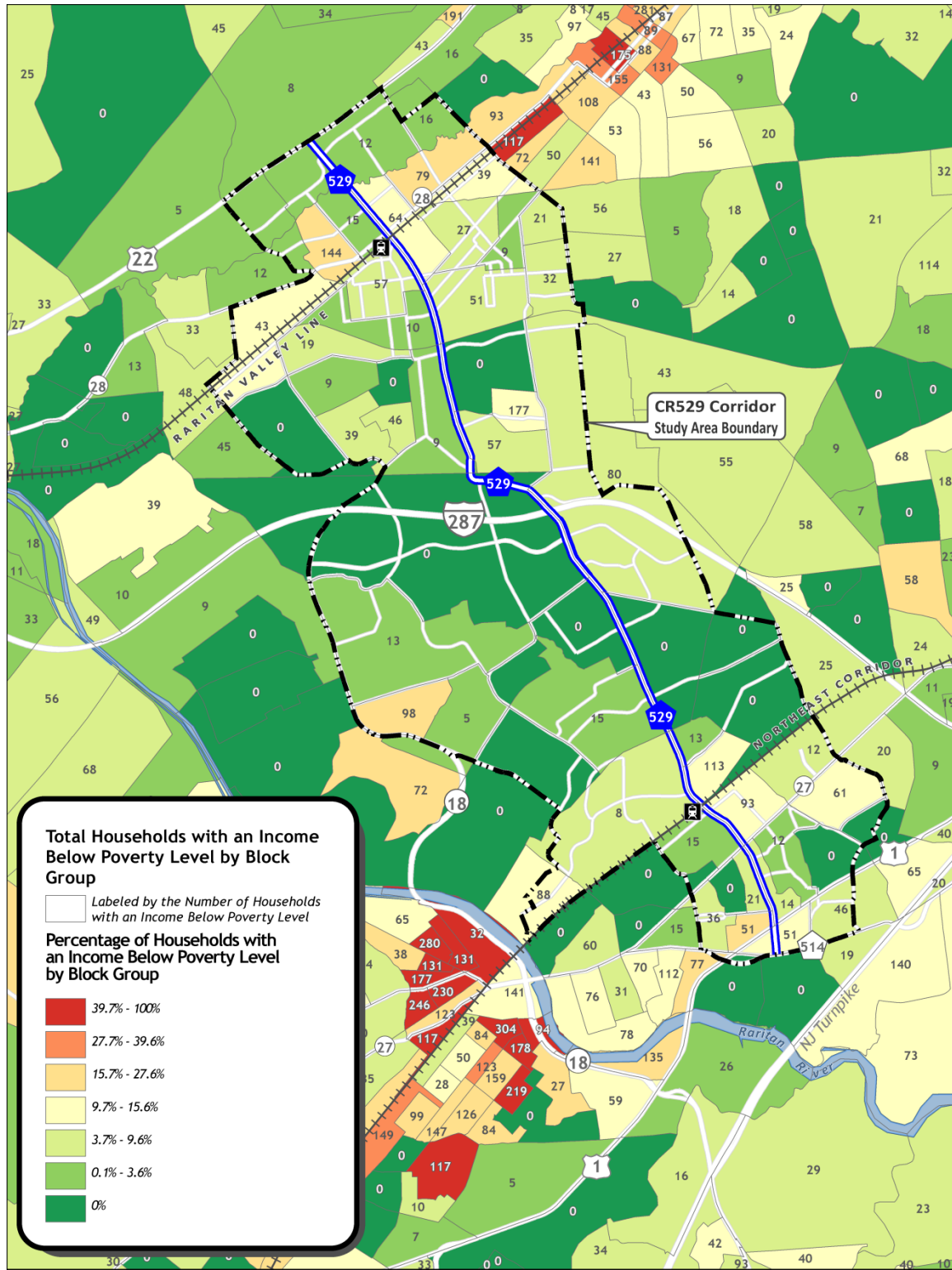
Source: U.S. Census, 2008–2012 American Community Survey Estimates.

The following map illustrates areas of the Study Area with the highest rates and greatest total numbers of households living below poverty level. The warmer colors (from yellow to oranges to red) indicate higher poverty rates and the shades of green indicate lower poverty rates and the labels indicate the total number of households with an income below poverty level. The map shows that the Study Area does not contain any block groups in the highest (>39.7%) or second highest (27.7%-39.6%) categories which could be characterized as extremely high poverty level rates.

However, there are areas in the Study Area with notably high numbers of households with an income below poverty level and experiencing moderately high rates of household poverty, between 15.7% and 27.6% of households in poverty. The locations with moderately high rates and numbers of households living below the poverty level generally coincide with a dominant presence of multifamily housing units or locations that are situated in close proximity to one of the two train stations in the Study Area (Edison and Dunellen stations).

## Map 5—7: Total and Percentage of Households with an Income Below Poverty Level

Source: U.S. Census, 2008–2012 American Community Survey Estimates.



## 6.0 Employment Profile

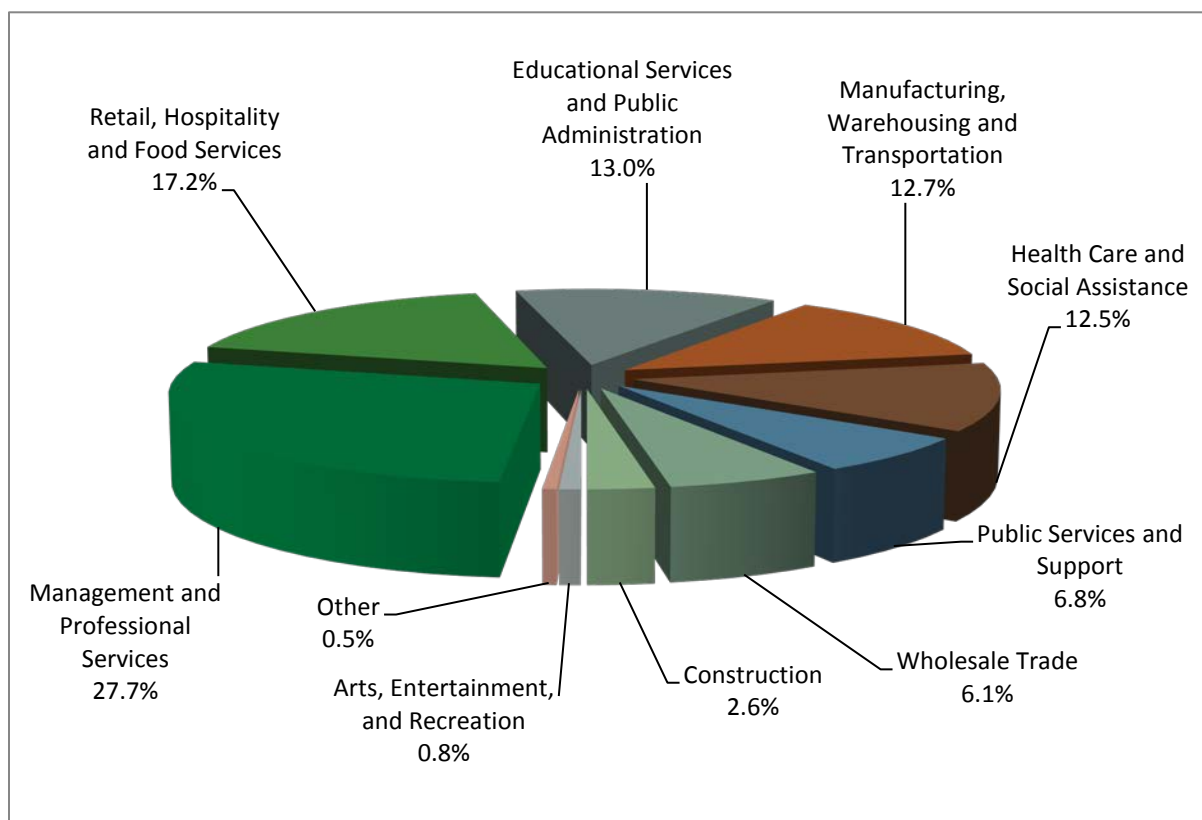
This section of the report analyzes employment characteristics of the employed resident labor force and of the workforce employed in the CR 529 Study Area, as of the beginning of the second quarter of 2011 (the most recent year available when employment data was downloaded for this technical assessment).

### 6.1 Employed Resident Labor Force

#### 6.1.1 Top Industries

In the CR 529 Corridor Study Area, there were 38,601 resident workers. The leading industry groupings among the primary jobs of individuals living in the CR 529 Corridor Study Area, were Management and Professional Services (27.7%); Retail, Hospitality and Food Services (17.2%); Educational Services and Public Administration (13.0%); Manufacturing, Warehousing and Transportation (12.7%) and Health Care and Social Assistance (12.5%).

**Figure 6—1: Primary Jobs of CR 529 Corridor Study Area Residents, by Industry Groupings (2011)**



Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

The table below highlights the remarkable similarities between the top 5 industries employing workers who reside in each of the subareas, (see Map 2—2: Subareas of the County Route 529 Corridor Study Area on page 9 for subarea locations), as well as the Corridor as a whole.

**Table 6—1: Top 5 Industries of the Employed Labor Force, Ranked by Number of Primary Jobs, CR 529 Corridor Study Area & Subareas (2011)**

Rank		North	Central	South	CR 529 Corridor
1	<i>Industry</i>	<i>Health Care and Social Assistance</i>	<i>Health Care and Social Assistance</i>	<i>Professional, Scientific, and Technical Services</i>	<i>Health Care and Social Assistance</i>
	Count	2,226	272	2,604	4,833
	Share	13.1%	12.4%	13.4%	12.5%
2	<i>Industry</i>	<i>Retail Trade</i>	<i>Professional, Scientific, and Technical Services</i>	<i>Health Care and Social Assistance</i>	<i>Professional, Scientific, and Technical Services</i>
	Count	1,876	272	2,335	4,590
	Share	11.1%	12.4%	12.0%	11.9%
3	<i>Industry</i>	<i>Manufacturing</i>	<i>Retail Trade</i>	<i>Retail Trade</i>	<i>Retail Trade</i>
	Count	1,766	242	2,293	4,411
	Share	10.4%	11.0%	11.8%	11.4%
4	<i>Industry</i>	<i>Professional, Scientific, and Technical Services</i>	<i>Educational Services</i>	<i>Educational Services</i>	<i>Manufacturing</i>
	Count	1,714	215	1,587	3,363
	Share	10.1%	9.8%	8.2%	8.7%
5	<i>Industry</i>	<i>Manufacturing</i>	<i>Manufacturing</i>	<i>Manufacturing</i>	<i>Educational Services</i>
	Count	1,766	193	1,404	3,311
	Share	10.4%	8.8%	7.2%	8.6%
Top 5	Count	9,348	1,194	10,223	20,508
	Share	55.2%	54.3%	52.5%	53.1%
Not in Top 5	Count	7,596	1,006	9,234	18,093
	Share	44.8%	45.7%	47.5%	46.9%
Total Primary Jobs		16,944	2,200	19,457	38,601

Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)



### 6.1.2 Employed Labor Force by Age

In the CR 529 Corridor Study Area slightly more than 58%, or the majority of the resident labor force, were between the ages of 30 and 54 in 2011. The age groups of 29 years or younger and age 55 or older each had approximately 20% of the share of employed labor force.

**Table 6—2: Employed Resident Labor Force in the CR 529 Corridor Study Area by Age (2011)**

Primary Jobs by Worker Age	2011	
	Count	Share
Age 29 or younger	8,421	21.8%
Age 30 to 54	22,480	58.2%
Age 55 or older	7,700	19.9%

Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

### 6.1.3 Employed Labor Force by Earnings

The majority of resident workers (54.6%) in the CR 529 Corridor Study Area earned more than \$3,333 per month in 2011.

**Table 6—3: Earnings of Workers Residing in the CR 529 Corridor Study Area (2011)**

Primary Jobs by Earnings	2011	
	Count	Share
\$1,250 per month or less	6,509	16.9%
\$1,251 to \$3,333 per month	10,998	28.5%
More than \$3,333 per month	21,094	54.6%

Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

### 6.1.4 Employed Labor Force by Race and Ethnicity

The most prevalent race of the employed labor force residing in the CR 529 Corridor Study Area was white alone. However, there are two races that had a notably significant presence in the Study Area as well, which are Asian (25.5%) and Black or African American (17.4%). Hispanics accounted for about 12.3% of the employed labor force.

**Table 6—4: Race of Workers Residing in CR 529 Corridor Study Area (2011)**

Primary Jobs by Worker Race	2011	
	Count	Share
White Alone	21,252	55.1%
Black or African American Alone	6,732	17.4%
American Indian or Alaska Native Alone	130	0.3%
Asian Alone	9,840	25.5%
Native Hawaiian or Other Pacific Islander Alone	56	0.1%
Two or More Race Groups	591	1.5%

Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

**Table 6—5: Ethnicity of Workers Residing in CR 529 Corridor Study Area (2011)**

Primary Jobs by Worker Ethnicity	2011	
	Count	Share
Not Hispanic or Latino	33,856	87.7%
Hispanic or Latino	4,745	12.3%

Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

### 6.1.5 Employed Labor Force by Educational Attainment

In the CR 529 Study Area, the vast majority of the employed resident labor force earned a high school degree or higher (70.4%). More than one-third (35.4%) of the employed labor force had achieved a bachelor's degree or higher. Educational attainment for resident workers aged 29 or younger is not reported, representing nearly 22% of the resident workers.

**Table 6—6: Educational Attainment of Workers Residing in the CR 529 Corridor Study Area (2011)**

Primary Jobs by Worker Educational Attainment	2011	
	Count	Share
Less than high school	3,017	7.8%
High school or equivalent, no college	5,517	14.3%
Some college or Associate degree	7,975	20.7%
Bachelor's degree or advanced degree	13,671	35.4%
Educational attainment not available (workers aged 29 or younger)	8,421	21.8%

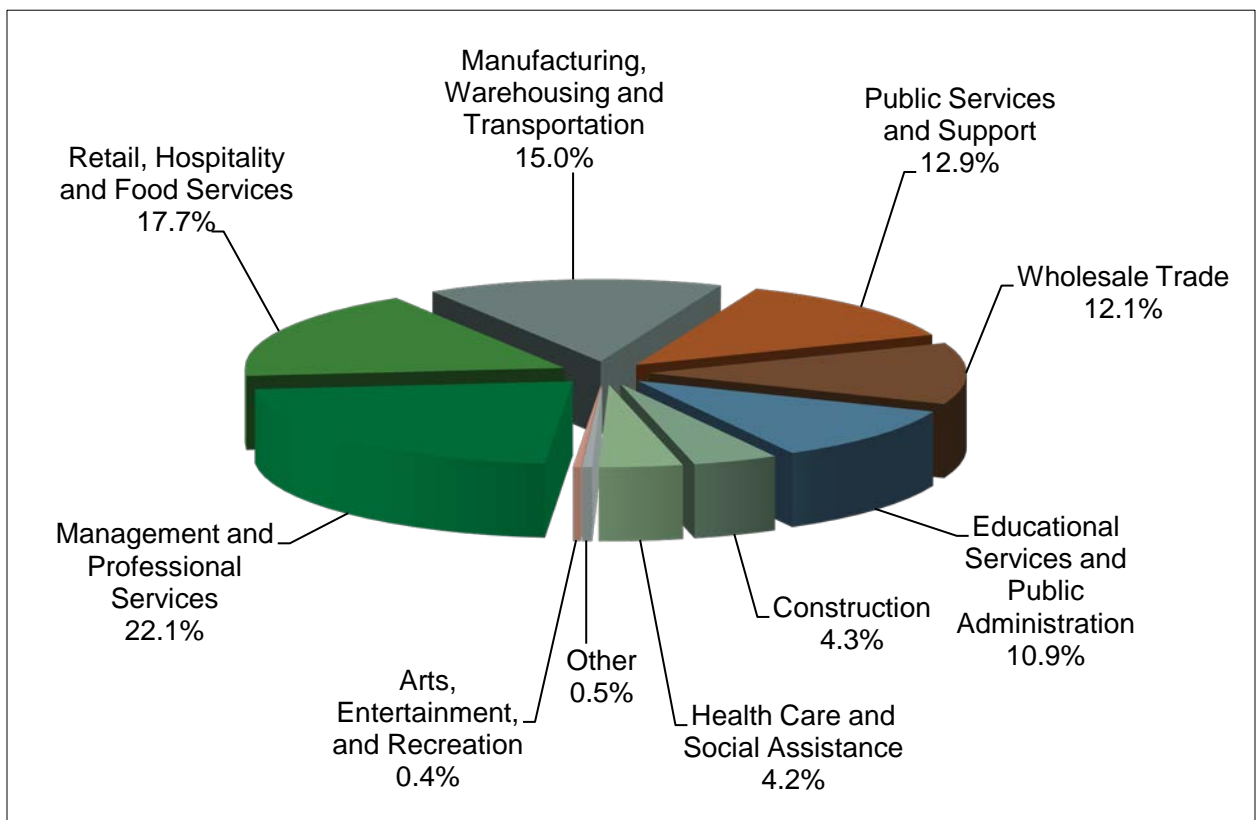
Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

## 6.2 Workers Employed in the Study Area

### 6.2.1 Top Industries

In the CR 529 Corridor Study Area, there were 47,964 primary jobs. The leading industry groupings of primary jobs located in the CR 529 Corridor Study Area, were Management and Professional Services (22.1%); Retail, Hospitality and Food Services (17.7%); Manufacturing, Warehousing and Transportation (15.0%); Public Services and Support (12.9%) and Wholesale Trade (12.1%).

**Figure 6—2: Primary Jobs located in the CR 529 Corridor Study Area, by Industry Groupings (2011)**



Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

The table below highlights the similarities and differences between the top 5 industries employing workers within each of the subareas, (see Map 2—2: Subareas of the County Route 529 Corridor Study Area on page 9 for subarea locations), as well as the CR 529 Corridor Study Area as a whole.

**Table 6—7: Top 5 Industries Ranked by Number of Primary Jobs in the CR 529 Corridor Study Area & Subareas (2011)**

Rank		North	Central	South	CR 529 Corridor Study Area
1	<i>Industry</i>	<i>Manufacturing</i>	<i>Administration &amp; Support, Waste Management and Remediation</i>	<i>Educational Services</i>	<i>Administration &amp; Support, Waste Management and Remediation</i>
	Count	1,349	4,321	2,836	6,178
	Share	17.1%	19.1%	16.2%	12.9%
2	<i>Industry</i>	<i>Retail Trade</i>	<i>Wholesale Trade</i>	<i>Professional, Scientific, and Technical Services</i>	<i>Manufacturing</i>
	Count	978	3,617	2,583	6,077
	Share	12.4%	16.0%	14.8%	12.7%
3	<i>Industry</i>	<i>Construction</i>	<i>Manufacturing</i>	<i>Retail Trade</i>	<i>Wholesale Trade</i>
	Count	879	3,334	2,194	5,794
	Share	11.1%	14.7%	12.6%	12.1%
4	<i>Industry</i>	<i>Wholesale Trade</i>	<i>Retail Trade</i>	<i>Administration &amp; Support, Waste Management and Remediation</i>	<i>Retail Trade</i>
	Count	794	2,441	1,462	5,613
	Share	10.1%	10.8%	8.4%	11.7%
5	<i>Industry</i>	<i>Health Care and Social Assistance</i>	<i>Professional, Scientific, and Technical Services</i>	<i>Manufacturing</i>	<i>Professional, Scientific, and Technical Services</i>
	Count	687	2,346	1,394	5,404
	Share	8.7%	10.4%	8.0%	11.3%
Top 5	Count	4,687	16,059	10,469	29,066
	Share	59.4%	71.0%	59.9%	60.6%
Not in Top 5	Count	3,197	6,650	7,002	18,898
	Share	40.6%	29.0%	40.1%	39.4%
Total Primary Jobs		7,884	22,609	17,471	47,964

Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

### 6.2.2 Primary Jobs by Worker Age

In the CR 529 Corridor Study Area 58% of the primary jobs in the corridor at the beginning of the second quarter of 2011 were held by workers between the ages of 30 and 54. The age groups of 29 years or younger and age 55 or older each had approximately 20% of the share of primary jobs.

**Table 6—8: Age of Workers Employed in CR 529 Corridor Study Area (2011)**

Primary Jobs by Worker Age	2011	
	Count	Share
Age 29 or younger	10,458	21.8%
Age 30 to 54	27,825	58.0%
Age 55 or older	9,681	20.2%

Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

### 6.2.3 Primary Jobs by Earnings

The majority (53.4%) of workers employed in the CR 529 Corridor Study Area earned more than \$3,333 per month in 2011.

**Table 6—9: Earnings of Workers Employed in the CR 529 Corridor Study Area (2011)**

Primary Jobs by Earnings	2011	
	Count	Share
\$1,250 per month or less	7,930	16.5%
\$1,251 to \$3,333 per month	14,415	30.1%
More than \$3,333 per month	25,619	53.4%

Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

### 6.2.4 Primary Jobs by Worker Race and Ethnicity

The race of workers who were employed in the CR 529 Corridor Study Area was predominately white (70.3%). However, two races that had significant presence in the Study Area workforce, which are Asian (16.1%) and Black or African American (11.7%). Hispanics held about 14.1% of the primary jobs located in the CR 529 Corridor Study Area.



**Table 6—10: Race of Workers Employed in CR 529 Corridor Study Area (2011)**

Primary Jobs by Worker Race	2011	
	Count	Share
White Alone	33,720	70.3%
Black or African American Alone	5,634	11.7%
American Indian or Alaska Native Alone	174	0.4%
Asian Alone	7,727	16.1%
Native Hawaiian or Other Pacific Islander Alone	64	0.1%
Two or More Race Groups	645	1.3%

Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

**Table 6—11: Ethnicity of Workers Employed in CR 529 Corridor Study Area (2011)**

Primary Jobs by Worker Ethnicity	2011	
	Count	Share
Not Hispanic or Latino	41,207	85.9%
Hispanic or Latino	6,757	14.1%

Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

### 6.2.5 Primary Jobs by Educational Attainment

In the CR 529 Study Area, the majority of the primary jobs were held by employees who earned a high school degree or higher (70.1%). Slightly less than one-third (32.7%) of the primary jobs held by employees had achieved a bachelor's degree or higher. Educational attainment is not reported for workers aged 29 or younger, representing nearly 22% of the primary jobs.

**Table 6—12: Educational Attainment of Workers Residing in CR 529 Corridor Study Area (2011)**

Primary Jobs by Worker Educational Attainment	2011	
	Count	Share
Less than high school	3,902	8.1%
High school or equivalent, no college	7,792	16.2%
Some college or Associate degree	10,133	21.1%
Bachelor's degree or advanced degree	15,679	32.7%
Educational attainment not available (workers aged 29 or younger)	10,458	21.8%

Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

## 7.0 Work Commute Travel Behavior

This section of the report uses work commute travel behavior data to identify patterns that help provide insight for potential public transportation enhancements throughout the CR 529 Corridor Study Area. The first section focuses on mode share for the journey to work; the primary means of transportation that residents of the CR 529 Corridor Study Area used to travel to work. The next section looks at the origins and destinations of workers who live in the Study Area and juxtaposes them with origins and destinations of workers commuting to jobs within the Study Area.

This chapter draws upon a combination of data sources, including 2008-2012 American Community Survey (ACS) 5-year estimates and Longitudinal Employer-Household Dynamics (LEHD), both of which are data from the Census Bureau. The ACS five-year estimates represent average characteristics across the 2008-2012 timeframe. The LEHD data, unlike ACS five-year average estimates, represents state labor data for jobs covered under the respective state's unemployment insurance system. The state assigns place of employment information and the Census Bureau assigns place of residence. The 2011 LEHD data<sup>9</sup> that was queried for this report analyzed **primary jobs**, which are defined as the job that provides the most earnings for each worker. In essence, this "one job per worker" analysis shows the number of employed people in the labor force and the corresponding primary commute patterns of the employed labor force. One important consideration regarding the use of this data is that LEHD may represent only the primary address of the employer, which may not capture the actual origin or destination of each and every work trip (e.g. employees in satellite offices or workers at a construction site).

The inherent limitation with these data sources is that the travel behavior data is confined to the limited scope of commute trips. Essentially, they point to travel between a person's place of residence and their place of work, which captures only an approximately 16% share of all trips in Middlesex County, according to the most recent 2010/2011 Regional Household Travel Survey (RHTS) jointly conducted by NJTPA and NYMTC. Other trip purpose categories, such as "other home-based trips" (e.g., shopping and social/recreation trips) and "other non-home/non-work trips", account for much larger shares of the total trips, 53% and 21%, respectively.

---

<sup>9</sup> All data downloaded from the LEHD OnTheMap Origin-Destination Database for year 2011 represents employment at the beginning of the second quarter of 2011.

## 7.1 Journey to Work

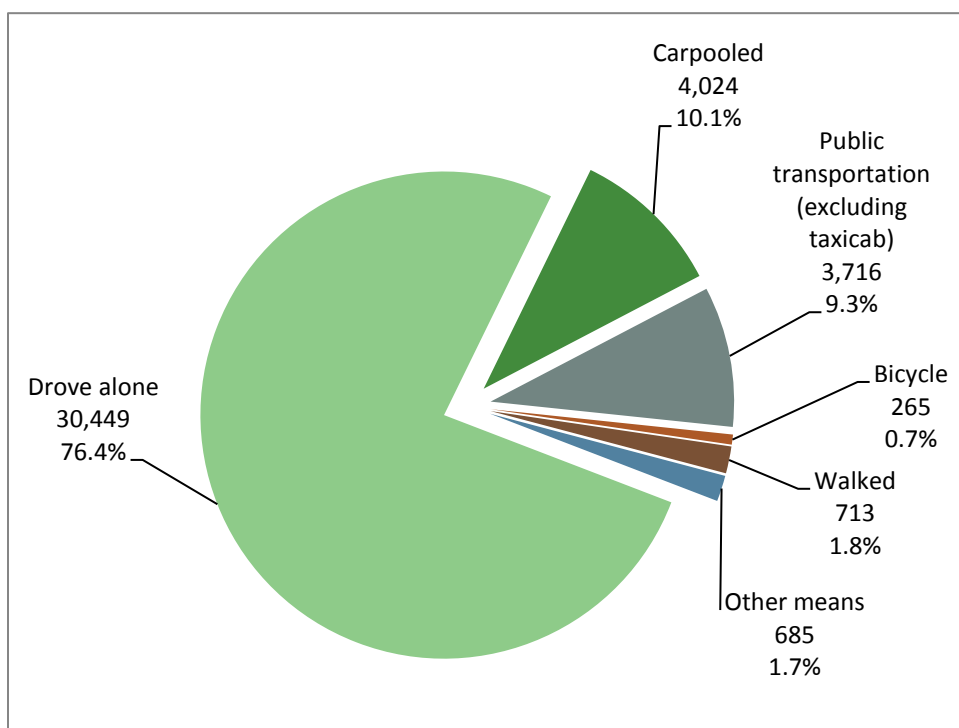
In the Study Area, 39,852 residents commuted to jobs outside of their homes. 76.4% of these commuters drove alone to work. During 2008–2012, excluding telecommuters, 9.3% took public transportation to get to work. By comparison, 11.1% of commuters Statewide took public transit.

During 2008–2012, approximately 9.0% of the workers, including telecommuters, who lived in the Study Area used public transportation to travel to work (3,716 out of 41,316 workers). The same figure for New Jersey was 10.7%. A total of 1,463 workers in the Study Area reportedly worked from home.

During 2008–2012, a total of 3,484 workers in the Study Area commuted by bus or rail. Of these commuters, 81% chose to take the train to work. In comparison, 29% of workers Statewide who commuted by bus or rail chose to take the bus.

**Figure 7—1: Means of Transportation to Work in CR 529 Corridor Study Area (2008–2012)**

(Pie-chart excludes the 1,463 workers estimated to have been working from home)



Source: U.S. Census, 2008–2012 American Community Survey Estimates. In The 2008–2012 ACS, “other” includes taxi, motorcycle, or other unspecified modes; and, “public transportation” includes: bus, streetcar, subway, railroad, or ferry

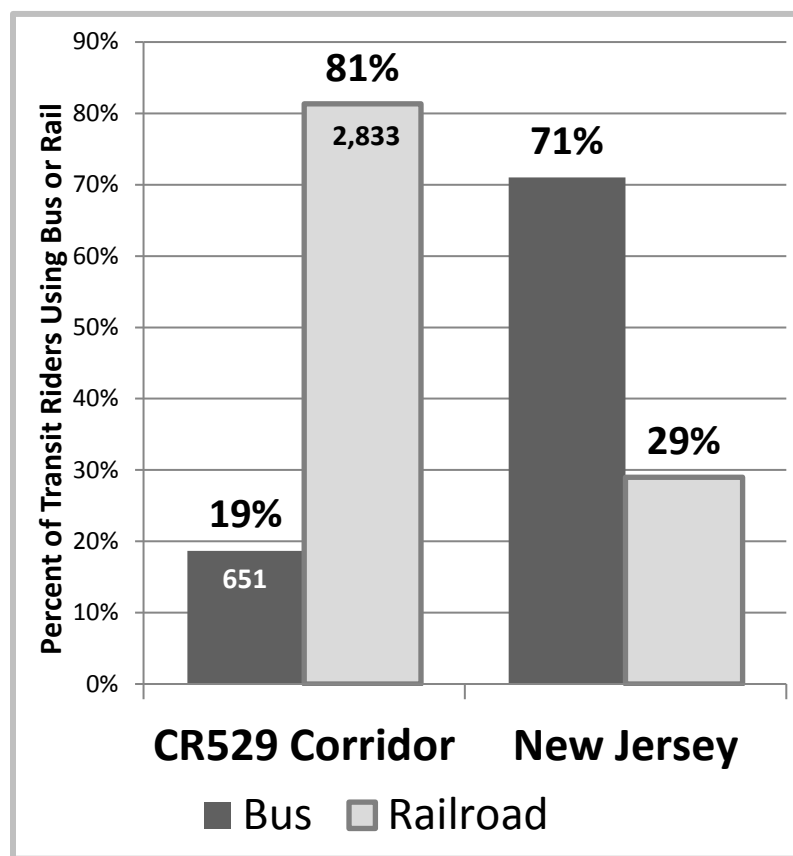
**Table 7—1: Workers by Means of Transportation to Work in CR 529 Corridor Study Area and NJ (2008–2012)**

(Table includes the 1,463 workers in worked from home category)

	CR 529		New Jersey	
	Workers	Percent	Workers	Percent
<b>Total</b>	<b>41,316</b>	<b>100.0%</b>	<b>4,127,735</b>	<b>100.0%</b>
Drove alone	30,449	73.7%	2,961,672	71.8%
Carpooled	4,024	9.7%	359,583	8.7%
Public transportation (excluding taxicab)	3,716	9.0%	442,221	10.7%
Bicycle	265	0.6%	13,924	0.3%
Walked	713	1.7%	130,828	3.2%
Other means	685	1.7%	65,934	1.6%
Worked at home	1,463	3.5%	153,573	3.7%

Source: U.S. Census, 2008–2012 American Community Survey Estimates. In The 2008–2012 ACS, “other” includes taxi, motorcycle, or other unspecified modes; and, “public transportation” includes: bus, streetcar, subway, railroad, or ferry

**Figure 7—2: Bus versus Rail in CR 529 Corridor Study Area and NJ (ACS 2008–2012)**



Source: U.S. Census, 2008–2012 American Community Survey Estimates.

The following map illustrates areas where the highest use of public transportation can be found within the Study Area. The highest concentration of workers using public transportation to work appears to be in the area around the Edison Station to the south.

Source: U.S. Census, 2008–2012 American Community Survey Estimates.

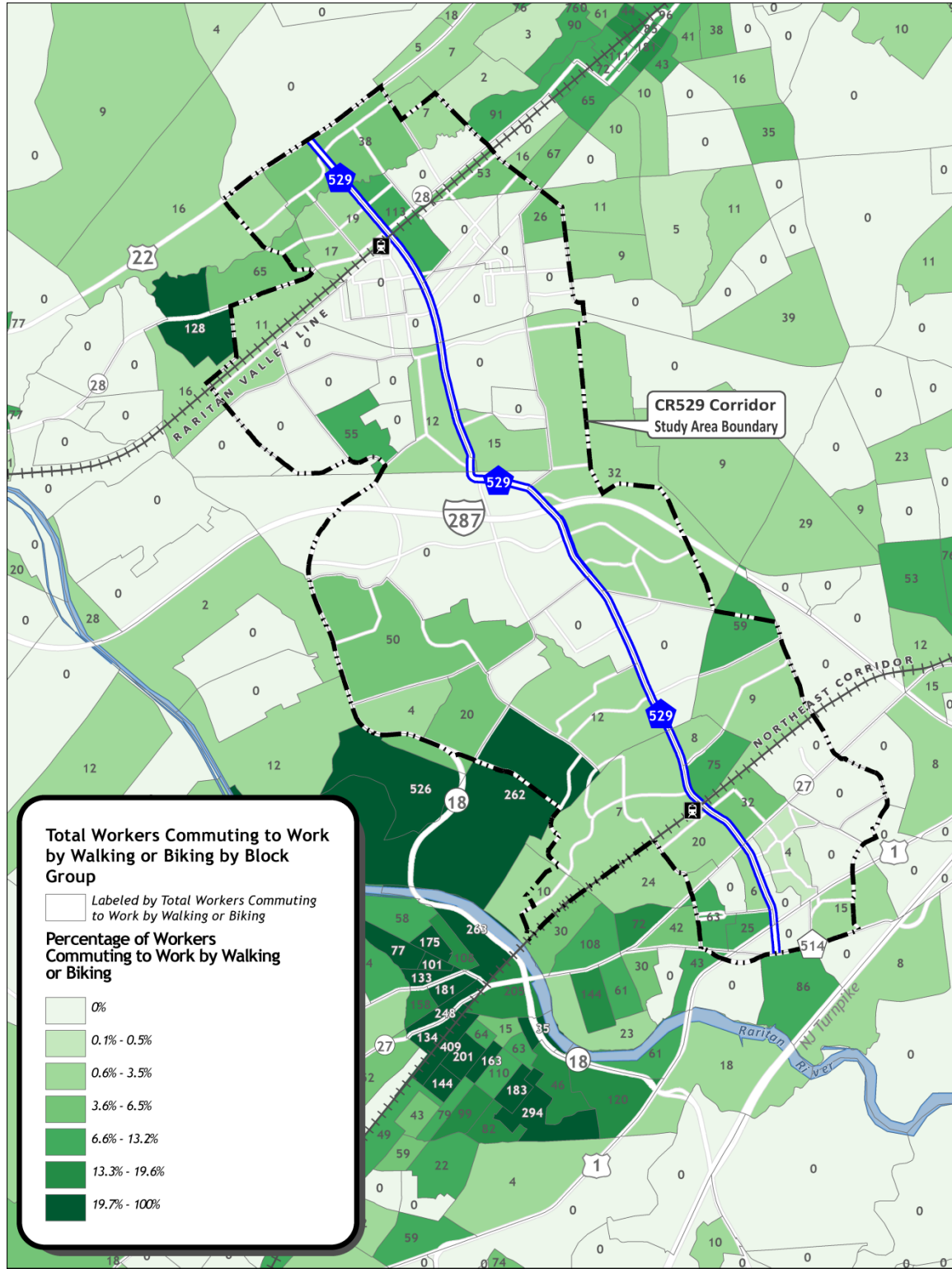




During 2008–2012, a total of 978 people was estimated as commuting by non-motorized transportation modes (bike or walked), making up about 2.5% of commuters in the Study Area, excluding telecommuters. The following map illustrates areas where the highest concentration of walking and cycling commuters can be found within the Study Area. The most walkers and cyclists appear to be concentrated around the Busch and Livingston campuses of Rutgers University in Piscataway.

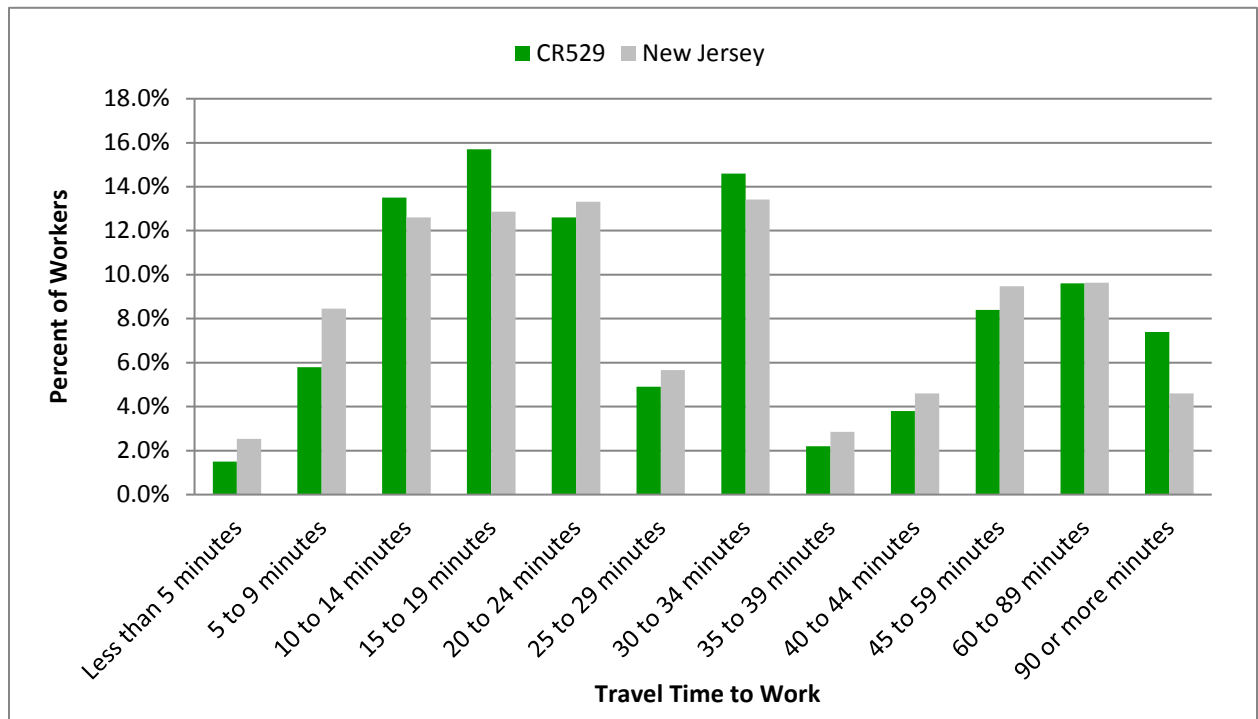
## Map 7—2: Total and Percentage of Workers Commuting to Work by Walking or Biking

Source: U.S. Census, 2008–2012 American Community Survey Estimates.



During 2008–2012, the highest percentage of workers (excluding telecommuters) in the Study Area traveled 15 to 19 minutes to work. In comparison, the highest percentage of workers Statewide traveled 30 to 34 minutes to work, which was also the second highest category for the Study Area.

**Figure 7—3: Workers (who did not work from home) by Travel Time to Work in CR 529 Corridor Study Area and NJ (2008–2012)**



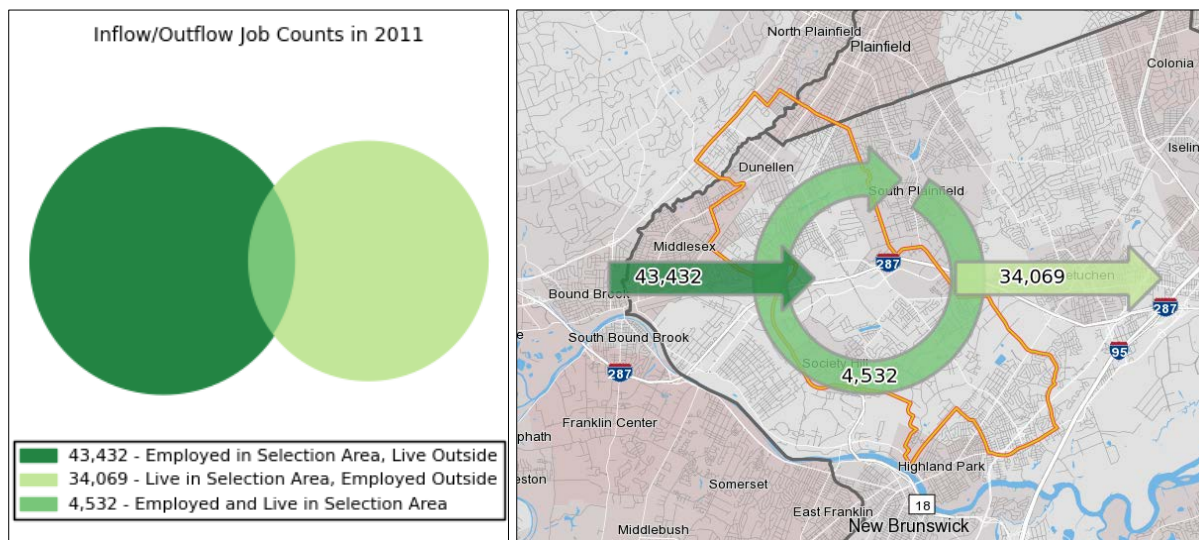
Source: U.S. Census, 2008–2012 American Community Survey Estimates.

## 7.2 Inflow/Outflow of Primary Jobs

During 2011 there were 47,964 primary jobs in the CR 529 Corridor Study Area, with a **net** inflow of 9,363 workers. There were 43,432 people who were employed in the Study Area, but lived outside of its boundary; there were 34,069 people who lived in the Study Area and worked outside of it; and approximately 4,500 workers who both lived and worked in the Study Area.

**Figure 7—4: Inflow/Outflow Primary Job Counts in the CR 529 Corridor Study Area (2011)**

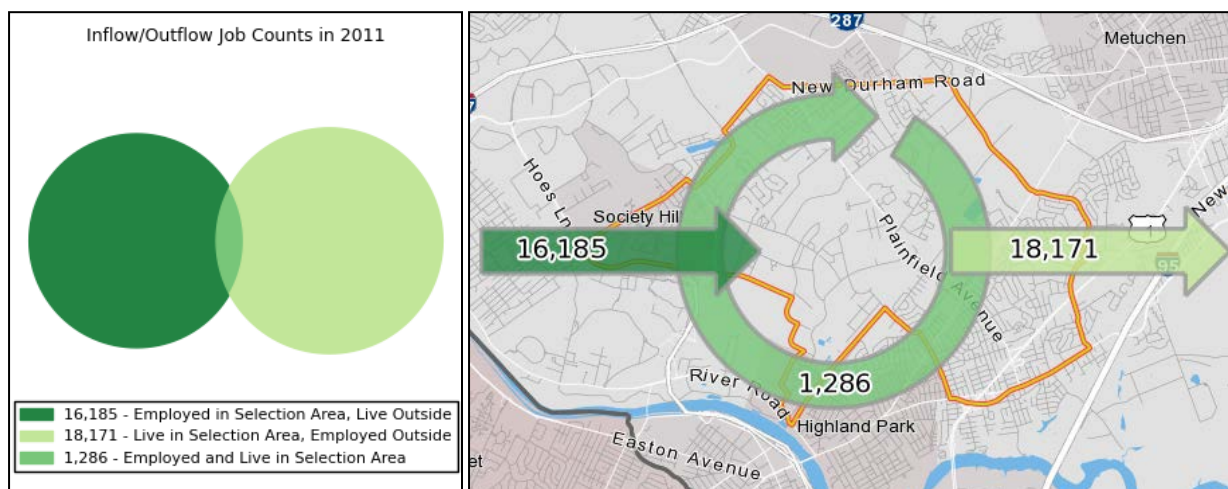
**Net Primary Job Inflow of +9,363 Workers**



Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

**Figure 7—5: Inflow/Outflow Primary Job Counts in the CR 529 Corridor South Subarea (2011)**

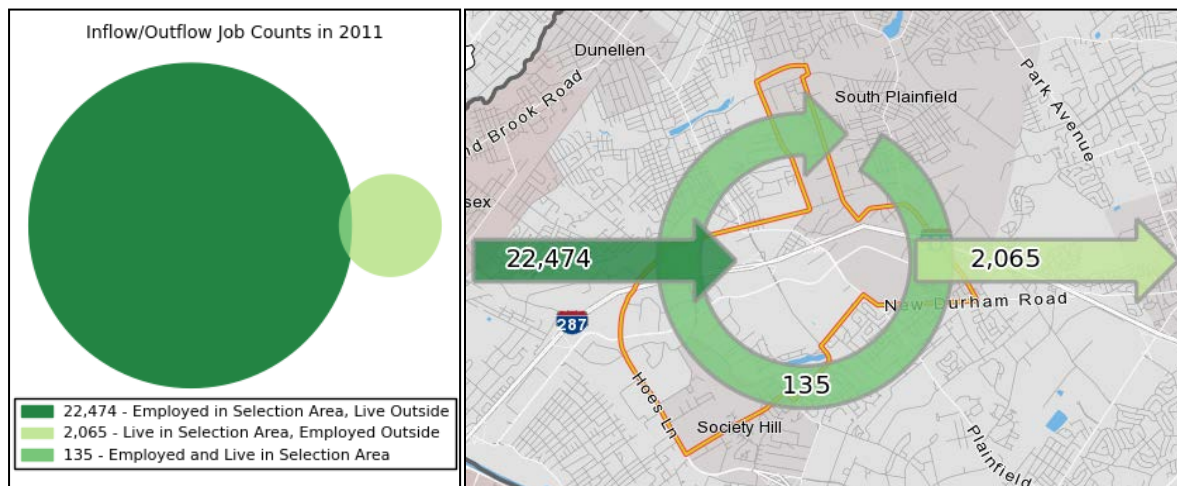
**Net Primary Job Outflow of -1,986 Workers**



Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

**Figure 7—6: Inflow/Outflow Primary Job Counts in the CR 529 Corridor Central Subarea (2011)**

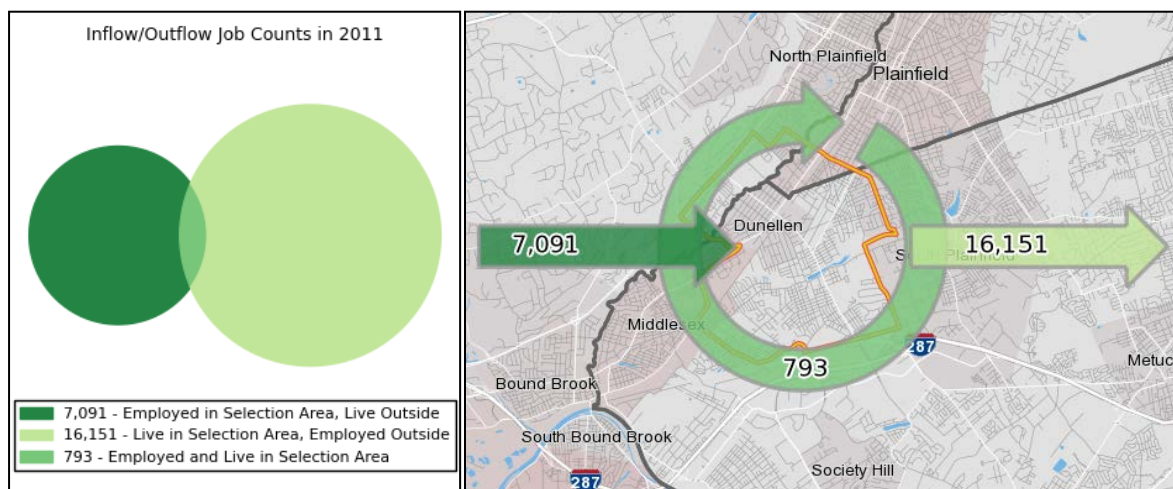
**Net Primary Job Inflow of +20,409 Workers**



Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

**Figure 7—7: Inflow/Outflow Primary Job Counts in the CR 529 Corridor North Subarea (2011)**

**Net Primary Job Outflow of -9,060 Workers**



Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

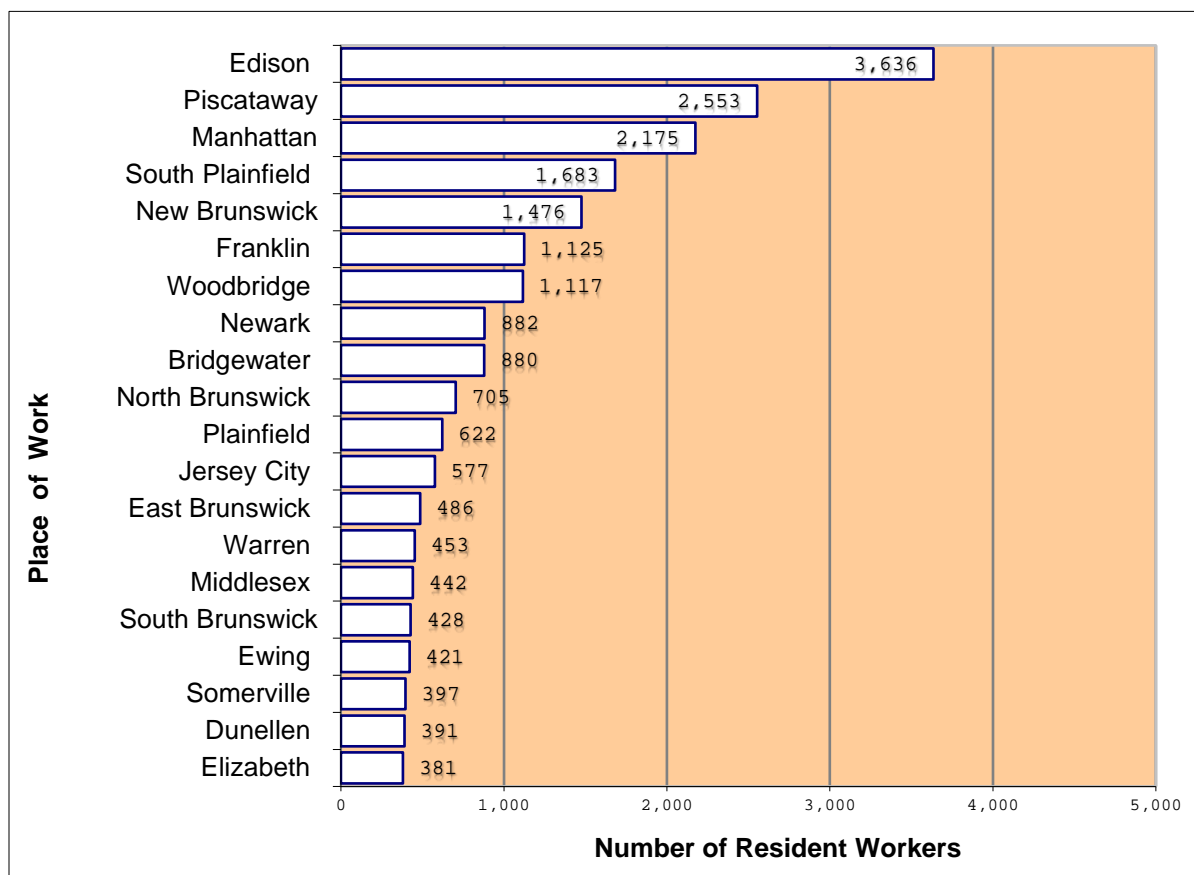


### 7.3 Commute Shed Analysis (Home to Work)

A Commute Shed Analysis (CSA) illustrates where workers who live in a particular study area are employed. As of 2011, there were 38,601 total primary jobs held by CR-529 Corridor residents.

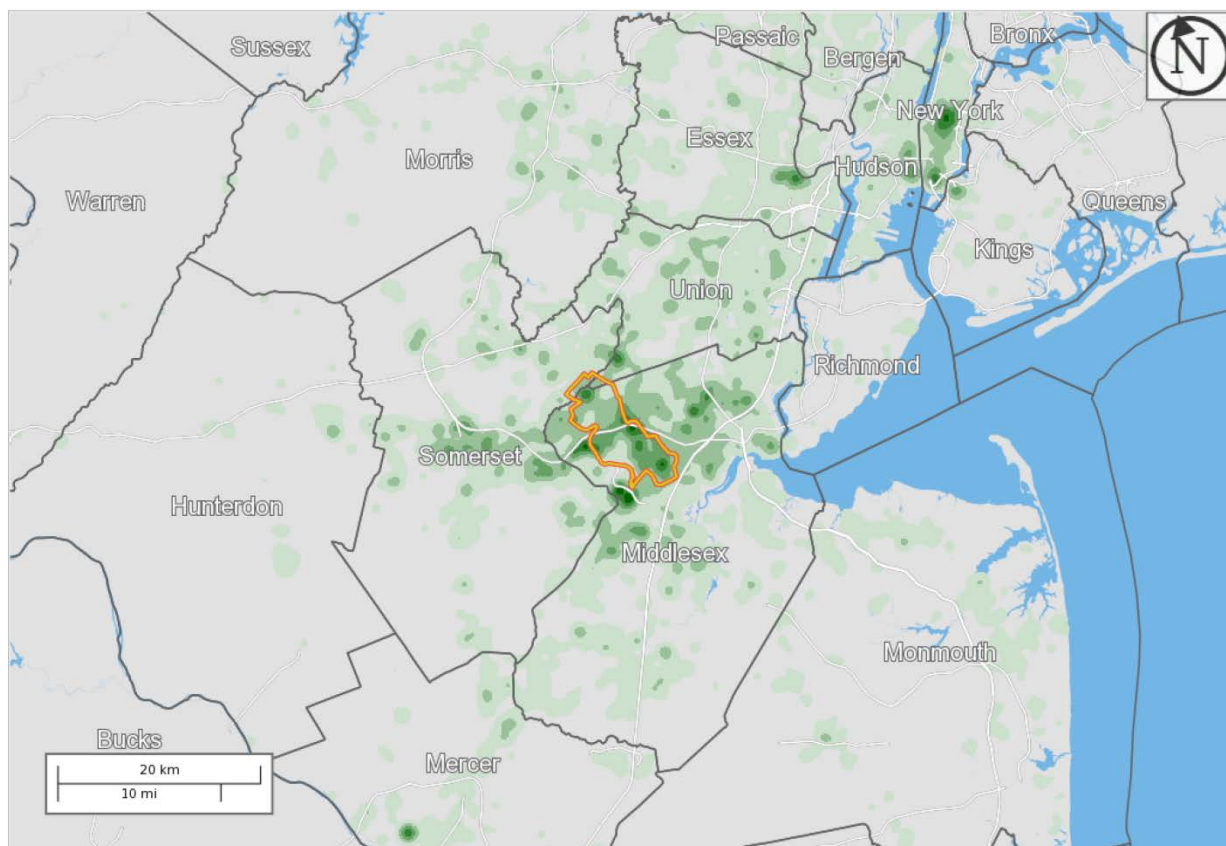
The following chart highlights the top 20 municipal workplace destinations (primary jobs) of residents of the CR-529 Study Area. The map on the following page cartographically depicts the relative land area density (jobs per square mile) of the primary employment locations where residents of the CR 529 Study Area commuted to in 2011.

**Figure 7—8: Top 20 Work Locations by Municipality for Workers Who Lived in the CR 529 Corridor Study Area, Primary Jobs (2011)**



Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

**Map 7—3: Density of Work Locations for Workers who live in the CR 529 Corridor Study Area, Primary Jobs (2011)**



### Map Legend

#### Job Density [Jobs/Sq. Mile]

- 5 - 54
- 55 - 203
- 204 - 451
- 452 - 799
- 800 - 1,246

#### Selection Areas

- Analysis Selection

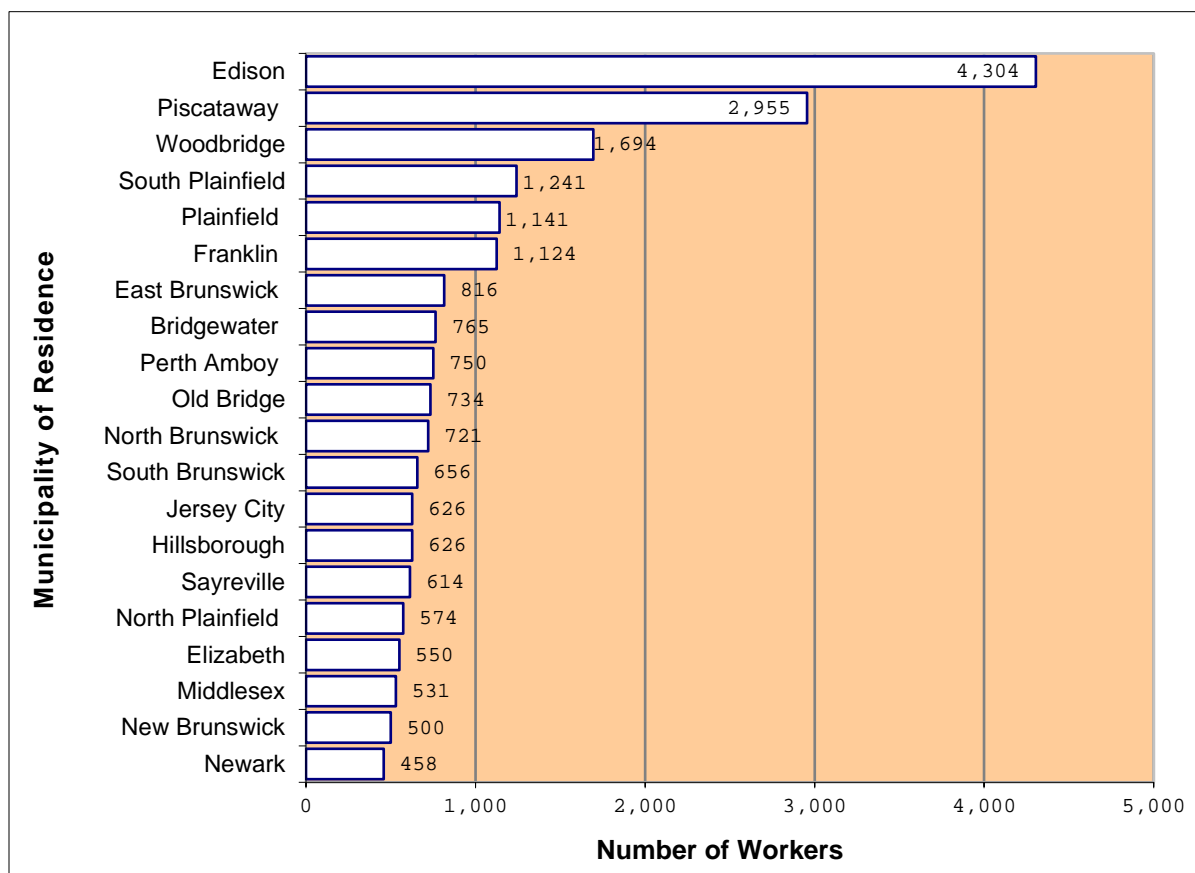


Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

## 7.4 Labor Shed Analysis (Work to Home)

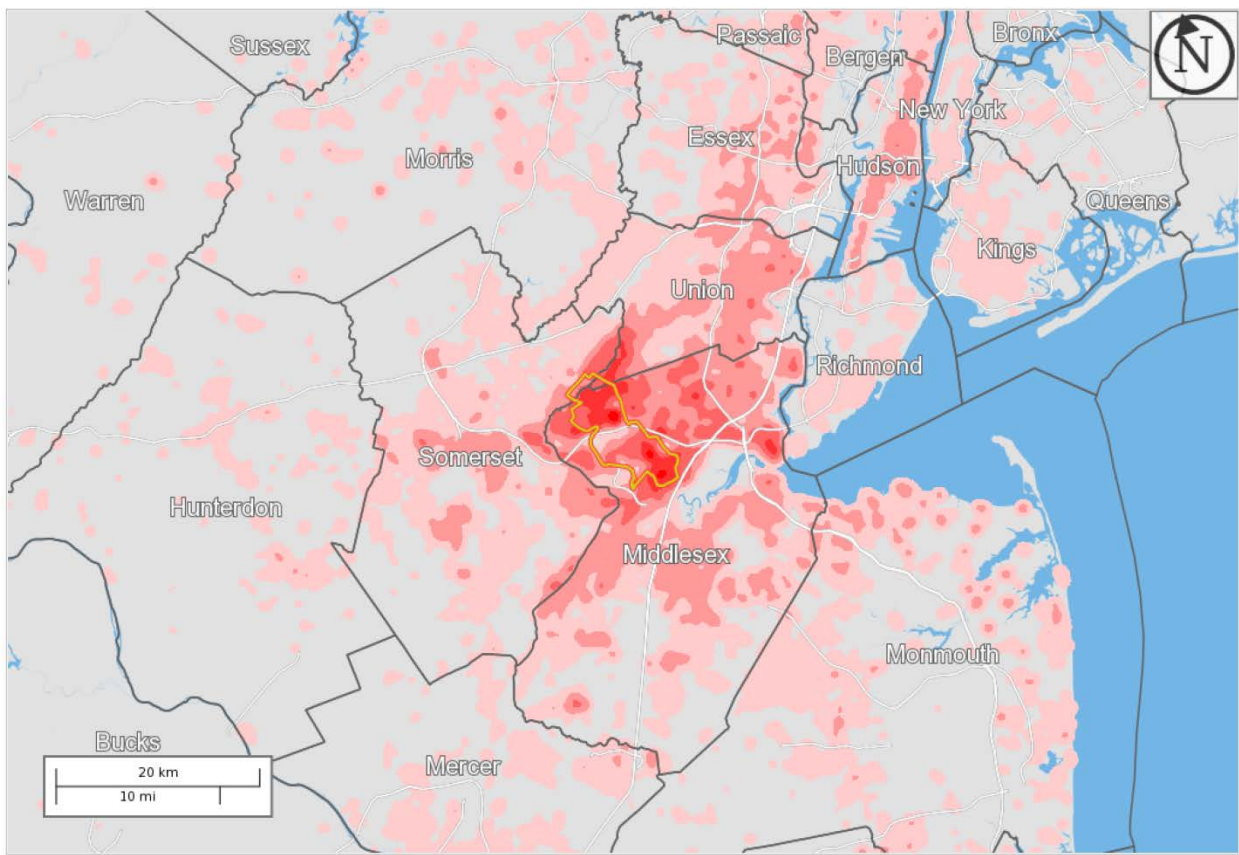
A Labor Shed Analysis (LSA) illustrates where workers who work in a particular study area reside. As of 2011, there were 47,964 total primary jobs in the CR 529 Corridor. The Figure 7—9 chart below highlights the top 20 municipal home locations of employees of the CR 529 Corridor Study Area. Map 7—4, on the following page, graphically depicts the relative land area density (primary jobs per square mile) of the residence locations where workers of the CR 529 Study Area commute from in 2011.

**Figure 7—9: Top 20 Home Locations by Municipality for Workers who were employed in the CR 529 Corridor Study Area, Primary Jobs (2011)**



Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

**Map 7—4: Density of Home Locations for Workers who are employed in the CR 529 Corridor Study Area, Primary Jobs (2011)**



**Map Legend**

**Job Density [Jobs/Sq. Mile]**

- 5 - 34
- 35 - 121
- 122 - 267
- 268 - 470
- 471 - 733

**Selection Areas**

- Analysis Selection



Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

## 7.5 Paired Analysis

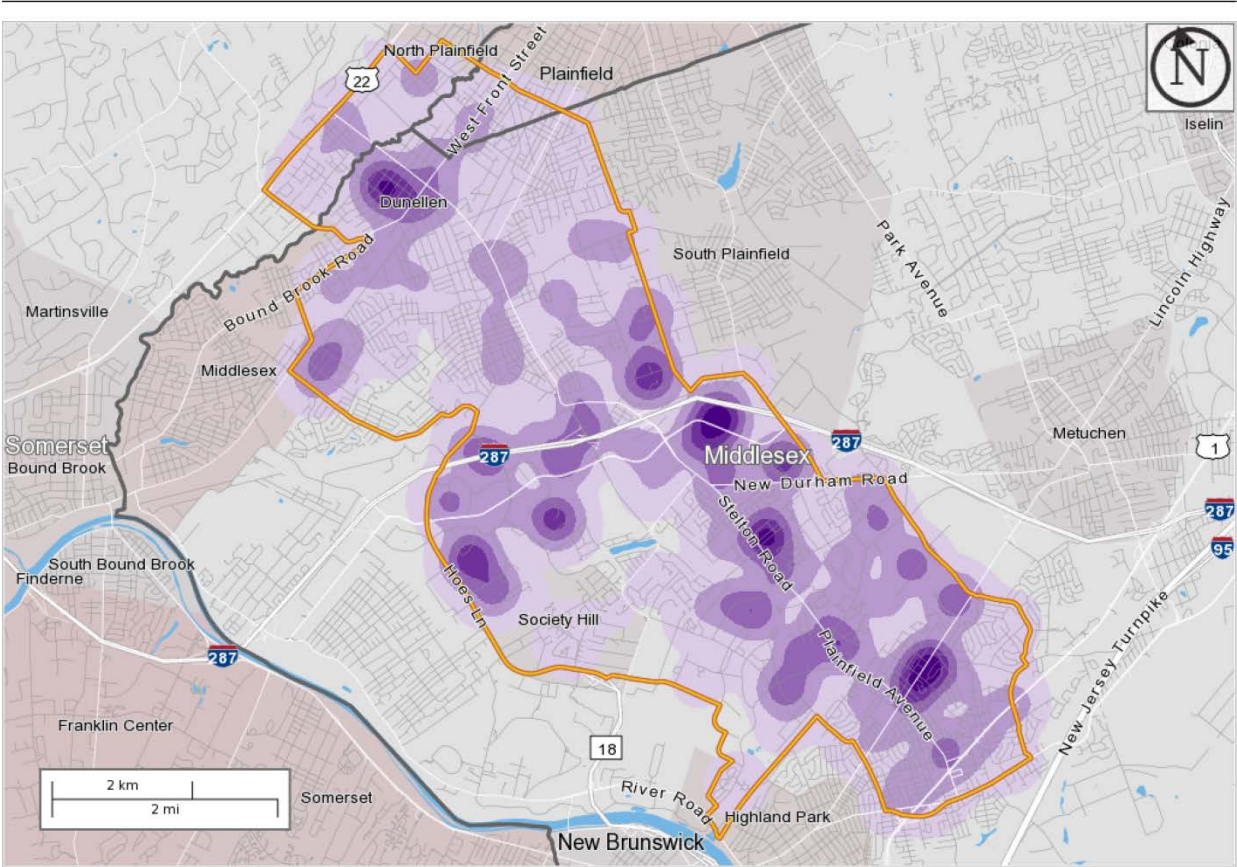
Paired Area Analysis generates results showing the home and work locations of workers that share the paired areas. Essentially in the Paired Area Analysis, the densities of job locations of workers that live in the CR 529 Study Area are displayed. The following four maps illustrate the location of areas of high employment for people who live, as well as, work in the CR 529 Study Area.

The first map (Map 7—5) is of density of jobs of people who live and work in the entire CR 529 Study Area. When the Study Area is looked at as a whole, there are prevalent employment densities in Dunellen, along the Interstate 287 corridor and at the intersection of CR 529 and State Route 27 in Edison. In the subsequent maps, employment densities within the CR 529 Study Area are paired with the Study Area Subareas (see Map 2—2: Subareas of the County Route 529 Corridor Study Area on page 9).

The next map (Map 7—6), the density of primary job locations of workers who live in the North Subarea and work in the CR 529 Study Area is illustrated. The location of employment densities for these workers (2,227 primary jobs) is spatially extended out throughout the Study Area. Map 7—7: Density of Primary Jobs for Workers who live in the Central Subarea and are Employed in the CR 529 Corridor Study Area (2011), shows the employment densities of workers who work in the CR 529 Study Area that reside in the Central Subarea (251 primary jobs). As illustrated, there is a high density of employment of workers who live in the Central Subarea that work in the CR 529 Study Area within the Central Subarea and areas to the south along the CR 529 Corridor Study Area. Similar to the Central Subarea, the employment densities of the resident workers who live in the South Subarea and work in the CR 529 Study Area (2,054 primary jobs) work either in the Subarea that they live or in the next closest subarea. The compilation of paired area analysis maps graphically illustrates the employment locations of workers who live in the Study Area.



**Map 7—5: Density of Primary Jobs for Workers who live in the CR 529 Corridor Study Area and are Employed in the CR 529 Corridor Study Area (2011)**



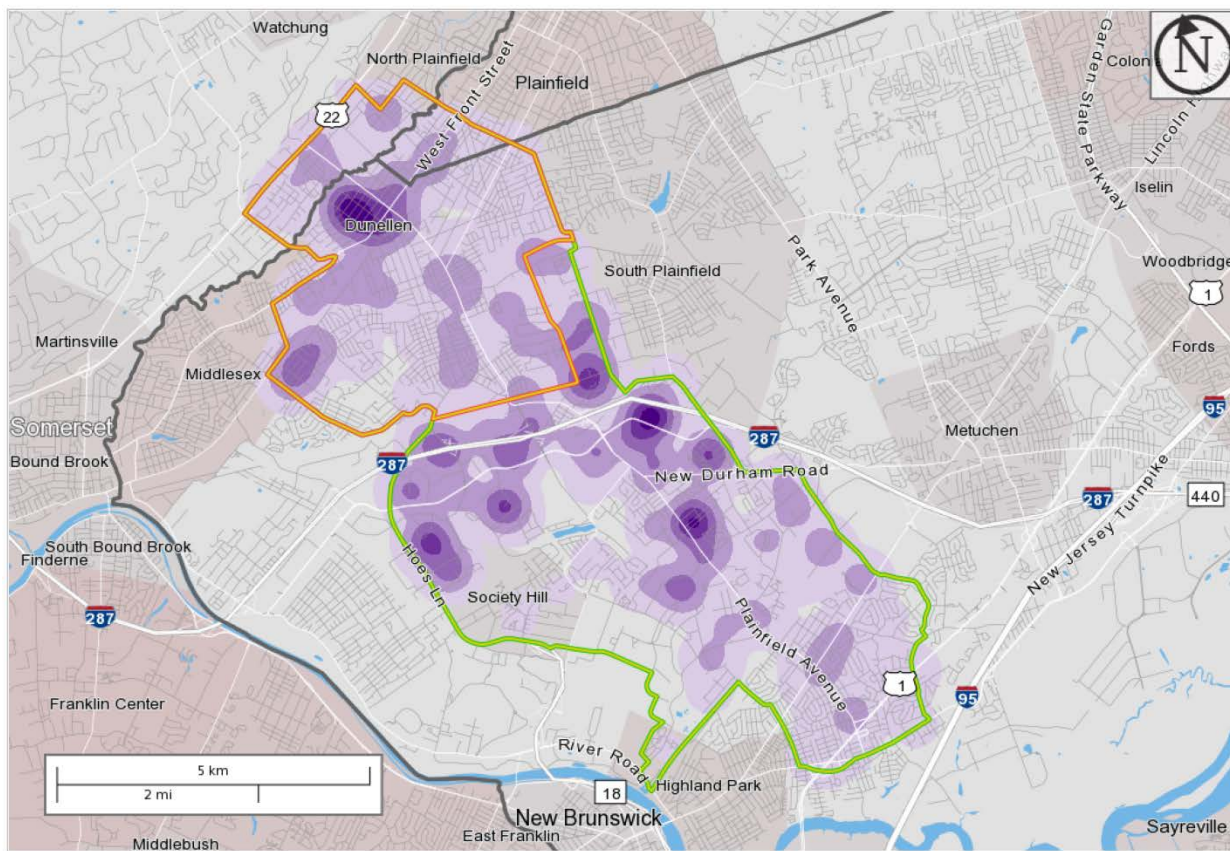
### Map Legend

Job Density [Jobs/Sq. Mile]	Selection Areas
5 - 112	Analysis Selection
113 - 435	Paired Area Selection
436 - 973	
974 - 1,726	
1,727 - 2,695	



Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

**Map 7—6: Density of Primary Jobs for Workers who live in the North Subarea and are Employed in the CR 529 Corridor Study Area (2011)**



### Map Legend

#### Job Density [Jobs/Sq. Mile]

- 5 - 74
- 75 - 282
- 283 - 629
- 630 - 1,114
- 1,115 - 1,739

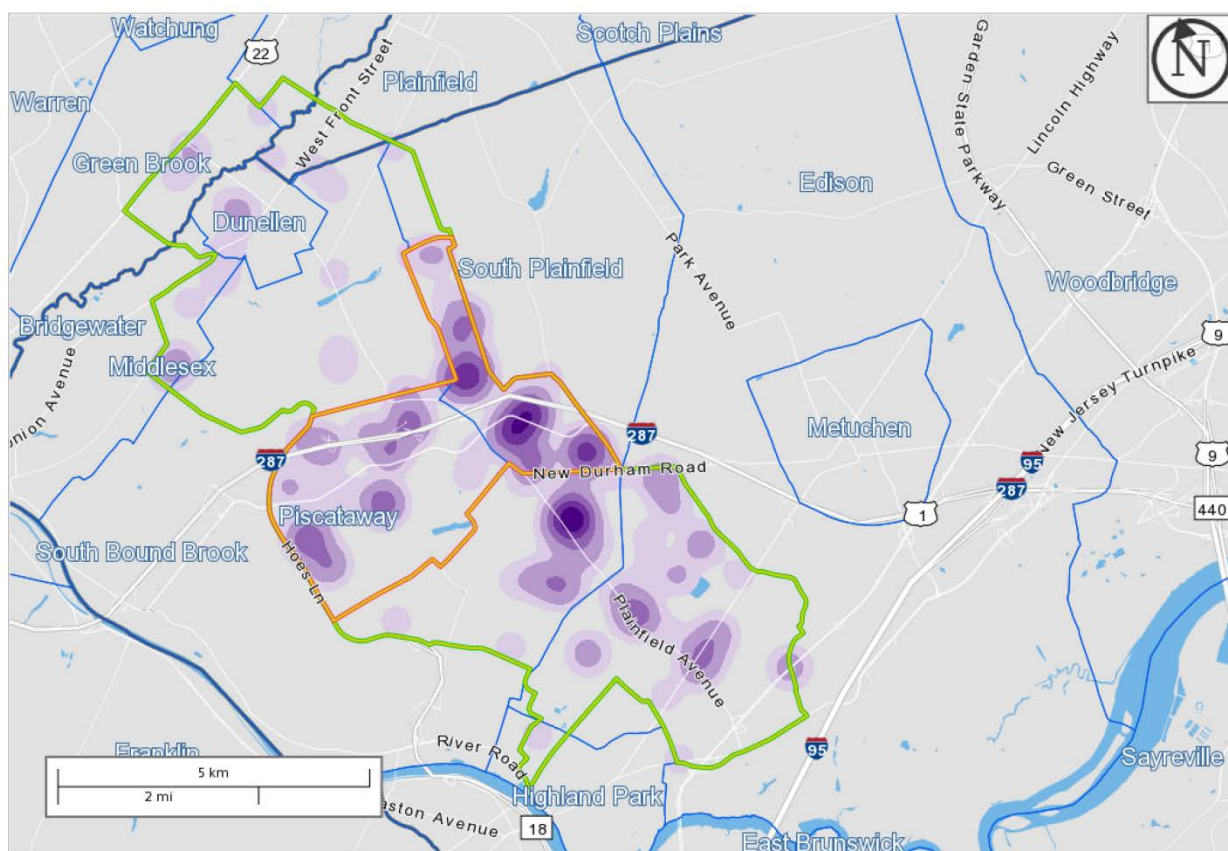
#### Selection Areas

- Analysis Selection
- Paired Area Selection



Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

**Map 7—7: Density of Primary Jobs for Workers who live in the Central Subarea and are Employed in the CR 529 Corridor Study Area (2011)**



### Map Legend

#### Job Density [Jobs/Sq. Mile]

- 5 - 16
- 17 - 49
- 50 - 104
- 105 - 182
- 183 - 282

#### Selection Areas

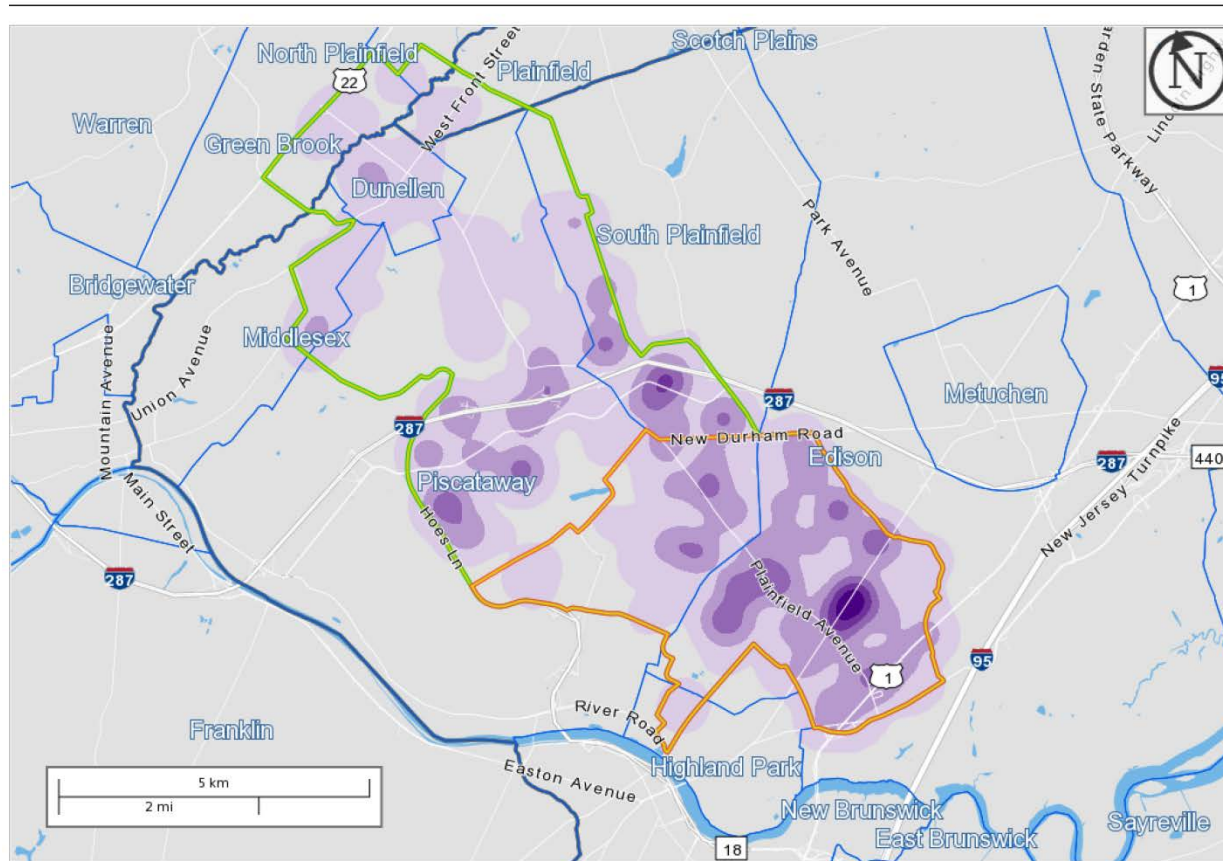
- Analysis Selection
- Paired Area Selection



Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)



**Map 7—8: Density of Primary Jobs for Workers who live in the South Subarea and are Employed in the CR 529 Corridor Study Area (2011)**



### Map Legend

#### Job Density [Jobs/Sq. Mile]

- 5 - 100
- 101 - 387
- 388 - 865
- 866 - 1,534
- 1,535 - 2,395

#### Selection Areas

- Analysis Selection
- Paired Area Selection



Source: US Census Bureau, LEHD OnTheMap Origin-Destination Database (<http://onthemap.ces.census.gov>)

## 8.0 Transit Needs Assessment

### 8.1 Existing Rail Service

Passenger rail service in the CR 529 Corridor Study Area is provided by New Jersey Transit Corporation, marketed as New Jersey Transit, along two regional rail lines—the Northeast Corridor Line and the Raritan Valley Line. There are two rail stations in the CR 529 Study Area, which are located in Edison and Dunellen.

New Jersey Transit rail lines provide convenient service to Newark and New York from both stations in the CR 529 Study Area. Both lines offer all-day service, with headways of 15 to 30 minutes during the peak periods and 30 to 60 minutes during the mid-day hours. All operate on an hourly basis during the weekend. Service is dual-directional, so commuters can move both northward and southward along the rail lines as well as both into and out of Middlesex County activity centers. As such, rail service provides a good transportation option, especially for the markets that fall within a half-mile of the stations.

#### 8.1.1 Northeast Corridor (Edison Station)

**Service to:**

**Trenton Transit Center – Hamilton – Princeton Junction – Jersey Avenue** (limited service) – **Edison – Metuchen – Metropark – Rahway – Linden – Broad Street Elizabeth – North Elizabeth** (limited service) – **Newark Liberty International Airport – Newark Penn Station** (transfer in Newark to Path service to downtown Manhattan) – **Secaucus Junction – New York Penn Station**

#### *Overview of Service*

New Jersey Transit's Northeast Corridor commuter rail line, offering local and express services, is accessible from Edison Station along the CR 529 Corridor just north of NJ Route 27. New Jersey Transit operates trains along this corridor from Trenton to the south (with connections to SEPTA service to the Philadelphia market) and to Newark Liberty International Airport, Newark Penn Station and New York Penn Station in Midtown Manhattan to the north.

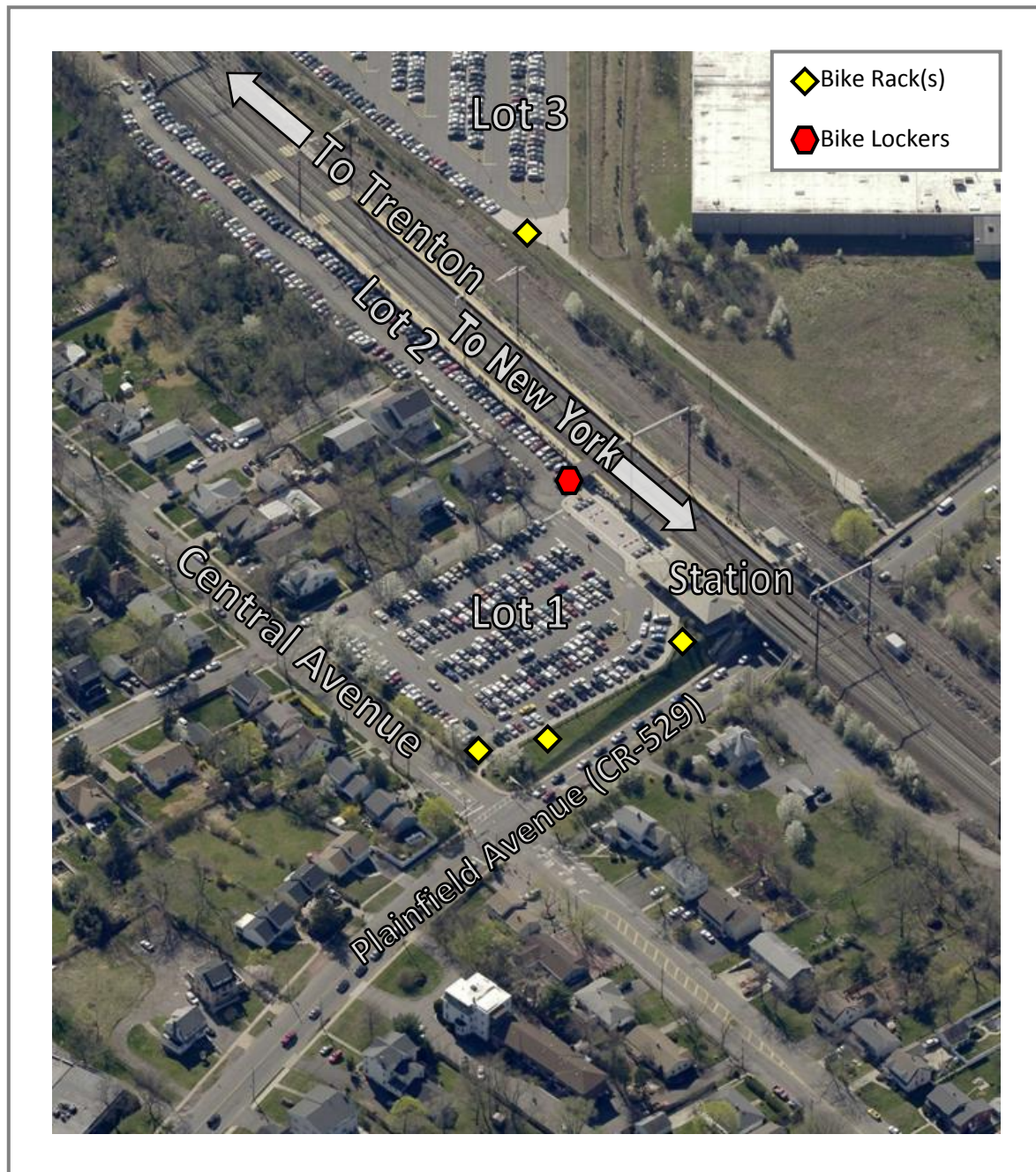
As of the writing of this report, there were 98 weekday trains with a scheduled stop at Edison station: 50 New York-bound trains and 48 Trenton-bound trains. Annual average weekday total passengers boarding at Edison station in 2004 was 2,757 compared to 3,161 during 2014, representing a 15% increase in ridership at this station.

This line provides considerable intrastate and New York City oriented service, with stops in other regional employment and activity centers such as Princeton, Newark, Trenton, New Brunswick, Metropark, and Elizabeth, and access to other key New Jersey Transit rail Lines at Newark Penn Station, Secaucus Junction and the Hoboken



Terminal via a Secaucus Junction transfer. Connections to Amtrak regional inter-city service are possible at New York Penn Station, Newark Penn Station, Newark Liberty International Airport Station, Metropark, New Brunswick, and Trenton. There is no connecting bus service offered at Edison station; however, transfers to connecting bus service, New Jersey Transit light rail, and PATH rail are possible at various other stops along this line. Edison station is served by private taxicab.

**Figure 8—1: Oblique Aerial View of Edison Station**



### *Edison Station*

Edison station includes three (3) park & ride lots with a grand total capacity of 812 parking spaces. Two of the three parking lots are situated on the New York-bound side of the station, accessible from Central Avenue and Reed Street, having a combined capacity of 335 parking spaces. The third parking lot, situated on the Trenton-bound side of the station, has a capacity of 477 parking spaces with automobile driveway access from Kilmer Road (approximately 1,300 feet west of Plainfield Avenue). Daily parking is available at a cost of \$4.00 per day and permit parking is available for \$165.00 per quarter (\$55.00 per month). Up until 10 AM, permit holders have priority over daily parkers. Daily parking is permitted in 120 out of the 477 numbered parking spaces located in the Kilmer Road parking lot (Lot 3). The remaining numbered parking lot spaces are reserved exclusively for permit holders until 10 AM. After 10 AM daily parking is allowed in any numbered space.



View of the main Edison Station building (New York-bound side of the station)

Ten (10) bike lockers are located between the end of Reed Street and the station platform on the New York-bound side of the station. According to staff of Keep Middlesex Moving (KMM), the entity responsible for managing the rental of the bike lockers, all 10 bike lockers are currently rented and there are 29 people on the waiting list (as of the spring of 2015). The term of a rental commitment is 6 months at a cost of \$7.50 per month.





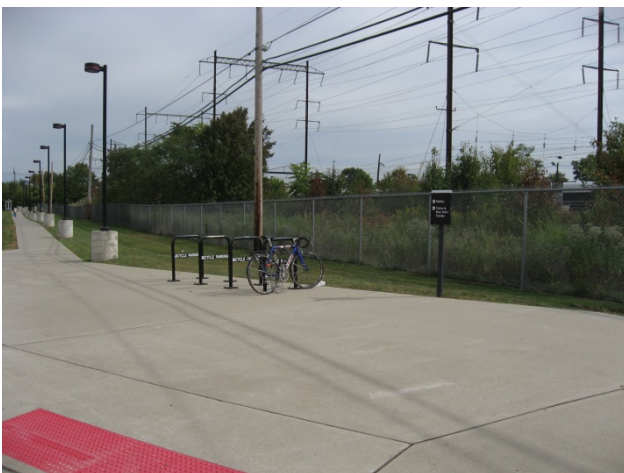
Inverted-U bicycle racks nearest to the main Edison Station building (New York-bound side of the station)

There are several bicycle racks situated on the station property accommodating 41 bicycles. On the New York-bound side of the station there are six (6) inverted-U and three (3) ribbon style bike racks, providing 33 out of the 41 bike rack spaces located at Edison station. These six (6) bike racks are generally situated along the onsite sidewalk and/or in the grassy area located between the Central Avenue parking lot (Parking Lot 1) and Plainfield Avenue.



Ten bike lockers (5x2) adjacent to the New York-bound platform at Edison Station

On the Trenton-bound side of the station, there are four (4) inverted-U racks, with a capacity for securing eight (8) bikes. These four (4) racks are located adjacent to the northerly corner of the Kilmer Road parking lot (Parking Lot 3) near the daily parking payment kiosk, which is a little more than a ¼-mile walk from the New York-bound side of the station.



Inverted-U bicycle racks adjacent to the Kilmer Road parking area (Lot 3) at Edison Station

Onsite field observations are indicative that there may be a possible shortage of conveniently-located bike racks on the New York-bound side of the station due to the fact that cyclists are utilizing structures other than bike racks to secure their bicycles, such as nearby guard rails, rather than utilizing the ribbon racks placed a further distance from the station building (see top photo).

### 8.1.2 Raritan Valley Line (Dunellen Station)

**Service to:**

**High Bridge – Raritan – Somerville – Bridgewater – Bound Brook – Plainfield – Netherwood – Fanwood – Westfield – Garwood** (limited service) – **Cranford – Roselle Park – Union – Newark Penn Station** (transfer in Newark to Path service to downtown Manhattan) – **Secaucus Junction** (limited service) – **New York Penn Station** (via transfer in Newark, limited one-seat ride service during off-peak trips)

#### *Overview of Service*

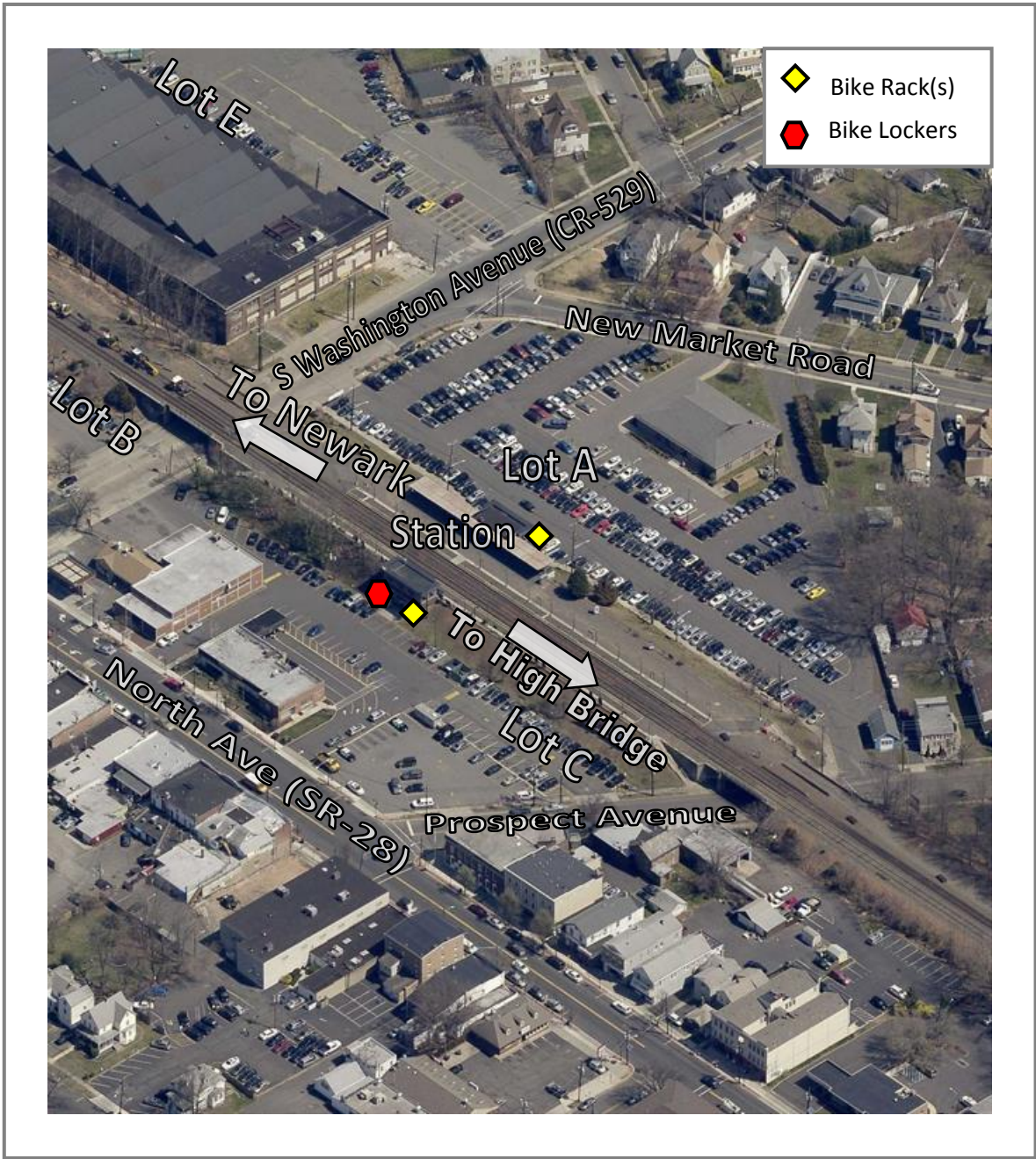
The Raritan Valley Line provides service from New York and Northern New Jersey to Westfield, and westward toward Somerville and High Bridge, and eastward to Newark Penn Station. The line crosses the northern portion of the CR 529 Corridor Study Area, with a stop at Dunellen Station. As of the writing of this report, there were 53 weekday trains with a scheduled stop at Dunellen Station. There were 906 average weekday total passenger boardings at Dunellen Station in 2014 versus 789 during 2004, representing a 15% increase. Connecting buses at Dunellen Station are New Jersey Transit's 59, 65, 66, 113 and 114. One mile north of Dunellen Station, New Jersey Transit's 117 express bus stops along Route 22.

One-seat ride service to Midtown Manhattan Penn Station is available on a limited number of off-peak trips. Peak-hour riders must transfer at Newark Station onto the Northeast Corridor or North Jersey Coast Line trains for service to New York Penn Station. The Raritan Valley Rail Coalition, in which Middlesex County is represented, has advocated for one seat ride service on this line to midtown Manhattan through the use of dual powered (diesel and electric) locomotives that are undergoing testing in a variety of settings prior to their permanent deployment.





Figure 8—2: Oblique Aerial View of Dunellen Station





### *Dunellen Station*

Dunellen Station includes five (5) park & ride lots (Lots A-E) with a grand total capacity of 382 parking spaces. The primary parking lot (Lot A) has a capacity of 255 parking spaces and is located on the New York-bound side of the station at the intersection of South Washington Avenue and New Market Road, generally situated between the Dunellen Public Library and the Dunellen Train Station. The other four parking lots are much smaller (17-60 spaces each) and are dispersed in the immediately surrounding blocks of the station. Daily parking is available at a cost of \$4.00 per day. Resident parking permits are \$40.00 per month and non-resident parking permits are \$50.00 per month.

Two (2) bike lockers are located near the entrance to the out-bound side of the station. According to staff of Keep Middlesex Moving (KMM), both bike lockers are currently rented and there are three (3) people on the waiting list (as of the spring of 2015). The term of a rental commitment is 6 months at a cost of \$7.50 per month.

There are six inverted-u bicycle racks situated on the station property accommodating 12 bicycles. Onsite field observations are indicative that there may be a possible shortage of conveniently-located bike racks due to the fact that some cyclists were unable to lock their bicycles to the bike racks (see photo at top right).



Inverted-U bicycle racks near New York-bound entrance to Dunellen station



Two bike lockers (1x2) near the High Bridge-bound entrance to Dunellen Station



High Bridge-bound entrance to Dunellen Station

## 8.2 Existing Bus Services

### 8.2.1 New Jersey Transit

New Jersey Transit Corporation, doing business as (“d/b/a”) New Jersey Transit (NJT), operates local bus routes that are typically laid out to traverse residential areas with sufficient density having the propensity to support transit service demand and to offer connections to job sites, educational sites, shopping centers, medical facilities, social & recreational facilities, and places of personal business (i.e., downtown areas featuring post offices, banks, town halls, etc.) – namely to carry people to the places they want and need to go on a local level. Routes are usually spaced at half-mile increments and greater, in order to cater to different markets and travel patterns in different corridors. The system is coordinated at transfer points to interface with regional bus and rail, taxi, paratransit, and park and ride facilities. Local buses should also provide relatively frequent service, in order to capture ridership not only during the peak-hours, but throughout the day. This has the effect of making bus transit more feasible and appealing for trips above and beyond the journey to work -- trips for such purposes as shopping and recreation that do not typically have a fixed "start" time and "end" time, for instance. The New Jersey Transit buses that provide local service to the CR 529 Study Area are comprised generally of the 800 routes. These routes have received new buses with improved handicapped accommodations and bicycle racks manufacture by North American Bus Industries Bus, LLC (“NABI Bus, LLC”)<sup>10</sup>.

The regional New Jersey Transit routes are mainly oriented toward New York City, specifically the employment centers of Midtown and Downtown Manhattan. Additional New Jersey Transit regional routes provide service to such northern New Jersey transportation and employment centers such as Newark.

Currently there are nine New Jersey Transit (NJT) bus lines that service the County Route 529 (CR 529) Corridor Study Area.

---

<sup>10</sup> NABI Bus, LLC was acquired by New Flyer Industries in 2013 which in 2015 discontinued NABI’s product lines which are now branded under the new name of New Flyer of America, Inc. Source: [https://en.wikipedia.org/wiki/North\\_American\\_Bus\\_Industries](https://en.wikipedia.org/wiki/North_American_Bus_Industries)

## **NJT Route 59**

### **Service to:**

**Dunellen – Plainfield – Scotch Plains – Westfield – Garwood –  
Cranford – Roselle – Elizabeth – Hillside - Newark**

The 59 Route carried 1,643,711 passengers in 2013. The 59 starts in Newark and ends in Dunellen in the study area. It ends at the train station on Washington Avenue CR 529. The maximum fare is \$3.80. There are 5 zones on the route and there are 24 weekday bus runs that end in Dunellen. Ridership declined –3.6% from 2009 to 2013. The 59 bus connects with the Raritan Valley Line at 6 locations (Dunellen, Plainfield, Westfield, Garwood, Cranford, and Elizabeth). At Elizabeth, it also connects with the Northeast Corridor Line. Service at Dunellen operates on a 60-minute headway during off-peak hours and on a 30-minute headway during peak hours on weekdays. Service is also available on Saturday and Sunday.

## **NJT Route 65**

### **Service to:**

**Bridgewater Commons Mall – Somerville (*limited service*)**

The 65 Route carried 127,050 passengers in 2013. The 65 starts in Dunellen and ends in Newark at the Washington Park stop of the Newark Subway. There are 5 zones on the route and the maximum fare is \$3.80. There are 8 weekday runs and am peak service and afternoon pm return service from Dunellen. Also 2 express morning peak runs from Newark to Somerville and Bridgewater Commons, as well as 9 runs to Dunellen. The 65 connects to the Raritan Valley Line at Dunellen, Plainfield and Somerville.

## **NJT Route 66**

### **Service to:**

**Bound Brook (*limited service*) – Dunellen – Plainfield – North  
Plainfield – Scotch Plains – Cranford (Union County College –  
Mountainside – Springfield – Union – Hillside – Newark  
(Washington Park) [*service running between Dunellen and Cranford  
operates weekdays during peak periods only*]**

The 66 Route carried 644,934 passengers in 2013. The 66 starts in Dunellen and 2 runs end in Newark from the study area in the am peak. There are 52 zones and maximum fare of \$3.80. The connecting rail service is at Somerville, Dunellen, and Plainfield on the Raritan Valley Line. The 65/66 at Dunellen operates only during peak hours. There is Saturday service on both the 65/66 and no Sunday service on either route in Dunellen. The Newark terminal connects with the Newark Subway stop at Washington Park.

## **NJT Route 113**

### **Service to:**

**Dunellen – Plainfield – Scotch Plains - Fanwood – Westfield –  
Garwood – Cranford – Roselle Park – Union –Hillside – Elizabeth –  
New York (Port Authority)**

The 113 Route carried 1,135,605 passengers in 2013. The 113 starts in Dunellen at the train station on CR 529 Washington Avenue at New Market Road and ends at the Port Authority Bus Terminal in New York City. The commute time is 1hour, 21minutes on the schedule. Much of the route is on US 22 and NJ 28. There are 23 runs that start from Dunellen to New York. There are 4 zone boundaries. The 113 connects to the Raritan Valley Rail Line at Dunellen, Plainfield, Westfield, Cranford, Netherwood, Fanwood, and Roselle Park. There is Saturday and Sunday service from Dunellen.

## **NJT Route 114**

### **Service to:**

**Bridgewater (Bridgewater Commons Mall) – Somerville – Bound Brook – Dunellen – Plainfield – North Plainfield – Scotch Plains – Mountainside – Springfield – Union – Hillside – New York (Port Authority Bus Terminal)**

The 114 Route from Bridgewater Commons Mall to New York Port Authority bus terminal carried 1,758,190 passengers in 2013. The route to New York has 23 runs from Bridgewater Commons Mall to Port Authority Bus Terminal and 57 runs leaving Port Authority and ending at various stops in New Jersey along Route 22 locations in the corridor.

## **NJT Route 117**

### **Service to:**

**Somerville – Bound Brook – North Plainfield – Scotch Plains – Mountainside – Union – New York Express (Port Authority Bus Terminal)**

***Note: this line operates weekdays during peak hours via Route 22.***

The 117 Route from Port Authority to Somerville via Route 22 express has 5 stops at New York, Union, Mountainside, Scotch Plains, and Somerville, which carried 81,993 passengers in 2013 during am peak and pm peak.



## **NJT Route 810**

### **Service to:**

**New Brunswick – Highland Park – Edison (Menlo Park, Roosevelt  
Care Center) – Metuchen – Fords – Woodbridge Center Mall**

The 810 Route starts in New Brunswick and ends at Woodbridge Center Mall and runs through the 529 Study Area at the intersection of New Jersey 27 with CR 529 Plainfield Avenue in Edison. The 810 Route carried 283,000 riders in 2013. The connection to the CR 529 Corridor is about a mile away from the north east Corridor Edison Station. There is hourly service from 6 am to 9 pm on 16 runs during weekdays and 15 runs on Saturday and 18 runs on Sunday. There are two zones \$2.35 maximum fare and \$.75 for transfers.

## **NJT Route 814**

### **Service to:**

**North Brunswick (Fashion Plaza, North Brunswick Shopping  
Center, DeVry College, Technology Center of NJ) – New Brunswick  
– Highland Park – Edison (Heller Industrial Park, Middlesex County  
College)**

The 814 Route starts in North Brunswick and ends at Middlesex County College and runs through the CR 529 study area in Edison where it runs along CR 514 Woodbridge Avenue and intersects with CR 529 at the intersection with Plainfield Avenue. The 814 Route carried 311,026 passengers in 2013. There are 17 weekday runs each way to Middlesex County College on the portion of the route which crosses 529 in the study area. There are five runs each way on Saturdays and no service on Sundays. The maximum fair is one zone \$1.50 with transfers at \$.70.

## **NJT Route 819**

### **Service to:**

**Piscataway – Plainfield (Rail Station) – South Plainfield (Hadley Center Mall, Municipal Building) – Edison – Metuchen (Rail Station)**

The 819 Route starts in Piscataway, goes to Plainfield, and then on to South Plainfield (Hadley Center Mall, Middlesex Mall past the South Plainfield Municipal Building then back to Plainfield). A second route variation goes to Edison, and Metuchen Rail Station. There are 12 runs of the 819 that run for a very short way on CR 529 at Hadley Center and Middlesex Mall. Those runs do not connect to Metuchen Station or The Northeast Corridor Line. The 819 Route carried 207,189 passengers in 2013 which was an increase of 16.1% over 2012. The 819 Route has been growing consistently over the past three years. A total of 79,677 riders have been added to the route. There is weekday and Saturday service on the 819 Portion of the route that serves CR 529 and the one zone fair is \$1.50.

## **8.2.2 Suburban Transit**

### **Route 702**

### **Service to:**

**South Plainfield – Plainfield – North Plainfield – Dunellen –  
Piscataway – Edison – Highland Park – Somerset – New Brunswick  
– East Brunswick – Atlantic City**

The 702 Route is a limited special-purpose service to Atlantic City casinos that operates through the CR-529 Corridor Study Area **on Saturdays and Sundays only**. In addition, a minimum of 21 passengers or paid fares are required for the bus to operate to Atlantic City. One midmorning trip starts in South Plainfield at 9:50 AM and makes stops in Plainfield, North Plainfield, Dunellen, Piscataway, Middlesex Mall, and Edison, then travels to Highland Park, New Brunswick and East Brunswick before proceeding to Atlantic City, schedule to arrive at 1:30 PM. There is a single return trip departing from Atlantic City at 7:25 PM.

### 8.2.3 Rutgers University Intercampus

The Rutgers University Intercampus bus is a service provided for all five campuses located in New Brunswick and Piscataway. It is available to all members of the university community. The following routes operate in the CR-529 Corridor Study Area.

#### **B Route**

**Service to: Livingston Student Center - Quads**

**Health Center – Werblin Recreation Center Science Building –  
Library of Science & Medicine – Busch Suites – Busch Campus  
Center – Livingston Plaza**

The B Route runs Monday through Thursday from 7am-2am with frequency every 5 minutes; 12:30 p.m. to 7 p.m. and 15 minutes after 8:30 pm and 30 minutes after 10 pm to 2 am. Friday service is slightly different than Monday to Thursday.

#### **LX Route**

**Service to: College Avenue – Livingston Campus**

**Rutgers Student Center – Scott hall – New Brunswick Rail Station  
(after 9:30pm) – Student Activities Center – Livingston Plaza –  
Livingston Student Center – Quads – College Avenue**

The LX Route runs College Avenue to Livingston Express from 7 am to 2:30 am Monday to Thursday and services train at New Brunswick station after 9:30 pm. Thursday and Friday services is frequent and runs until 3:30 am.

#### **REXL Route**

**Service to: Cook – Douglass Campus – Livingston Campus**

**Red Oak Lane – Lipman Hall – College Hall – Livingston Plaza –  
Livingston Student Center – Public Safety Building – Cabaret  
Theater**

Monday to Thursday service is 7 am to 11:04 pm every 5 -6 minutes and Friday 6:30 am to 10:59 pm with frequent service every 7 to 12 minutes and 18 minutes on Friday from 6:30 am to 11 pm. The REXL Route has added 9 pm to 11 pm stops at Bravo Supermarket and Rockoff Hall.

## **Weekend 1, Weekend 2 & All Campus Routes**

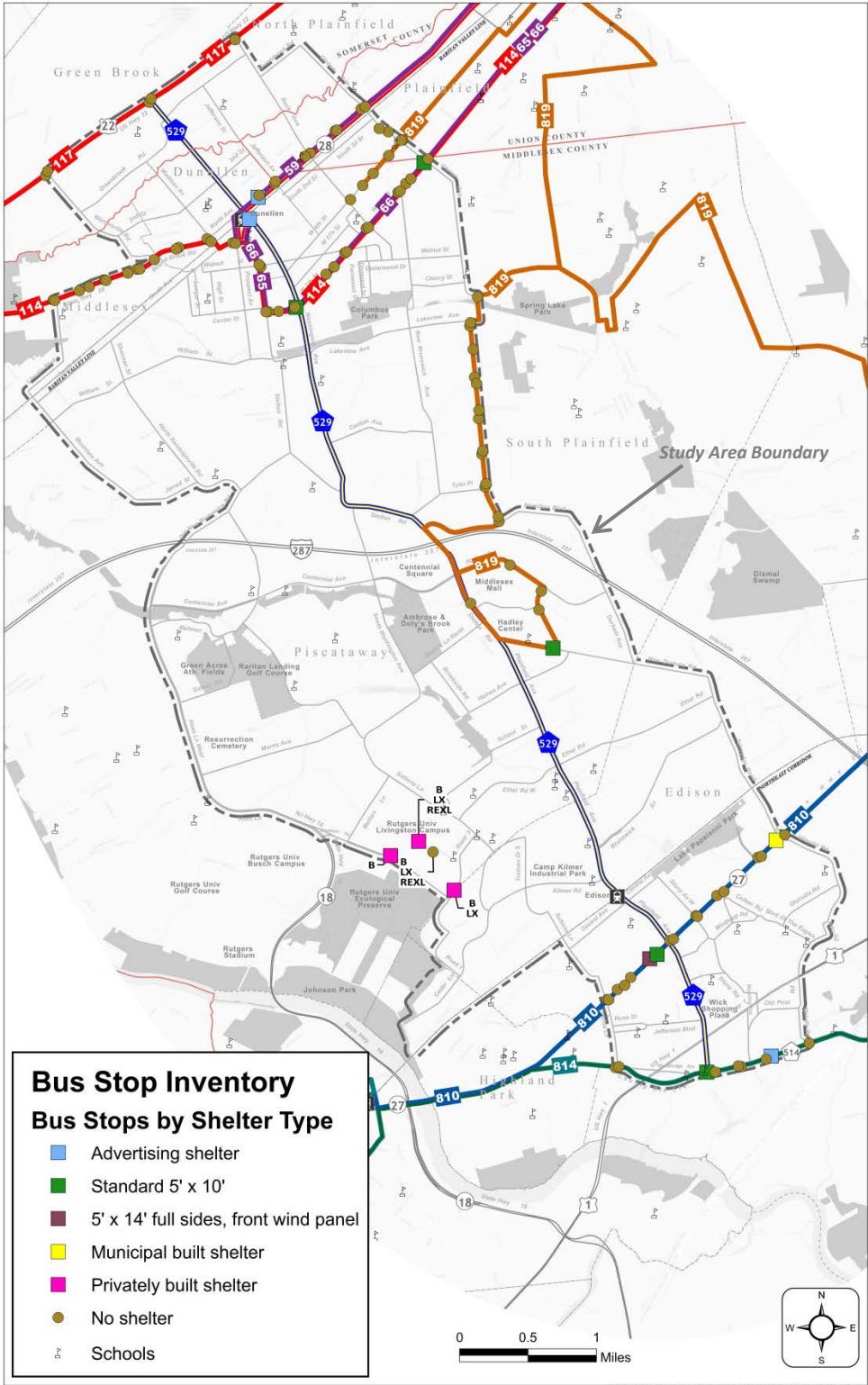
### **Service to:**

#### **All New Brunswick – Piscataway Campuses**

These routes loop through all campuses when regular classes are not held. Weekend 1 destinations are College Avenue, Busch, Livingston, College Avenue (SAC), and Cook/Douglass. Weekend 2 destinations are College Avenue, Cook/Douglass, College Avenue (SAC), Livingston, and Busch. Weekend 1 and 2 routes generally operate on headways of between 20 and 30 minutes; late night overnight service on Friday and Saturday nights is provided with hourly headways between 3:00 AM and 8:45 AM. The all campus routes operate on weekdays during winter, spring and summer breaks.

### Map 8—1: New Jersey Transit Bus Lines and Rutgers Livingston Campus Bus Stops

*This map is also provided in Appendix D in a higher resolution 11 x 17 inches (tabloid) page size format*





## 8.3 Discontinued Bus Services

### 8.3.1 Suburban

Suburban Transit formerly operated a local bus route that provided service in the CR 529 Corridor Study Area. Service ended in 2012.

#### **Route 100L (“100 Local”)**

**Service to: Dunellen from Princeton**

**South Brunswick – North Brunswick – New Brunswick – Highland Park – Edison – Piscataway – South Plainfield – Dunellen**

Route 100L from Princeton to New Brunswick and to Dunellen was a local route variation of the New York commuter 100 line to New York City which runs on NJ-27 and NJ-18 with 15-minute headways weekdays at East Brunswick and all-day service.

The local service ran from New Brunswick to Dunellen during peak hours only. The 100L Route ran on Route 27 through Highland Park and on CR 529 to Dunellen via Edison, Piscataway, and South Plainfield to Dunellen.

### 8.3.2 New Jersey Transit

New Jersey Transit had also discontinued a commuter shuttle service, designated as the Route 980, which had formerly provided service in the CR 529 Corridor Study Area.

#### **Route 980**

**Service to: New Brunswick Rail Station (Somerset at George Street)**

**New Brunswick Rail Station – Piscataway (Colgate) – Knightsbridge Road – Centennial Avenue – Municipal Complex – Corporate Place South**

The 980 Route was a commuter shuttle service which ran from New Brunswick station (Somerset Street at George Street) and ran 4 runs in the a.m. peak and 4 during the p.m. peak hours to Piscataway (Colgate), Knightsbridge Road, and Centennial Municipal Complex–Corporate Place South. It was discontinued after the 2008 recession and run temporarily by Middlesex County until early 2014.

### **8.3.3 Edison Light Transit (to Edison Station)**

In April of 2011 Edison Township discontinued its municipally-operated “Edison Light Transit” peak-period feeder service to Edison Station.

#### **Edison Light Transit**

##### **Service to: Edison Rail Station**

**Rivendell/Plainfield Avenue – Hicks/Ethel Road – Star Point –  
Ethel Road/Victoria Park – Hana Road/Brunswick Avenue –  
Merrywood Drive/Brunswick Avenue – Piscataway Commons –  
Oxford Arms/New Brunswick Avenue – Durham Woods – Village  
Court/Talmadge Road – Village Commons/Talmadge Road –  
Village Gate/Talmadge Road – Talmadge Village –  
Waterford/Talmadge Road – Hana Road/Merrywood 1&2**

The Edison Light Transit service run by Edison Township provided shuttle services on weekdays to the train station from 6 am to 8:30 am and 5 pm to 8 pm. There were 2 buses which made stops and met 13 trains traveling to New York or Trenton in the morning and 9 trains in the evening. Each trip was 10 to 20 minutes depending on traffic and was timed to meet trains. The cost was \$1.50 per ride on prepaid cards, or \$3.00 for a single ride. Limited service was provided for 7 holidays.

## 8.4 Bus Stop Inventory

There is a total of 108 bus stops within the CR 529 Corridor Study Area. The vast majority of bus stops located in the Study Area (96%) is served by New Jersey Transit. Most of the bus stops (88%) have no shelters, but of the bus stops with shelters, the most prevalent shelter type is the standard 5 feet by 10 feet shelter. A detailed inventory of bus stops in the Study Area can be found in Appendix B.

**Table 8—1: Number of Public Bus Stops in the CR 529 Corridor Study Area, by Service Provider and Bus Line**

Bus Line by Service Provider	Number of Bus Stops	
	Count	Percent of Total*
<b><i>New Jersey Transit</i></b>	<b>104</b>	<b>96%</b>
59: Dunellen--Elizabeth--Newark	35	32%
65: Somerville--Mountainside--Union--Newark (Washington Park)	11	10%
66: Somerville--Mountainside--Union--Newark (Washington Park)	17	16%
113: Dunellen--Elizabeth--New York (PABT)	5	5%
114: Bridgewater Commons Mall--Somerville--New York (PABT)	35	32%
117: Somerville--Route 22 Express--New York (PABT)	27	25%
810: New Brunswick--Menlo Park Mall--Metuchen--Woodbridge Center Mall	11	10%
814: North Brunswick--New Brunswick--Highland Park--Edison	9	8%
819: Metuchen--Edison--South Plainfield--Piscataway--Plainfield	10	9%
<b><i>Coach USA</i></b>	<b>4</b>	<b>4%</b>
100L: Princeton--Dunellen (discontinued)	4	4%
<b><i>Rutgers-New Brunswick/Piscataway Inter-campus Bus</i></b>	<b>4</b>	<b>4%</b>
B: Livingston Campus--Busch Campus	4	4%
LX: College Avenue Campus--Livingston Campus	3	3%
REXL: Cook-Douglass Campus--Livingston Campus	2	2%
<b><i>Grand Total Number of Stops</i></b>	<b>108</b>	<b>100%</b>

Source: New Jersey Transit and Middlesex County Office of Planning; \*NOTE: 108 total bus stops (sum does not equal total because multiple stops are served by multiple lines and/or providers)

**Table 8—2: Public Bus Stops in the CR 529 Corridor Study Area, by Bus Shelter Type**

Bus Shelter Type	Number of Stops	Percent of Stops
Standard 5' x 10'	5	5%
Advertising shelter	3	3%
5' x 14' full sides, front wind panel	1	1%
Privately built shelter	3	3%
Municipal built shelter	1	1%
No shelter	95	88%
<b>Grand Total</b>	<b>108</b>	<b>100%</b>

Source: New Jersey Transit and Middlesex County Office of Planning

**Table 8—3: Number of Public Bus Stops by Bus Shelter Type and Common Line/Route Destination**

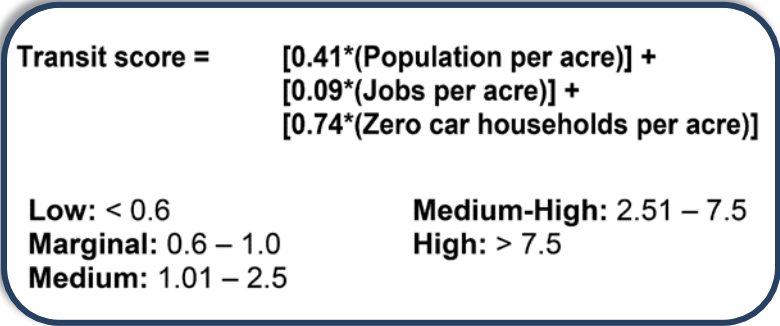
Bus Shelter Type	Bus Line/Route Destinations Noted at Stop Location	Number of Stops	Percent of Stops
<b>Standard 5' x 10'</b>		<b>5</b>	<b>5%</b>
	65 To Bridgewater	1	1%
	114 To Bridgewater		
	65 To Newark	1	1%
	66 To Newark		
	114 To New York		
	810 To Woodbridge Center	1	1%
	814 To North Brunswick	1	1%
	819 To Piscataway	1	1%
	819 To South Plainfield		
<b>Advertising shelter</b>		<b>3</b>	<b>3%</b>
	59 To Newark	2	2%
	113 To New York		
	814 To North Brunswick	1	1%
<b>5' x 14' full sides, front wind panel</b>		<b>1</b>	<b>1%</b>
	810 To New Brunswick	1	1%
	100L Suburban To So. Brnswck (discontinued)		
<b>Privately built shelter</b>		<b>3</b>	<b>3%</b>
	B To Busch Campus Student Center	1	1%
	LX To Rutgers Student Center (CAC)		
	REXL To College Hall (Cook-Douglass Campus)		
	B To Busch Campus Student Center	1	1%
	LX To Rutgers Student Center (CAC)		
	B To Busch Campus Student Center	1	1%
<b>Municipal built shelter</b>		<b>1</b>	<b>1%</b>
	810 To New Brunswick	1	1%
<b>No shelter</b>		<b>95</b>	<b>88%</b>
	59 To Dunellen	4	4%
	113 To Dunellen		
	59 To Elizabeth-Dunellen	1	1%
	113 To Dunellen		
	59 To Newark	4	4%
	113 To New York		
	65 To Bridgewater	15	14%
	114 To Bridgewater		
	65 To Newark	9	8%
	114 To New York		
	65 To Newark	9	8%
	66 To Newark		
	114 To New York		
	810 To New Brunswick	4	4%
	810 To Woodbridge Center	7	6%
	814 To Middlesex County College	4	4%
	814 To North Brunswick	3	3%
	819 To Metuchen	2	2%
	819 To Metuchen	9	8%
	819 To South Plainfield		
	819 To Piscataway	12	11%
	819 To Piscataway	3	3%
	819 To South Plainfield		
	810 To New Brunswick	3	3%
	100L Suburban To So. Brnswck (discontinued)		
	<<No sign, flag stop only>>	3	3%
	117-to Port Authority Bus Terminal		
	<<No sign, flag stop only>>	2	2%
	117-to Somerville		
	B To Busch Campus Student Center	1	1%
	LX To Rutgers Student Center (CAC)		
	REXL To College Hall (Cook-Douglass Campus)		
<b>Grand Total</b>		<b>108</b>	<b>100%</b>

Source: New Jersey Transit compiled and summarized by Middlesex County Office of Planning

## 8.5 New Jersey Transit's Transit Score

While the name “*Transit Score*” intuitively appears at first glance to be a measure of the level of transit service being provided, it actually measures the *anticipated demand* for transit service. The “Transit Score”, jointly developed by staff of New Jersey Transit and staff of the Delaware Valley Regional Planning Commission (DVRPC), provides a score that represents the expected transit mode share for work-to-home and home-to-work based trips. The score itself is calculated by summation of three independent variable coefficients (population density, employment density and the density of households with no car available).<sup>11</sup> While the score formula and the regression analysis upon which it is derived are highly technical in nature, it offers an easy to understand way to see the relationship between demographic characteristics and land use patterns in general and public transportation service and investment. A transit score can also serve as an indicator of the relationship between land use intensity and transit.

**Figure 8—3: Transit Score Formula and Score Categories of the DVRPC Protocol**



**Transit score =**      **[0.41\*(Population per acre)] +**  
                                 **[0.09\*(Jobs per acre)] +**  
                                 **[0.74\*(Zero car households per acre)]**

**Low:** < 0.6                      **Medium-High:** 2.51 – 7.5  
**Marginal:** 0.6 – 1.0           **High:** > 7.5  
**Medium:** 1.01 – 2.5

Source: DVRPC as cited in footnote

See Map 8—2 on page 106 and Map 8—3 on page 107 which illustrate the Transit Score by Traffic Analysis Zone (TAZ) by categories of score ranges. Map 8—3: 2040 Transit Score by Traffic Analysis Zone highlights specific TAZ's where demographic forecasting anticipates a shift into a higher score category by 2040 that is higher than the medium category. These are the TAZ's that may likely warrant increased levels of service commensurate with future population and employment growth.

<sup>11</sup> For a full description of the methodology and a detailed explanation supporting the calculation “Creating a Regional Transit Score Protocol--Full Report”, Delaware Valley Regional Planning Commission, 2007. Downloadable from <http://www.dvrpc.org/Transit/> or directly [http://www.dvrpc.org/asp/pubs/publicationabstract.asp?pub\\_id=07005](http://www.dvrpc.org/asp/pubs/publicationabstract.asp?pub_id=07005)



## Map 8—2: 2010 Transit Score by Traffic Analysis Zone

This map is also provided in Appendix D in a higher resolution 11 x 17 inches (tabloid) page size format



### Map 8—3: 2040 Transit Score by Traffic Analysis Zone

This map is also provided in Appendix D in a higher resolution 11 x 17 inches (tabloid) page size format



## 8.6 Transit Needs Assessment

Existing bus service was found to be more available towards the northern end of the Study Area, with seven of the nine New Jersey Transit (NJT) bus lines serving the Study Area running north of William Street and Lakeview Drive in Piscataway. NJT 819 serves a small part of the central area, around Hadley Center and Middlesex Mall. NJT 810 and 814 run through the southern end of the Study Area along Route 27 and County Route 514, respectively. The portion of Livingston campus of Rutgers University that lies within the Study Area is served by three Rutgers campus buses. As shown in Map 8—1: New Jersey Transit Bus Lines and Rutgers Livingston Campus Bus Stops found on page 100 above, the current bus route network is in need of better connectivity throughout the Study Area and especially in the following areas where bus transit needs exist:

- From US Route 22 to US Route 1 and Woodbridge Avenue (CR 514): local bus service connections needed especially for connections to NJT 117 Bus on Route 22; Dunellen Train Station and NJT 59 and 113 Buses; NJT 65, 66, and 114 Buses on Washington Avenue; Centennial Square; Middlesex Mall and Hadley Center; NJT 810 Bus on Route 27; Edison Train Station; Wick Shopping Plaza; and NJT 814 at Woodbridge Avenue (CR514)
- Bus service for multi-family apartment complexes with high trip activity to employment centers, shopping centers, train stations, schools or recreational parks. These apartment complexes include those in Camp Kilmer industrial park and the Talmadge Road industrial area; on Cedar Lane in Highland Park; Aspen Court, Princeton Gardens, Pleasant View Gardens along New Brunswick Avenue; and Tanglewood Terrace Apartments on Old New Brunswick Road
- Between Edison Train Station and Rutgers University Livingston Campus: via Route 529 (Plainfield Avenue), Kilmer Road (with service to Sutton – Kilmer Industrial Park, Road 3, Avenue E)
- Between Dunellen Train Station and Edison Train Station: a need for peak period bus shuttles between the stations, and possibly encouragement of public-private participation in the provision of shuttle services to both stations
- Along the Centennial Avenue Corridor from CR 529 (Stelton Road) to River Road (CR622)
- Along US Route 1 Commercial Corridor from Woodbridge Avenue to I-287 (Edison)
- From Study Area to Middlesex County College via CR 529 and CR514
- From Study Area to Somerset County Transportation's shuttle system (e.g. Somerville to Livingston-Busch Campus and/or US Route 22 corridor connection)

- From Study Area to nearby County parks (e.g., Johnson Park in Piscataway, Donaldson Park in Highland Park, Spring Lake Park in South Plainfield, Thomas Edison Park and/or Roosevelt Park in Edison)

## 9.0 Bicycle and Pedestrian Needs Assessment

### 9.1 Sidewalks Inventory

The purpose of the Sidewalks Inventory was to provide location and attribute information on sidewalks located along the sides of CR 529 and selected roads within the 529 Corridor Study Area in Middlesex County, Somerset and Union counties, New Jersey. Location and attribute information for sidewalks on roadways within the CR 529 Corridor Study Area that were readily identified as having a function greater than a local road (exclusive of I-287) were selected for inclusion and was collected during an automobile windshield field survey during the months of August and September of 2014. For the purpose of this inventory, a series of data collection maps were printed covering the full extent of the corridor. Handwritten notations on the printed map series were used as the principal medium to capture location and attribute information. Utilizing information gathered and recorded on the printed maps during field surveys, the characteristics and location or absence of sidewalks were recorded as according to the left and right side of the roadway frontage in terms of NJDOT straight line diagram (SLD) route measure values (milepost start and end). Data was recorded into a route event table that enables GIS software to display the data as lines using dynamic segmentation based on the standard route identification (SRI) number, milepost start (MP\_START) and milepost end (MP\_END) fields.

**Table 9—1: Bi-directional Miles of Roadway Centerline by Detailed Sidewalk Classification**

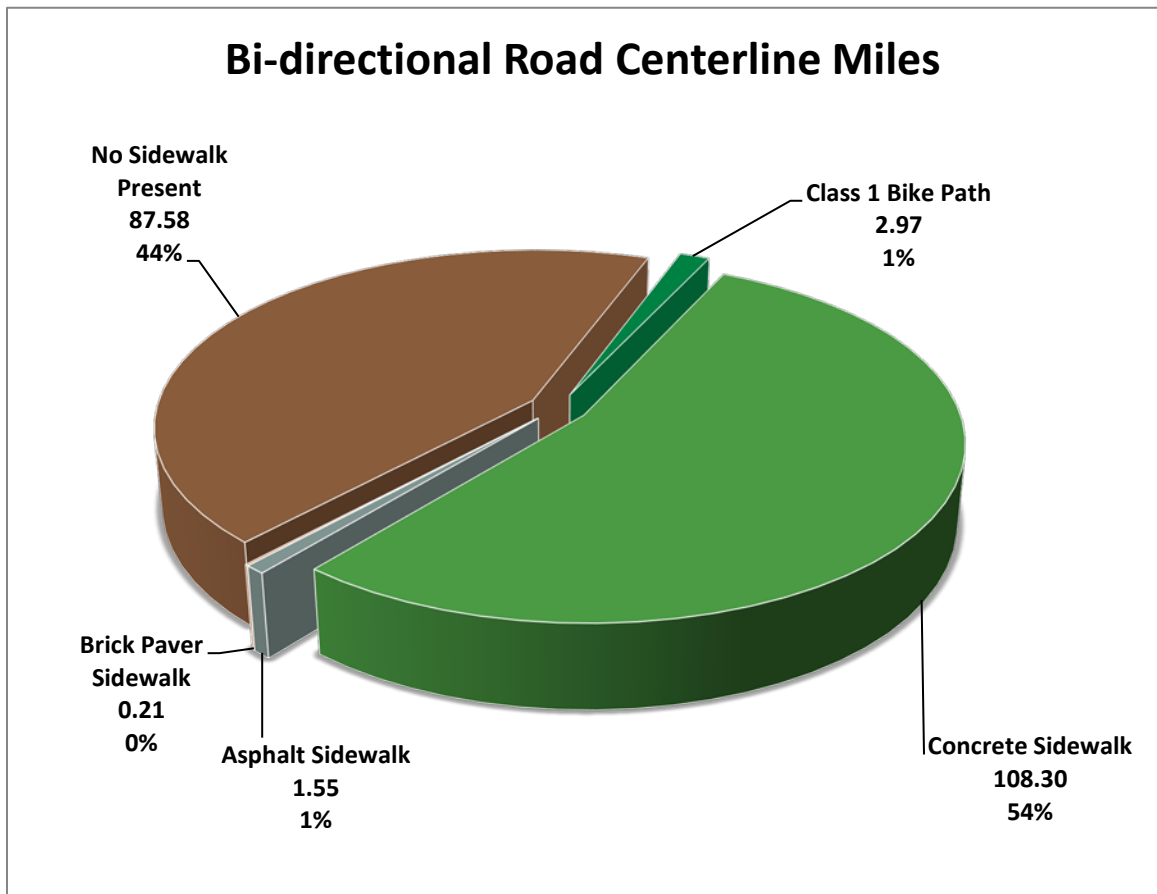
Sidewalk Classification	Directional Miles*	Percent Total
<b>Class 1 Bike Path</b>	<b>2.97</b>	<b>1.5%</b>
Asphalt, medium (6-10 feet wide), Class 1 Bike Path	2.35	1.2%
Asphalt, large (>10 feet wide), Class 1 Bike Path	0.59	0.3%
Concrete, large (>10 feet wide), Class 1 Bike Path	0.03	0.0%
<b>Concrete Sidewalk</b>	<b>108.30</b>	<b>54.0%</b>
Concrete, small (2-5 feet wide)	104.98	52.3%
Concrete, medium (6-10 feet wide)	3.29	1.6%
Concrete, large (>10 feet wide)	0.03	0.0%
<b>Asphalt Sidewalk</b>	<b>1.55</b>	<b>0.8%</b>
Asphalt, small (2-5 feet wide)	0.86	0.4%
Asphalt, medium (6-10 feet wide)	0.63	0.3%
Asphalt, large (>10 feet wide)	0.05	0.0%
<b>Brick Paver Sidewalk</b>	<b>0.21</b>	<b>0.1%</b>
Brick, medium (6-10 feet wide)	0.03	0.0%
Brick, small (2-5 feet wide)	0.18	0.1%
<b>No Sidewalk Present</b>	<b>87.58</b>	<b>43.7%</b>
Path (i.e. worn earth)	3.25	1.6%
None	84.33	42.0%
<b>Grand Total</b>	<b>200.60</b>	<b>100.0%</b>

\*directional mileage includes mileage on the left AND right sides of all roads



**Figure 9—1: Sidewalks Inventory Summation Chart**

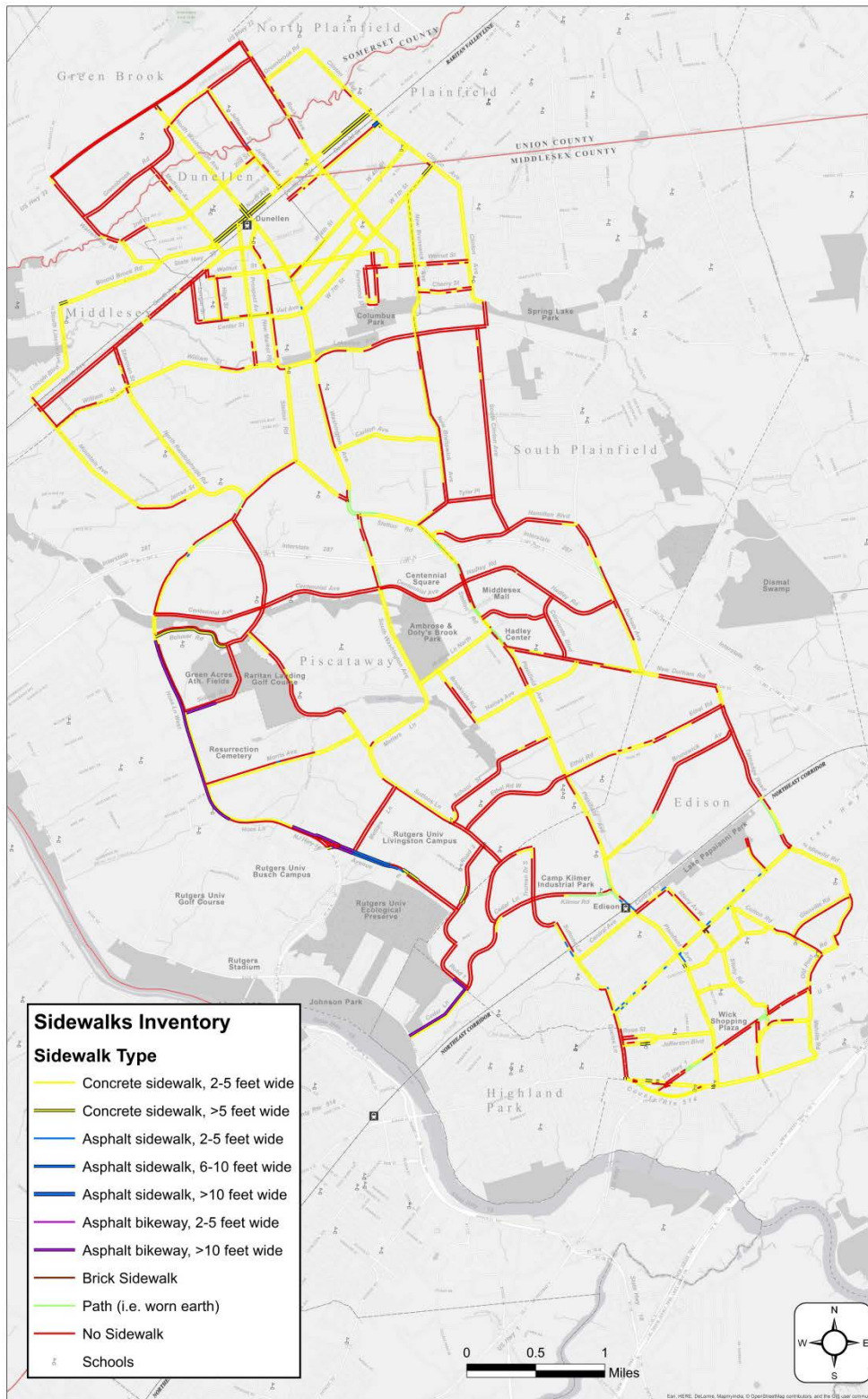
Total of 200.6 miles (100.26 miles left side; 100.34 miles right)



Source: Middlesex County Office of Planning, Division of Transportation (as of August-September 2014)

## Map 9—1: Sidewalks Inventory Map

This map is also provided in Appendix D in a higher resolution 11 x 17 inches (tabloid) page size format



## 9.2 Shoulders Inventory

The purpose of the Shoulder Inventory was to provide location and attribute information on shoulders and bikeways located on the sides of selected roads within the 529 Corridor Study Area in Middlesex County, NJ. Location and attribute information for shoulders and bikeways on the sides of roadways within the CR 529 Corridor Study Area that were readily identified as having a function greater than a local road (exclusive of I-287) were selected for inclusion and collected during an automobile windshield field survey during the months of August and September of 2014. For the purpose of this inventory, a series of data collection maps were printed covering the full extent of the corridor. Handwritten notations on the printed map series were used as the principal medium to capture location and attribute information. Utilizing information gathered and recorded on the printed maps during field surveys, the characteristics and location or absence of shoulders were recorded as according to the left and right side of the roadway frontage in terms of NJDOT straight line diagram (SLD) route measure values (milepost start and end). Data was recorded into a route event table that enables GIS software to display the data as lines using dynamic segmentation based on the standard route identification (SRI) number, milepost start (MP\_START) and milepost end (MP\_END) fields.

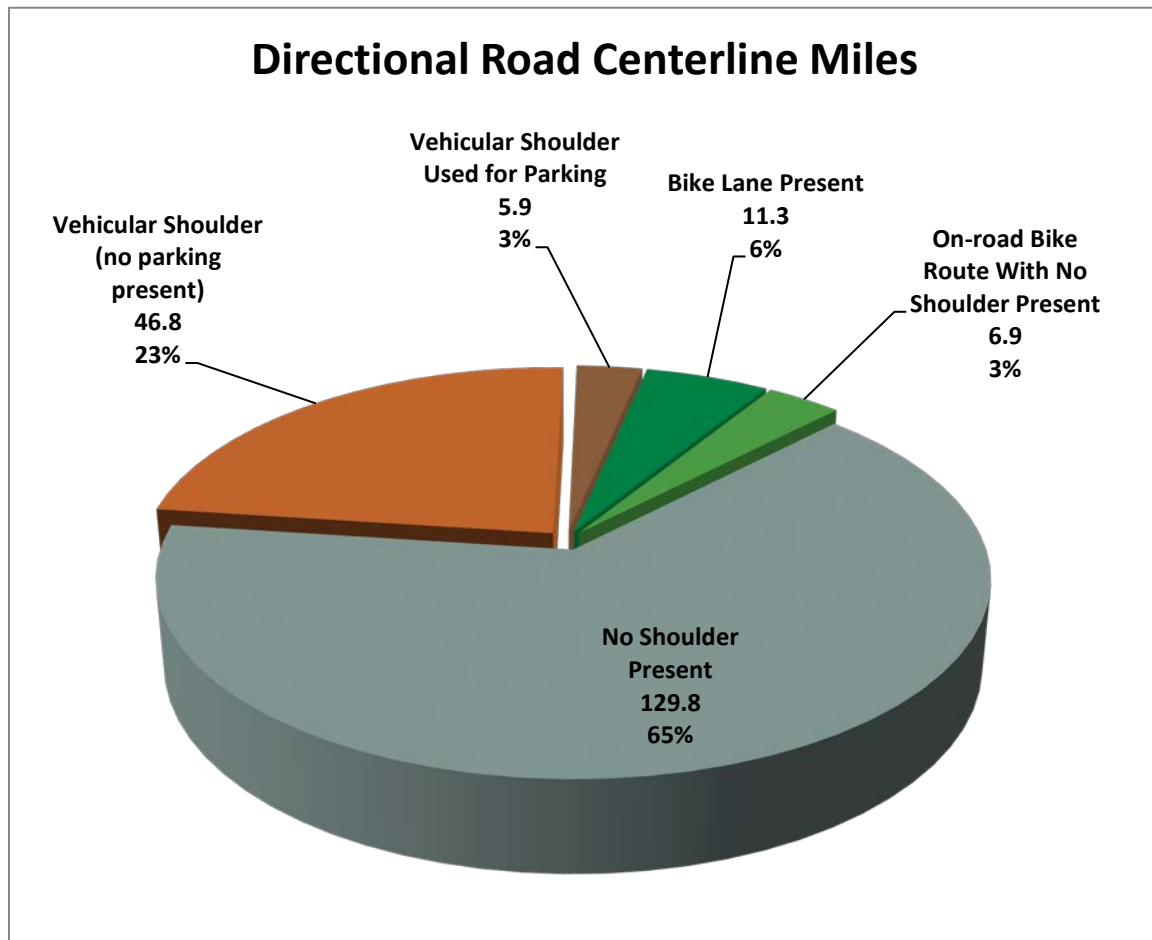
**Table 9—2: Bi-directional Miles of Roadway Centerline by Detailed Shoulder Classification**

Shoulder Classification	Directional Miles*	Percent Total
<b>Bike Lane Present</b>	<b>11.3</b>	<b>5.6%</b>
Class 2 Bikeway, small (2-5 feet wide)	7.0	3.5%
Class 2 Bikeway, medium (6-10 feet wide)	4.3	2.1%
<b>On-road Bike Route With No Shoulder Present</b>	<b>6.9</b>	<b>3.4%</b>
Class 3 Bike Route (bike route shared roadway)	6.9	3.4%
<b>No Shoulder Present</b>	<b>130.4</b>	<b>65.0%</b>
No shoulder	130.4	65.0%
<b>Vehicular Shoulder (no parking present)</b>	<b>47.4</b>	<b>23.6%</b>
Shoulder, small (2-5 feet wide)	7.6	3.8%
Shoulder, medium (6-10 feet wide)	31.9	15.9%
Shoulder, large (>10 feet wide)	7.9	3.9%
<b>Vehicular Shoulder Used for Parking/Parking Allowed</b>	<b>4.7</b>	<b>2.3%</b>
Shoulder, medium (6-10 feet wide), with vehicle parking	4.7	2.3%
<b>Grand Total</b>	<b>200.6</b>	<b>100.0%</b>

\*directional mileage includes mileage on the left AND right sides of all roads

**Figure 9—2: Shoulders Inventory Summation Chart**

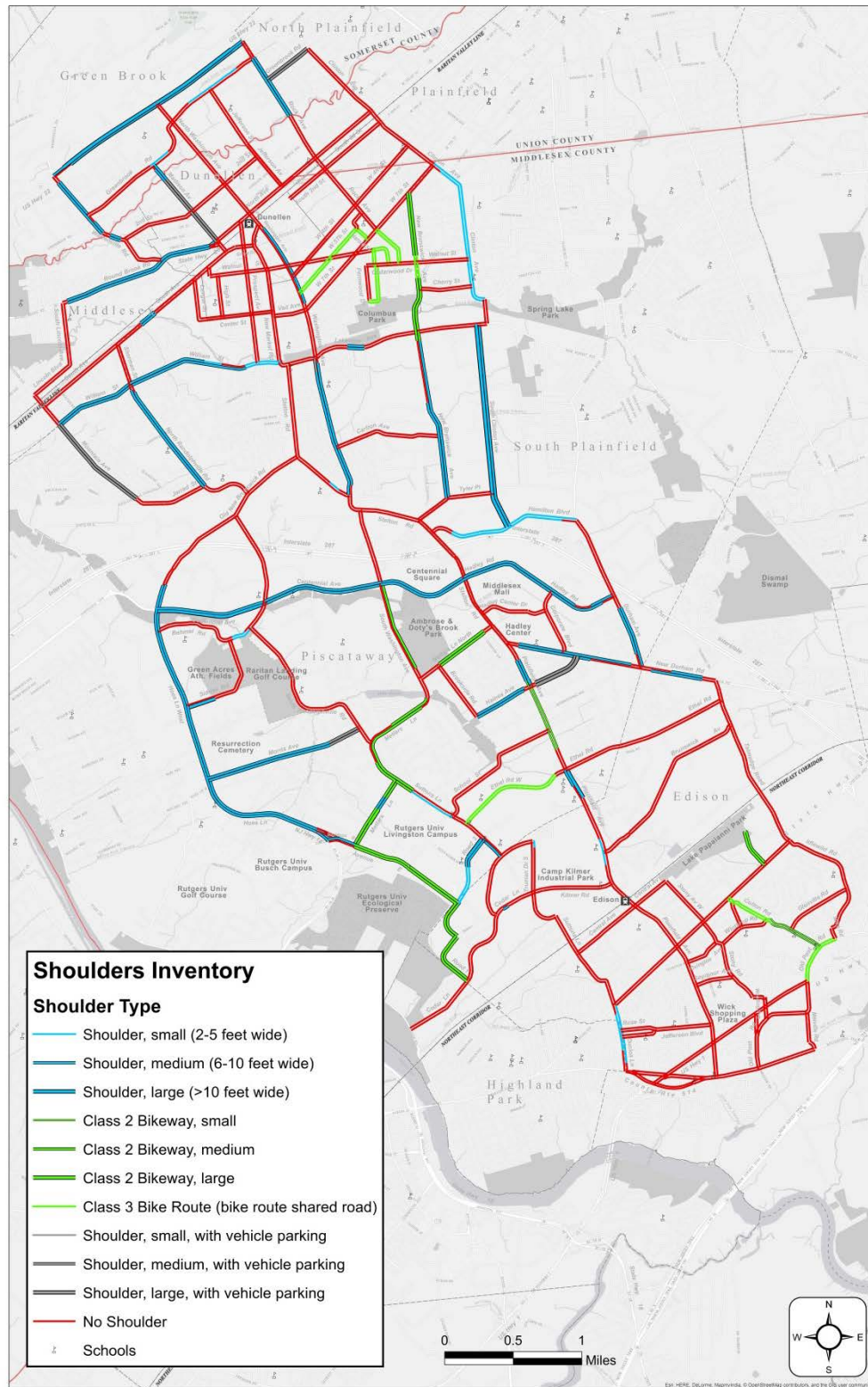
Total of 200.6 miles (100.26 miles left side; 100.34 miles right)



Source: Middlesex County Office of Planning, Division of Transportation (as of August-September 2014)

## Map 9—2: Shoulders Inventory Map

This map is also provided in Appendix D in a higher resolution 11 x 17 inches (tabloid) page size format





### 9.3 Bikeway Inventory

The 9.1 Sidewalks Inventory captured sidewalks marked for bicycle usage (bike path running along but separated from the roadway), which are typically known as Class 1 bikeways. The 9.2 Shoulders Inventory captured road mileage with marked bike lanes (Class 2) and with bike route signage or with marked lane and/or shared lane pavement markings (Class 3). The following table summarizes the mileage of bikeway by bikeway classification. Of the 200.6 miles of roadway that was inventoried 10.5% of the total mileage had a bikeway present. Map 9—3: Bikeway Inventory Map on the following page illustrates the location and classification of the bikeways that were identified in either the 9.1 Sidewalks Inventory or 9.2 Shoulders Inventory.

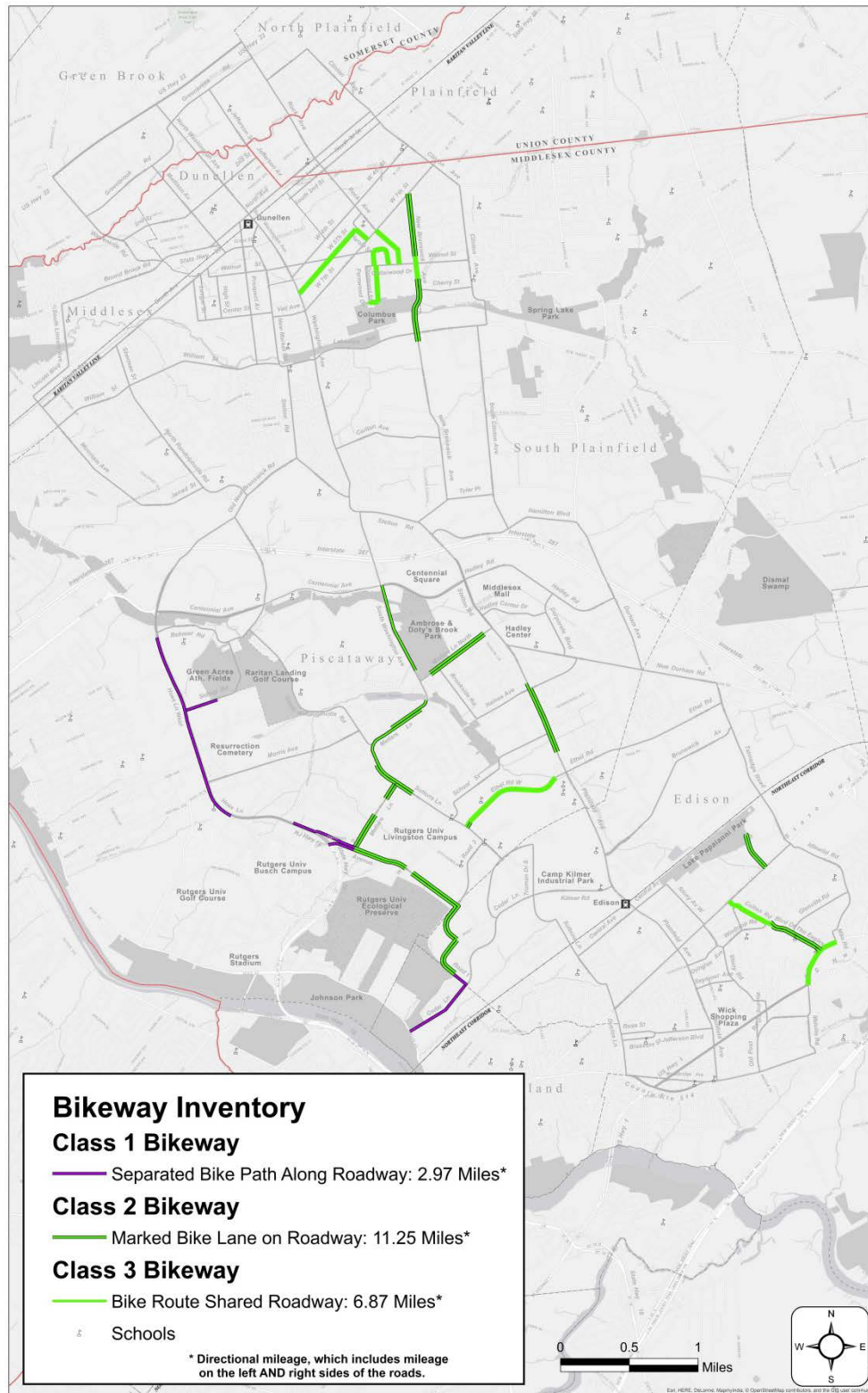
**Table 9—3: Bi-directional Miles of Roadway Centerline by Detailed Bikeway Classification**

Bikeway Classification	Directional Miles*	Percent Total
<b>Bikeway Present</b>	<b>21.1</b>	<b>10.5%</b>
<b>Class 1 (Bike Path)</b>	<b>3.0</b>	<b>1.5%</b>
Asphalt, medium (6-10 ft wide), Class 1 Bike Path	2.4	1.2%
Asphalt, large (>10 ft wide), Class 1 Bike Path	0.6	0.3%
Concrete, large (>10 ft wide), Class 1 Bike Path	0.0	0.0%
<b>Class 2 (Marked Bike Lane Present)</b>	<b>11.3</b>	<b>5.6%</b>
Class 2 Bikeway, small (2-5 ft wide)	7.0	3.5%
Class 2 Bikeway, medium (6-10 ft wide)	4.3	2.1%
<b>Class 3 (On-road Bike Route; shared roadway)</b>	<b>6.9</b>	<b>3.4%</b>
Class 3 Bike Route (bike route shared road)	6.9	3.4%
<b>No Bikeway Present</b>	<b>179.5</b>	<b>89.5%</b>
<b>Grand Total</b>	<b>200.6</b>	<b>100.0%</b>

\*directional mileage includes mileage on the left AND right sides of all roads inventoried

## Map 9—3: Bikeway Inventory Map

This map is also provided in Appendix D in a higher resolution 11 x 17 inches (tabloid) page size format



## 9.4 Inventory of Pedestrian Facilities at Signalized Intersections

Location and physical attribute information regarding pedestrian facilities at signalized intersections located on selected roads within the CR 529 Corridor Study Area in Middlesex County, NJ were inventoried between August and October of 2014 as part of the data collection phase of this Study. Attribute information for marked crosswalks, pedestrian ramps, pedestrian signal heads and pedestrian signal push buttons were collected on all signalized intersections within the field study extent (except for the signals on the portion of Hoes Lane that was being reconstructed as the State Route 18 extension to Interstate 287).

Pedestrian ramps include area of sidewalks and traffic islands that transition to depressed curbing for pedestrians of all ages to navigate a curb with a stroller and/or wheelchair, and for those with visual and mobility impairments. The Americans with Disability Act (ADA) encourages detectable warning surfaces such as red truncated domes and a slope less than 2%; however, this inventory did NOT include the collection of data relative to conformity with ADA requirements (only identified the presence or absence of a ramp). Marked crosswalks are delineated painted areas which traverse the roadway and show the pedestrian and motorist the desired path of crossing at each leg of the intersection. Reflective crosswalk striping is a recommended enhancement for night-time vision. Pedestrian facilities were inventoried at the location of signalized intersections along all legs of the intersection. For the purpose of this project, field data forms were created for each of the signalized intersection locations and utilized to manually capture multiple attribute information through onsite observation. A detailed inventory of pedestrian facilities at signalized intersections can be found in Appendix C.

**Table 9—4: Summary of Signalized Intersection Inventory by Jurisdiction and Traffic Control Type**

Traffic Control Type	Jurisdiction				Grand Total
	Municipal	NJDOT	County	PENDING	
Traffic Signal	42	37	22	0	101
School Zone Flashers	4	0	0	0	4
Intersection Flashers	2	0	0	0	2
Fire Station Signal	1	0	0	0	1
Pending Signal	0	0	0	4	4
<b>Grand Total</b>	<b>49</b>	<b>37</b>	<b>22</b>	<b>4</b>	<b>112</b>

Source: Middlesex County Office of Planning, Division of Transportation (August-October 2014)

## 9.5 Identification of Gaps in the Existing Bicycle and Pedestrian Infrastructure Network

### 9.5.1 Sidewalks

Sidewalks were found to be largely continuous along road frontages with more narrow sidewalks along residential and nonresidential land uses (i.e. development on smaller lot sizes). However, there are notable locations within the sidewalk network that are incomplete and disconnected as shown in Map 9—1: Sidewalks Inventory Map. Gaps in sidewalk connectivity may need to be addressed where trip attractors and generators are present; such as at the following locations:

- Route 1 (Edison): intermittent gaps noted on both sides from Woodbridge Avenue to Old Post Road
- Near Edison Train Station (Edison): Central Avenue from Plainfield Avenue to Stony Avenue West; Plainfield Avenue from north of Kilmer Road to Edison Train Station
- Kilmer Road from Road 1 to Plainfield Avenue (Edison)
- Duclos Lane (Highland Park/Edison municipal boundary)
- Truman Drive South from Suttons Lane to Kilmer Homes and Rivendell Heights (i.e. Road 2 / Yosko Dr) (near Edison/Piscataway municipal boundary)
- Near Edison High School: southerly side of Glenville Road; easterly side of Idlewild Road; easterly side of Old Post Road (along Shop Rite shopping center) (Edison)
- Brunswick Avenue from Hana Road to Talmadge Road (Edison)
- Ethel Road where missing between Stelton Road and Talmadge Road (Edison and Piscataway)
- New Durham Road (Piscataway, South Plainfield and Edison)
- Talmadge Road from Route 27 to New Durham Road (Edison)
- Stelton Road from Haines Avenue to Hamilton Boulevard (Piscataway, and parts of municipal boundary shared with South Plainfield)
- Westerly side and missing pieces on easterly side of Old New Brunswick Road from Centennial Avenue to North Randolphville Road (Piscataway)
- Missing pieces on South Washington Avenue (Piscataway) between Centennial Avenue and Stelton Road
- Westerly side of New Brunswick Avenue (South Plainfield/Piscataway municipal boundary)
- Missing pieces around bend in Stelton Road (Piscataway) in the vicinity of the crossing with the Port Reading Secondary (i.e. from Stop and Shop shopping center to Cumberland Road)
- Easterly side of South Washington Avenue from Carlton Avenue to Academy Street (Piscataway)
- Easterly side of New Market Road from Lakeview Avenue to Dunellen Train Station (Piscataway and Dunellen)
- Lakeview Avenue from South Washington Avenue to New Brunswick Avenue (Piscataway)
- Southern end of Prospect Avenue, after train tracks to where sidewalk starts (Dunellen)
- Missing pieces along Cedarwood Drive from New Brunswick Avenue to Greenwood Drive (Piscataway)
- South Avenue from Pulaski Street to Mountain Avenue (Middlesex and Dunellen)
- Sherman Avenue from William Street to South Avenue (Middlesex/Piscataway municipal boundary)
- South 2nd Street from Clinton Avenue to end (Plainfield and Piscataway)
- Rock Avenue from Taft Avenue to Route 22 (North Plainfield/Green Brook municipal boundary)

- Missing pieces along Jefferson Avenue from North Avenue to Route 22 (keep bridge open to pedestrians and cyclists) (Green Brook, and Dunellen/Plainfield municipal boundary)
- Warrenville Road from Route 22 to 2<sup>nd</sup> Street (Green Brook and Middlesex)

### 9.5.2 Bike Route Network

Existing bike routes, totaling over 21 miles, were found to be fairly disconnected throughout the County Route 529 Corridor Study Area as shown in Map 9—3: Bikeway Inventory Map. Most of these bike routes, which include separated bike paths, marked bike lanes, and shared bike lanes (roads marked as bike routes but where cyclist must share the road with motor vehicles), were found towards the southern half of the Study Area, south of I-287. A smaller number of bike routes are present towards the northern half of the Study Area, mostly in the neighborhood around Arbor Intermediate School situated southeast of the Dunellen Train Station. In order to improve bicycle mobility in the Study Area, the bike route network is in need of better connectivity especially in the following areas where gaps exist:

- Kilmer Road, Truman Drive South, and Suttons Lane: connect Edison Train Station to Rutgers University Livingston Campus (Edison and Piscataway)
- Connection(s) on roads between Edison Train Station and Dunellen Train Station
- Connect existing bike path on Hoes Lane to Centennial Avenue (Piscataway)
- Centennial Avenue from Hoes Lane to South Washington Avenue (Piscataway)
- Plainfield Avenue from Edison Train Station to start of bike lane to the north of Ethel Road (Edison/Piscataway)
- Ethel Road from end of its existing bike lane to New Brooklyn Road (Edison/Piscataway)
- Gaps in existing bike lanes along both sides of Metlars Lane from Avenue E to Stelton Road (Piscataway)
- Connection(s) from the Study Area to the Middlesex Greenway trailhead in Metuchen. (Piscataway, South Plainfield, Edison, Metuchen)
- Connections(s) from the Study Area to the Johnson Park bike trail system (Highland Park)
- South Washington Avenue towards the south of Dunellen Train Station (Dunellen and Piscataway)
- W 7<sup>th</sup> Street to connect existing bike lanes and marked bike routes in that area (Piscataway)
- New Brunswick Avenue from Stelton Road to start of marked bike lane to the south of Lakeview Avenue (Piscataway/South Plainfield municipal boundary)
- South Avenue from Mountain Avenue to Dunellen Train Station (Middlesex and Dunellen)
- William Street from New Market Avenue to Mountain Avenue (Piscataway)



### 9.5.3 Signalized Intersections

#### *Crosswalks*

Of all the 112 signalized intersections in the County Route 529 Corridor Study Area, 88% had no more than two missing crosswalks. The remaining 12% had three or four missing crosswalks. Refer to Map 9—4: Signalized Intersections by the Number of Missing Marked Crosswalks to see the number of crosswalks missing at each intersection.

**Table 9—5: Signalized Intersections by the Number of Missing Marked Crosswalks**

<b>Number of Missing Crosswalks</b>	<b>Count of Intersections</b>	<b>Percent Total</b>
No crosswalks missing	68	61%
1 missing crosswalk	16	14%
2 missing crosswalks	14	13%
3 missing crosswalks	9	8%
4 missing crosswalks	5	4%
<b>Grand Total</b>	<b>112</b>	<b>100%</b>

#### *Curb Ramps*

Of all signalized intersections in the Study Area, a majority of 53% had no curb ramps missing. 90% of all signalized intersections had at most four missing curb ramps. The remaining 10% were missing more than five curb ramps. Refer to Map 9—5: Signalized Intersections by the Number of Missing Pedestrian Ramps to see the number of missing pedestrian ramps at each signalized intersection in the Study Area.

**Table 9—6: Signalized Intersections by the Number of Missing Pedestrian Ramps**

<b>Number of Missing Ramps</b>	<b>Count of Intersections</b>	<b>Percent Total</b>
No ramps missing	59	53%
1-2 missing ramps	24	21%
3-4 missing ramps	18	16%
5-6 missing ramps	7	6%
7-8 missing ramps	4	4%
<b>Grand Total</b>	<b>112</b>	<b>100%</b>

### *Pedestrian Signal Heads and Countdown Timers*

Of all the signalized intersections in the Study Area, up to 70% had no more than two pedestrian signal heads missing. The remaining 30%, or 34 intersections, are missing at least three signal heads. Refer to Map 9—6: Signalized Intersections by the Number of Missing Pedestrian Signal Heads to see the number of missing pedestrian signal heads at each intersection.

**Table 9—7: Signalized Intersections by the Number of Missing Pedestrian Signal Heads**

<b>Number of Missing Pedestrian Signal Heads</b>	<b>Count of Intersections</b>	<b>Percent Total</b>
No pedestrian signal heads missing	68	61%
1-2 missing pedestrian signal heads	10	9%
3-4 missing pedestrian signal heads	11	10%
5-6 missing pedestrian signal heads	8	7%
7-8 missing pedestrian signal heads	15	13%
<b>Grand Total</b>	<b>112</b>	<b>100%</b>

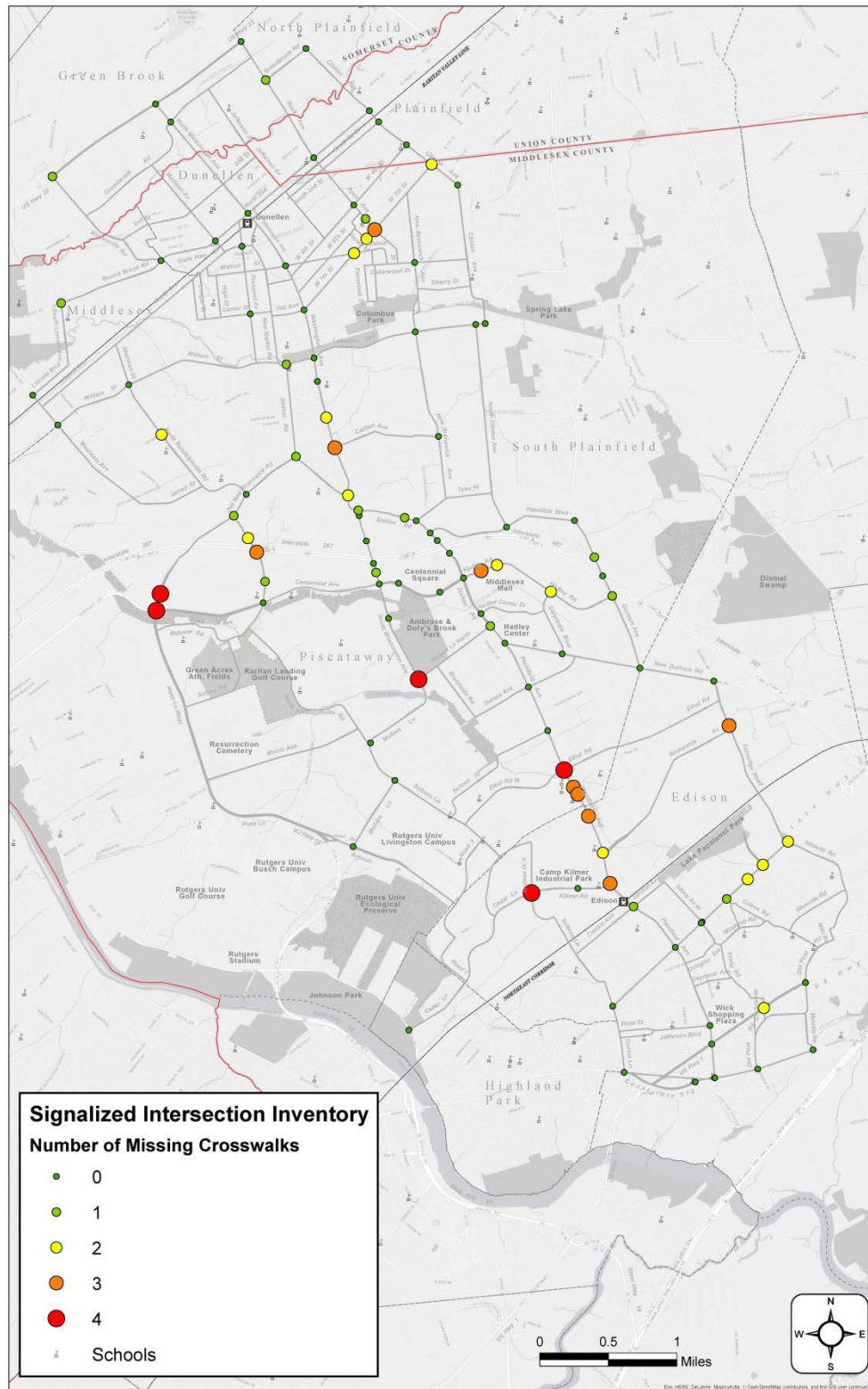
Of all the signalized intersections in the Study Area, 27% have pedestrian signal heads with countdown timers. The remaining 73% have either no countdown timer present or have no pedestrian signal head present. Refer to Map 9—7: Signalized Intersections by Presence of Pedestrian Countdown Timers to see where pedestrian countdown timers are present for all signalized intersections.

**Table 9—8: Signalized Intersections by Presence of Pedestrian Countdown Timers**

<b>Number of Signals by Presence of Pedestrian Countdown Timers</b>	<b>Count of Intersections</b>	<b>Percent Total</b>
Yes-pedestrian signal head(s) with countdown timers present	30	27%
No-pedestrian signal head(s) with no countdown timer present	37	33%
N/A-no pedestrian signal head present at intersection	45	40%
<b>Grand Total</b>	<b>112</b>	<b>100%</b>

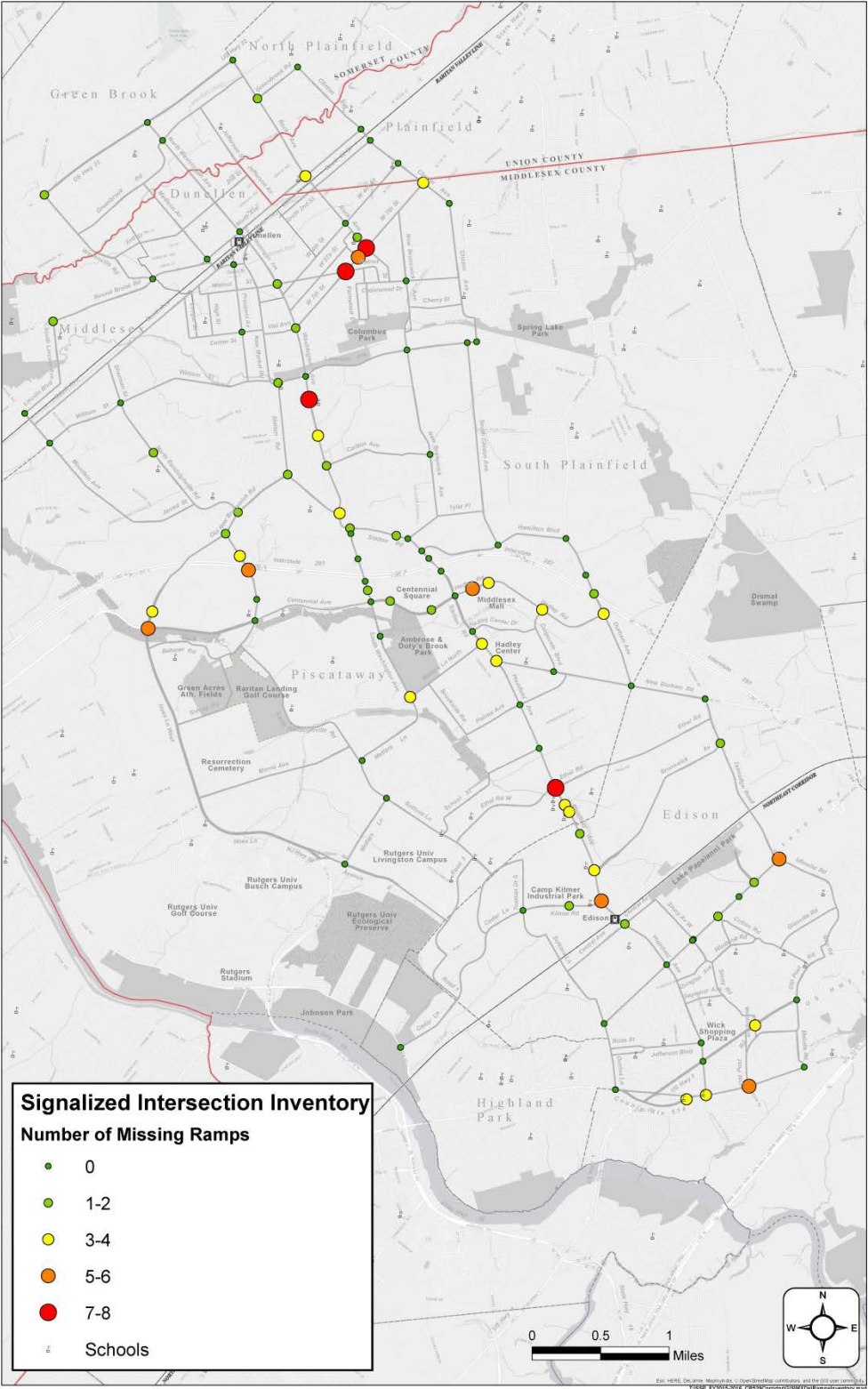
## Map 9—4: Signalized Intersections by the Number of Missing Marked Crosswalks

This map is also provided in Appendix D in a higher resolution 11 x 17 inches (tabloid) page size format



**Map 9—5: Signalized Intersections by the Number of Missing Pedestrian Ramps**

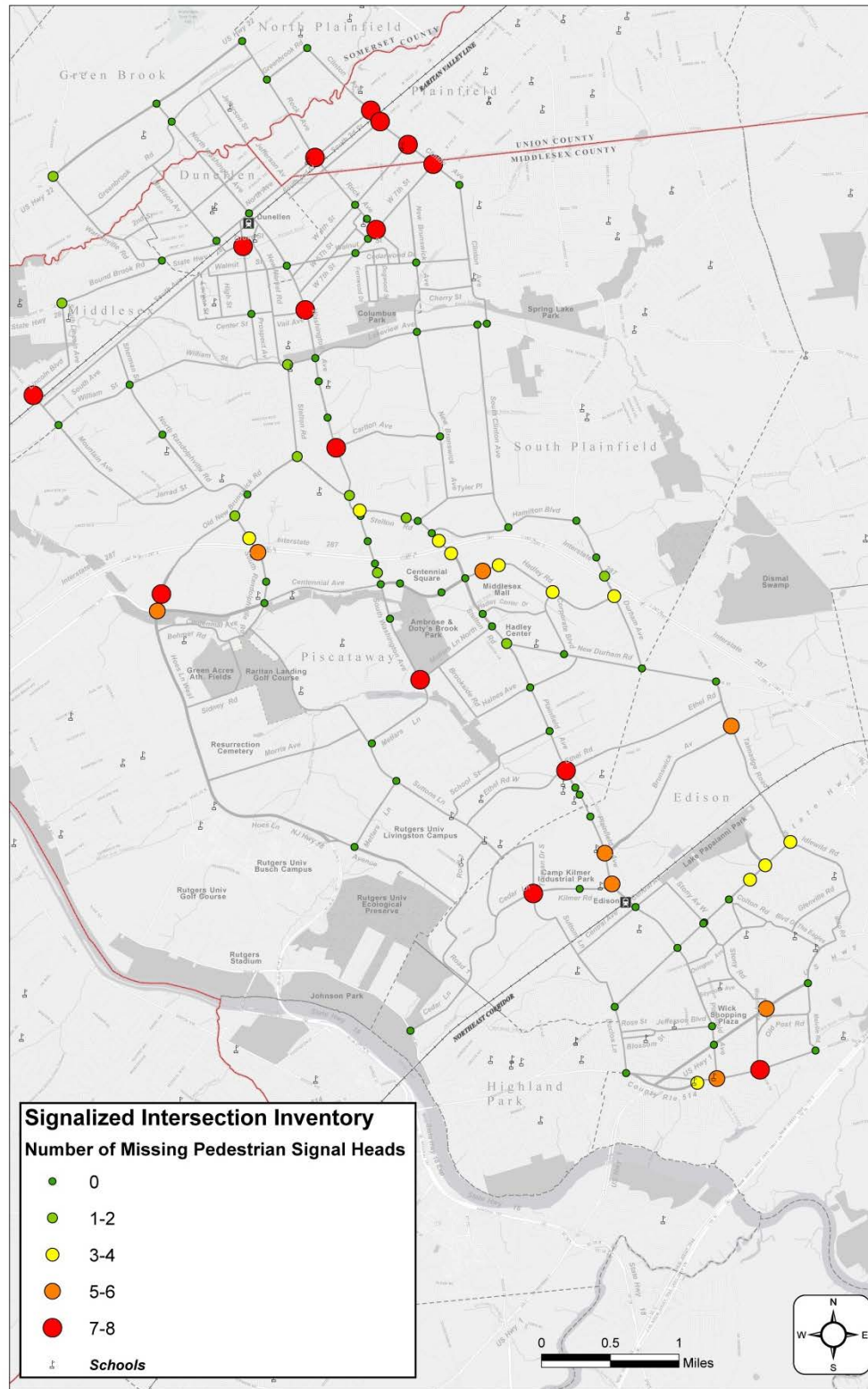
*This map is also provided in Appendix D in a higher resolution 11 x 17 inches (tabloid) page size format*





## Map 9—6: Signalized Intersections by the Number of Missing Pedestrian Signal Heads

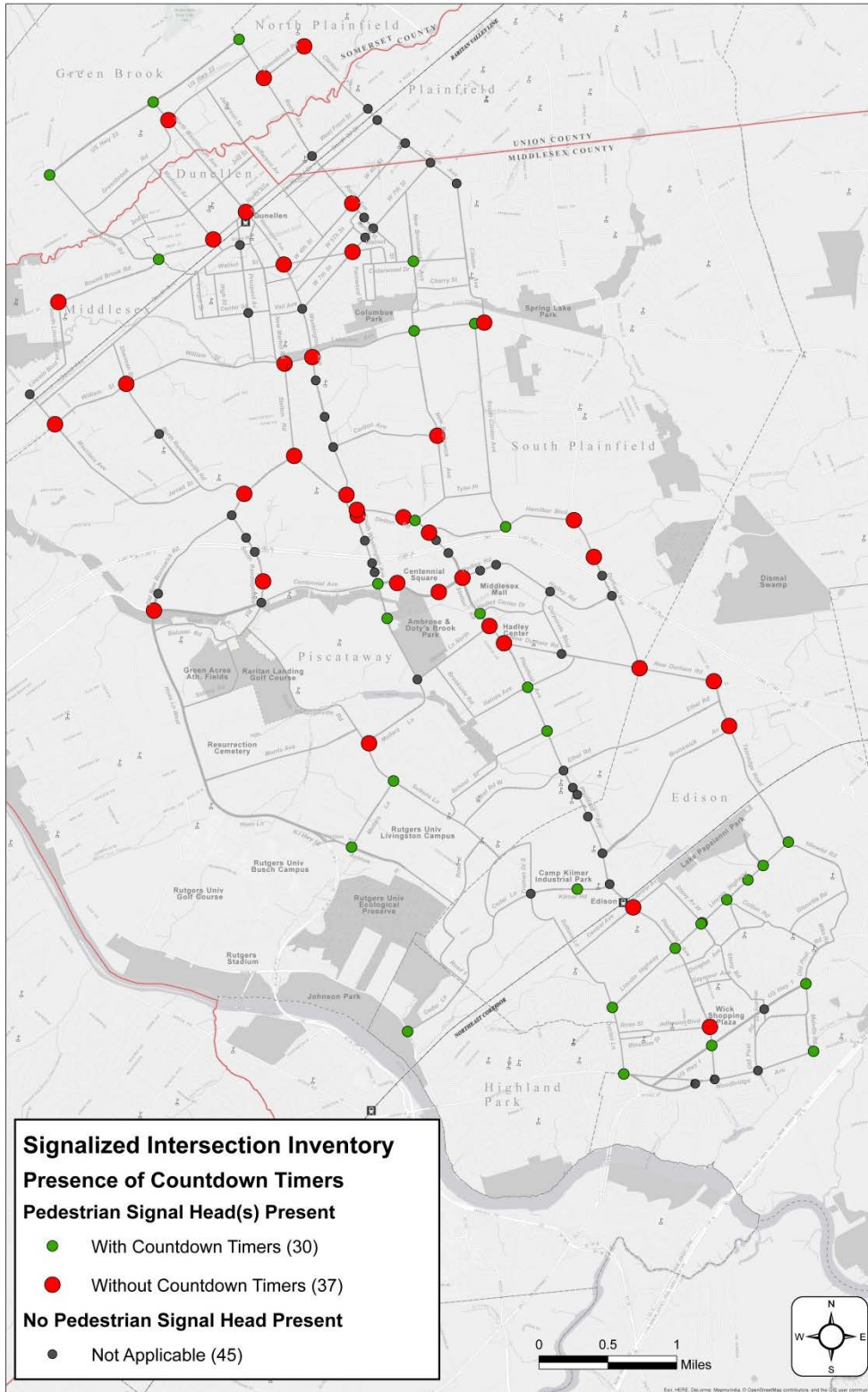
This map is also provided in Appendix D in a higher resolution 11 x 17 inches (tabloid) page size format





## Map 9—7: Signalized Intersections by Presence of Pedestrian Countdown Timers

This map is also provided in Appendix D in a higher resolution 11 x 17 inches (tabloid) page size format



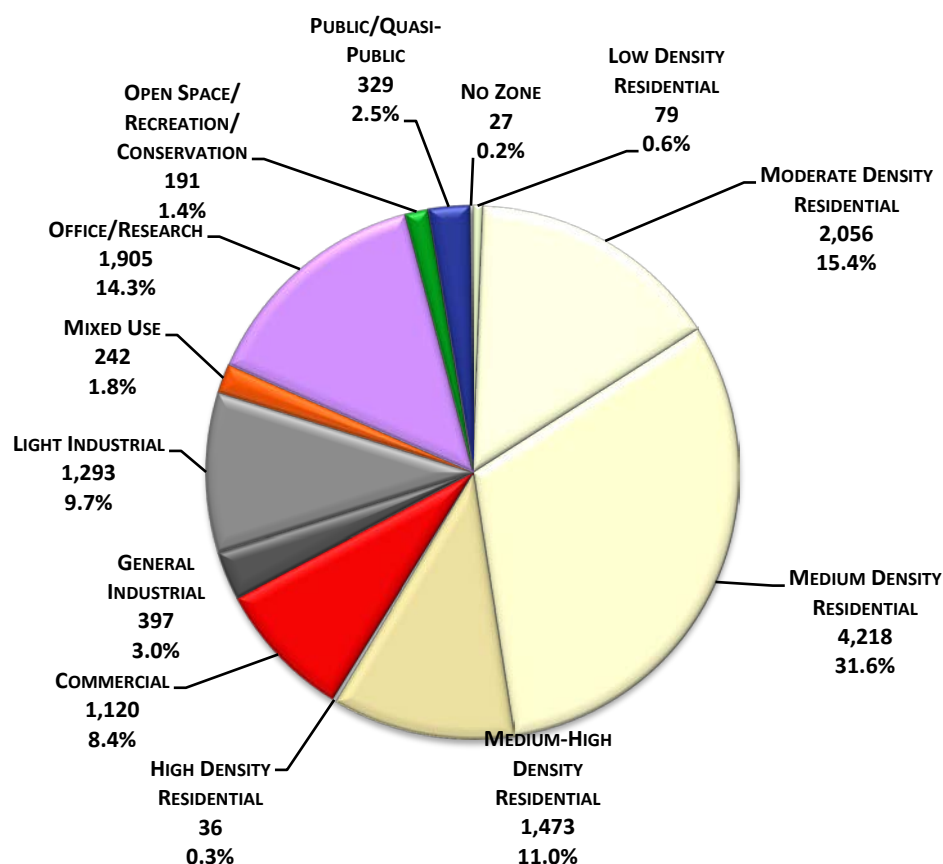
## 10.0 Zoning, Land Use and Development Patterns and Trends

### 10.1 Zoning

Almost 60% of the Study Area is zoned for some form of residential use. Medium Density Residential is the residential category with the highest overall percentage at 32%, which equates to approximately 4,218 acres of the total 13,365 acres in the Study Area. Approximately fourteen percent (14%) is zoned for office and research use, and most of the remaining acreage includes commercial or light and general industrial. There is only 1% (or 191 acres) of areas zoned as open space, recreation or conservation purposes.

**Figure 10—1: Detailed Zoning Acreage Pie Chart Summary, CR 529 Corridor Study Area**

Numeric values represent acres and percent total acres



When the Study Area is broken out into subareas, there are interesting patterns of similarities and differences in zoning categories. The North and South Subareas are similar to the Route 529 Corridor Study Area due to the prevalence of residential uses. The North Subarea has most acreage zoned as residential with 77% of its total acreage zoned as such. Forty-two percent (42%) of the North Subarea that is zoned for residential uses is also Medium Density Residential. The South also has a similar pattern of zoning categories with 59% of its land base allocated to Residential and 37% of its residential Medium Density. However, unlike the Study Area, the Central Subarea does not have a majority of acreage zoned as residential. The largest category of zoning in the

Central Subarea is Office and Research with 42%. This may be contributed to the fact that Interstate 287 runs through the center of the Central Subarea. All subareas have very small amount, less than 2% in all subareas, of acreage explicitly zoned for open space, recreation and/or conservation.

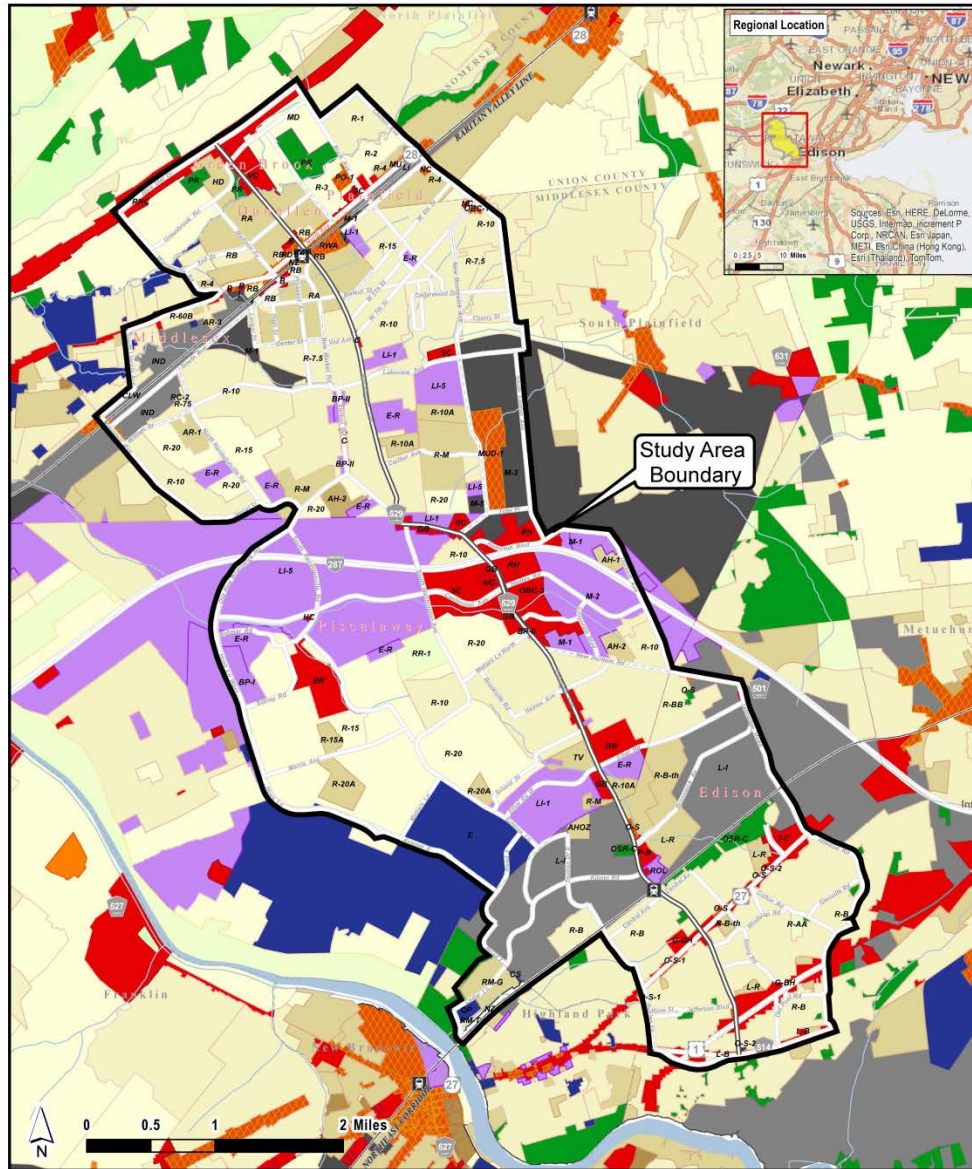
**Table 10—1: Acreage Summations of Zoning by CR 529 Subareas (South, Central and North)**

Zoning Composite Category	South Subarea		Central Subarea		North Subarea	
	Acres	Percent	Acres	Percent	Acres	Percent
Low Density Residential	12	0%	67	2%	0	0%
Moderate Density Residential	618	12%	660	20%	778	16%
Medium Density Residential	1,910	37%	201	6%	2,107	42%
Medium-High Density Residential	488	10%	68	2%	917	18%
High Density Residential	0	0%	0	0%	36	1%
Commercial	374	7%	530	16%	215	4%
General Industrial	0	0%	291	9%	105	2%
Light Industrial	1,020	20%		0%	273	6%
Mixed Use	29	1%	94	3%	119	2%
Office/Research	249	5%	1,362	42%	294	6%
Open Space/Recreation/Conservation	104	2%	0	0%	87	2%
Public/Quasi-Public	317	6%	0	0%	12	0%
No Zone	13	0%	0	0%	14	0%
<b>Grand Total</b>	<b>5,134</b>	<b>100%</b>	<b>3,272</b>	<b>100%</b>	<b>4,958</b>	<b>100%</b>

Map 10—1: Detailed Zoning Map of the County Route 529 Corridor Study Area illustrates the similarities in the spatial patterns of residential zoning present in the North and South Subareas as compared to the Central Subarea. The dominance of Office and Research and Industrial zoning is clearly visible in the Central Subarea along the Interstate 287 corridor including associated major local roads such as Centennial Avenue, Hadley Road, South Clinton Avenue, and South Washington Avenue. Map 10—1: Detailed Zoning Map also shows the prevalence of nonresidential zoning along other highway corridors in the Study Area, such as routes 1, 27, 28 and 22. Most locations directly fronting on CR 529 are largely zoned for residential uses except for those areas that are generally proximate to Interstate 287, state & US highways and Ethel Rd.

## Map 10—1: Detailed Zoning Map

This map is also provided in Appendix D in a higher resolution 11 x 17 inches (tabloid) page size format



### LEGEND

#### RESIDENTIAL ZONES

- RURAL: Lot size greater than 6 acres
- VERY LOW DENSITY: Lot size between 2 & 6 acres
- LOW DENSITY: Lot size between 40,00 sq.ft. and 2 acres
- MODERATE DENSITY: 1.1 to 4.0 DU/acre
- MEDIUM DENSITY: 4.1 to 8.0 DU/acre
- MEDIUM-HIGH DENSITY: 4.1 to 16.0 DU/acre
- HIGH DENSITY: 16.1 to 25.0 DU/acre
- VERY HIGH DENSITY: Greater than 25.0 DU/acre
- Senior Housing

#### NONRESIDENTIAL & MIXED-USE ZONES

- Commercial
- Mixed Use
- Office/Research
- Light Industrial
- General Industrial

#### PUBLIC ZONES

- Public/Quasi-Public
- Open Space/ Recreation/Conservation
- No Zone

#### ZONE DISTRICT ABBREVIATIONS

R-10 (Refer to municipal zoning ordinance)

#### TRANSPORTATION

PASSENGER RAIL LINE

## Detailed Zoning County Route 529 Corridor Study Area

### Improving Transit Services and Bicycle-Pedestrian Access

Prepared by:

Middlesex County Office of Planning  
Division of Transportation

April 15, 2015

Sources: Middlesex County Office of Planning,  
Division of Data Management and Technical Services;  
Somerset County Planning Division;  
& City of Plainfield Planning Division



T:\SSP\_FY2015-2016\_CR529CorridorGIS\MDaZoning\CR529\_Comprehensive\_Zoning.mxd



## 10.2 Land Use

This section of the report summarizes existing land use characteristics in the CR 529 Corridor Study Area. County-based tax assessment data in tabular format (MOD-IV extracts) were downloaded during March and April 2015 from the record search link posted at <http://njactb.org/> (NJ Association of County Tax Boards). The raw comma separated text data was imported into spreadsheet software (MS Excel) in which property classification codes, nonresidential use codes (if used) and detailed property use codes for tax exempt properties were translated into land use categories.

Digital tax parcels in Geographic Information System (GIS) format were obtained from GIS data custodians in Middlesex, Somerset and Union counties. The tabular tax assessment data was joined to the GIS parcel features using the unique ID from the assessment table (a concatenation of municipal code, tax block identifier, tax lot identifier, and condominium identifier (if present)). Unmatched parcel records were matched by manually looking up the additional lots field included in the tabular assessment data. GIS parcel acreage by land use was cross tabulated and summarized by subarea (see Map 2—2: Subareas of the County Route 529 Corridor Study Area found on page 9).

The following four pie charts, a detailed summation table and four maps illustrate the results of assigning parcel land use classification based on tax assessment classifications.

More than half of the parcel acreage (51%) in the South Subarea (the area generally south of the I-287 Corridor) is residential, with a significant acreage of multifamily residential (over 500 acres or 12% of the parcel acreage in the South Subarea). A notably large share of the acreage (16%) in the South Subarea is used for school and/or governmental purposes, largely attributable to the presence of the Livingston Campus of Rutgers University.

Not surprisingly, the Central Subarea (i.e. the I-287 Corridor) is dominated by commercial and industrial land uses, 27% and 24% respectively. A relatively large share of the Central Subarea (13%) is classified as parks and open space.

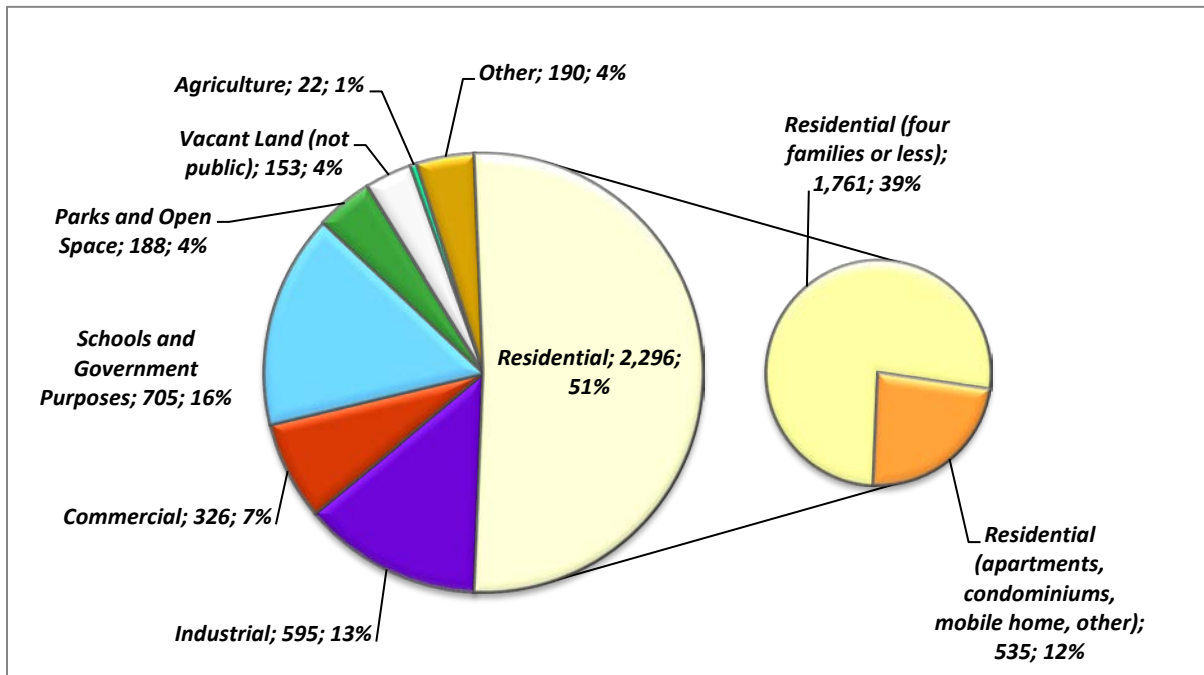
The North Subarea (i.e. north of the I-287 Corridor) is largely residential (62%). Schools and government (8%), Industrial (7%), Parks and Open Space (6%) and Commercial properties (5%) reflect a balance among nonresidential uses.

Map 10—2 through Map 10—5 are included to show the spatial land use patterns throughout the corridor.



**Figure 10—2: Composite Land Use Parcel Acreage in the South Subarea**

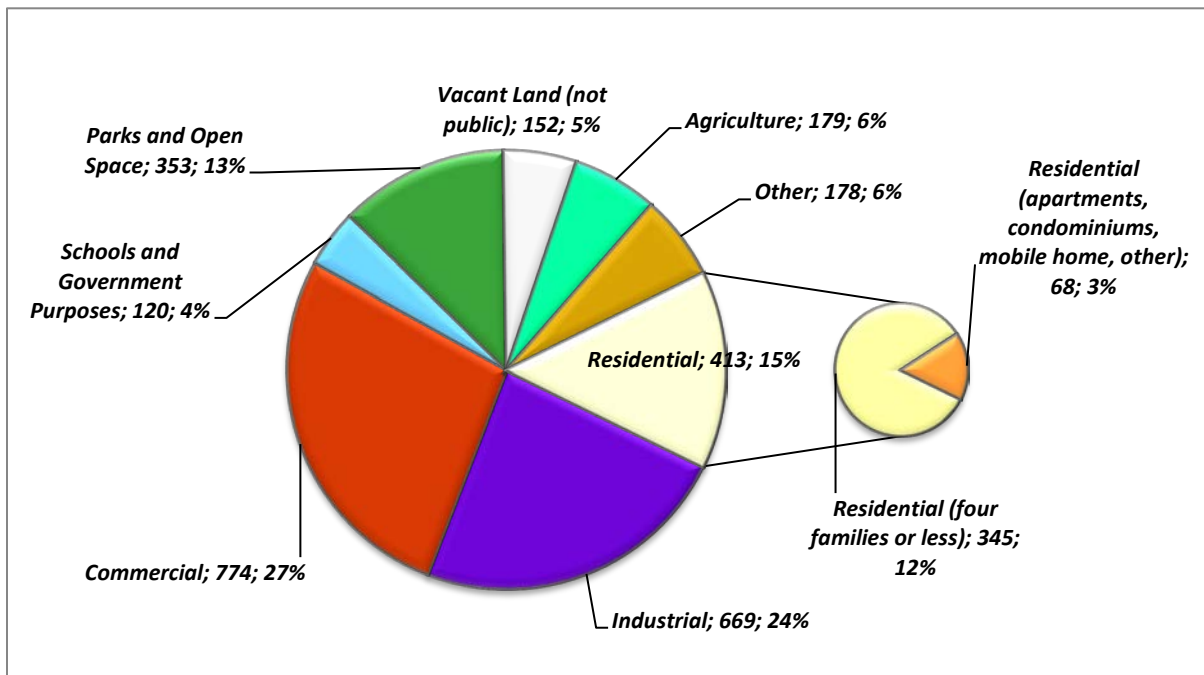
Note: Pie slices are labeled by “Land Use Category; Number of Parcel Acres; Percent Total Acres”



Sources: As noted below Table 10-2 on page 133

**Figure 10—3: Composite Land Use Parcel Acreage in the Central Subarea**

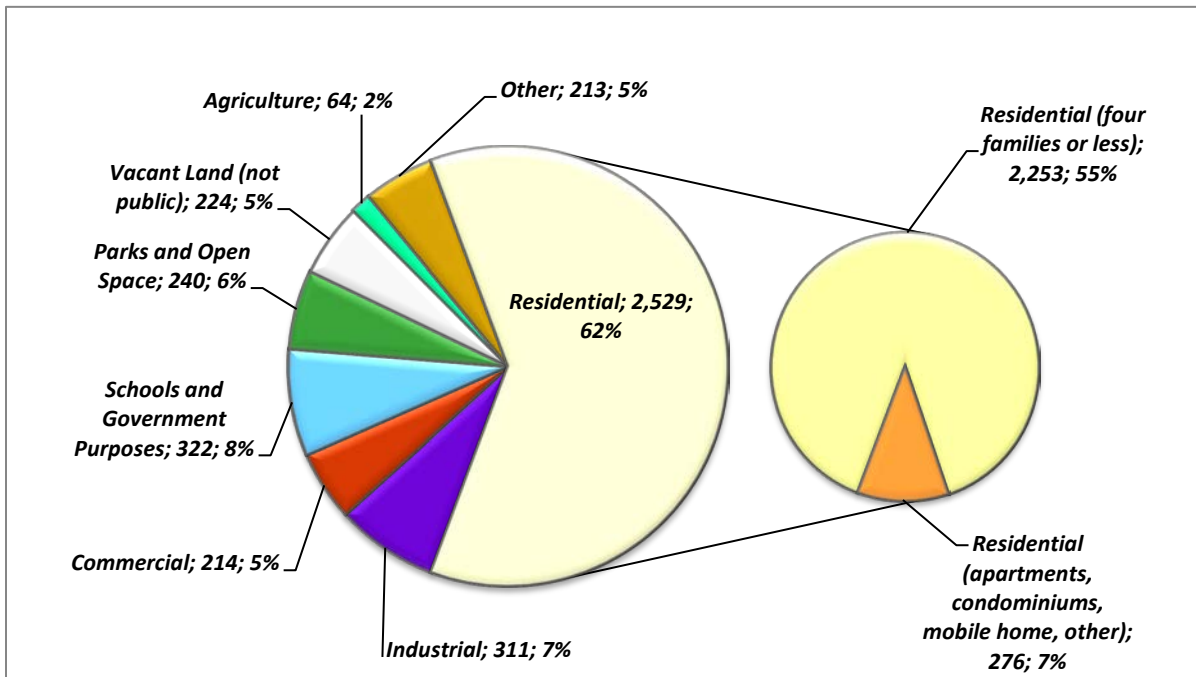
Note: Pie slices are labeled by “Land Use Category; Number of Parcel Acres; Percent Total Acres”



Sources: As noted below Table 10-2 on page 133

**Figure 10—4: Composite Land Use Parcel Acreage in the North Subarea**

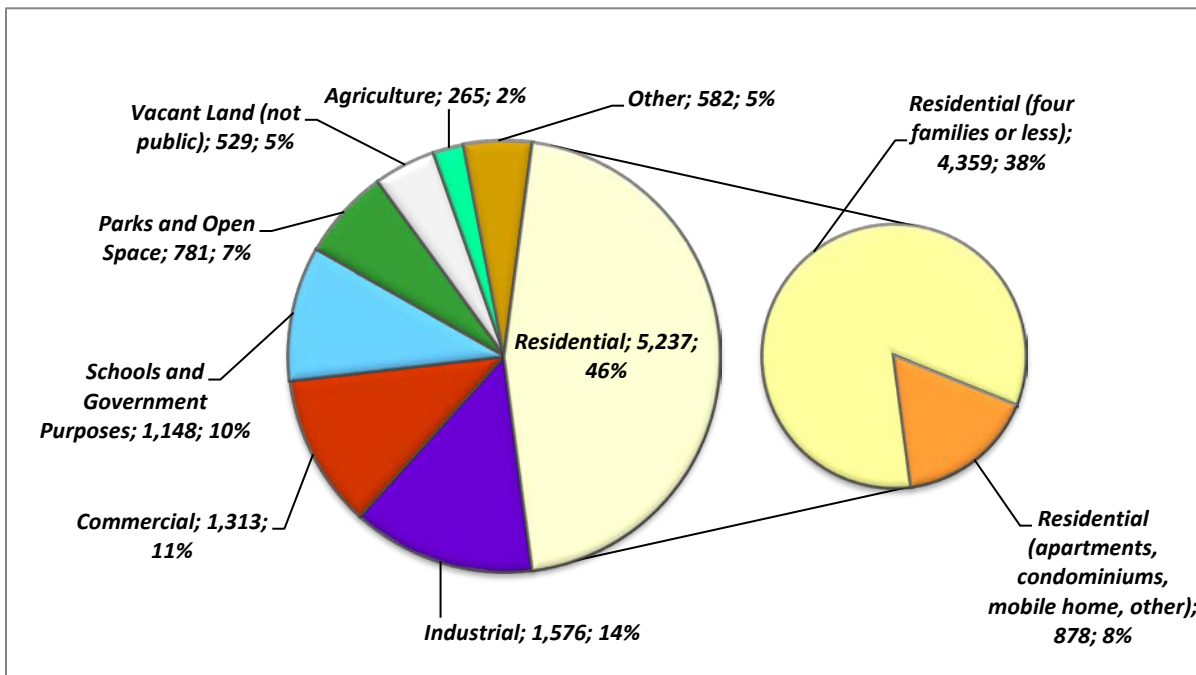
Note: Pie slices are labeled by "Land Use Category; Number of Parcel Acres; Percent Total Acres"



Sources: As noted below Table 10-2 on page 133

**Figure 10—5: Composite Land Use Parcel Acreage in the CR 529 Corridor Study Area**

Note: Pie slices are labeled by "Land Use Category; Number of Parcel Acres; Percent Total Acres"



Sources: As noted below Table 10-2 on page 133

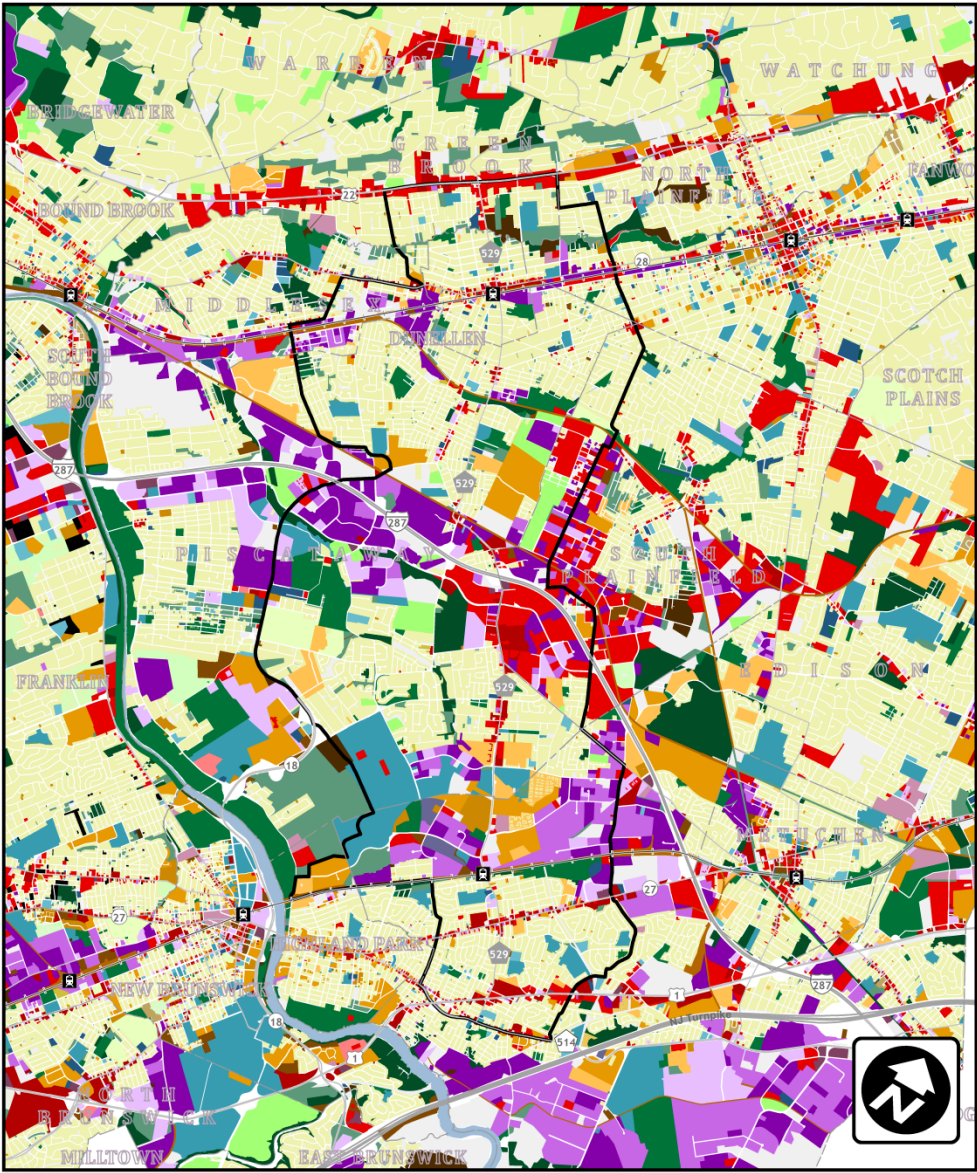
**Table 10—2: Summary of Detailed Land Use by Subarea within the Study Area**

Land Use Categories	South Subarea		Central Subarea		North Subarea		CR 529 Corridor	
	Parcel Acres	Percent	Parcel Acres	Percent	Parcel Acres	Percent	Parcel Acres	Percent
<b>Residential (four families or less)</b>	<b>1,761</b>	<b>39.3%</b>	<b>345</b>	<b>12.2%</b>	<b>2,253</b>	<b>54.7%</b>	<b>4,359</b>	<b>38.1%</b>
Residential (four families or less)	1,761	39.3%	345	12.2%	2,253	54.7%	4,359	38.1%
<b>Residential (apartments, condominiums, mobile home, other)</b>	<b>535</b>	<b>11.9%</b>	<b>68</b>	<b>2.4%</b>	<b>276</b>	<b>6.7%</b>	<b>878</b>	<b>7.7%</b>
Residential (apartment/multifamily)	219	4.9%	17	0.6%	216	5.2%	452	4.0%
Residential (condominium)	242	5.4%	45	1.6%	49	1.2%	336	2.9%
Residential (other)	71	1.6%	6	0.2%	11	0.3%	88	0.8%
Mobile Home Parks	2	0.0%	0	0.0%	0	0.0%	2	0.0%
<b>Industrial</b>	<b>595</b>	<b>13.3%</b>	<b>669</b>	<b>23.6%</b>	<b>311</b>	<b>7.6%</b>	<b>1,576</b>	<b>13.8%</b>
Industrial	210	4.7%	572	20.2%	233	5.7%	1,015	8.9%
Warehouses/Storage/Garages	385	8.6%	97	3.4%	79	1.9%	560	4.9%
<b>Commercial</b>	<b>326</b>	<b>7.3%</b>	<b>774</b>	<b>27.3%</b>	<b>214</b>	<b>5.2%</b>	<b>1,313</b>	<b>11.5%</b>
Commercial	120	2.7%	478	16.8%	147	3.6%	745	6.5%
Office Buildings	84	1.9%	203	7.2%	17	0.4%	305	2.7%
Retail Sales & Services	82	1.8%	79	2.8%	34	0.8%	195	1.7%
Automotive Uses	20	0.4%	5	0.2%	8	0.2%	33	0.3%
Hotels/Motels/Lodging	7	0.2%	8	0.3%	0	0.0%	15	0.1%
Hospital	13	0.3%	0	0.0%	0	0.0%	13	0.1%
Healthcare/Assisted Living	0	0.0%	0	0.0%	7	0.2%	7	0.1%
<b>Schools and Government Purposes</b>	<b>705</b>	<b>15.8%</b>	<b>120</b>	<b>4.2%</b>	<b>322</b>	<b>7.8%</b>	<b>1,148</b>	<b>10.0%</b>
Schools	577	12.9%	70	2.5%	145	3.5%	792	6.9%
Vacant Public Land	114	2.5%	33	1.2%	154	3.7%	301	2.6%
Civic	14	0.3%	17	0.6%	23	0.6%	54	0.5%
<b>Parks and Open Space</b>	<b>188</b>	<b>4.2%</b>	<b>353</b>	<b>12.4%</b>	<b>240</b>	<b>5.8%</b>	<b>781</b>	<b>6.8%</b>
Parks & Recreation	154	3.4%	186	6.6%	189	4.6%	530	4.6%
Conservation Purposes	33	0.7%	167	5.9%	51	1.2%	251	2.2%
<b>Vacant Land (not public)</b>	<b>153</b>	<b>3.4%</b>	<b>152</b>	<b>5.4%</b>	<b>224</b>	<b>5.4%</b>	<b>529</b>	<b>4.6%</b>
Vacant Land (not public)	153	3.4%	152	5.4%	224	5.4%	529	4.6%
<b>Agriculture</b>	<b>22</b>	<b>0.5%</b>	<b>179</b>	<b>6.3%</b>	<b>64</b>	<b>1.6%</b>	<b>265</b>	<b>2.3%</b>
Agriculture	22	0.5%	179	6.3%	64	1.6%	265	2.3%
<b>Other</b>	<b>190</b>	<b>4.3%</b>	<b>178</b>	<b>6.3%</b>	<b>213</b>	<b>5.2%</b>	<b>582</b>	<b>5.1%</b>
Railroad Properties	59	1.3%	15	0.5%	101	2.5%	176	1.5%
Cemeteries & Related	0	0.0%	143	5.1%	25	0.6%	168	1.5%
Religious & Charitable Organizations	39	0.9%	12	0.4%	19	0.5%	70	0.6%
Utilities	14	0.3%	0	0.0%	49	1.2%	63	0.5%
Military Land	52	1.2%	0	0.0%	0	0.0%	52	0.5%
Transportation Facilities	19	0.4%	5	0.2%	9	0.2%	33	0.3%
Tax Lien Foreclosure	2	0.0%	3	0.1%	7	0.2%	12	0.1%
Parking	2	0.0%	0	0.0%	2	0.0%	4	0.0%
Mixed Use	3	0.1%	0	0.0%	1	0.0%	4	0.0%
<b>Grand Total</b>	<b>4,476</b>	<b>100.0%</b>	<b>2,838</b>	<b>100.0%</b>	<b>4,118</b>	<b>100.0%</b>	<b>11,432</b>	<b>100.0%</b>

Sources: Tax Assessment Data (MOD-IV databases) downloaded March-April 2015 from record search link posted at <http://njactb.org/> (NJ Association of County Tax Boards); Digitized GIS parcels from Middlesex, Somerset and Union counties.

**Map 10—2: Detailed Land Use by Tax Parcel Assessment Data, Regional View**

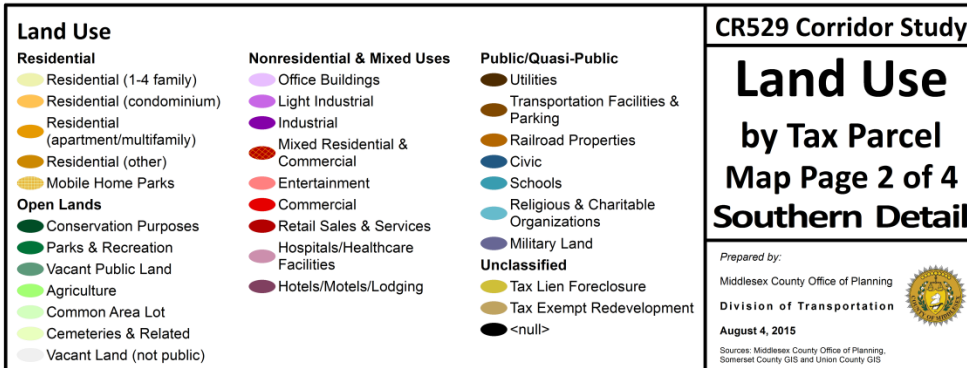
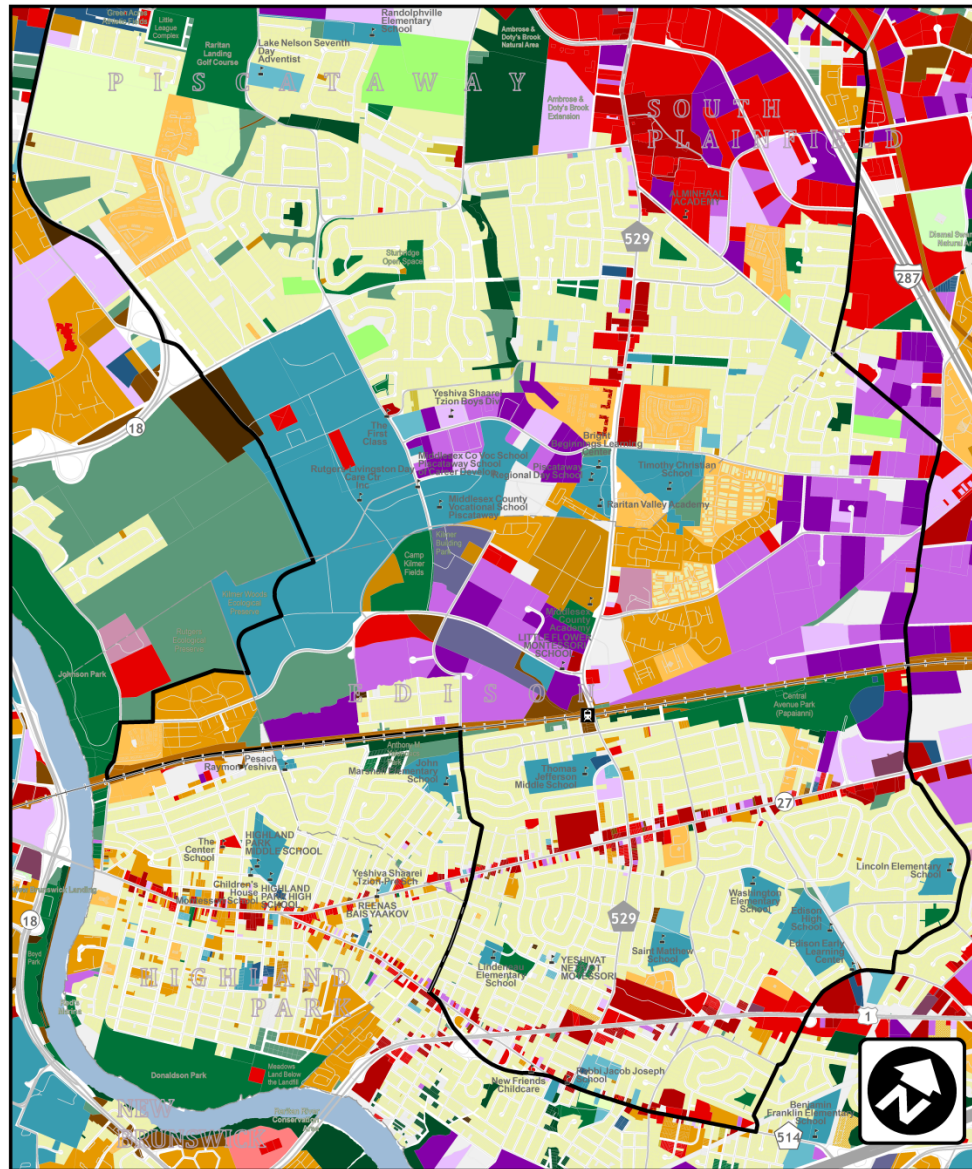
*This map is also provided in Appendix D in a higher resolution 11 x 17 inches (tabloid) page size format*





### Map 10—3: Detailed Land Use by Tax Parcel Assessment Data, Southern Detail

This map is also provided in Appendix D in a higher resolution 11 x 17 inches (tabloid) page size format

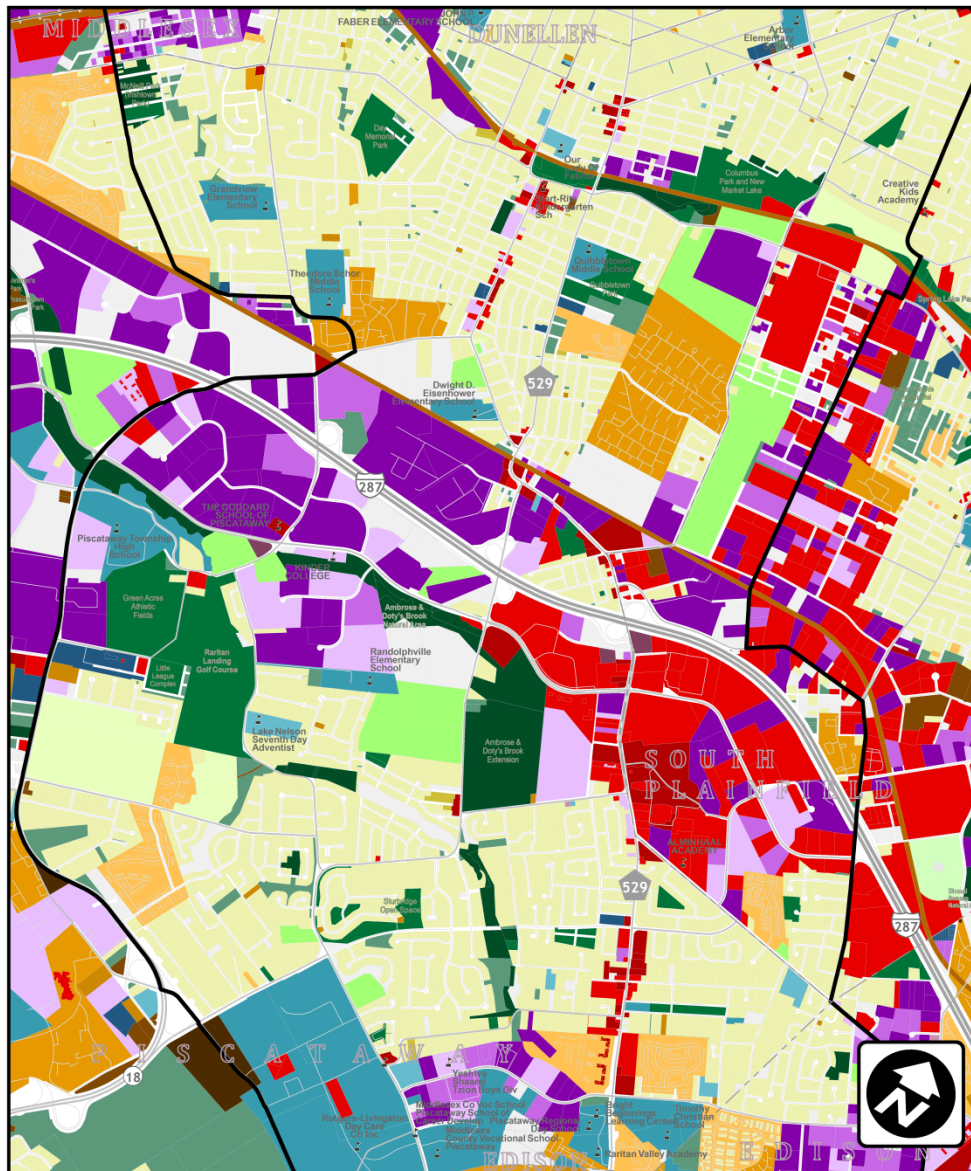


T:\GIS\EV9514\2016\_PRC529\corridor\GIS\MX\Parcel\CR529\_CorridorDetail\_TaxParcel\_LandUse.mxd



## Map 10—4: Detailed Land Use by Tax Parcel Assessment Data, Central Detail

This map is also provided in Appendix D in a higher resolution 11 x 17 inches (tabloid) page size format



### Land Use

#### Residential

- Residential (1-4 family)
- Residential (condominium)
- Residential (apartment/multifamily)
- Residential (other)
- Mobile Home Parks

#### Open Lands

- Conservation Purposes
- Parks & Recreation
- Vacant Public Land
- Agriculture
- Common Area Lot
- Cemeteries & Related
- Vacant Land (not public)

#### Nonresidential & Mixed Uses

- Office Buildings
- Light Industrial
- Industrial
- Mixed Residential & Commercial
- Entertainment
- Commercial
- Retail Sales & Services
- Hospitals/Healthcare Facilities
- Hotels/Motels/Lodging

#### Public/Quasi-Public

- Utilities
- Transportation Facilities & Parking
- Railroad Properties
- Civic
- Schools
- Religious & Charitable Organizations
- Military Land

#### Unclassified

- Tax Lien Foreclosure
- Tax Exempt Redevelopment
- <null>

### CR529 Corridor Study

## Land Use by Tax Parcel Map Page 3 of 4 Central Detail

Prepared by:

Middlesex County Office of Planning  
Division of Transportation

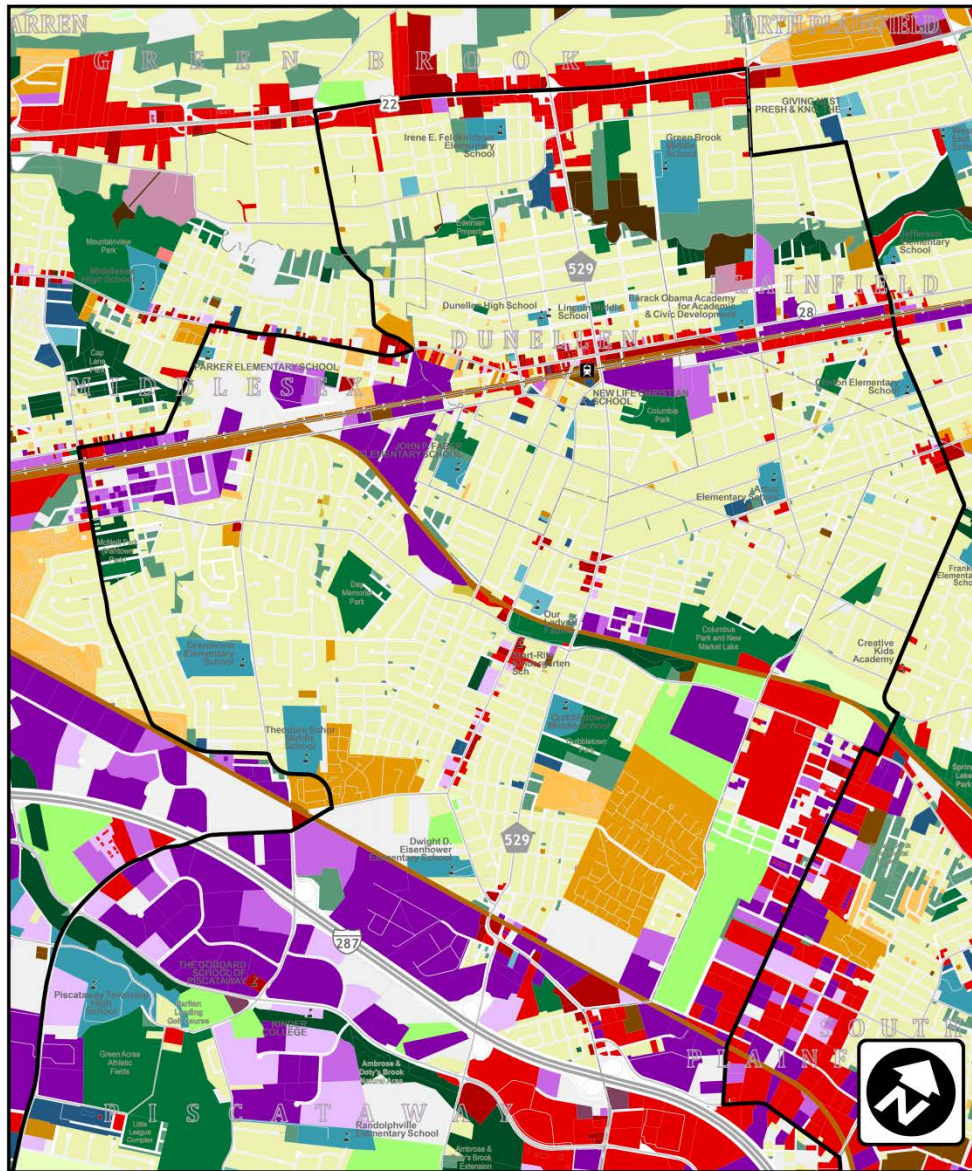
August 4, 2015

Sources: Middlesex County Office of Planning,  
Somerset County GIS and Union County GIS



## Map 10—5: Detailed Land Use by Tax Parcel Assessment Data, Northern Detail

This map is also provided in Appendix D in a higher resolution 11 x 17 inches (tabloid) page size format



### Land Use

#### Residential

- Residential (1-4 family)
- Residential (condominium)
- Residential (apartment/multifamily)
- Residential (other)
- Mobile Home Parks

#### Open Lands

- Conservation Purposes
- Parks & Recreation
- Vacant Public Land
- Agriculture
- Common Area Lot
- Cemeteries & Related
- Vacant Land (not public)

#### Nonresidential & Mixed Uses

- Office Buildings
- Light Industrial
- Industrial
- Mixed Residential & Commercial
- Entertainment
- Commercial
- Retail Sales & Services
- Hospitals/Healthcare Facilities
- Hotels/Motels/Lodging

#### Public/Quasi-Public

- Utilities
- Transportation Facilities & Parking
- Railroad Properties
- Civic
- Schools
- Religious & Charitable Organizations
- Military Land

#### Unclassified

- Tax Lien Foreclosure
- Tax Exempt Redevelopment
- <null>

### CR529 Corridor Study

## Land Use by Tax Parcel Map Page 4 of 4 Northern Detail

Prepared by:

Middlesex County Office of Planning  
Division of Transportation

August 4, 2015

Sources: Middlesex County Office of Planning,  
Somerset County GIS and Union County GIS



FIGURE 10-5: DETAILED LAND USE BY TAX PARCEL ASSESSMENT DATA, NORTHERN DETAIL



### 10.2.1 Major trip generators/attractors

A review of the land use maps enables the identification of numerous areas of trip generation and trip attractors (areas of high to/from trip activity) throughout the corridor, listed below and sorted generally from south to north.

#### *South Subarea*

- Route 1 commercial corridor from Woodbridge Avenue to I-287 (Edison)
- Route 27 commercial corridor from Highland Park to I-287 (Edison)
- Talmadge Road industrial area (Edison)
- Camp Kilmer industrial park (Edison & Piscataway)
- Edison Train Station
- Various multi-family complexes situated between Camp Kilmer industrial park and the Talmadge Road industrial area (Edison)
- Livingston Campus of Rutgers University
- Multi-family complexes on Cedar Lane in Highland Park Borough (near Johnson Park, county park).

#### *Central Subarea*

- Hadley Center (mall) and Middlesex Mall (South Plainfield)
- Hadley Road-Centennial Avenue industrial/commercial corridor (South Plainfield & Piscataway)
- Hamilton Boulevard-South Clinton Avenue industrial area (South Plainfield),

#### *North Subarea*

- Dunellen Train Station
- Route 28 commercial corridor (Middlesex, Dunellen, and Plainfield)
- Route 22 commercial corridor (Green Brook and North Plainfield)
- South Avenue industrial corridor (Middlesex Borough)
- Aspen Court - Princeton Gardens - Pleasant View Gardens apartment complexes along New Brunswick Avenue (Piscataway)
- Tanglewood Terrace Apartments on Old New Brunswick Road (Piscataway)

## 10.3 Major Development Activity, Approvals and Proposals

**Table 10—3: Major Developments Proposed, Approved and/or Constructed Since 2008**

Name	Proposed Land Use	Municipality	Acres	Number of Housing Units	Non-residential Square Feet	STATUS
HARRIS STEEL SITE (Tyler Pl and New Brunswick Avenue)	MULTI-FAMILY RESIDENTIAL	South Plainfield	86.5	460	0	Proposed in affordable housing plan
PISCATAWAY CROSSING	MULTI-FAMILY RESIDENTIAL AND RETAIL	Piscataway	40.9	595	49,400	Construction not started
LACKLAND HOLDING CO, LLC	MULTI-FAMILY RESIDENTIAL	Piscataway	24.9	442	0	Construction not started
ASPEN COURT	MULTI-FAMILY RESIDENTIAL	Piscataway	27.5	412	0	Constructed and occupied
DUNELLEN DOWNTOWN REDEVELOPMENT PLAN (former Art Color factory)	MULTI-FAMILY RESIDENTIAL AND RETAIL	Dunellen	19.0	380	40,000 (estimated)	Proposed in redevelopment plan
CELEBRATION SOUTH PLAINFIELD	MULTI-FAMILY RESIDENTIAL (age-restricted)	South Plainfield	27.2	340	0	Under construction; condos and townhomes for sale
FAIRWAYS AT PISCATAWAY	MULTI-FAMILY RESIDENTIAL	Piscataway	33.2	331	0	Nearly complete
GREENHOUSE ESTATES AT PISCATAWAY	SINGLE-FAMILY RESIDENTIAL	Piscataway	36.4	152	0	Constructed and occupied
KILMER HOMES I & II	MULTI-FAMILY RESIDENTIAL	Edison	6.7	120	0	Constructed and occupied (Spring 2015 moving in)
THE CROSSINGS AT HIGHLAND PARK	MULTI-FAMILY RESIDENTIAL	Highland Park	10.5	94	0	Under construction
OVERLOOK AT HIGHLAND PARK	MULTI-FAMILY RESIDENTIAL	Highland Park	12.6	82	0	Constructed and occupied
EDISON TOWNE SQUARE	COMMERCIAL	Edison	96.5	0	975,060	Under construction; Sam's Club occupied
SEAGIS EDISON 2170, LLC	WAREHOUSE	Edison	49.9	0	923,000	Construction not started
EDISON WAREHOUSE / DISTRIBUTION FACILITY	WAREHOUSE / OFFICE	Edison	45.5	0	695,073	Constructed; occupancy not known
PISCATAWAY BUSINESS CENTER	WAREHOUSE DISTRIBUTION CENTER	Piscataway	44.5	0	538,800	Constructed and occupied
6 & 8 CORPORATE PLACE	OFFICE/WAREHOUSE	Piscataway	26.6	0	274,500	Approved
500 STELTON ROAD	SELF STORAGE MINI-WAREHOUSE	Piscataway	7.0	0	117,532	Constructed and occupied
DIGITAL REALTY TRUST	DATA CENTER AND SUBSTATION DEVELOPMENT	Piscataway	27.5	0	106,870	Constructed and occupied
<b>Totals</b>			<b>623</b>	<b>3,408</b>	<b>3,720,235</b>	

**Middlesex County Board of Chosen Freeholders**

Ronald G. Rios, *Director*

Charles E. Tomaro, *Deputy Director*

Charles Kenny, *Chair, Infrastructure Management Committee*

Kenneth Armwood, Leslie Koppel, Shanti Narra, Blanquita B. Valenti



**Middlesex County Department of Infrastructure Management  
Office of Planning  
Division of Transportation**

County Administration Building, 5th Floor  
75 Bayard Street  
New Brunswick, NJ 08901  
732-745-3843

[www.middlesexcountynj.gov](http://www.middlesexcountynj.gov)

Follow Us:

