

# Joint Base Regional Transportation Mobility Study

August 15, 2011

**Prepared for:**



Burlington County, NJ



Ocean County, NJ

**Prepared by:**



11 Tindall Road  
Middletown, NJ 07748

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## Executive Summary

The Joint Base Regional Transportation Mobility Study examines the mobility impacts resulting from mission changes at Joint Base McGuire-Dix-Lakehurst, and regional growth in population and employment. Its goal is to promote safe and efficient transportation around the Joint Base.

The study includes a detailed analysis of information on existing conditions within five miles of the Joint Base. Central to this analysis is an examination of high frequency crash locations within the region. These locations are mapped in Figure 3 of this study, and summarized in Table ES-1, below.

**Table ES-1: High-Frequency Crash Locations, Selected Characteristics**

Location	Total Crashes	Intersection (Yes/No)	Signalized (Yes/No)
NJ 38, US 206 & CR 530, Southampton (Location 1 on Figure 3)	95	Yes	Yes
BC 537 & US 206, Springfield (Location 2 on Figure 3)	74	Yes	Yes
NJ 70 & OC 539, Manchester (Location 3 on Figure 3)	87	Yes	Yes
NJ 37 & OC 39, Toms River (Location 4 on Figure 3)	82	Yes	Yes
OC 639 & OC 528, Jackson (Location 5 on Figure 3)	69	Yes	Yes
NJ 70 & NJ 72, Woodland (Location 6 on Figure 3)	45	Yes	No (Circle)
OC 527 & NJ 70, Toms River (Location 7 on Figure 3)	54	Yes	Yes
BC 530 & BC 616, Pemberton Borough (Location 8 on Figure 3)	56	Yes	Yes
OC 640 & OC 528, Plumsted (Location 9 on Figure 3)	40	Yes	Yes
NJ 70 & OC 637, Toms River (Location 10 on Figure 3)	46	Yes	Yes
US 9, between OC 84 & 92, Toms River (Location 11 on Figure 3)	58	No	N/A
NJ 70 & OC 2, Manchester (Location 12 on Figure 3)	50	Yes	Yes
OC 527 & OC 622, Toms River (Location 13 on Figure 3)	42	Yes	Yes
OC 527 & OC 636, Jackson (Location 14 on Figure 3)	44	Yes	Yes
BC 530 & Club House Rd., Pemberton (Location 15 on Figure 3)	47	Yes	No (Stop Sign)
NJ 70 & NJ 37, Lakehurst (Location 16 on Figure 3)	39	Yes	No (Circle)
OC 527 & OC 59, Toms River (Location 17 on Figure 3)	30	Yes	No (Stop Sign)
NJ 70 & US 9, Toms River (Location 18 on Figure 3)	49	Yes	No (Inter.)
NJ 70 & OC 571, Manchester (Location 19 on Figure 3)	48	Yes	Yes
OC 571 & OC 547, Manchester (Location 20 on Figure 3)	31	Yes	Yes
NJ 37 & Bananier Dr., Toms River (Location 21 on Figure 3)	33	Yes	Yes
US 9 & OC 620, Toms River (Location 22 on Figure 3)	33	Yes	Yes
OC 571, between Ridge Ave. & OC 547, Manchester (Location 23 on Figure 3)	27	No	N/A
OC 528, between Whitesville Rd. & OC 626, Lakewood (Location 24 on Figure 3)	27	No	N/A
<b>Total</b>	<b>1206</b>	<b>N/A</b>	<b>N/A</b>

The study was also performed with the benefit of a customized transportation model. This model projected future traffic conditions (as measured by volume/capacity ratios) at the regional level for the years 2015 and 2035, and included scenarios that included the mission changes at the Joint Base, as well as scenarios that assumed no mission changes would be realized. The purpose of these scenarios was to isolate the impact of the mission changes within the model. The results of this model are summarized in Table ES-2.

**Table ES-2: Change in Volume/Capacity Ratio**

Model Run	Portion of Roadways with Volume/Capacity Ratio < 0.75	Portion of Roadways with Volume/Capacity Ratio ≥ 0.75, < 1.00	Portion of Roadways with Volume/Capacity Ratio ≥ 1.00, < 1.25	Portion of Roadways with Volume/Capacity Ratio ≥ 1.25	Study Area Average Volume/Capacity Ratio
2010 – Baseline	60.1%	16.8%	19.1%	4.0%	0.59
2015 – No Build (No Mission Changes)	56.9%	16.3%	20.7%	6.1%	0.61
2015 – Build (With Mission Changes)	56.4%	16.3%	21.7%	5.5%	0.62
2035 – No Build (No Mission Changes)	46.9%	14.0%	26.4%	12.7%	0.75
2035 – Build (With Mission Changes)	46.6%	12.7%	28.2%	12.5%	0.76
Change: 2010 to 2035 Build (With Mission Changes)	-13.5%	-4.1%	9.1%	8.5%	0.17

Note: Roadway segments with volume/capacity ratios of more than 1.00 are considered to be operating above capacity.

The above information, combined with details on other existing conditions, was used to identify target locations, for which basic and advanced alternatives were proposed to improve mobility and mitigate the issues foreseen by the customized transportation model.

In total, twenty locations were selected. All of these locations were projected to have either a 2035 volume/capacity ratio of 1.25 or greater, were the site of a high-frequency crash location, or both. These locations were selected and prioritized as indicated in the section of this report entitled *Alternatives Analysis*. These locations are mapped in Figure 18. Tables 22 and 23 provide complete details of the solutions that have been proposed for them, their feasibility, and potential permitting issues.

It is intended that this report serve as a guide to focus further review and analysis for targeted transportation improvements within the study area. By pursuing the recommendations presented in the Alternatives Analysis, the various jurisdictions within the study area can take a proactive step to facilitate safe and efficient motorized and non-motorized mobility around Joint Base McGuire-Dix-Lakehurst.

# Introduction

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## Purpose

The Joint Base Regional Transportation Mobility Study identifies transportation concerns within a five-mile buffer of Joint Base McGuire-Dix-Lakehurst, and develops strategies and project concepts to alleviate them. Its overarching goal is to ensure safe and efficient motorized and non-motorized transportation for all, both in the short-and long-terms.

This study has been drafted as an implementation measure of the 2009 Joint Land Use Study, which was prepared by Ocean and Burlington counties to examine the compatibility of Joint Base McGuire-Dix-Lakehurst with the surrounding communities, and develop strategies to plan for and ensure the harmonious future growth of both. It is a direct result of the Joint Land Use Study's recommendations to:

- Examine alternative routing measures to offset county road closures and military through-traffic within residential neighborhoods;
- Develop a military traffic routing plan and evaluate weight tolerances due to weight loads of military vehicles on local roads and bridges; and,
- Explore transit opportunities for military personnel and civilians.

## Background

Joint Base McGuire-Dix-Lakehurst comprises 42,200 acres (approximately 66 square miles) in central New Jersey. It extends approximately 19 miles from east to west and is located in nine municipalities in two counties, namely: Pemberton Township, New Hanover Township, North Hanover Township, Springfield Township and Wrightstown Borough in Burlington County; and, Manchester Township, Jackson Township, Plumsted Township and Lakehurst Borough in Ocean County. Also within close proximity to the Joint Base is Pemberton Borough, which is entirely surrounded by Pemberton Township. The study area of this report consists of these municipalities and portions of other municipalities located within five miles of Joint Base McGuire-Dix-Lakehurst. Municipalities located within five miles of the Joint Base include portions of Chesterfield Township, Eastampton Township, Mansfield Township, Southampton Township, and Woodland Township in Burlington County, and Berkeley Township, Lacey Township, Lakewood Township, and Toms River Township in Ocean County. Figure 1 depicts the regional location of the Joint Base and the study area of this report.

The creation of Joint Base McGuire-Dix-Lakehurst is the result of a recommendation of the 2005 Base Realignment and Closure (BRAC) Commission to consolidate the installation management and support functions of Fort Dix, Naval Air Engineering Station Lakehurst, and McGuire Air Force Base to the new Joint Base. The motive behind its creation was to reduce redundancy in support functions and personnel

by consolidating management and oversight. Joint Base McGuire-Dix-Lakehurst formally came into existence on October 1, 2009. It is the only tri-service military base in the United States, and the largest employer in Ocean and Burlington counties.

## Mission Changes

In addition to creating Joint Base McGuire-Dix-Lakehurst, the 2005 BRAC Commission's decision will result in several mission changes prior to September 15, 2011, which is the deadline for full implementation of all BRAC actions. These changes include:

- Establishment of the Northeast Regional Readiness Command Headquarters at Fort Dix;
- Relocation of the HQ 78th Division from Camp Kilmer to Fort Dix;
- Establishment of a Sustainment Brigade for the Northeast Regional Readiness Command Headquarters and the HQ 78th Division at Fort Dix;
- Relocation of the 244th Aviation Brigade from Fort Sheridan to Fort Dix;
- Relocation of the mobilization functions of Aberdeen Proving Ground, Washington Navy Yard, and Naval Submarine Base New London to Fort Dix;
- Redesignation of Fort Dix as a Joint Pre-Deployment/Mobilization Site for Aberdeen Proving Ground, Washington Navy Yard, and Naval Submarine Base New London;
- Relocation of Equipment Concentration Site 27 from Fort Dix to Naval Air Engineering Station Lakehurst;
- Relocation of Company A, 228th Aviation and Reserve Intelligence Area 16 from Naval Air Station Joint Reserve Base Willow Grove to Fort Dix;
- Relocation of Marine Air Group 49 from Naval Air Station Joint Reserve Base Willow Grove to Fort Dix;
- Relocation of Marine Heavy Helicopter Squadron 772 from Naval Air Station Joint Reserve Base Willow Grove to Fort Dix;
- Relocation of Marine Wing Support Squadron 472 from Naval Air Station Joint Reserve Base Willow Grove to Fort Dix;
- Relocation of Naval Air Reserve Assets from Naval Air Station Joint Reserve Base Willow Grove to Fort Dix;
- Relocation of Marine Light Attack Helicopter Squadron 775, Detachment A from Cambria Regional Airport to Fort Dix;
- Relocation of Battery G 3rd Battalion, 14th Marines from West Trenton Marine Reserve Center to Fort Dix;
- Relocation of Fleet Logistics Support Squadron 52 from Naval Air Station Joint Reserve Base Willow Grove to McGuire Air Force Base;
- Relocation of Fleet Logistics Support Squadron 64 from Naval Air Station Joint Reserve Base Willow Grove to McGuire Air Force Base;
- Relocation of the 244th Aviation Brigade and Company A, 2-228th Aviation Brigade from Naval Air Station Joint Reserve Base Willow Grove to McGuire Air Force Base; and,

- Relocation of Aircraft Intermediate Maintenance Department, Aviation Supply Division from Naval Air Station Joint Reserve Base Willow Grove to McGuire Air Force Base.

In addition to the above, a new Consolidated Logistics Training Facility is being constructed by the New Jersey Army National Guard in the western portion of Naval Air Engineering Station Lakehurst, along Ocean County Route 539 (Whiting-New Egypt Road) in Plumsted Township. This 150-acre facility will provide space for training, maintenance, and storage.

The combined impact of these mission changes will be great. As reported in the 2009 Joint Land Use Study, their population impact will be an estimated 3,698, broken down as follows: 625 active military personnel; 25 civilian personnel; 1,616 reservists; 350 full-time staff<sup>1,2</sup> at the Consolidated Logistics Training Facility; 400 direct personnel at the Northeast Regional Readiness Command Headquarters; and, 682 family members accompanying inbound military personnel. These additions to the Joint Base's current full- and part-time population of 42,067 will result in increased traffic volumes.

### Local Development Activity

The 2009 Joint Land Use Study estimates regional growth potential with buildout calculations for the area within two miles of the Joint Base. These calculations show: a total development potential of 8,826 residential units on residentially-zoned vacant or agricultural lands; and, 564.6 acres of non-residentially zoned vacant or agricultural lands. The distribution of this development potential is provided in Table 1.

**Table 1: Buildout Calculations of 2009 Joint Land Use Study (Summary)**

	Maximum Residential Development Potential (Units)	Max. Non-Residential Development Potential (Net Acres)
Jackson Township	762	81.2
Lakehurst Borough	48	5.9
Manchester Township	2,392	191.8
Plumsted Township	412	11.7
New Hanover Township	438	46.5
North Hanover Township	954	158.5
Pemberton Borough	20	0.0
Pemberton Township	3,166	67.6
Springfield Township	315	0.0
Wrightstown Borough	319	1.4
<b>Total</b>	<b>8,826</b>	<b>564.6</b>
Source: 2009 Joint Land Use Study		

In addition to the potential reported in the buildout calculations, the 2009 Joint Land Use Study also identifies several projects and sites in the study area municipalities that have either been approved for

<sup>1</sup> This figure includes 100 staff associated with Equipment Concentration Site No. 27, which will be located at the Consolidated Logistics Training Facility.

<sup>2</sup> This figure may be as high as 1,000 on weekends. However, weekday totals are used for the purpose of this study.

development, or have significant redevelopment potential. It also identifies other factors that could impact local development patterns. This information is summarized below:

- Jackson Township:
  - Megan's Run Site: Approved for 127 units
  - Clayton Sand Site: Significant redevelopment potential
- Lakehurst Borough:
  - Development of Middlesex-Ocean-Monmouth Rail Line could have a significant impact on local development patterns
- Manchester Township:
  - Heritage Minerals Site: Approved for 2,205 units
  - River Pointe Site: Approved for 504 units
  - Pinelands Retirement Community-1 Zone: Potential for 330 units on lands not classified as vacant or agricultural
- New Hanover Township:
  - The Township has potential for non-residential redevelopment
- North Hanover Township:
  - The Township is planning for future development in close proximity to Wrightstown Borough as part of a multi-municipal Town Center
- Pemberton Borough:
  - Block 102, Lot 1: Approved for 18 units
  - Significant commercial redevelopment potential exists in the southeast of the Borough, as well as along Burlington County Route 616 (Hanover Street)
- Pemberton Township:
  - The northwestern portion of the Township located to the North of Pemberton Borough has been designated as a town center in the Third Round Cross Acceptance Process of the New Jersey State Development and Redevelopment Plan, and in the Township's 2008 Master Plan
  - The Township is planning for future non-residential development along US Route 206
- Wrightstown Borough:
  - There is significant non-residential redevelopment activity in the Borough's downtown

As can be seen in Table 1 and the list provided above, there is significant development and redevelopment potential in the study area municipalities. Concurrently, Joint Base McGuire-Dix-Lakehurst is actively partnering with the State of New Jersey, the New Jersey Pinelands Commission, Burlington County, Ocean County and surrounding townships to purchase land and restrictive easements in order to mitigate incompatible growth within its Air Installations Compatible Use Zones (AICUZs).

## Planning Framework

The Joint Base Regional Mobility Study has been prepared in coordination with: the Ocean County Planning Department; the Burlington County Bridge Commission, Office of Economic Development and Regional Planning; the Office of Economic Adjustment of the United States Department of Defense; the United States Air Force; the United States Navy; and the United States Army.

It comprehensively examines the regional circulation system within the context of the Base's mission changes. To do so, it uses a customized transportation model<sup>3</sup> to predict future conditions in 2015 and 2035 (see the section of this report entitled *Impact Analysis*), and proposes specific projects to correct regional areas of concern. These projects are presented within the context of a basic and advanced alternatives analysis, the distinction between the two being their focus on existing and proposed infrastructure, respectively. The end result is a set of prioritized and implementable actions.

## Outreach

Various local officials from the study area municipalities were interviewed during July and August of 2010. These interviews provided valuable information on transportation and mobility issues from a local perspective. A fair amount of this information was corroborated in the section of this report entitled *Existing Conditions*. A copy of the made during each meeting is provided in Appendix 1.

In addition to the above, the Joint Base Regional Transportation Mobility Study has been prepared with the benefit of a statistically-valid, online travel survey of the total Joint Base McGuire-Dix-Lakehurst population of 42,067, which includes: enlisted and civilian military personnel; contractors working on, or regularly accessing, the Joint Base; and, family members of military personnel residing on the Joint Base<sup>4</sup>. A copy of the survey is provided in Appendix 5.

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<sup>3</sup> The customized regional transportation model is adapted from regional transportation models of the North Jersey Regional Transportation Planning Authority and the Delaware Valley Regional Planning Commission.

<sup>4</sup> Employees of the State and Federal prisons located on Joint Base McGuire-Dix-Lakehurst were not surveyed.



# Existing Conditions

## Crash Analysis

Because of their value in assessing roadway safety, a crash analysis has been incorporated into the Joint Base Regional Transportation Mobility Study. This crash analysis was performed with the benefit of New Jersey Department of Transportation-sourced data on vehicle crashes occurring from January 1, 2007 through December 31, 2009. The crash records for the entire study area are summarized in Table 2 and mapped in Figure 2.

**Table 2: Summarized Crash Records, 2007-2009**

Crash Type <sup>5</sup>	Study Area Total		Burlington County		Ocean County	
Unknown	2	0.0%	0	0.0%	2	0.0%
Same Direction (Rear End)	2136	32.1%	757	11.4%	1379	20.7%
Same Direction (Side Swipe)	510	7.7%	169	2.5%	341	5.1%
Right Angle	1051	15.8%	393	5.9%	658	9.9%
Opposite Direction (Head On, Angular)	134	2.0%	41	0.6%	93	1.4%
Opposite Direction (Side Swipe)	102	1.5%	43	0.6%	59	0.9%
Struck Parked Vehicles	63	0.9%	32	0.5%	31	0.5%
Left Turn/U-Turn	281	4.2%	156	2.3%	125	1.9%
Backing	68	1.0%	38	0.6%	30	0.5%
Encroachment	30	0.5%	18	0.3%	12	0.2%
Overtaken	89	1.3%	52	0.8%	37	0.6%
Fixed Object	1132	17.0%	618	9.3%	514	7.7%
Animal	745	11.2%	332	5.0%	413	6.2%
Pedestrian	58	0.9%	22	0.3%	36	0.5%
Pedalcyclist	35	0.5%	13	0.2%	22	0.3%
Non-Fixed Object	77	1.2%	24	0.4%	53	0.8%
Railcar-Vehicle	1	0.0%	0	0.0%	1	0.0%
Other	140	2.1%	12	0.2%	128	1.9%
<b>Total</b>	<b>6654</b>	<b>100.0%</b>	<b>2720</b>	<b>40.9%</b>	<b>3934</b>	<b>59.1%</b>

As can be seen above, a total of 6,654 crashes occurred within the study area from January 1, 2007 through December 31, 2009. Over three-quarters (76.1 percent) of the crashes were attributed to one of the following four crash types: same direction (rear end) – 32.1 percent; fixed object – 17.0 percent; right angle – 15.8 percent; and, animal crashes – 11.2 percent.

The 2,720 crashes that occurred in the Burlington County-portions of the study area from January 1, 2007 through December 31, 2009 accounted for 6.9 percent of the 39,385 crashes that occurred in all of

<sup>5</sup> Crash types are defined by the New Jersey Department of Transportation and recorded in State of New Jersey Police Crash Investigation Reports (Form NJTR-1).

Burlington County during the same period. Approximately 16.4 percent of the Burlington County's roadways are located in the study area.

Similarly, the 3,934 crashes that occurred in the Ocean County-portions of the study area from January 1, 2007 through December 31, 2009 accounted for 7.5 percent of the of the 52,539 crashes that occurred in all of Ocean County during the same period. Approximately 16.9 percent of Ocean County's roadways are located in the study area.

Because of the large size of the study area, GIS analysis was performed in order to identify high-frequency crash locations and permit a more complete analysis of the crash data at the regional level. Specifically, a grid of 40,000 square-foot cells (measuring 200 feet on each side) was overlaid on the study area and the number of records located within each cell was counted. This operation facilitated the identification of high-frequency crash locations.

To provide an accurate and standardized tally of the number of crashes associated with the cells that contained 25 or more crashes<sup>6</sup>, radial measurements of 200 feet<sup>7,8</sup> were then made from the center point of each cell's respective intersection, or, when the cell was not associated with an intersection, from its center point. This step was necessary because the center points of the cells in the grid did not always correspond to the center point of the intersection to which it was associated<sup>9</sup>. By using the area defined by a radial measurement from each high-frequency crash location, be they intersections or not, an accurate and standardized tally of the number of crashes on each approach was facilitated.

High frequency crash locations are depicted in Figure 3 and described in Table 3 through Table 6.

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<sup>6</sup> Because of the high number of crashes and their dispersion throughout the large study area, it was necessary to focus this report on those locations with a minimum of 25 crashes indicated by the grid of 40,000 square-foot cells. There were a total of 24 cells associated with 25 or more crashes.

<sup>7</sup> Because of the high number of what appear to be crashes associated with queuing on the northern and southern approaches, radial measurements of 400 feet were made from high-frequency crash locations located along US Route 206.

<sup>8</sup> The use of 200 feet corresponds to the dimensioning of the cells in the overlaid grid. While some crashes may be located slightly beyond 200 feet, such crashes are far enough away that they may not necessarily be the result of conditions at the high-frequency crash location.

<sup>9</sup> This is a natural occurrence, and expected when a standardized grid is overlaid on a complex geographical space.

**Table 3: High-Frequency Crash Locations, Selected Characteristics**

Location	Total Crashes	Intersection (Yes/No)	Signalized (Yes/No)
NJ 38, US 206 & CR 530, Southampton (Location 1 on Figure 3)	95	Yes	Yes
BC 537 & US 206, Springfield (Location 2 on Figure 3)	74	Yes	Yes
NJ 70 & OC 539, Manchester (Location 3 on Figure 3)	87	Yes	Yes
NJ 37 & OC 39, Toms River (Location 4 on Figure 3)	82	Yes	Yes
OC 639 & OC 528, Jackson (Location 5 on Figure 3)	69	Yes	Yes
NJ 70 & NJ 72, Woodland (Location 6 on Figure 3)	45	Yes	No (Circle)
OC 527 & NJ 70, Toms River (Location 7 on Figure 3)	54	Yes	Yes
BC 530 & BC 616, Pemberton Borough (Location 8 on Figure 3)	56	Yes	Yes
OC 640 & OC 528, Plumsted (Location 9 on Figure 3)	40	Yes	Yes
NJ 70 & OC 637, Toms River (Location 10 on Figure 3)	46	Yes	Yes
US 9, between OC 84 & 92, Toms River (Location 11 on Figure 3)	58	No	N/A
NJ 70 & OC 2, Manchester (Location 12 on Figure 3)	50	Yes	Yes
OC 527 & OC 622, Toms River (Location 13 on Figure 3)	42	Yes	Yes
OC 527 & OC 636, Jackson (Location 14 on Figure 3)	44	Yes	Yes
BC 530 & Club House Rd., Pemberton (Location 15 on Figure 3)	47	Yes	No (Stop Sign on Club House Road)
NJ 70 & NJ 37, Lakehurst (Location 16 on Figure 3)	39	Yes	No (Circle)
OC 527 & OC 59, Toms River (Location 17 on Figure 3)	30	Yes	No (Stop Sign on OC 59)
NJ 70 & US 9, Toms River (Location 18 on Figure 3)	49	Yes	No (Interchange)
NJ 70 & OC 571, Manchester (Location 19 on Figure 3)	48	Yes	Yes
OC 571 & OC 547, Manchester (Location 20 on Figure 3)	31	Yes	Yes
NJ 37 & Bananier Dr., Toms River (Location 21 on Figure 3)	33	Yes	Yes
US 9 & OC 620, Toms River (Location 22 on Figure 3)	33	Yes	Yes
OC 571, between Ridge Ave. & OC 547, Manchester (Location 23 on Figure 3)	27	No	N/A
OC 528, between Whitesville Rd. & OC 626, Lakewood (Location 24 on Figure 3)	27	No	N/A
<b>Total</b>	<b>1206</b>	<b>N/A</b>	<b>N/A</b>

**Table 4: Crashes at High-Frequency Crash Locations from 2007-2009, by Crash Type**

Location	Same Direction (Rear End)	Same Direction (Side Swipe)	Right Angle	Opposite Direction (Head On, Angular)	Opposite Direction (Side Swipe)	Struck Parked Vehicle	Left Turn/U-Turn	Backing	Encroachment	Overtuned	Fixed Object	Animal	Pedestrian	Pedalcyclist	Non-Fixed Object	Other	Total
NJ 38, US 206 & CR 530, Southampton (Location 1 on Figure 3)	53	8	17	1	0	1	10	0	0	0	1	2	1	0	1	0	95
BC 537 & US 206, Springfield (Location 2 on Figure 3)	21	6	25	1	1	1	15	0	0	1	2	0	0	0	1	0	74
NJ 70 & OC 539, Manchester (Location 3 on Figure 3)	29	11	23	3	0	0	12	0	1	0	6	1	0	0	0	1	87
NJ 37 & OC 39, Toms River (Location 4 on Figure 3)	45	14	11	1	0	0	2	1	0	0	3	2	1	2	0	0	82
OC 639 & OC 528, Jackson (Location 5 on Figure 3)	26	5	21	4	1	1	2	0	0	1	2	2	1	1	1	1	69
NJ 70 & NJ 72, Woodland (Location 6 on Figure 3)	20	4	3	1	0	0	0	0	0	3	14	0	0	0	0	0	45
OC 527 & NJ 70, Toms River (Location 7 on Figure 3)	19	8	19	2	0	0	3	0	0	0	3	0	0	0	0	0	54
BC 530 & BC 616, Pemberton Borough (Location 8 on Figure 3)	25	10	8	0	0	0	8	3	1	0	0	0	1	0	0	0	56
OC 640 & OC 528, Plumsted (Location 9 on Figure 3)	3	2	11	1	0	0	2	0	0	0	10	6	1	0	1	3	40
NJ 70 & OC 637, Toms River (Location 10 on Figure 3)	27	5	7	1	2	0	1	0	0	0	1	1	0	0	1	0	46
US 9, between OC 84 & 92, Toms River (Location 11 on Figure 3)	25	6	18	0	0	0	2	3	0	0	2	0	1	1	0	0	58
NJ 70 & OC 2, Manchester (Location 12 on Figure 3)	30	0	1	0	2	0	4	0	0	1	4	4	1	1	0	2	50
OC 527 & OC 622, Toms River (Location 13 on Figure 3)	19	6	7	1	0	0	2	2	0	1	2	0	1	0	0	1	42
OC 527 & OC 636, Jackson (Location 14 on Figure 3)	11	3	13	3	2	0	0	0	0	0	3	6	0	0	0	3	44
BC 530 & Club House Rd., Pemberton (Location 15 on Figure 3)	7	3	26	0	0	0	8	0	0	1	2	0	0	0	0	0	47
NJ 70 & NJ 37, Lakehurst (Location 16 on Figure 3)	9	9	10	1	4	0	0	0	0	1	5	0	0	0	0	0	39
OC 527 & OC 59, Toms River (Location 17 on Figure 3)	3	0	8	0	0	0	1	0	1	0	8	4	1	0	0	4	30
NJ 70 & US 9, Toms River (Location 18 on Figure 3)	19	5	16	1	1	0	1	0	0	0	3	0	2	0	0	1	49
NJ 70 & OC 571, Manchester (Location 19 on Figure 3)	24	5	6	0	0	0	8	1	0	0	3	0	0	0	1	0	48

**Table 4 (Continued): Crashes at High-Frequency Crash Locations from 2007-2009, by Crash Type**

Location	Same Direction (Rear End)	Same Direction (Side Swipe)	Right Angle	Opposite Direction (Head On, Angular)	Opposite Direction (Side Swipe)	Struck Parked Vehicle	Left Turn/U-Turn	Backing	Encroachment	Overtuned	Fixed Object	Animal	Pedestrian	Pedalcyclist	Non-Fixed Object	Other	Total
OC 571 & OC 547, Manchester (Location 20 on Figure 3)	10	4	8	2	0	0	2	0	0	1	3	1	0	0	0	0	31
NJ 37 & Bananier Dr., Toms River (Location 21 on Figure 3)	22	2	2	0	0	1	0	0	0	0	3	0	1	0	1	1	33
US 9 & OC 620, Toms River (Location 22 on Figure 3)	16	2	8	0	0	1	0	0	0	0	3	2	0	0	1	0	33
OC 571, between Ridge Ave. & OC 547, Manchester (Location 23 on Figure 3)	3	0	4	1	0	0	1	0	0	0	2	13	1	0	1	1	27
OC 528, between Whitesville Rd. & OC 626, Lakewood (Location 24 on Figure 3)	8	3	6	0	0	2	2	0	0	0	0	2	1	0	1	2	27
<b>Total</b>	<b>474</b>	<b>121</b>	<b>278</b>	<b>24</b>	<b>13</b>	<b>7</b>	<b>86</b>	<b>10</b>	<b>3</b>	<b>10</b>	<b>85</b>	<b>46</b>	<b>14</b>	<b>5</b>	<b>10</b>	<b>20</b>	<b>1206</b>

**Table 5: Crashes at High-Frequency Crash Locations from 2007-2009, by Road Surface Condition**

	Unknown	Dry	Wet	Snowy	Icy	Slush	Water	Oil	Total
NJ 38, US 206 & CR 530, Southampton (Location 1 on Figure 3)	0	66	26	0	3	0	0	0	95
BC 537 & US 206, Springfield (Location 2 on Figure 3)	0	53	19	1	1	0	0	0	74
NJ 70 & OC 539, Manchester (Location 3 on Figure 3)	0	69	17	0	1	0	0	0	87
NJ 37 & OC 39, Toms River (Location 4 on Figure 3)	0	66	16	0	0	0	0	0	82
OC 639 & OC 528, Jackson (Location 5 on Figure 3)	0	44	22	1	0	1	0	1	69
NJ 70 & NJ 72, Woodland (Location 6 on Figure 3)	0	30	15	0	0	0	0	0	45
OC 527 & NJ 70, Toms River (Location 7 on Figure 3)	0	46	8	0	0	0	0	0	54
BC 530 & BC 616, Pemberton Borough (Location 8 on Figure 3)	0	43	8	1	2	1	1	0	56
OC 640 & OC 528, Plumsted (Location 9 on Figure 3)	0	25	12	1	1	1	0	0	40
NJ 70 & OC 637, Toms River (Location 10 on Figure 3)	0	39	6	1	0	0	0	0	46
US 9, between OC 84 & 92, Toms River (Location 11 on Figure 3)	0	43	13	2	0	0	0	0	58
NJ 70 & OC 2, Manchester (Location 12 on Figure 3)	0	40	9	1	0	0	0	0	50
OC 527 & OC 622, Toms River (Location 13 on Figure 3)	0	34	7	0	0	1	0	0	42
OC 527 & OC 636, Jackson (Location 14 on Figure 3)	0	31	11	1	1	0	0	0	44
BC 530 & Club House Rd., Pemberton (Location 15 on Figure 3)	0	36	11	0	0	0	0	0	47
NJ 70 & NJ 37, Lakehurst (Location 16 on Figure 3)	0	31	7	1	0	0	0	0	39
OC 527 & OC 59, Toms River (Location 17 on Figure 3)	1	16	9	3	1	0	0	0	30
NJ 70 & US 9, Toms River (Location 18 on Figure 3)	0	32	17	0	0	0	0	0	49
NJ 70 & OC 571, Manchester (Location 19 on Figure 3)	0	37	10	1	0	0	0	0	48
OC 571 & OC 547, Manchester (Location 20 on Figure 3)	0	24	3	1	3	0	0	0	31
NJ 37 & Bananier Dr., Toms River (Location 21 on Figure 3)	0	24	9	0	0	0	0	0	33
US 9 & OC 620, Toms River (Location 22 on Figure 3)	0	28	5	0	0	0	0	0	33
OC 571, between Ridge Ave. & OC 547, Manchester (Location 23 on Figure 3)	0	22	3	0	2	0	0	0	27
OC 528, between Whitesville Rd. & OC 626, Lakewood (Location 24 on Figure 3)	0	22	4	0	1	0	0	0	27
<b>Total</b>	<b>1</b>	<b>901</b>	<b>267</b>	<b>15</b>	<b>16</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>1206</b>

**Table 6: Crashes at High-Frequency Crash Locations from 2007-2009, by Day of Week**

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total
NJ 38, US 206 & CR 530, Southampton (Location 1 on Figure 3)	12	16	17	15	11	17	7	95
BC 537 & US 206, Springfield (Location 2 on Figure 3)	5	10	10	13	17	9	10	74
NJ 70 & OC 539, Manchester (Location 3 on Figure 3)	8	17	12	14	12	17	7	87
NJ 37 & OC 39, Toms River (Location 4 on Figure 3)	14	16	15	9	15	8	5	82
OC 639 & OC 528, Jackson (Location 5 on Figure 3)	10	16	5	11	15	7	5	69
NJ 70 & NJ 72, Woodland (Location 6 on Figure 3)	8	5	7	6	5	5	9	45
OC 527 & NJ 70, Toms River (Location 7 on Figure 3)	11	7	5	13	7	9	2	54
BC 530 & BC 616, Pemberton Borough (Location 8 on Figure 3)	11	5	9	10	8	9	4	56
OC 640 & OC 528, Plumsted (Location 9 on Figure 3)	5	6	9	4	4	6	6	40
NJ 70 & OC 637, Toms River (Location 10 on Figure 3)	9	7	6	7	10	5	2	46
US 9, between OC 84 & 92, Toms River (Location 11 on Figure 3)	11	9	8	8	10	7	5	58
NJ 70 & OC 2, Manchester (Location 12 on Figure 3)	11	7	7	7	3	8	7	50
OC 527 & OC 622, Toms River (Location 13 on Figure 3)	8	6	9	3	7	4	5	42
OC 527 & OC 636, Jackson (Location 14 on Figure 3)	4	13	4	8	3	3	9	44
BC 530 & Club House Rd., Pemberton (Location 15 on Figure 3)	9	6	5	8	8	5	6	47
NJ 70 & NJ 37, Lakehurst (Location 16 on Figure 3)	5	7	10	4	8	3	2	39
OC 527 & OC 59, Toms River (Location 17 on Figure 3)	6	9	2	3	5	4	1	30
NJ 70 & US 9, Toms River (Location 18 on Figure 3)	6	11	14	3	8	2	5	49
NJ 70 & OC 571, Manchester (Location 19 on Figure 3)	8	8	7	8	7	7	3	48
OC 571 & OC 547, Manchester (Location 20 on Figure 3)	6	1	5	5	3	6	5	31
NJ 37 & Bananier Dr., Toms River (Location 21 on Figure 3)	5	3	9	3	8	5		33
US 9 & OC 620, Toms River (Location 22 on Figure 3)	4	4	3	9	8	2	3	33
OC 571, between Ridge Ave. & OC 547, Manchester (Location 23 on Figure 3)	2	9	6	1	4	0	5	27
OC 528, between Whitesville Rd. & OC 626, Lakewood (Location 24 on Figure 3)	7	5	6	2	4	2	1	27
<b>Total</b>	<b>185</b>	<b>203</b>	<b>190</b>	<b>174</b>	<b>190</b>	<b>150</b>	<b>114</b>	<b>1206</b>

## Traffic Counts

This study was performed with the benefit of several traffic counts performed at gates to Joint Base McGuire-Dix-Lakehurst and various other locations throughout the study area. In total, there were 38 traffic count locations, among which were: nine gate locations; 19 locations with turning movement counts; and, ten locations with counts taken by automatic traffic recorders. These locations are mapped in Figure 4 and discussed below.

## Existing Counts

### Turning Movement Counts

Turning movement counts provide detailed information about the flow of traffic through an intersection. For each approach to an intersection, they provide information on the number of right and left turns, through-movements, and pedestrian crossings. Because they are performed manually, the turning movement counts used in this study are limited to morning and afternoon counts taken on weekday in August, September, or October 2010.

A total of 19 turning movement counts have been performed for use in calibrating the model used in the regional traffic analysis that was completed as a part of this study (see the section of this report entitled *Impact Analysis*). The count locations are mapped in Figure 4 and listed below:

- CR 528 & CR 571 in Jackson Township
  - Performed on August 31, 2010
  - Location 16 on Figure 4
  - Detailed in Appendix 2
- South Stump Tavern Road & CR 528 in Jackson Township
  - Performed on August 31, 2010
  - Location 15 on Figure 4
  - Detailed in Appendix 2
- South Stump Tavern Road & CR 571 in Jackson Township
  - Performed on October 19, 2010
  - Location 1 on Figure 4
  - Detailed in Appendix 2
- CR 537 & CR 640 in Jackson Township
  - Performed on October 27, 2010
  - Location 3<sup>10</sup> on Figure 4
  - Detailed in Appendix 2

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<sup>10</sup> This location is not within five miles of Joint Base McGuire-Dix-Lakehurst. However, it has been included in this study because it is a major decision point for traffic travelling to the Joint Base.



- CR 527 & CR 638 in Jackson Township
  - Performed on October 28, 2010
  - Location 2<sup>11</sup> on Figure 4
  - Detailed in Appendix 2
- NJ Route 70 & NJ Route 37 in Lakehurst Borough
  - Performed on September 1, 2010
  - Location 18 on Figure 4
  - Detailed in Appendix 2
- NJ Route 70 & CR 547 in Lakehurst Borough
  - Performed on October 20, 2010
  - Location 4 on Figure 4
  - Detailed in Appendix 2
- CR 547 & CR 571 in Manchester Township
  - Performed on August 31, 2010
  - Location 17 on Figure 4
  - Detailed in Appendix 2
- CR 537 & CR 665 in North Hanover Township
  - Performed on September 1, 2010
  - Location 19 on Figure 4
  - Detailed in Appendix 2
- CR 528 & CR 640 in Plumsted Township
  - Performed on August 31, 2010
  - Location 20 on Figure 4
  - Detailed in Appendix 2
- CR 687 & CR 616 in Pemberton Borough
  - Performed on September 2, 2010
  - Location 21 on Figure 4
  - Detailed in Appendix 2
- CR 539 & CR 640 in Plumsted Township
  - Performed on October 19, 2010
  - Location 5 on Figure 4
  - Detailed in Appendix 2
- CR 545 & CR 667 in Pemberton Township
  - Performed on October 20, 2010
  - Location 7 on Figure 4
  - Detailed in Appendix 2

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<sup>11</sup> This location is not within five miles of Joint Base McGuire-Dix-Lakehurst. However, it has been included in this study because it is a major decision point for traffic travelling to the Joint Base.

- CR 530 & CR 645 in Pemberton Township
  - Performed on October 20, 2010
  - Location 8 on Figure 4
  - Detailed in Appendix 2
- CR 669 & CR 630 in Pemberton Township
  - Performed on October 21, 2010
  - Location 6 on Figure 4
  - Detailed in Appendix 2
- CR 537 & CR 545 in Springfield Township
  - Performed on September 1, 2010
  - Location 24 on Figure 4
  - Detailed in Appendix 2
- CR 670 & CR 537 in Springfield Township
  - Performed on September 1, 2010
  - Location 22 on Figure 4
  - Detailed in Appendix 2
- CR 670 & CR 537 in Springfield Township
  - Performed on September 1, 2010
  - Location 23 on Figure 4
  - Detailed in Appendix 2
- CR 537 & NJ Route 68 in Springfield Township
  - Performed on October 19, 2010
  - Location 9 on Figure 4
  - Detailed in Appendix 2

Table 7 reports total volume by approach for each of the turning movement count locations. Complete details are provided in Appendix 2.

<b>Table 7: Total Peak-Hour Volume by Approach of Turning Movement Count Locations</b>				
	<b>Southbound</b>	<b>Westbound</b>	<b>Northbound</b>	<b>Eastbound</b>
CR 528 & CR 571 in Jackson Township (Location 16 on Figure 4)	279 (AM) 625 (PM)	115 (AM) 187 (PM)	549 (AM) 357 (PM)	164 (AM) 200 (PM)
S. Stump Tavern Rd & CR 528 in Jackson Twp. (Location 15 on Figure 4)	10 (AM) 10 (PM)	127 (AM) 192 (PM)	121 (AM) 110 (PM)	207 (AM) 315 (PM)
S. Stump Tavern Rd & CR 571 in Jackson Twp. (Location 1 on Figure 4)	223 (AM) 566 (PM)	0 (AM) 0 (PM)	543 (AM) 358 (PM)	81 (AM) 64 (PM)
CR 537 & CR 640 in Jackson Township (Location 3 on Figure 4)	10 (AM) 35 (PM)	316 (AM) 610 (PM)	204 (AM) 55 (PM)	327 (AM) 404 (PM)
CR 527 & CR 638 in Jackson Township (Location 2 on Figure 4)	282 (AM) 979 (PM)	166 (AM) 228 (PM)	1022 (AM) 375 (PM)	136 (AM) 71 (PM)
NJ Route 70 & NJ Route 37 in Lakehurst Borough (Location 18 on Figure 4)	0 (AM) 0 (PM)	595 (AM) 942 (PM)	621 (AM) 629 (PM)	945 (AM) 1611 (PM)
NJ Route 70 & CR 547 in Lakehurst Borough (Location 4 on Figure 4)	401 (AM) 882 (PM)	1135 (AM) 1143 (PM)	96 (AM) 92 (PM)	879 (AM) 903 (PM)
CR 547 & CR 571 in Manchester Township (Location 17 on Figure 4)	264 (AM) 396 (PM)	481 (AM) 262 (PM)	388 (AM) 635 (PM)	356 (AM) 629 (PM)
CR 537 & CR 665 in North Hanover Township (Location 19 on Figure 4)	52 (AM) 90 (PM)	347 (AM) 338 (PM)	133 (AM) 63 (PM)	260 (AM) 435 (PM)
CR 528 & CR 640 in Plumsted Township (Location 20 on Figure 4)	71 (AM) 194 (PM)	221 (AM) 256 (PM)	62 (AM) 57 (PM)	182 (AM) 261 (PM)
CR 687 & CR 616 in Pemberton Borough (Location 21 on Figure 4)	315 (AM) 957 (PM)	254 (AM) 389 (PM)	517 (AM) 379 (PM)	0 (AM) 0 (PM)
CR 539 & CR 640 in Plumsted Township (Location 5 on Figure 4)	182 (AM) 560 (PM)	32 (AM) 61 (PM)	639 (AM) 257 (PM)	25 (AM) 72 (PM)
CR 545 & CR 667 in Pemberton Township (Location 7 on Figure 4)	314 (AM) 1102 (PM)	119 (AM) 98 (PM)	763 (AM) 560 (PM)	152 (AM) 235 (PM)
CR 530 & CR 645 in Pemberton Township (Location 8 on Figure 4)	193 (AM) 614 (PM)	468 (AM) 746 (PM)	559 (AM) 283 (PM)	435 (AM) 683 (PM)
CR 669 & CR 630 in Pemberton Township (Location 6 on Figure 4)	90 (AM) 450 (PM)	2 (AM) 1 (PM)	501 (AM) 235 (PM)	533 (AM) 389 (PM)
CR 537 & CR 545 in Springfield Township (Location 24 on Figure 4)	446 (AM) 397 (PM)	340 (AM) 663 (PM)	315 (AM) 336 (PM)	401 (AM) 419 (PM)
CR 670 & CR 537 in Springfield Township (Location 22 on Figure 4)	227 (AM) 124 (PM)	388 (AM) 898 (PM)	0 (AM) 0 (PM)	554 (AM) 327 (PM)
CR 670 & CR 537 in Springfield Township (Location 23 on Figure 4)	0 (AM) 0 (PM)	254 (AM) 557 (PM)	104 (AM) 342 (PM)	794 (AM) 409 (PM)
CR 537 & NJ Route 68 in Springfield Township (Location 9 on Figure 4)	503 (AM) 247 (PM)	276 (AM) 426 (PM)	204 (AM) 520 (PM)	383 (AM) 257 (PM)

### Automatic Traffic Recorder Counts

Automatic traffic recorder counts were performed at ten locations and used to calibrate the transportation model used in the regional traffic analysis that was performed as a part of this study (see *Impact Analysis*, below). These counts are summarized in Table 8. Complete information is provided in Appendix 2.

**Table 8: Summarized Automatic Traffic Recorder Counts, Daily Total**

Location	NB/EB	SB/WB
NJ 68, South of CR 537, Springfield (Location 25 on Figure 4)	3034	3136
CR 545, South of CR 537, Springfield (Location 10 on Figure 4)	5871	5539
CR 667, South of CR 616, New Hanover (Location 26 on Figure 4)	3099	2929
CR 630, West of Joint Base, Pemberton Township (Location 11 on Figure 4)	2994	2753
CR 530, between CR 645 and CR 545, Pemberton Township (Location 27 on Figure 4)	7307	7256
CR 670, West of NJ 68, Springfield (Location 12 on Figure 4)	3035	2841
CR 539, South of Joint Base, Manchester (Location 13 on Figure 4)	5419	4944
CR 640, South of CR 537, Jackson (Location 28 on Figure 4)	1661	1695
CR 547, South of CR 571, Manchester (Location 29 on Figure 4)	7569	6331
NJ 70, West of NJ 37, Lakehurst (Location 14 on Figure 4)	N/A	15703

Note: Figures represent daily total traffic on a Tuesday for all locations except Location 14. Location 14 figure represents daily total traffic on a Thursday.

## Gate Traffic Counts

Traffic counts were performed at nine of the ten<sup>12</sup> gates to Joint Base McGuire-Dix-Lakehurst during November and December 2010<sup>13</sup>. Table 9 provides a summary of the weekday<sup>14</sup> gate traffic counts. The gate traffic count locations are mapped in Figure 4.

**Table 9: Summarized Gate Traffic Counts**

Direction	Browns Mills Gate (Texas Gate)		Dix Main/68 Gate		Checkpoint 9 (Commercial Gate 9)		McGuire Gate (McGuire Main Gate)		Pemberton Gate (Juliestown Gate)		Wrightstown Gate		Gate 4 (Lakehurst Commercial Gate)		Gate 3 (Pinehurst Gate)		Gate 1 (Lakehurst Main Gate)		All Gates (Total)	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
12:00 AM	9	21	21	24	17	22	40	49	0	0	11	33	0	0	0	0	1	1	99	150
1:00 AM	9	7	8	12	10	12	33	28	0	0	11	8	0	0	0	0	2	3	73	70
2:00 AM	0	4	3	3	11	8	25	16	0	0	3	0	0	0	0	0	3	0	45	31
3:00 AM	1	29	20	1	11	4	29	17	0	0	14	0	0	0	0	0	1	0	76	51
4:00 AM	9	29	19	10	23	8	45	14	0	0	18	0	0	0	0	0	14	2	128	63
5:00 AM	226	71	136	24	121	42	199	27	21	8	76	1	0	1	11	1	141	13	931	188
6:00 AM	502	128	462	55	449	91	470	65	235	49	314	76	8	8	174	165	395	19	3009	656
7:00 AM	623	211	843	104	471	159	486	195	468	101	586	146	250	10	238	252	446	83	4411	1261
8:00 AM	368	231	424	126	247	173	376	227	196	122	333	182	93	29	1	2	363	67	2401	1159
9:00 AM	343	197	248	135	192	130	279	177	138	110	240	178	49	21	0	0	149	66	1638	1014
10:00 AM	287	192	235	120	194	144	236	190	89	81	207	197	33	36	0	0	115	124	1396	1084
11:00 AM	366	379	195	207	158	147	338	426	128	146	361	523	35	48	0	0	152	500	1733	2376
12:00 PM	503	286	205	224	223	211	368	365	141	137	541	524	44	42	0	0	274	196	2299	1985
1:00 PM	299	267	201	243	168	223	300	247	124	113	351	328	38	34	0	0	207	190	1688	1645
2:00 PM	277	231	184	234	155	265	278	247	106	141	221	332	15	45	1	2	103	206	1340	1703
3:00 PM	320	417	155	431	145	386	236	492	142	258	252	461	16	52	83	60	80	397	1429	2954
4:00 PM	281	498	120	853	136	480	200	670	183	435	229	780	12	9	187	186	65	589	1413	4500
5:00 PM	203	348	127	424	47	438	196	470	117	176	212	459	2	2	44	46	61	338	1009	2701
6:00 PM	127	194	107	219	11	256	189	315	0	0	145	287	1	0	0	0	32	116	612	1387
7:00 PM	79	149	70	139	65	133	130	231	0	0	136	211	2	1	0	0	22	59	504	923
8:00 PM	51	114	46	100	149	13	115	144	0	0	92	75	2	1	0	0	15	43	470	490
9:00 PM	9	111	49	58	115	0	84	72	0	0	56	90	0	0	0	0	18	35	331	366
10:00 PM	0	73	48	32	103	0	79	87	0	0	46	49	0	0	0	0	13	5	289	246
11:00 PM	0	63	38	35	67	0	51	114	0	0	30	33	0	0	0	0	5	7	191	252
<b>Total</b>	<b>4892</b>	<b>4250</b>	<b>3964</b>	<b>3813</b>	<b>3288</b>	<b>3345</b>	<b>4782</b>	<b>4885</b>	<b>2088</b>	<b>1877</b>	<b>4485</b>	<b>4973</b>	<b>600</b>	<b>339</b>	<b>739</b>	<b>714</b>	<b>2677</b>	<b>3059</b>	<b>27515</b>	<b>27255</b>

<sup>12</sup> Traffic counts were not taken for the gate that provides access to the Falcon Courts North housing area, since it is self-contained and does not provide access to other areas of Joint Base McGuire-Dix-Lakehurst.

<sup>13</sup> Counts for Dix Main/68 Gate, located at the intersection of Burlington County Route 616 and NJ Route 68 in New Hanover Township, were performed in early December 2010. Counts at all other gates were performed in November 2010.

<sup>14</sup> Counts at all gates except Gate 4 (Lakehurst Commercial Gate), Gate 3 (Pinehurst Gate) and Gate 1 (Lakehurst Main Gate) were taken on a Tuesday. Counts for Gate 4 (Lakehurst Commercial Gate), Gate 3 (Pinehurst Gate) and Gate 1 (Lakehurst Main Gate) were taken on a Thursday.

As can be seen in Table 9, the total inbound traffic of all gates (i.e., the sum of inbound traffic at all gates) peaks from 7:00 a.m. to 8:00 a.m. The total outbound traffic of all gates peaks from 4:00 p.m. to 5:00 p.m. In addition to these morning and afternoon peaks, there is also a spike in total gate traffic during the mid-day period, from 11:00 a.m. to 1:00 p.m., which is likely the result of non-resident personnel of Joint Base McGuire-Dix-Lakehurst taking lunches or running mid-day errands off of the Joint Base.

In addition to information on the peak hours of inbound and outbound traffic, the gate traffic counts also yield information on the overall use of gates to Joint Base McGuire-Dix-Lakehurst. Table 10 provides the percentage of total gate usage that is represented by each of the nine gates where traffic counts were performed.

**Table 10: Percent of Total Gate Use**

	Browns Mills Gate (Texas Gate)	Dix Main/68 Gate	Checkpoint 9 (Commercial Gate 9)	McGuire Gate (McGuire Main Gate)	Pemberton Gate (Juliestown Gate)	Wrightstown Gate	Gate 4 (Lakehurst Commercial Gate)	Gate 3 (Pinehurst Gate)	Gate 1 (Lakehurst Main Gate)	All Gates (Total)
Total (%)	16.7	14.2	12.1	17.7	7.2	17.3	1.7	2.7	10.5	100.0

### Trip Rates

Trip rates for Joint Base McGuire-Dix-Lakehurst have been calculated by dividing the count of total gate traffic by an estimate of the Joint Base’s typical weekday population present<sup>15</sup>. The result of this operation assigns a discrete number of trips generated per part of population. Tables 11 and 12 provide complete information for morning and afternoon peak hours, respectively.

**Table 11: Morning Peak Hour Trip Rates**

Morning Peak (7:00 a.m. to 8:00 a.m.)	Total Trips	/	Population Present	=	Trips per Part of Population Present
Inbound	4,411	/	30,417	=	0.15
Outbound	1,261	/	30,417	=	0.04
Total	5,672	/	30,417	=	0.19

<sup>15</sup> The estimated typical weekday population present is a subset of the total Joint Base McGuire-Dix-Lakehurst population of 42,067. This estimate has been prepared with assistance from Department of Defense personnel.

**Table 12: Afternoon Peak Hour Trip Rates**

Afternoon Peak (4:00 p.m. to 5:00 p.m.)	Total Trips	/	Population Present	=	Trips per Part of Population Present
Inbound	1,413	/	30,417	=	0.05
Outbound	4,500	/	30,417	=	0.15
Total	5,913	/	30,417	=	0.19

As has been shown above, the total trip rates for the morning and afternoon peak hours are 0.19 trips per part of population present. As would be expected, the number of inbound trips per part of population present is higher than that of outbound trips during the morning peak hour. The reverse accurately describes the number of outbound trips per part of population present during the afternoon peak hour.

In addition to the above, Table 13 provides details on the daily total trip rate. The inbound and outbound trips per part of population present both equal 0.90. This is reflective of the fact that the numbers of inbound and outbound trips made through the gates of Joint Base McGuire-Dix-Lakehurst in a typical 24 hour period are similar. These calculated trip generation rates compare favorably to the trip rates that are published in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 8<sup>th</sup> Edition.

**Table 13: Daily Total Trip Rates**

Daily Total	Total Trips	/	Population Present	=	Trips per Part of Population Present
Inbound	27,515	/	30,417	=	0.90
Outbound	27,255	/	30,417	=	0.90
Total	54,770	/	30,417	=	1.80

## Public Transportation

The study area's existing motorized public transportation network comprises bus routes operated by New Jersey Transit (NJ Transit), Burlington County Transportation Services, Ocean County Transportation Services, and Joint Base McGuire-Dix-Lakehurst. These services are mapped in Figure 5 and discussed below.

### NJ Transit Bus Service

The study area is served by two New Jersey Transit bus lines, namely: Route 317 and Route 559.

#### Route 559

Route 559 connects Lakewood Township with Atlantic City and intermediate points. It traverses the study area via the US Route 9 Corridor in Lakewood and Toms River townships. This route operates daily with 23 southbound buses and 22 northbound buses at average headways of approximately 66 minutes. The first southbound bus originates at 12:20 a.m., and the first northbound bus originates at 12:30 a.m. The average travel time between the termini is approximately 150 minutes. Time-points in

the study area include US Route 9 at Ocean County Route 571 in Toms River and the Toms River Park and Ride, which is near the southeastern corner of US Route 9 and Ocean County Route 527.

Route 559 provides connecting service to NJ Transit Route 317, which is the only other NJ Transit bus route that services the study area. This connection is provided at the Lakewood Bus Terminal in Lakewood Township. The average wait to connect to eastbound buses on Route 317 is 27 minutes. The average wait to connect to westbound buses on Route 317 is 42 minutes. Further details on Route 317 are provided below.

### **Route 317**

Route 317 connects Philadelphia and Camden with Asbury Park and intermediate points, including Joint Base McGuire-Dix-Lakehurst. It traverses the study area primarily via Ocean County routes 528 and 616, Burlington County routes 616, 545 and 530, and NJ Route 38. On weekdays, this route operates with nine eastbound departures and ten westbound departures at average headways of approximately 115 minutes. The first eastbound bus originates in Philadelphia at 4:48 a.m., and the first westbound bus originates in New Hanover Township at 5:27 a.m. The frequency of buses before 9:00 a.m. is reduced on weekends, with one less eastbound and two less westbound departures.

The average travel time between the Philadelphia and Asbury Park termini is approximately 232 minutes, although several buses terminate or originate in the study area. Between the Fort Dix Transportation Building in New Hanover Township and Philadelphia, the average travel time is 113 minutes. The average travel time between the Fort Dix Transportation Building and Asbury Park is 119 minutes. In addition to its service to Joint Base McGuire-Dix-Lakehurst, Route 317 also serves Burlington County College's Pemberton Township campus. Direct, regional connections to New York City and intermediate points are available from Asbury Park via NJ Transit's North Jersey Coast commuter rail service. Travel time from Asbury Park to New York City is approximately two hours. In addition, connections to Trenton and intermediate points are available from the Walter Reed Transportation Center in Camden via NJ Transit's RiverLine light rail service. Travel time from Camden to Trenton is approximately one hour.

Please note that because Route 317 traverses Joint Base McGuire-Dix-Lakehurst, increased security is present along this route. NJ Transit indicates that passengers traveling through the Joint Base in either Asbury Park- or Philadelphia-bound buses may be required to show photo identification to military police. Those passengers whose destination is a point within the Joint Base will be required to produce military identification. In the event that a passenger cannot produce sufficient identification, the passenger is subject to removal by military police from the bus, and may not be permitted to continue its journey.



## **Burlington County Transportation Services**

The study area is served by Burlington County Transportation Services' BurLink bus service, namely: BurLink Route 1.

### **BurLink Route 1**

BurLink Route 1 connects Pemberton Township with the City of Beverly and the Beverly-Edgewater Park Station of NJ Transit's RiverLine light rail system. Intermediate points served by BurLink Route 1 include Mount Holly, Lumberton, Westampton, and Willingboro. It traverses the study area primarily via Burlington County routes 530, 630, 645, 646, 668, and 687, and operates on weekdays from 6:40 a.m. to 6:40 p.m., with limited service between 10:40 a.m. and 12:40 p.m., and after 5:40 p.m. A total of fourteen east- and westbound departures are made per day with headways of one hour, except during limited service periods.

The scheduled travel time between the Beverly and Pemberton Township termini is two hours. While the service does not operate within Joint Base McGuire-Dix-Lakehurst, it services Burlington County College and the Browns Mills and County Lakes sections of Pemberton Township.

## **Ocean County Transportation Services**

Four routes of Ocean County Transportation Services' Ocean Ride shuttle bus service provide service to or within the immediate vicinity of Joint Base McGuire-Dix-Lakehurst. Among these routes are: Ocean Ride Route 1; Ocean Ride Route 1A; Ocean Ride Route 2; and, Ocean Ride Route 10.

### **Ocean Ride Route 1**

Ocean Ride Route 1 connects residential areas of Manchester and Berkeley townships with local and regional destinations, such as: Crestwood Village Shopping Center; Holiday City Mini Mall; Toms River Park and Ride; Toms River Shopping Center; Saint Barnabas Hospital/Community Medical Center; Ocean County Vocational School; and, the Ocean County Mall in Toms River Township. The service operates on Monday, Wednesday, and Fridays with one eastbound departure at 8:30 a.m., and two westbound departures from the Ocean County Mall at 10:30 a.m. and 1:50 p.m.

### **Ocean Ride Route 1A**

Ocean Ride Route 1A connects residential areas of Manchester Township with local and regional destinations, such as the: Whiting Commons Shopping Center; Ocean County Library (Manchester Branch); Manchester Municipal Complex; Downtown Lakehurst; and, the Ocean County Mall in Toms River Township. The service operates from 8:45 a.m. to 2:40 p.m. on Monday, Wednesday, and Fridays. There are two eastbound departures, and two westbound departures. Eastbound departures are at 8:45 a.m. and 11:15 a.m. Westbound departures from the Ocean County Mall are at 10:00 a.m. and 1:45 p.m.

## **Ocean Ride Route 2**

Ocean Ride Route 2 connects Joint Base McGuire-Dix-Lakehurst, Downtown Lakehurst, and residential areas of Manchester Township with local and regional destinations, such as: Manchester Municipal Complex; Lakehurst Mall; Holiday City Mini Mall; Toms River Park and Ride; Saint Barnabas Hospital/Community Medical Center; and, the Ocean County Mall in Toms River Township. The service operates on Tuesdays and Thursdays with one eastbound departure at 9:00 a.m., and two westbound departures from the Ocean County Mall at 11:45 a.m. and 2:00 p.m.

## **Ocean Ride Route 10**

Ocean Ride Route 10 operates on Tuesdays. It connects residential areas of Plumsted Township with local and regional destinations, such as: Plumsted Municipal Complex; Ocean County Library (Plumsted Branch); Downtown Plumsted (New Egypt); and, Jackson Plaza Shopping Center, where the service terminates. The service operates with one eastbound departure to Jackson Plaza Shopping Center at 9:15 a.m., and returns to Plumsted at 12:00 p.m.

On the first Tuesday of January, March, May, July, September, and December, the service continues from Jackson Plaza Shopping Center to the Ocean County Mall in Toms River. The shuttle begins its return trip from the Ocean County Mall to Plumsted at 1:00 p.m.

On the first Tuesday of February, April, June, August, and October, the service continues from Jackson Plaza Shopping Center to Lakewood and Brick townships. Among the key destinations served on this route continuation are the NJ Transit Bus Terminal and Ocean County Park in Lakewood Township, and the Kohl's Plaza and Brick Plaza shopping centers in Brick Township. The shuttle begins its return trip from Brick Plaza to Plumsted at 1:00 p.m.

## **Joint Base Shuttle**

The Joint Base Shuttle operates exclusively within the boundaries of Joint Base McGuire-Dix-Lakehurst. It serves key destinations, such as the: Commissary; Billeting; Regional Training Center East; Club Dix; Jon Mann Park; Mills Clinic; NCO Academy; Dorms; and, Troop Medical Clinic.

The Joint Base Shuttle runs from 7:00 a.m. to 10:00 p.m. There are three departures per hour, with maximum headways of thirty minutes.

## NJ Transit Rail Service

A future NJ Transit rail service from Manchester Township and Lakehurst Borough to New York's Pennsylvania Station is envisioned. At this stage, a Draft Environmental Impact Statement (DEIS) has been prepared, and various alignment alternatives have been studied and explored by members of a working group from Monmouth, Ocean and Middlesex counties. Among the investigated alternatives were alignments leading from Manchester Township and Lakehurst Borough to: Matawan Borough whence trains would join with NJ Transit's North Jersey Coast Train for direct service to New York; South Brunswick Township whence passengers would connect to New York- or Trenton-bound trains of NJ Transit's Northeast Corridor Line; and, Red Bank Borough whence trains would join with NJ Transit's North Jersey Coast Train for direct service to New York.

On May 27, 2009, NJ Transit issued a press release indicating that county officials have urged NJ Transit to pursue an alignment leading to the Borough of Red Bank. Based on the alternatives that were studied as part of the DEIS, the alignment to Red Bank would make use of existing freight tracks that would be upgraded to accommodate the needs of passenger rail travel. In addition, a spur from Farmingdale Borough to Freehold Township may also be incorporated within this alternative. Figure 5 depicts the Red Bank alignment as it exists in the study area.

## Non-Motorized Transportation

The study area's non-motorized transportation network is composed of: greenways; bikeways; and, multi-purpose trails. The following sections elaborate on these terms, and provide an overview of the regionally-connective facilities that exist within the study area<sup>16</sup>.

### Greenways

Greenways are linear corridors of undeveloped land that facilitate non-motorized connections at the local and regional levels, and may contain bikeways and multi-purpose trails. Regionally-significant greenways of the study area are discussed below.

### Rancocas Creek Greenway

The Rancocas Creek Greenway follows the length of Rancocas Creek as it traverses northern Burlington County. It is in various stages of completion and, when finished, will connect Pemberton Township, Pemberton Borough, Southampton Township, and Eastampton Township with points west via a network of predominantly multi-purpose, off-road trails located in agricultural, open space, and conservation

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<sup>16</sup> Please note that the inventory provided within this report may not be exhaustive. Given the scope of this report, it discusses only existing and regionally-connective facilities that are, at least, partially complete. Planned facilities that are totally incomplete and facilities that are not regionally-connective (i.e., trails contained within parks, open space, or conservation areas) are not discussed.

areas. The greenway will terminate in Delanco Township, Riverside Township, or Delran Township, where it will connect with the planned Delaware River Greenway<sup>17</sup>.

It is envisioned that the Rancocas Creek Greenway connect population centers with natural and recreational areas. One such area is the Burlington County Park System's Historic Smithville Park, which is located at the western limit of the study area in Eastampton Township. Other key areas within the study area portions of the Rancocas Creek Greenway include the population and commercial centers of Pemberton Borough and the Browns Mills section of Pemberton Township, as well as various open space and recreational sites. Figure 6 depicts the Rancocas Creek Greenway project area as it relates to the study area.

Additional details on the Rancocas Creek Greenway are provided in the Delaware Valley Regional Planning Commission's 1996 *Rancocas Creek Greenway Implementation Plan for the Main Stem* and 2009 *Connections: The Regional Plan for a Sustainable Future*, as well as the 2002 *Burlington County Parks and Open Space Master Plan* of the Burlington County Department of Resource Conservation.

### **Barker's Brook Greenway**

Barker's Brook Greenway is a greenway concept that is detailed in the 2002 *Burlington County Parks and Open Space Master Plan*. When realized, the Barker's Brook Greenway will be a spur from the Rancocas Creek Greenway into Springfield Township<sup>18</sup>.

It is envisioned that the greenway provide recreational access to agricultural and cultural landscapes in Springfield Township by means of multi-purpose trails located within abandoned railway rights-of-way and bicycle-compatible roadway improvements. Among the key destinations of the greenway will be: Arney's Mount Friends Meeting House and Burial Ground, a nationally-listed historic site; and, preserved farmland areas. Because it is proximate to the Barker's Brook Greenway project area, access to Pemberton Township High School may also be possible.

Figure 6 depicts the extent of the Barker's Brook Greenway project area. Additional details are provided in the 2002 *Burlington County Parks and Open Space Master Plan* of the Burlington County Department of Resource Conservation.

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<sup>17</sup> The Delaware River Greenway has been planned by the Burlington County Department of Resource Conservation, and is located entirely outside of the study area of this report. Complete details on this greenway are provided in the 2002 *Burlington County Parks and Open Space Master Plan*.

<sup>18</sup> Though unfinished, this report discusses Barker's Brook Greenway since it is associated with the Rancocas Creek Greenway, which is in various stages of completion.

## Bikeways

Bikeways are facilities that provide opportunities for commuting and traveling by bicycle on bicycle-compatible roadways or multi-purpose trails. Regionally-connective bikeways with complete segments are discussed below.

### Pemberton-Mount Holly Bikeway

Mapping contained within the 2002 *Burlington County Parks and Open Space Master Plan* depicts the Pemberton-Mount Holly Bikeway, which is a regionally-connective bikeway that is comprised of multi-purpose trails and bicycle-compatible roadways.

The bikeway is in various stages of completion. When complete, it will provide a recreational and commuter bicycle linkage from Mount Holly Township and Eastampton Township into Pemberton Township and Pemberton Borough. In addition to linking the population and commercial centers of Pemberton Borough and the Browns Mills section of Pemberton Township, the bikeway will connect, such destinations as: Historic Smithville Park at the western edge of the study area in Eastampton Township; and, various other open space and recreational sites. In addition, northern spurs from the bikeway will provide direct connections to Joint Base McGuire-Dix-Lakehurst, Fort Dix Elementary School, Marcus W Newcomb Middle School, and Helen A. Fort Middle School via CR 616. A southern spur along the bicycle compatible CR 646 will link the bikeway with Brendan T. Byrne State Park.

Existing sections include the multi-purpose Pemberton Rail Trail (discussed in *Multi-Purpose Trails*), and bicycle-compatible roadways. The existing and proposed sections of the Pemberton-Mount Holly Bikeway are depicted in Figure 6.

### New Egypt Bike Trail

The feasibility of the New Egypt Bike Trail has been studied by the Ocean County Department of Planning, and its construction is recommended<sup>19</sup> by the March 5, 2010 Draft Circulation Element of the Plumsted Township Master Plan. If completed, the New Egypt Bike Trail would likely include a multi-purpose trail and is, therefore, discussed in *Multi-Purpose Trails*, below.

## Multi-Purpose Trails

Multi-purpose trails are off-road trails that accommodate non-motorized transportation. Depending on the type of trail surface, they may be used by pedestrians, bicyclists, equestrians, and in-line skaters, among others. The study area's regionally-connective trails are discussed below.

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<sup>19</sup> The New Egypt Bike Trail is incomplete and still in the planning stages. However, it is included in this discussion of existing conditions on account of its significance as a regionally-connective non-motorized transportation linkage and a firm commitment local, regional, and private commitment to its realization.

## Pemberton Rail Trail

The Pemberton Rail Trail is a multi-purpose trail that has been located within an abandoned railway right-of-way. It has been created by with the assistance of the Pemberton Rotary Club and functions as part of a northern spur of the Mount Holly-Pemberton Bikeway.

The Pemberton Rail Trail is entirely located in Pemberton Township. Its eastern terminus is located at the intersection of Indian Trail<sup>20</sup> and Birmingham Road. Its western terminus is located along CR 616, between CR 668 and the Pemberton Township-Pemberton Borough municipal line.

Given the incomplete status of the Mount Holly-Pemberton Bikeway, the Pemberton Rail Trail is currently more of a recreational asset than it is an asset to commuters. However, once the bikeway is complete, the rail trail's value as a commuter linkage will increase as the population and commercial center of Pemberton Borough<sup>21</sup> is connected with western points.

Figure 6 depicts the location of the Pemberton Rail Trail.

## New Egypt Bike Trail

Though its name suggests use by bicycles, the proposed New Egypt Bike Trail would likely include a multi-purpose trail and is, therefore, discussed under the rubric of *Multi-Purpose Trails*.

The March 5, 2010 Draft Circulation Element of the Plumsted Township Master Plan proposes the construction of the New Egypt Bike Trail for bicycle and pedestrian usage within a former railway right-of-way that is currently used by JCP&L. The multi-purpose trail would connect the population and commercial center of New Egypt with northerly-situated civic uses, including: the Plumsted Township Municipal Building; Plumsted Township High School; Plumsted Township Middle School; Plumsted Township Primary School; and, the Plumsted Branch of the Ocean County Library. Its southern terminus would be located at CR 528. Its northern terminus would initially be located at CR 537, though future linkages to Monmouth County are envisioned.

Figure 6 depicts the proposed location of the New Egypt Bike Trail.

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<sup>20</sup> Indian Trail is a local street.

<sup>21</sup> While the Pemberton Rail Trail does not enter Pemberton Borough, it traverses the area directly north of the Borough and connections to the Borough are possible via CR 616, which is the principal north-south thoroughfare and commercial artery of the Borough.

## Commuter Patterns

An online travel survey was administered during the month of November 2010. This survey collected a range of information on local commuting patterns around Joint Base McGuire-Dix-Lakehurst. While both residents and non-residents were surveyed, the responses of residents are withheld from this study due to an insufficient sample size<sup>22</sup>. There were, however, a sufficient number of responses collected from non-residents of Joint Base McGuire-Dix-Lakehurst. Their responses are summarized provided below.

Responses from Non-Residents of Joint Base McGuire-Dix-Lakehurst: A total of 769 responses were received from military, civilian and contracted personnel not residing on Joint Base McGuire-Dix-Lakehurst. Based on an estimated maximum of 34,430 non-resident personnel<sup>23</sup>, the number of responses yields a statistically valid sample size.

The survey provided valuable information on the commuting patterns of non-resident personnel. Key among this is details on the zip codes from which non-resident personnel begin their journeys to the Joint Base. Figure 7 provides a general overview of the zip codes from which non-residents begin their journeys to the Joint Base. Table 14 provides additional information on this subject.

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<sup>22</sup> A total of 123 responses from Joint Base residents were collected, whereas the total number of Joint Base residents is 7,637. The number of respondents is insufficient to yield reliable survey results.

<sup>23</sup> This number is the difference of registered individuals working on the Joint Base (42,067), less registered individuals residing on the Joint Base (7,637). It should be noted that the not all non-resident personnel work on the base at the same time, some may not work regularly, and some may work less than a full-time schedule.

Table 14: Place of Journey Origin, by ZIP Code

Zip Code	Post Office Name	State	Survey Respondents in ZIP Code	Estimated Non-Resident Joint Base Personnel Originating in Zip Code (Margin of Error: ≤ 4%)	Average Reported Journey to Joint Base (Miles)
08015	Browns Mills	NJ	57	2,552	10
08060	Mount Holly	NJ	51	2,283	16
08753	Toms River	NJ	40	1,791	13
08068	Pemberton	NJ	27	1,209	12
08054	Mount Laurel	NJ	26	1,164	24
08053	Marlton	NJ	23	1,030	30
08088	Vincetown	NJ	23	1,030	23
08527	Jackson	NJ	22	985	12
08016	Burlington	NJ	20	895	20
08048	Lumberton	NJ	20	895	17
08755	Toms River	NJ	20	895	10
08759	Manchester	NJ	20	895	8
08055	Medford	NJ	16	716	30
08731	Forked River	NJ	14	627	19
08005	Barnegat	NJ	12	537	28
08721	Bayville	NJ	12	537	17
08757	Toms River	NJ	11	492	8
08050	Manahawkin	NJ	10	448	35
08022	Columbus	NJ	9	403	12
08722	Beachwood	NJ	9	403	13
08562	Wrightstown	NJ	8	358	6
08641	Trenton	NJ	8	358	4
08081	Sicklerville	NJ	7	313	47
08046	Willingboro	NJ	7	313	22
08733	Lakehurst	NJ	7	313	7
07728	Freehold	NJ	7	313	20
07731	Howell	NJ	7	313	22
08533	New Egypt	NJ	7	313	12
08701	Lakewood	NJ	7	313	8
08724	Brick	NJ	7	313	22
08742	Pt. Pleasant Beach	NJ	7	313	22
08505	Bordentown	NJ	6	269	18
08648	Trenton	NJ	6	269	41
08690	Trenton	NJ	6	269	30
08511	Cookstown	NJ	6	269	5
08734	Lanoka Harbor	NJ	6	269	18
Various	Other <sup>24</sup>	NJ, PA, DE, NY	218	9,760	Not Reported
<b>Total</b>			<b>769</b>	<b>34,430</b>	<b>23</b>

<sup>24</sup> Complete details are not given for this category due to the small number of respondents in individual zip codes. In addition, it includes survey respondents (2 out of 769, or 0.26 percent) who did not know the zip code from which they begin their journey to the Joint Base.



Regarding the days on which survey respondents access Joint Base McGuire-Dix-Lakehurst, 98.0 percent indicated that they accessed the Joint Base on weekdays, and total of 12.6 percent indicated that they access the base on weekends. The day with the most reported access is generally Wednesday, with 98.0 percent of the respondents indicating that they access the Joint Base.

As shown in Table 15, on the following page, the survey also collected details on the usage of gates to the Joint Base.

**Table 15: Use of Gates for Entry, Percent of Total Use by ZIP Code of Journey Origin of Non-Resident Personnel**

Zip Code	Post Office Name	State	Bolling Gate (Falcon Courts North)	Browns Mills Gate (Texas Gate)	Dix Main/68 Gate	Gate 1 (Lakehurst Main Gate)	Gate 3 (Pinehurst Gate)	Gate 4 (Lakehurst Commercial Gate)	McGuire Gate (McGuire Main Gate)	Pemberton Gate (Juliestown Gate)	Wrightstown Gate	Unknown	Total
08015	Browns Mills	NJ	0.0	80.7	0.0	5.3	7.0	0.0	7.0	0.0	0.0	0.0	100.0
08060	Mount Holly	NJ	0.0	0.0	19.6	3.9	3.9	0.0	54.9	9.8	7.8	0.0	100.0
08753	Toms River	NJ	0.0	2.5	0.0	65.0	20.0	12.5	0.0	0.0	0.0	0.0	100.0
08068	Pemberton	NJ	0.0	3.7	40.7	0.0	14.8	0.0	14.8	25.9	0.0	0.0	100.0
08054	Mount Laurel	NJ	3.8	7.7	11.5	3.8	3.8	0.0	53.8	11.5	3.8	0.0	100.0
08053	Marlton	NJ	0.0	0.0	34.8	17.4	26.1	0.0	8.7	13.0	0.0	0.0	100.0
08088	Vincentown	NJ	0.0	8.7	17.4	4.3	39.1	0.0	13.0	17.4	0.0	0.0	100.0
08527	Jackson	NJ	0.0	0.0	0.0	59.1	0.0	27.3	4.5	0.0	0.0	9.1	100.0
08016	Burlington	NJ	5.0	0.0	35.0	15.0	0.0	0.0	40.0	0.0	5.0	0.0	100.0
08048	Lumberton	NJ	0.0	5.0	15.0	5.0	10.0	0.0	55.0	5.0	5.0	0.0	100.0
08755	Toms River	NJ	0.0	0.0	0.0	75.0	5.0	10.0	10.0	0.0	0.0	0.0	100.0
08759	Manchester	NJ	0.0	5.0	0.0	45.0	45.0	5.0	0.0	0.0	0.0	0.0	100.0
08055	Medford	NJ	0.0	0.0	31.3	18.8	18.8	0.0	18.8	12.5	0.0	0.0	100.0
08731	Forked River	NJ	0.0	0.0	0.0	78.6	14.3	7.1	0.0	0.0	0.0	0.0	100.0
08005	Barneget	NJ	0.0	25.0	0.0	58.3	16.7	0.0	0.0	0.0	0.0	0.0	100.0
08721	Bayville	NJ	0.0	0.0	0.0	83.3	8.3	8.3	0.0	0.0	0.0	0.0	100.0
08757	Toms River	NJ	0.0	0.0	0.0	72.7	9.1	9.1	9.1	0.0	0.0	0.0	100.0
08050	Manahawkin	NJ	0.0	0.0	0.0	30.0	60.0	0.0	10.0	0.0	0.0	0.0	100.0
08022	Columbus	NJ	0.0	0.0	11.1	11.1	11.1	0.0	55.6	11.1	0.0	0.0	100.0
08722	Beachwood	NJ	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
08562	Wrightstown	NJ	0.0	0.0	0.0	0.0	12.5	0.0	37.5	0.0	50.0	0.0	100.0
08641	Trenton	NJ	0.0	12.5	0.0	0.0	0.0	0.0	62.5	0.0	25.0	0.0	100.0
08081	Sicklerville	NJ	0.0	0.0	28.6	28.6	0.0	0.0	28.6	0.0	14.3	0.0	100.0
08046	Willingboro	NJ	0.0	0.0	14.3	0.0	0.0	0.0	57.1	14.3	14.3	0.0	100.0
08733	Lakehurst	NJ	0.0	0.0	0.0	57.1	42.9	0.0	0.0	0.0	0.0	0.0	100.0
07728	Freehold	NJ	0.0	0.0	0.0	57.1	0.0	14.3	14.3	0.0	14.3	0.0	100.0
07731	Howell	NJ	0.0	0.0	0.0	42.9	0.0	0.0	42.9	0.0	14.3	0.0	100.0
08533	New Egypt	NJ	0.0	0.0	0.0	28.6	0.0	0.0	42.9	0.0	28.6	0.0	100.0
08701	Lakewood	NJ	0.0	0.0	0.0	71.4	0.0	28.6	0.0	0.0	0.0	0.0	100.0
08724	Brick	NJ	0.0	0.0	0.0	42.9	14.3	28.6	0.0	0.0	14.3	0.0	100.0
08742	Pt. Pleasant Beach	NJ	0.0	0.0	0.0	42.9	0.0	28.6	28.6	0.0	0.0	0.0	100.0
08505	Bordentown	NJ	0.0	0.0	16.7	16.7	0.0	0.0	33.3	0.0	33.3	0.0	100.0
08648	Trenton	NJ	0.0	0.0	0.0	83.3	16.7	0.0	0.0	0.0	0.0	0.0	100.0
08690	Trenton	NJ	0.0	0.0	0.0	50.0	0.0	50.0	0.0	0.0	0.0	0.0	100.0
08511	Cookstown	NJ	0.0	0.0	0.0	0.0	0.0	0.0	66.7	0.0	33.3	0.0	100.0
08734	Lanoka Harbor	NJ	0.0	0.0	0.0	83.3	16.7	0.0	0.0	0.0	0.0	0.0	100.0
Various	Other <sup>25</sup>	NJ, PA, DE, NY	Not Reported										

<sup>25</sup> Complete details are not given for this category due to the small number of respondents in individual zip codes. In addition, it includes survey respondents (3 out of 769, or 0.39 percent) who did not know the name of the gate they use to enter the Joint Base.

With regard to the gates used to exit the Joint Base, the survey revealed that the vast majority (84.5 percent) of respondents exit through the same gate as they enter. A total of 13.5 percent of survey respondents exit through another gate, and 2.0 percent did not indicate the gate from which they exit Joint Base McGuire-Dix-Lakehurst.

Details on the length of time it takes for non-resident personnel to reach Joint Base McGuire-Dix-Lakehurst were also collected by the survey. This information is reported in Table 16, which also includes the length of time it takes them to return from the Joint Base. Regarding the destinations from the Joint Base, 95.8 percent of survey respondents indicated that they return to their point of origin.

**Table 16: Average Journey Time To and From Joint Base Reported by Non-Resident Personnel, by ZIP Code**

Zip Code	Post Office Name	State	Average Reported Journey to Joint Base (Minutes)	Average Reported Journey from Joint Base (Minutes)
08015	Browns Mills	NJ	23	27
08060	Mount Holly	NJ	29	39
08753	Toms River	NJ	26	33
08068	Pemberton	NJ	24	30
08054	Mount Laurel	NJ	43	46
08053	Marlton	NJ	52	58
08088	Vincentown	NJ	35	41
08527	Jackson	NJ	22	26
08016	Burlington	NJ	34	39
08048	Lumberton	NJ	34	38
08755	Toms River	NJ	21	22
08759	Manchester	NJ	21	25
08055	Medford	NJ	45	48
08731	Forked River	NJ	31	40
08005	Barnegat	NJ	35	40
08721	Bayville	NJ	29	35
08757	Toms River	NJ	17	33
08050	Manahawkin	NJ	42	44
08022	Columbus	NJ	23	28
08722	Beachwood	NJ	26	34
08562	Wrightstown	NJ	14	25
08641	Trenton	NJ	13	13
08081	Sicklerville	NJ	72	83
08046	Willingboro	NJ	35	48
08733	Lakehurst	NJ	17	15
07728	Freehold	NJ	34	43
07731	Howell	NJ	36	40
08533	New Egypt	NJ	22	24
08701	Lakewood	NJ	19	22
08724	Brick	NJ	42	44
08742	Pt. Pleasant Beach	NJ	44	41
08505	Bordentown	NJ	33	41
08648	Trenton	NJ	51	55
08690	Trenton	NJ	46	47
08511	Cookstown	NJ	11	13
08734	Lanoka Harbor	NJ	32	40
Various	Other <sup>26</sup>	NJ, PA, DE, NY	Not Reported	Not Reported

<sup>26</sup> Complete details are not given for this category due to the small number of respondents in individual zip codes. In addition, it includes survey respondents (2 out of 769, or 0.26 percent) who did not know the zip code from which they begin their journey to the Joint Base.

In addition, the survey also collected information on which major study area roadways are used by non-resident personnel on their way to the Joint Base. Among these are several county and state roadways, as indicated in Table 17 and Figure 8.

<b>Roadway</b>	<b>Survey Respondents Reporting Use</b>	<b>Survey Respondents Reporting Use (Percent)</b>
BC Route 528	20	2.6
BC Route 530	57	7.4
BC Route 537	140	18.2
BC Route 539	31	4.0
BC Route 543	9	1.2
BC Route 545	45	5.9
BC Route 616	61	7.9
BC Route 630	21	2.7
BC Route 642	1	0.1
BC Route 667	1	0.1
BC Route 668	1	0.1
BC Route 669	4	0.5
BC Route 670	31	4.0
BC Route 680	2	0.3
BC Route 690	1	0.1
OC Route 527	16	2.1
OC Route 528	13	1.7
OC Route 530	19	2.5
OC Route 537	24	3.1
OC Route 539	34	4.4
OC Route 547	133	17.3
OC Route 571	113	14.7
OC Route 614	1	0.1
OC Route 615	1	0.1
OC Route 616	5	0.7
OC Route 638	2	0.3
NJ Route 37	98	12.7
NJ Route 38	55	7.2
NJ Route 68	54	7.0
NJ Route 70	208	27.0
NJ Route 72	18	2.3
US Route 206	65	8.5
US Route 9	20	2.6

## Roadway Structures

The roadway structures in the study area include bridges, culverts, and similar structures. Digital geographic data from Ocean and Burlington counties indicate that there are a total of 159 roadway structures within the study area. These structures are mapped in Figure 9.

Interviews with officials of study area municipalities have yielded relevant information on roadway structures of special concern, including structures with capacity issues or structures associated with local drainage issues. These structures are identified in Figure 9 and detailed in Table 18. It is important to note that none of the roadway structures listed below overlap with high-frequency crash locations or areas with high volume/capacity ratios (discussed in *Impact Analysis*, below).

**Table 18: Roadway Structures of Concern**

Structure Type	Location	Issue
Bridge	CR 667 at North Run, New Hanover	Narrow bridge
Bridge	CR 667 at North Run, North Hanover	Narrow bridge
Bridge	CR 616, Pemberton Borough	Historic bridge with need for improvements
Bridge	Catesville Road, Pemberton Township	Bridge floods
Bridge	CR 665, North Hanover	Bridge floods
Bridge	Birmingham Road, Pemberton Township	Bridge floods
Culvert	CR 537, North Hanover	Drainage; Needs improvements/maintenance

In addition to the above, it is important to note that the load ratings associated with a significant portion of the study area's roadway structures are not posted. Also, military load ratings have not been calculated for many of the roadway structures.

# Impact Analysis

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## Regional Traffic Analysis

This section describes the methodology and results of a regional traffic analysis that was undertaken to determine roadway system deficiencies. This analysis was prepared with official travel demand models of the metropolitan planning organizations with jurisdiction in the study area. In addition to the growth that is anticipated to occur around Joint Base McGuire-Dix-Lakehurst, it examines the impact of mission changes at the Joint Base<sup>27</sup>. Complete details on its methodology and results are presented below.

## Approach

The study area falls within the jurisdiction of two metropolitan planning organizations, namely: the North Jersey Transportation Planning Authority, which has jurisdiction over Ocean County and twelve other counties in northern and central New Jersey; and, the Delaware Valley Regional Planning Commission, which has jurisdiction over Burlington County and the eight other counties of the Delaware Valley region.

The latest versions of the official travel demand models were obtained from these organizations, and reviewed them for data consistency and accuracy. Through this review, the North Jersey Transportation Planning Authority's model (called North Jersey Regional Transportation Model-Enhanced or simply by its initials, NJRTM-E) was found to also include the entirety of Burlington County. Major data elements, such as population and employment at the traffic analysis zone<sup>28</sup>-level, were imported from the Delaware Valley Regional Planning Commission's model into the NJRTM-E. This resulted in an update of the NJTRM-E with the latest official population and employment projections for Burlington County. To properly account for trip patterns related to Joint Base McGuire-Dix-Lakehurst, the model was then enhanced with additional data on the roadway network, socioeconomic conditions, and trips to and from Joint Base McGuire-Dix-Lakehurst. These enhancements are discussed below.

## Roadway Network Enhancements

The regional model was modified to represent that all traffic to and from the Joint Base must pass through its access gates. Before modification, the official model allowed all traffic in the region to use all roads on Joint Base McGuire-Dix-Lakehurst as if they were open for use by the general public. However, all roads on the Joint Base are not open for use by the general public. The highway network was, therefore, modified and each of the access gates to the Joint Base was coded into the model by adding a

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<sup>27</sup> A separate and detailed traffic impact study for the Consolidated Logistics Training Facility has been prepared for The New Jersey National Guard by Orth-Rodgers Associates, Inc. A copy of this traffic impact study is provided in Appendix 6.

<sup>28</sup> Traffic Analysis Zone (TAZ) is the basic geographical unit used to provide socioeconomic data (i.e., population, households, auto ownership and income of household, and employment) for travel demand modeling. Such data is used to estimate trips that are produced and attracted within a TAZ. TAZs are usually constructed by multiple census blocks. The purpose of using census blocks to define TAZs is to conveniently collect socioeconomic data.

new traffic analysis zone representing all activity at the respective gate. This enhancement required removing some roads from general public use, as well as moving some zonal connectors to the gate areas. These modifications are depicted in Figure 10.

### **Socioeconomic Data Enhancements**

Socioeconomic information on population, households, and employment is the most important determinant of the amount of trips generated by the traffic model. Consequently, it is essential to have sound projections of these variables in order to accurately calculate trip generation and forecast future traffic. As such, a digital geographic data layer was prepared with metropolitan planning organization-sourced data on existing and future population, households, and employment at the traffic analysis zone-level. This data layer covered the entire study area, and was reviewed by planning and engineering staff in Ocean and Burlington counties. Revisions were then made based upon input received from the counties.

Table 19 provides a summary of the socioeconomic data for all municipalities within the traffic analysis zones covering the study area.



**Table 19: Socioeconomic Data**

	2010 Population	2010 Households	2010 Employment	2015 Population	2015 Households	2015 Employment	2035 Population	2035 Households	2035 Employment
Berkeley Township (Ocean County)	50586	23726	9395	52840	24822	9743	64078	30248	11486
Toms River Township (Ocean County)	95528	36597	40692	100012	38496	42019	117537	46321	45344
Jackson Township (Ocean County)	57759	20559	11705	65014	23499	12299	99500	38007	15995
Lacey Township (Ocean County)	27765	10585	6268	29774	11489	6499	38595	15621	7600
Lakehurst Borough (Ocean County)	2550	907	878	2660	953	907	3282	1214	1030
Lakewood Township (Ocean County)	71191	23510	30275	74813	24917	31259	94386	32618	34769
Manchester Township (Ocean County)	45378	23253	5405	47519	24509	5684	59277	31336	7490
Plumsted Township (Ocean County)	8165	2971	1438	9042	3341	1524	13997	5466	2173
Upper Freehold Township (Monmouth County)	5284	1754	1599	5777	1924	1743	7585	2560	2365
<b>Subtotal (Ocean and Monmouth Counties)</b>	<b>364206</b>	<b>143862</b>	<b>107655</b>	<b>387451</b>	<b>153950</b>	<b>111677</b>	<b>498237</b>	<b>203391</b>	<b>128252</b>
<i>Growth from 2010</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<b>23245</b>	<b>10088</b>	<b>4022</b>	<b>134031</b>	<b>59529</b>	<b>20597</b>
<i>Growth from 2010 (%)</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<b>6.4</b>	<b>7.0</b>	<b>3.7</b>	<b>36.8</b>	<b>41.4</b>	<b>19.1</b>
<i>Average Annual Growth Rate (%)</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<b>1.2</b>	<b>1.4</b>	<b>0.7</b>	<b>1.3</b>	<b>1.4</b>	<b>0.7</b>
Chesterfield Township (Burlington County)	6835	1033	912	7444	1130	939	9546	1461	1034
Eastampton Township (Burlington County)	7244	2618	1310	7785	2825	1444	9655	3530	1908
Mansfield Township (Burlington County)	8873	3641	1997	10083	4154	2176	14262	5919	2795
New Hanover Township (Burlington County)	10043	1249	9217	10462	1314	9435	11905	1536	10186
North Hanover Township (Burlington County)	7760	2661	855	7970	2747	917	8698	3030	1132
Pemberton Borough (Burlington County)	1517	586	923	1711	664	930	2382	931	954
Pemberton Township (Burlington County)	29252	10349	8863	29826	10596	9105	31806	11387	9941
Southampton Township (Burlington County)	11241	4972	3896	11623	5161	4102	12945	5784	4812
Springfield Township (Burlington County)	3848	1314	1140	4151	1424	1252	5198	1795	1637
Woodland Township (Burlington County)	1400	458	1478	1439	473	1489	1576	522	1529
Wrightstown Borough (Burlington County)	733	298	2895	769	314	2993	900	373	3332
<b>Subtotal Total (Burlington County)</b>	<b>88746</b>	<b>29179</b>	<b>33486</b>	<b>93263</b>	<b>30802</b>	<b>34782</b>	<b>108873</b>	<b>36268</b>	<b>39260</b>
<i>Growth from 2010</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<b>4517</b>	<b>1623</b>	<b>1296</b>	<b>20127</b>	<b>7089</b>	<b>5774</b>
<i>Growth from 2010 (%)</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<b>5.1</b>	<b>5.6</b>	<b>3.9</b>	<b>22.7</b>	<b>24.3</b>	<b>17.2</b>
<i>Average Annual Growth Rate (%)</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<b>1.0</b>	<b>1.1</b>	<b>0.8</b>	<b>0.8</b>	<b>0.9</b>	<b>0.6</b>
<b>Total (Ocean, Monmouth, and Burlington Counties)</b>	<b>452952</b>	<b>173041</b>	<b>141141</b>	<b>480714</b>	<b>184752</b>	<b>146459</b>	<b>607110</b>	<b>239659</b>	<b>167512</b>
<i>Growth from 2010</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<b>27762</b>	<b>11711</b>	<b>5318</b>	<b>154158</b>	<b>66618</b>	<b>26371</b>
<i>Growth from 2010 (%)</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<b>6.1</b>	<b>6.8</b>	<b>3.8</b>	<b>34.0</b>	<b>38.5</b>	<b>18.7</b>
<i>Average Annual Growth Rate (%)</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<b>1.2</b>	<b>1.3</b>	<b>0.7</b>	<b>1.2</b>	<b>1.3</b>	<b>0.7</b>

Source: North Jersey Transportation Planning Authority (Ocean and Monmouth Counties); Delaware Valley Regional Planning Commission (Burlington County)

As indicated in Table 19, the population for the municipalities within Ocean and Monmouth counties is expected to increase by slightly more than 134,000 people (36.8 percent) between 2010 and 2035. Similarly, employment is expected to increase by approximately 20,600 (19.1 percent) units.

During the same 2010-2035 period, the eleven Burlington County municipalities that are listed in Table 19 are expected to gain just over 20,100 residents. Employment is expected to increase by nearly 5,800 (17.2 percent) units. A unit of employment is equivalent to one in-place job in any of the following sectors: agriculture; mining; construction; manufacturing; transportation; wholesale; retail; fire; service; government; or, military.

Figure 11 depicts the population changes at the traffic analysis zone-level between 2010 and 2035. Figure 12 shows similar information for employment.

### Allocation of Trips to Joint Base McGuire-Dix-Lakehurst

The gate traffic counts that are introduced and discussed in the section of this report entitled *Traffic Counts* were used in this regional traffic analysis. In addition, the results of the online travel survey that is detailed in the section entitled *Commuter Patterns* were also incorporated into this traffic analysis. As outlined below, the gate traffic counts and travel survey results provided valuable insight into the level of trip activity that is associated with Joint Base McGuire-Dix-Lakehurst.

The gate traffic counts were used to modify the regional model outputs related to all trip activity at the Joint Base for the morning and afternoon periods of 6:00 a.m. to 9:00 a.m. and 3:00 p.m. to 6:00 p.m., respectively<sup>29</sup>. The information that was used is summarized in Table 20, which shows morning and afternoon period counts by direction for each gate.

**Table 20: Summarized Gate Traffic Counts, 6:00 a.m. to 9:00 a.m. and 3:00 p.m. to 6:00 p.m.**

Direction	Browns Mills Gate (Texas Gate)		Dix Main/68 Gate		Checkpoint 9 (Commercial Gate 9)		McGuire Gate (McGuire Main Gate)		Pemberton Gate (Juliestown Gate)		Wrightstown Gate		Gate 4 (Lakehurst Commercial Gate)		Gate 3 (Pinehurst Gate)		Gate 1 (Lakehurst Main Gate)		All Gates (Total)	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
6:00 AM	502	128	462	55	449	91	470	65	235	49	314	76	8	8	174	165	395	19	3009	656
7:00 AM	623	211	843	104	471	159	486	195	468	101	586	146	250	10	238	252	446	83	4411	1261
8:00 AM	368	231	424	126	247	173	376	227	196	122	333	182	93	29	1	2	363	67	2401	1159
<b>Total (Morning)</b>	<b>1493</b>	<b>570</b>	<b>1729</b>	<b>285</b>	<b>1167</b>	<b>423</b>	<b>1332</b>	<b>487</b>	<b>899</b>	<b>272</b>	<b>1233</b>	<b>404</b>	<b>351</b>	<b>47</b>	<b>413</b>	<b>419</b>	<b>1204</b>	<b>169</b>	<b>9821</b>	<b>3076</b>
3:00 PM	320	417	155	431	145	386	236	492	142	258	252	461	16	52	83	60	80	397	1429	2954
4:00 PM	281	498	120	853	136	480	200	670	183	435	229	780	12	9	187	186	65	589	1413	4500
5:00 PM	203	348	127	424	47	438	196	470	117	176	212	459	2	2	44	46	61	338	1009	2701
<b>Total (Afternoon)</b>	<b>804</b>	<b>1263</b>	<b>402</b>	<b>1708</b>	<b>328</b>	<b>1304</b>	<b>632</b>	<b>1632</b>	<b>442</b>	<b>869</b>	<b>693</b>	<b>1700</b>	<b>30</b>	<b>63</b>	<b>314</b>	<b>292</b>	<b>206</b>	<b>1324</b>	<b>3851</b>	<b>10155</b>

As shown in Table 20, 9,821 vehicles entered and 3,076 vehicles exited the Joint Base during the morning period. As one would expect, the pattern changes during the afternoon period and more vehicles exit the Joint Base than enter; a total of 10,155 vehicles exited and 3,851 entered during the afternoon period.

<sup>29</sup> Please note that the morning and afternoon peak one-hour periods fall within these timeframes.

The travel survey provided the zip code of each survey records at the trips starting or ending at locations other than the Joint Base. One end of the trips was always at the Joint Base since the survey was conducted for persons associated with the Joint Base.

Information on the zip code of origin and destination of journeys to and from Joint Base McGuire-Dix-Lakehurst was harvested from the online travel survey results. This information provided a basis for the allocation of trips to and from the Joint Base to appropriate traffic analysis zones within the model.

With trips allocated, morning and afternoon vehicle trip tables were developed based on the survey data, and the model's original output of trips related to the Joint Base was modified according to known travel patterns. The model was then run for morning and afternoon travel periods.

Further refinements to the model results were made during the 2010 model validation process. These refinements targeted roadways located off of the Joint Base and were based on new traffic counts conducted as a part of this Joint Base Regional Transportation Mobility Study.

## Results

### 2010

The morning and afternoon model runs for 2010 were analyzed to determine the level of traffic congestion occurring within the roadway system. The model-estimated traffic volumes were compared against roadway capacities to calculate volume/capacity ratios and identify locations where traffic volumes exceed available capacities.

The 2010 model run facilitates the identification of roadway segments with congestion issues. It does so by comparing the morning and afternoon period volume/capacity ratios for each of the roadway segments, and assigning the maximum of the two to the segment for representation on a map showing traffic congestion. This map is included in this report as Figure 13.

### 2015

The 2015 model run was prepared by incorporating the same network refinements as were made for the 2010 model run. Since the original metropolitan planning organization-sourced models reflected 2010 and 2020 conditions, the input files were interpolated to develop a 2015 dataset.

To separate the traffic impacts associated with changes occurring on the Joint Base, two scenarios for 2015 were analyzed. The first scenario (2015 No-Build) assumes that the growth in the development outside of the Joint Base will continue as represented by socioeconomic forecasts, but the level of activity on the Joint Base will be static and remain at 2010 levels. The second scenario (2015 Build) adds additional trip activity at the Joint Base as a result of the mission changes described in the section of this report entitled *Mission Changes*. This approach, which is similar to that of a traffic impact study, provides for the ability to identify impacts associated with the mission changes.

The 2015 No-Build scenario uses the interpolated 2015 socioeconomic data along with the 2010 number of trips to and from the Joint Base. This methodology provides for growth in the amount of background traffic, but assumes no growth in the number of trips made to or from the Joint Base.

The 2015 Build scenario, on the other hand, uses the interpolated 2015 socioeconomic data and adds an estimate<sup>30</sup> of incremental trips associated with the mission changes to the 2010 number of trips to and from the Joint Base. Thus, this methodology provides for growth in the amount of background traffic and the number of trips associated with the Joint Base.

Table 21 provides the gate-level distribution of trips associated with the 3,698 additional personnel resulting from mission changes. It is assumed that all changes at the Joint Base will be accomplished by 2015 and there will be no further increase in Joint Base personnel between 2015 and 2035.

**Table 21: Increase in Gate Traffic due to Mission Changes, 2015 Model Run**

Direction	Browns Mills Gate (Texas Gate)		Dix Main/68 Gate		Checkpoint 9 (Commercial Gate 9)		McGuire Gate (McGuire Main Gate)		Pemberton Gate (Juliestown Gate)		Wrightstown Gate		Gate 4 (Lakehurst Commercial Gate)		Gate 3 (Pinehurst Gate)		Gate 1 (Lakehurst Main Gate)		All Gates (Total)	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Morning (6:00 AM to 9:00 AM)	238	92	276	46	186	68	101	36	143	44	197	65	0	0	0	0	0	0	1140	352
Afternoon (3:00 PM to 6:00 PM)	128	204	64	276	52	211	48	120	70	141	110	275	0	0	0	0	0	0	473	1227

The 2015 model run was conducted for both 2015 No-Build and 2015 Build scenarios. Similar to the 2010 model run, roadway segments with traffic congestion issues were identified by comparing morning and afternoon volume/capacity ratios. The greater of each ratio was then assigned to each roadway segment.

<sup>30</sup> The United States Department of Defense estimates that mission changes on Joint Base McGuire-Dix-Lakehurst will result in the addition of 3,698 personnel. Of these total, 3,298 will be associated with Fort Dix, while 400 will be associated with McGuire. Using the existing number of people associated with the Joint Base and the existing gate traffic counts, the project team developed a trip rate associated with each additional person. This calculation is detailed in Table 13. As detailed in Table 13, this rate is 1.8 trips per person, and is reflective of an average weekday and close to rates published by the Institute of Transportation Engineers (ITE). Based on this rate and hourly patterns for inbound and outbound traffic, the number of additional trips made during morning and evening periods was calculated for each of the additional 3,698 personnel.

Figures 14 and 15 depict the 2015 No-Build and 2015 Build scenario results, respectively. The relative increases in traffic due to additional trips in peak periods are small, and, thus, there is no significant increase in congestion in the 2015 Build scenario. The highest increases in both of the 2015 scenarios are at the Brown Mills Gate (Texas Gate), Dix Main/68 Gate, and Wrightstown Gate. A study is currently being conducted by another consultant to determine if any of these gates require modifications in order to accommodate the anticipated increase in traffic; it is recommended that this study also consider freight delivery issues at all gates.

## 2035

The model runs for the 2035 traffic conditions were obtained from both the North Jersey Transportation Planning Authority and the Delaware Valley Regional Planning Commission. Similar to the 2010 model run, socioeconomic data for Burlington County was sourced from the Delaware Valley Regional Planning Commission's model and incorporated into that of the North Jersey Transportation Planning Authority. It should be noted that information on the 2035 roadway network provided by the North Jersey Transportation Planning Authority included planned roadway improvements from the approved Transportation Improvement Program. The network customizations that were implemented to represent gates in the 2010 model run were incorporated into the 2035 model run.

Similar to 2015, two scenarios were analyzed: 2035 Build; and, 2035 No-Build. The 2035 No-Build scenario provides for the background growth while keeping the Joint Base trip activity at the 2010 conditions. The 2035 Build scenario adds the trips associated with the additional Joint Base personnel. As previously mentioned, it is assumed that all additional personnel at the Joint Base will arrive by 2015. Consequently, trip activity associated with the Joint Base remains the same as in the 2015 model. The only difference between the 2015 and 2035 model runs is the background growth in employment and population.

Once the model runs for the 2035 No-Build and the 2035 Build scenarios were completed for morning and afternoon periods, the results were analyzed in order to identify the traffic congestion on all roadways within five miles of the Joint Base. Figures 16 and 17 depict the 2035 No-Build and 2035 Build volume/capacity ratios where they are greater than or equal to 1.25. Because the model does not account for detailed activity at the gates, it is recommended that the Browns Mills Gate (Texas Gate), Dix Main/68 Gate, and Wrightstown Gate be analyzed to determine if design changes are warranted. Again, another consultant is studying whether any of these gates requires modification to accommodate the increase in traffic, and it is recommended that freight delivery issues be considered.

## Summary

The regional traffic analysis that was conducted for this study developed traffic estimates for roadways based on 2010, 2015 and 2035 traffic conditions. The no-build and build scenarios for 2015 and 2035 were developed to isolate the traffic impact associated with mission changes occurring on Joint Base McGuire-Dix-Lakehurst.

This analysis was used to identify roadway segments with recurring traffic congestion. Along with the crash analysis and other surveys conducted by the project team (see *Existing Conditions*), it was also used to identify locations for further review and analysis. In its analysis of these locations, the project team developed a set of basic and advanced alternatives to improve mobility. These alternatives are presented in the following section.

# Alternatives Analysis

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## Overview

Alternatives to improve regional transportation mobility were developed based on information yielded by the aforementioned review of existing conditions and the regional traffic analysis. These alternatives consider roadway, public transportation, and non-motorized transportation networks to promote safe and efficient mobility for the Joint Base region through 2035.

## Basic Alternatives

Basic alternatives do not propose new infrastructure. They often rely on modification of existing infrastructure, such as the restriping of traffic lanes or recalibration of existing traffic signals. In addition, basic alternatives may also include monitoring and study of operational characteristics. Often, basic alternatives are an economical first approach to solving a problem.

Several basic alternatives were developed to address existing high-frequency crash locations and areas where a high level of roadway congestion is anticipated by the 2015 and 2035 model runs of the regional traffic analysis. These alternatives are presented in Table 22, which includes complete information on their location, level of prioritization<sup>31</sup>, and the type and extent of issues they target. Table 22 also provides information on the feasibility of each project, including its relative cost and potential permitting issues<sup>32</sup>. In addition to Table 22, a regional overview of the locations for which basic alternatives have been developed is provided in Figure 18. An aerial view and information on location-specific environmental encumbrances is provided for each target location on electronic detail sheets provided in Appendix 3.

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<sup>31</sup> Basic and advanced alternatives were prioritized based on the number of crashes occurring within a particular target area and the 2035 volume/capacity ratios for relevant roadway segments.

Specifically, the number of crashes and the highest roadway volume/capacity ratio at each of the target locations were weighted by multiplying by a factor of two and 100, respectively. The weighted number of crashes was then added to the weighted volume/capacity ratio to produce a composite score. Composite scores were then ordered from highest to lowest, and the twenty locations with the highest scores were selected for inclusion in tables 22 and 23.

This method of prioritization has been applied to basic and advanced alternatives in tables 22 and 23.

<sup>32</sup> Complete details on cost and potential permitting issues are provided in the sections of this report entitled *Cost* and *Permitting*.

Table 22: Basic Alternatives

Priority Rank	Type	Location	Issue	Volume/Capacity		Solutions		Permitting (Potential)							Farmland and/or Open Space	Area Detail Sheet (Appendix 3)
				2015	2035	Capacity	Safety	NJDEP Flood Hazard Area	NJDEP Wetlands	NJ Pinelands	CAFRA	Sediment Control	T&E Habitat	NJDOT		
1	Safety; Capacity	NJ 70 and CR 539, Manchester	<ul style="list-style-type: none"> <li>Approximately 87 crashes (High Crash Location: 3)</li> <li>Capacity (CR 530 from NJ 70 to CR 539)</li> <li>Capacity (CR 539 from CR 14 to NJ 70)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Intersection counts, traffic projections, and traffic analyses (\$)</li> <li>Restripe NJ 70 approach to lengthen left turn lanes and provide right turn lanes (\$\$)</li> <li>Restripe CR 539 approaches for right turn lanes (\$\$)</li> <li>Explore potential for east-west bicycle, pedestrian, and rail connections within NJ 70 corridor (\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Check signal clearance intervals with MUTCD standards (\$)</li> <li>New Jersey Department of Transportation safety programs (\$)</li> </ul>	-	-	-	-	-	-	✓	-	Detail 1
				2.29	3.16			-	-	-	-	-	-	-	-	
				1.88	2.58			-	-	-	-	-	-	-	-	
2	Safety; Capacity	NJ 38 and US 206, Southampton <sup>33</sup>	<ul style="list-style-type: none"> <li>Approximately 95 crashes (High Crash Location: 1)</li> <li>Capacity (US 206 from East Railroad Avenue to NJ 38)</li> <li>Capacity (US 206 from NJ 38 to study area Boundary)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Intersection counts, traffic projections, and traffic analyses (\$)</li> <li>Restripe northbound and southbound US 206 approaches to add a shared thru/right turn lane (\$\$)</li> <li>Restripe left turn lanes on northbound and southbound US 206 (\$\$)</li> <li>Explore opportunities to eliminate gaps in Rancocas Creek Greenway Project Area (\$\$)</li> <li>Explore potential for non-motorized north-south connections in US 206 corridor (\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Highway access management/reduce points of conflicts (\$\$)</li> <li>Check signal clearance intervals with MUTCD standards (\$)</li> <li>New Jersey Department of Transportation safety programs (\$)</li> <li>Provide new or upgraded striping to make roadways within Pemberton-Mount Holly Bikeway Project Area bicycle compatible (\$\$)</li> <li>Provide MUTCD warning signs for farmland machinery on US 206 and other ag. Routes (\$\$)</li> </ul>	-	-	-	-	-	-	✓	-	Detail 2
				1.46	1.72			-	-	-	-	-	-	-		
				1.34	1.80			-	-	-	-	-	-	-		
3	Safety; Capacity	US 9, Toms River	<ul style="list-style-type: none"> <li>Approximately 58 crashes, between CR 84 and CR 92 (High Crash Location: 11)</li> <li>Approximately 49 crashes, at ramp from US 9 to NJ 70 WB (High Crash Location: 18)</li> <li>Capacity (US 9, between CR 84 and ramp from NJ 70 EB)</li> <li>Capacity (US 9, between ramp from NJ 70 EB and ramp to NJ 70 EB)</li> <li>Capacity (US 9, between ramp to NJ 70 WB and ramp to NJ 70 EB)</li> <li>Capacity (NJ 70, between ramp from CR 83 to NJ 70 WB and ramp from NJ 70 WB to US 9 SB)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Advance US 9 improvements by New Jersey Department of Transportation (\$)</li> <li>Advance US 9/NJ 70 interchange improvements by New Jersey Department of Transportation (\$)</li> <li>Improve acceleration/deceleration lanes on NJ 70 (\$\$)</li> <li>Explore potential for non-motorized north-south connections within US 9 corridor (\$\$)</li> <li>Continue to study potential for implementation of MOM rail line as a means to reduce north-south vehicular traffic (\$\$)</li> <li>Study bus prioritization to improve bus service and reduce bus travel times and delays(\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>New Jersey Department of Transportation safety programs (\$)</li> <li>Continue to monitor crash frequency (\$)</li> </ul>	-	-	-	-	-	-	✓	-	Detail 3A, 3B
				N/A	N/A			-	-	-	-	-	-			
				1.34	< 1.25			-	-	-	-	-	-			
				1.51	< 1.25			-	-	-	-	-	-			
				1.33	< 1.25			-	-	-	-	-	-			
< 1.25	1.56	-	-	-	-	-	-									

<sup>33</sup> As of June 2011, Burlington County had been collaborating with state and local officials on improvements for this intersection. We provide the alternatives presented in this table as a means of guidance and collaboration in the design process.



Table 22 (Continued): Basic Alternatives

Priority Rank	Type	Location	Issue	Volume/Capacity		Solutions		Permitting (Potential)							Farmland and/or Open Space	Area Detail Sheet (Appendix 3)
				2015	2035	Capacity	Safety	NJDEP Flood Hazard Area	NJDEP Wetlands	NJ Pinelands	CAFRA	Sediment Control	T&E Habitat	NJDOT		
4	Safety; Capacity	US 206 and CR 537, Springfield	<ul style="list-style-type: none"> <li>Approximately 74 crashes (High Crash Location: 2)</li> <li>Capacity (CR 537 from CR 669 to US 206)</li> <li>Capacity (US 206 from CR 537 to CR 669)</li> <li>Capacity (US 206 from CR 669 to midpoint between CR 669 and CR 630)</li> <li>Capacity (US 206 from CR 630 to midpoint between CR 669 and CR 630)</li> <li>Capacity (US 206 from CR 630 to CR 621)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Intersection counts, traffic projections, and traffic analyses (\$)</li> <li>Restripe left turn lanes on northbound and southbound US 206 (\$\$)</li> <li>Explore split-phase operation/protected left turn phase (\$\$)</li> <li>Explore opportunities to eliminate gaps in the Barker's Brook Greenway Project Area (\$\$)</li> <li>Explore potential for non-motorized north-south connections within US 206 corridor (\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Explore split-phase operation/protected left turn phase (\$)</li> <li>Highway access management/reduce points of conflict (\$\$)</li> <li>Check signal clearance intervals with MUTCD standards (\$)</li> <li>New Jersey Department of Transportation safety programs (\$)</li> <li>Investigate and pursue opportunities to make CR 669 and CR 668 bicycle compatible by means of new or upgraded striping (\$\$)</li> <li>Provide MUTCD warning signs for farmland machinery on US 206, CR 537 and other ag. Routes (\$\$)</li> </ul>	-	-	-	-	-	-	✓	-	Detail 4
				1.35	1.57											
				1.63	1.74											
				1.51	1.62											
				1.55	1.80											
5	Safety; Capacity	CR 530 and CR 616, Pemberton Borough <sup>34</sup>	<ul style="list-style-type: none"> <li>Approx. 56 crashes (High Crash Location No.: 8)</li> <li>Capacity (CR 644/CR 530, between CR 616 in Pemb. Boro and Scrapetown Road in Pemb. Twp)</li> <li>Capacity (CR 616, between University Ave in Pemb. Twp. &amp; CR 530 in Pemb. Boro)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Study additional by-pass/alternate/truck routes around downtown (\$\$)</li> <li>Improve signal coordination within downtown (\$\$\$)</li> <li>Improved signage for destinations outside downtown (\$\$)</li> <li>Study bus prioritization to improve bus service and reduce bus travel times and delays(\$\$)</li> <li>Explore opportunities to eliminate gaps in the Rancocas Creek Greenway Project Area (\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Study additional by-pass/alternate/truck routes around downtown (\$\$)</li> <li>Improve signal coordination within downtown (\$\$\$)</li> <li>Improved signage for destinations outside downtown (\$\$)</li> <li>Provide new or upgraded striping to make roadways within Pemberton-Mount Holly Bikeway Project Area bicycle compatible (\$\$)</li> </ul>	-	-	-	-	-	-	-	-	Detail 5
				< 1.25	2.10											
				< 1.25	1.29											
6	Safety; Capacity	CR 528 and CR 639, Jackson	<ul style="list-style-type: none"> <li>Approximately 69 crashes at CR 528 and CR 639 (High Crash Location: 5)</li> <li>Capacity (CR 528, from CR 639 to CR 626)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Intersection counts, traffic projections, and traffic analyses (\$)</li> <li>Restripe eastbound and westbound CR 528 approaches to add opposing left turn lane (\$\$)</li> <li>Study bus prioritization to improve bus service and reduce bus travel times and delays(\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Restripe eastbound and westbound CR 528 approaches to add opposing left turn lane (\$\$)</li> <li>Check signal clearance intervals with MUTCD standards (\$)</li> <li>New Jersey Department of Transportation safety programs (\$)</li> <li>Continue to monitor intersection for crash frequency/severity and capacity (\$)</li> </ul>	-	-	-	-	-	-	-	-	Detail 6

<sup>34</sup> As of June 2011, Burlington County had been collaborating with state and local officials on improvements for this intersection. We provide the alternatives presented in this table as a means of guidance and collaboration in the design process.

Table 22 (Continued): Basic Alternatives

Priority Rank	Type	Location	Issue	Volume/Capacity		Solutions		Permitting (Potential)							Farmland and/or Open Space	Area Detail Sheet (Appendix 3)	
				2015	2035	Capacity	Safety	NJDEP Flood Hazard Area	NJDEP Wetlands	NJ Pinelands	CAFRA	Sediment Control	T&E Habitat	NJDOT			
7	Safety; Capacity	CR 547 and CR 571, Manchester	<ul style="list-style-type: none"> <li>Approximately 31 crashes (High Crash Location: 20)</li> <li>Approximately 27 crashes (High Crash Location: 23)</li> <li>Capacity (CR 571, between CR 547 and NJ 70)</li> <li>Capacity (CR 571, from CR 547 in Manchester to CR 52 in Jackson)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Corridor study between Freehold Road and NJ 70 (\$\$)</li> <li>Intersection counts, traffic projections, and traffic analyses (\$)</li> <li>Corridor study between I-195 and CR 528 (\$\$)</li> <li>Continue to monitor for capacity issues (\$)</li> <li>Study bus prioritization to improve bus service and reduce bus travel times and delays(\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Continue to monitor crash frequency and type (\$)</li> <li>Develop effective safety improvements (\$\$)</li> <li>Respond to high frequency of animal crashes at location/provide deer reflectors or similar measure (\$\$\$)</li> </ul>	-	-	-	-	-	-	-	-	-	Detail 7A, 7B
				N/A	N/A			-	-	-	-	-	-	-	-		
				< 1.25	1.35			-	-	-	-	-	-	-	-		
				1.36	1.70			-	-	-	-	-	-	-	-		
8	Safety; Capacity	NJ 70 and CR 527, Toms River	<ul style="list-style-type: none"> <li>Approximately 54 crashes (High Crash Location: 7)</li> <li>Capacity (CR 527, between NJ 70 and CR 622)</li> <li>Capacity (NJ 70, between CR 527 and CR 637)</li> <li>Capacity (NJ 70, between CR 527 in Toms River and CR 571 in Manchester)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Intersection counts, traffic projections, and traffic analyses (\$)</li> <li>Continue to monitor for capacity issues (\$)</li> <li>Explore potential for east-west bicycle, pedestrian, and rail connections within NJ 70 corridor (\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Check signal clearance intervals with MUTCD standards (\$)</li> <li>Improve signage, striping, pavement markings (\$\$)</li> <li>New Jersey Department of Transportation safety programs (\$)</li> <li>Continue to monitor crash frequency (\$)</li> </ul>	-	-	-	-	-	-	✓	-	Detail 8	
				1.50	1.57			-	-	-	-	-	-	-			
				1.28	1.73			-	-	-	-	-	-	-			
				< 1.25	1.48			-	-	-	-	-	-	-			
9	Capacity	CR 687, Pemberton Borough	<ul style="list-style-type: none"> <li>Capacity (CR 687, between Cedar Lane and CR 616)</li> <li>Capacity (CR 616, between CR 687 and Jane Street)</li> </ul>	N/A	1.36	<ul style="list-style-type: none"> <li>Evaluate/design N. Pemberton Bypass (\$\$)</li> <li>Explore opportunities to provide westerly linkage by connecting northern spur and/or main (Browns Mills) branch of Pemberton-Mount Holly Bikeway with New Egypt Bike Trail (\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Provide new or upgraded striping to make roadways within Pemberton-Mount Holly Bikeway Project Area bicycle compatible (\$\$)</li> </ul>	-	-	-	-	-	-	-	-	Detail 9	
				2.35	2.75			-	-	-	-	-	-				
10	Safety; Capacity	NJ 70 and CR 637, Toms River	<ul style="list-style-type: none"> <li>Approximately 46 crashes (High Crash Location: 10)</li> <li>Capacity (NJ 70, between CR 527 and CR 637)</li> <li>Capacity (CR 637, between NJ 70 and CR 622)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Intersection counts, traffic projections, and traffic analyses (\$)</li> <li>Study replacing left turns from NJ 70 with jughandles (\$\$)</li> <li>Continue to monitor for capacity issues (\$)</li> <li>Explore potential for east-west bicycle, pedestrian, and rail connections within NJ 70 corridor (\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Study replacing left turns from NJ 70 with jughandles (\$\$)</li> <li>Check signal clearance intervals with MUTCD standards (\$)</li> <li>New Jersey Department of Transportation safety programs (\$)</li> <li>Continue to monitor crash frequency (\$)</li> </ul>	-	-	-	-	-	-	✓	-	Detail 10	
				1.28	1.73			-	-	-	-	-	-				
				< 1.25	1.27			-	-	-	-	-	-	-			

Table 22 (Continued): Basic Alternatives

Priority Rank	Type	Location	Issue	Volume/Capacity		Solutions		Permitting (Potential)							Farmland and/or Open Space	Area Detail Sheet (Appendix 3)
				2015	2035	Capacity	Safety	NJDEP Flood Hazard Area	NJDEP Wetlands	NJ Pinelands	CAFRA	Sediment Control	T&E Habitat	NJDOT		
11	Safety	NJ 37 and CR 39, Toms River	<ul style="list-style-type: none"> <li>Approximately 82 crashes at NJ 37 and CR 39 (High Crash Location: 4)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Study feasibility of and provide expanded bus service to reduce number of vehicles on roadway. Senior-oriented bus service should be focus (\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Check signal clearance intervals with MUTCD standards (\$)</li> <li>Improve signage/stripping/pavement markings for jughandle (\$\$)</li> <li>Improve signage/stripping/pavement markings on eastbound NJ 37 (\$\$)</li> <li>Continue to monitor crash frequency (\$)</li> </ul>	-	-	-	-	-	-	✓	-	Detail 11
12	Safety; Capacity	NJ 70 and CR 571, Manchester	<ul style="list-style-type: none"> <li>Approximately 48 crashes (High Crash Location: 19)</li> <li>Capacity (NJ 70, between CR 527 in Toms River and CR 571 in Manchester)</li> <li>Capacity (CR 571, between CR 547 and NJ 70)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Intersection counts, traffic projections, and traffic analyses (\$)</li> <li>Continue to monitor for capacity issues (\$)</li> <li>Study bus prioritization to improve bus service and reduce bus travel times and delays(\$\$)</li> <li>Explore potential for east-west bicycle, pedestrian, and rail connections within NJ 70 corridor (\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>New Jersey Department of Transportation safety programs (\$)</li> <li>Continue to monitor crash frequency (\$)</li> </ul>	-	-	-	-	-	-	✓	-	Detail 12
13	Safety; Capacity	CR 527 and CR 622, Toms River	<ul style="list-style-type: none"> <li>Approximately 42 crashes (High Crash Location: 13)</li> <li>Capacity (CR 527, between NJ 70 and CR 622)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Intersection counts, traffic projections, and traffic analyses (\$)</li> <li>Continue to monitor for capacity issues (\$)</li> <li>Explore modified traffic signal timing/phasing (\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>New Jersey Department of Transportation safety programs (\$)</li> <li>Continue to monitor crash frequency (\$)</li> </ul>	-	-	-	-	-	-	-	-	Detail 13
14	Safety; Capacity	NJ 70 and NJ 72, Pemberton Twp., Springfield and Woodland	<ul style="list-style-type: none"> <li>Approximately 45 crashes (High Crash Location: 6)</li> <li>Capacity (CR 646 and NJ 70)</li> <li>Capacity (CR 644, between NJ 70 and Upper Mill Road)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Continue to monitor for capacity issues (\$)</li> </ul>	<ul style="list-style-type: none"> <li>Improve signage, striping, pavement markings within traffic circle (\$\$)</li> <li>New Jersey Department of Transportation safety programs (\$)</li> <li>Continue to monitor crash frequency (\$)</li> </ul>	-	-	-	-	-	-	✓	-	Detail 14
15	Safety; Capacity	CR 527 and CR 528, Jackson	<ul style="list-style-type: none"> <li>Approximately 44 crashes (High Crash Location: 14)</li> <li>Capacity (CR 527 from CR 528 to study area boundary)</li> <li>Capacity (CR 527 from CR 528 to CR 8)</li> <li>Capacity (CR 527 from CR 8 to CR 527/Whitesville Road)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Intersection counts, traffic projections, and traffic analyses (\$)</li> <li>Explore split-phase operation/protected left turn phase (\$\$)</li> <li>Study bus prioritization to improve bus service and reduce bus travel times and delays(\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Explore split-phase operation/protected left turn phase (\$\$)</li> <li>Check signal clearance intervals with MUTCD standards (\$)</li> <li>Respond to high frequency of animal crashes at location/provide deer reflectors or similar measure (\$\$\$)</li> </ul>	-	-	-	-	-	-	-	-	Detail 15

Table 22 (Continued): Basic Alternatives

Priority Rank	Type	Location	Issue	Volume/Capacity		Solutions		Permitting (Potential)							Farmland and/or Open Space	Area Detail Sheet (Appendix 3)	
				2015	2035	Capacity	Safety	NJDEP Flood Hazard Area	NJDEP Wetlands	NJ Pinelands	CAFRA	Sediment Control	T&E Habitat	NJDOT			
16	Safety; Capacity	CR 528 and CR 640, Jackson and Plumsted	<ul style="list-style-type: none"> <li>Approximately 40 crashes (High Crash Location: 9)</li> <li>Capacity (CR 640, between CR 528 and Reed Road)</li> </ul>	N/A < 1.25	N/A 1.44	<ul style="list-style-type: none"> <li>Traffic signal warrant study (\$)</li> <li>Study capacity improvements, such as exclusive lanes (\$\$)</li> <li>Intersection counts, traffic projections, and traffic analyses (\$)</li> <li>Explore split-phase operation/protected left turn phase (\$\$)</li> <li>Continue to monitor for capacity issues (\$)</li> </ul>	<ul style="list-style-type: none"> <li>Study crash types/recommend mitigation measures (\$)</li> <li>Explore split-phase operation/protected left turn phase (\$\$)</li> <li>Respond to high frequency of animal crashes at location/provide deer reflectors or similar measure (\$\$\$)</li> </ul>	-	-	-	-	-	-	-	-	-	Detail 16
17	Safety	CR 530 and Club House Road, Pemberton Twp.	<ul style="list-style-type: none"> <li>Approximately 47 crashes (High Crash Location: 15)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Intersection counts, traffic projections, and traffic analyses (\$)</li> <li>Traffic signal warrant study (\$)</li> <li>Study by-pass/alternate/truck routes (\$\$)</li> <li>Improve signal coordination (\$\$)</li> <li>Improved signage for destinations (\$\$)</li> <li>Explore opportunities to provide westerly linkage by connecting northern spur and/or main (Browns Mills) branch of Pemberton-Mount Holly Bikeway with New Egypt Bike Trail (\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Traffic signal warrant study (\$)</li> <li>Study by-pass/alternate/truck routes (\$\$)</li> <li>Improve signal coordination (\$\$)</li> <li>Improved signage for destinations (\$\$)</li> <li>Provide new or upgraded striping to make roadways within Pemberton-Mount Holly Bikeway Project Area bicycle compatible (\$\$)</li> </ul>	-	-	-	-	-	-	-	-	-	Detail 17
18	Safety	NJ 70 and CR 2, Manchester	<ul style="list-style-type: none"> <li>Approximately 50 crashes (High Crash Location: 12)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Explore realignment of Beckerville Road to intersect 90 degrees with NJ 70 (\$)</li> <li>Explore potential for east-west bicycle, pedestrian, and rail connections within NJ 70 corridor (\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>New Jersey Department of Transportation safety programs (\$)</li> <li>Lighting/signage improvements (\$\$)</li> <li>Continue to monitor crash frequency (\$)</li> <li>Respond to high frequency of animal crashes at location/provide deer reflectors or similar measure (\$\$\$)</li> </ul>	-	-	-	-	-	-	✓	-	-	Detail 18
19	Safety; Capacity	US 9 from CR 620 to Monroe Avenue, Toms River	<ul style="list-style-type: none"> <li>Approximately 33 crashes (High Crash Location: 22)</li> <li>Capacity (US 9, between CR 620 and Monroe Avenue)</li> </ul>	N/A 1.31	N/A 1.36	<ul style="list-style-type: none"> <li>Traffic signal warrant study (\$)</li> <li>Restripe US 9 for southbound left turn lane (\$\$)</li> <li>Explore potential for non-motorized north-south connections within US 9 corridor (\$\$)</li> <li>Continue to study potential for implementation of MOM rail line as a means to reduce north-south vehicular traffic (\$\$)</li> <li>Study bus prioritization to improve bus service and reduce bus travel times and delays(\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>New Jersey Department of Transportation safety programs (\$)</li> <li>Continue to monitor crash frequency (\$)</li> </ul>	-	-	-	-	-	-	✓	-	-	Detail 19
20	Capacity	CR 571, Jackson	<ul style="list-style-type: none"> <li>Capacity (CR 571, between CR 528 and CR 52)</li> <li>Capacity (CR 571, between CR 528 and CR 638)</li> </ul>	< 1.25 < 1.25	1.66 1.76	<ul style="list-style-type: none"> <li>Study bus prioritization to improve bus service and reduce bus travel times and delays(\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	-	-	-	-	-	-	-	-	-	Detail 20

## Advanced Alternatives

Advanced alternatives propose new infrastructure. As an example, these alternatives may propose new travel lanes, the construction of by-passes, or reconfiguration of roadway alignments. They may build on basic alternatives, and are often considered to be a second-level approach to solving a problem.

Advanced alternatives were developed to address and improve mobility and safety in existing high-frequency crash locations and areas where a high level of roadway congestion was projected by the 2015 and 2035 model runs of the regional traffic analysis. These alternatives are presented in Table 23 in the same way that Table 22 presented basic alternatives and their feasibility.

Table 23 identifies a number of locations where capacity and safety solutions may be warranted. While the particular solutions employed will be dependent upon location-specific conditions, potential solutions may include, among others:

- Flattening vertical profiles;
- Installing rumble strips;
- Providing protective turn movement phases;
- Adding roadside lighting;
- Widening roadway shoulders to increase recovery area and provide a wider field of vision;
- Applying open graded friction coarse overlay or grooved pavement;
- Installing guide rail;
- Installing warning signs and devices such as flashing beacons;
- Installing roadside wildlife reflectors;
- Providing proper superelevation; and,
- Providing clear zones.

In addition to the above, please note that Figure 18 provides a regional overview of the locations for which advanced alternatives are proposed by this report. An aerial view and information on location-specific environmental encumbrances is provided for each target location on electronic detail sheets provided in Appendix 3.

Table 23: Advanced Alternatives

Priority Rank	Type	Location	Issue	Volume/Capacity		Solutions		Permitting (Potential)							Area Detail Sheet (Appendix 3)	
				2015	2035	Capacity	Safety	NJDEP Flood Hazard Area	NJDEP Wetlands	NJ Pinelands	CAFRA	Sediment Control	T&E Habitat	NJDOT		Farmland and/or Open Space
1	Safety; Capacity	NJ 70 and CR 539, Manchester	<ul style="list-style-type: none"> <li>Approximately 87 crashes (High Crash Location: 3)</li> <li>Capacity (CR 530 from NJ 70 to CR 539)</li> <li>Capacity (CR 539 from CR 14 to NJ 70)</li> </ul>	N/A 2.29 1.88	N/A 3.16 2.58	<ul style="list-style-type: none"> <li>Construct/widen all four corners and move right turn lanes out to accommodate acceleration lanes/merging areas (\$\$\$\$)</li> <li>Construct right turn lanes (\$\$\$\$)</li> <li>Use existing and former railway right-of-ways for east-west commuter rail service (\$\$\$\$)</li> <li>Develop multi-purpose trails within NJ 70 corridor. Provide connections to Rancocas Creek Greenway and Pemberton-Mount Holly Bikeway (\$\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Implement safety improvements/crash mitigation measures (\$\$\$)</li> </ul>	✓	✓	✓	-	✓	✓	✓	✓	Detail 1
2	Safety; Capacity	NJ 38 and US 206, Southampton <sup>35</sup>	<ul style="list-style-type: none"> <li>Approximately 95 crashes (High Crash Location: 1)</li> <li>Capacity (US 206 from East Railroad Avenue to NJ 38)</li> <li>Capacity (US 206 from NJ 38 to study area Boundary)</li> </ul>	N/A 1.46 1.34	N/A 1.72 1.80	<ul style="list-style-type: none"> <li>Construct/widen all four corners and move right turn lanes out to accommodate acceleration lanes/merging areas on US 206 northbound and southbound (\$\$\$\$)</li> <li>Construct left turn lanes on northbound and southbound US 206 (\$\$\$\$)</li> <li>Provide interconnected, multi-purpose trails within the Rancocas Creek Greenway Project Area (\$\$\$)</li> <li>Provide non-motorized north-south connections, such as off-road bicycle trails, within US 206 corridor (\$\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Construct left turn lanes on northbound and southbound US 206 (\$\$\$\$)</li> <li>Maximize off-road bicycle facilities within Pemberton-Mount Holly Bikeway (\$\$\$)</li> </ul>	✓	✓	✓	-	✓	✓	✓	✓	Detail 2
3	Safety; Capacity	US 9, Toms River	<ul style="list-style-type: none"> <li>Approx. 58 crashes, between CR 84 &amp; CR 92 (High Crash Loc. No.: 11)</li> <li>Approx. 49 crashes, at ramp from US 9 to NJ 70 WB (High Crash Loc. 18)</li> <li>Capacity (US 9, from CR 84 &amp; ramp from NJ 70 EB)</li> <li>Capacity (US 9, from ramp from NJ 70 EB &amp; ramp to NJ 70 EB)</li> <li>Capacity (US 9, from ramp to NJ 70 WB &amp; ramp to NJ 70 EB)</li> <li>Capacity (NJ 70, from ramp from CR 83 to NJ 70 WB &amp; ramp from NJ 70 WB to US 9 SB)</li> </ul>	N/A N/A 1.34 1.51 1.33 < 1.25	N/A N/A < 1.25 < 1.25 < 1.25 1.56	<ul style="list-style-type: none"> <li>Implement New Jersey Department of Transportation US 9 Corridor improvements (\$\$\$\$)</li> <li>Provide non-motorized north-south connections, such as off-road bicycle trails, within US 9 corridor (\$\$\$)</li> <li>Implement MOM rail line plans (\$\$\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Implement safety improvements/crash mitigation measures (\$\$\$)</li> </ul>	✓	✓	✓	✓	✓	✓	✓	✓	Detail 3A, 3B

<sup>35</sup> As of June 2011, Burlington County had been collaborating with state and local officials on improvements for this intersection. We provide the alternatives presented in this table as a means of guidance and collaboration in the design process.

Table 23 (Continued): Advanced Alternatives

Priority Rank	Type	Location	Issue	Volume/Capacity		Solutions		Permitting (Potential)							Farmland and/or Open Space	Area Detail Sheet (Appendix 3)
				2015	2035	Capacity	Safety	NJDEP Flood Hazard Area	NJDEP Wetlands	NJ Pinelands	CAFRA	Sediment Control	T&E Habitat	NJDOT		
4	Safety; Capacity	US 206 and CR 537, Springfield	<ul style="list-style-type: none"> <li>Approximately 74 crashes (High Crash Location: 2)</li> <li>Capacity (CR 537 from CR 669 to US 206)</li> <li>Capacity (US 206 from CR 537 to CR 669)</li> <li>Capacity (US 206 from CR 669 to midpoint between CR 669 and CR 630)</li> <li>Capacity (US 206 from CR 630 to midpoint between CR 669 and CR 630)</li> <li>Capacity (US 206 from CR 630 to CR 621)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Construct opposing left turn lanes on northbound and southbound US 206 (\$\$\$\$)</li> <li>Provide interconnected, multi-purpose trails within the Barker's Brook Greenway Project Area (\$\$\$)</li> <li>Provide non-motorized north-south connections, such as off-road bicycle trails, within US 206 corridor (\$\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Construct opposing left turn lanes on northbound and southbound US 206 (\$\$\$\$)</li> <li>Implement safety improvements/crash mitigation measures (\$\$\$)</li> <li>Develop bikeway using off-road facilities within corridor of CR 669 and CR 668 between US 206 and Pemberton Borough. Provide spurs, as necessary to reach schools and other points of public interest (\$\$\$)</li> </ul>	✓	✓	-	-	✓	✓	✓	✓	Detail 4
				1.35	1.57											
				1.63	1.74											
				1.51	1.62											
				1.55	1.80											
				< 1.25	1.32											
5	Safety; Capacity	CR 530 and CR 616, Pemberton Borough <sup>36</sup>	<ul style="list-style-type: none"> <li>Approximately 56 crashes (High Crash Location: 8)</li> <li>Capacity (CR 644/CR 530, between CR 616 in Pemberton Borough and Scrapetown Road in Pemberton Township)</li> <li>Capacity (CR 616, between University Avenue in Pemberton Township and CR 530 in Pemberton Borough)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Create by-pass routes (\$\$\$\$)</li> <li>Study bus prioritization to improve bus service and reduce bus travel times and delays(\$\$)</li> <li>Provide interconnected, multi-purpose trails within the Rancocas Creek Greenway Project Area (\$\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Create by-pass routes (\$\$\$\$)</li> <li>Implement safety improvements/crash mitigation measures (\$\$\$)</li> <li>Maximize off-road bicycle facilities within Pemberton-Mount Holly Bikeway (\$\$\$)</li> </ul>	✓	✓	✓	-	✓	✓	-	✓	Detail 5
				< 1.25	2.10											
				< 1.25	1.29											
6	Safety; Capacity	CR 528 and CR 639, Jackson	<ul style="list-style-type: none"> <li>Approximately 69 crashes at CR 528 and CR 639 (High Crash Location: 5)</li> <li>Capacity (CR 528, from CR 639 to CR 626)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Implement bus prioritization (\$\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Implement safety improvements/crash mitigation measures (\$\$\$)</li> </ul>	-	-	-	-	-	-	-	-	Detail 6
				1.29	1.72											

<sup>36</sup> As of June 2011, Burlington County had been collaborating with state and local officials on improvements for this intersection. We provide the alternatives presented in this table as a means of guidance and collaboration in the design process.

Table 23 (Continued): Advanced Alternatives

Priority Rank	Type	Location	Issue	Volume/Capacity		Solutions		Permitting (Potential)							Farmland and/or Open Space	Area Detail Sheet (Appendix 3)	
				2015	2035	Capacity	Safety	NJDEP Flood Hazard Area	NJDEP Wetlands	NJ Pinelands	CAFRA	Sediment Control	T&E Habitat	NJDOT			
7	Safety; Capacity	CR 547 and CR 571, Manchester	<ul style="list-style-type: none"> <li>Approximately 31 crashes (High Crash Location: 20)</li> <li>Approximately 27 crashes (High Crash Location: 23)</li> <li>Capacity (CR 571, between CR 547 and NJ 70)</li> <li>Capacity (CR 571, from CR 547 in Manchester to CR 52 in Jackson)</li> </ul>	N/A N/A < 1.25 1.36	N/A N/A 1.35 1.70	<ul style="list-style-type: none"> <li>Implement capacity improvements (\$\$\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Implement safety improvements/crash mitigation measures (\$\$\$)</li> </ul>	-	-	-	-	-	-	-	-	-	Detail 7A, 7B
8	Safety; Capacity	NJ 70 and CR 527, Toms River	<ul style="list-style-type: none"> <li>Approximately 54 crashes (High Crash Location: 7)</li> <li>Capacity (CR 527, between NJ 70 and CR 622)</li> <li>Capacity (NJ 70, between CR 527 and CR 637)</li> <li>Capacity (NJ 70, between CR 527 in Toms River and CR 571 in Manchester)</li> </ul>	N/A 1.50 1.28 < 1.25	N/A 1.57 1.73 1.48	<ul style="list-style-type: none"> <li>Implement capacity improvements (\$\$\$\$)</li> <li>Use existing and former railway right-of-ways to develop east-west commuter rail service (\$\$\$\$)</li> <li>Develop multi-purpose trails within NJ 70 corridor. Provide connections to Rancocas Creek Greenway and Pemberton-Mount Holly Bikeway (\$\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Implement safety improvements/crash mitigation measures (\$\$\$)</li> </ul>	✓	✓	✓	✓	✓	✓	✓	✓	✓	Detail 8
9	Capacity	CR 687, Pemberton Borough	<ul style="list-style-type: none"> <li>Capacity (CR 687, between Cedar Lane and CR 616)</li> <li>Capacity (CR 616, between CR 687 and Jane Street)</li> </ul>	< 1.25 2.35	1.36 2.75	<ul style="list-style-type: none"> <li>Construct North Pemberton Bypass Route (\$\$\$\$)</li> <li>Connect Pemberton-Mount Holly Bikeway with New Egypt Bike Trail (\$\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Maximize off-road bicycle facilities within Pemberton-Mount Holly Bikeway (\$\$\$)</li> </ul>	✓	✓	✓	-	✓	✓	-	✓	✓	Detail 9
10	Safety; Capacity	NJ 70 and CR 637, Toms River	<ul style="list-style-type: none"> <li>Approximately 46 crashes (High Crash Location: 10)</li> <li>Capacity (NJ 70, between CR 527 and CR 637)</li> <li>Capacity (CR 637, between NJ 70 and CR 622)</li> </ul>	N/A 1.28 < 1.25	N/A 1.73 1.27	<ul style="list-style-type: none"> <li>Implement capacity improvements (\$\$\$\$)</li> <li>Use existing and former railway right-of-ways to develop east-west commuter rail service (\$\$\$\$)</li> <li>Develop multi-purpose trails within NJ 70 corridor. Provide connections to Rancocas Creek Greenway and Pemberton-Mount Holly Bikeway (\$\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Implement safety improvements/crash mitigation measures (\$\$\$)</li> </ul>	✓	✓	✓	✓	✓	✓	✓	✓	✓	Detail 10
11	Safety	NJ 37 and CR 39, Toms River	<ul style="list-style-type: none"> <li>Approximately 82 crashes at NJ 37 and CR 39 (High Crash Location: 4)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Implement safety improvements/crash mitigation measures (\$\$\$)</li> </ul>	-	-	-	-	-	-	-	✓	-	Detail 11



Table 23 (Continued): Advanced Alternatives

Priority Rank	Type	Location	Issue	Volume/Capacity		Solutions		Permitting (Potential)							Farmland and/or Open Space	Area Detail Sheet (Appendix 3)	
				2015	2035	Capacity	Safety	NJDEP Flood Hazard Area	NJDEP Wetlands	NJ Pinelands	CAFRA	Sediment Control	T&E Habitat	NJDOT			
12	Safety; Capacity	NJ 70 and CR 571, Manchester	<ul style="list-style-type: none"> <li>Approximately 48 crashes (High Crash Location: 19)</li> <li>Capacity (NJ 70, between CR 527 in Toms River and CR 571 in Manchester)</li> <li>Capacity (CR 571, between CR 547 and NJ 70)</li> </ul>	N/A < 1.25 < 1.25	N/A 1.48 1.35	<ul style="list-style-type: none"> <li>Implement bus prioritization improvements (\$\$\$)</li> <li>Use existing and former railway right-of-ways to develop east-west commuter rail service (\$\$\$)</li> <li>Develop multi-purpose trails within NJ 70 corridor. Provide connections to Rancocas Creek Greenway and Pemberton-Mount Holly Bikeway (\$\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Implement safety improvements/crash mitigation measures (\$\$\$)</li> </ul>	✓	✓	✓	✓	✓	✓	✓	✓	✓	Detail 12
13	Safety; Capacity	CR 527 and CR 622, Toms River	<ul style="list-style-type: none"> <li>Approximately 42 crashes (High Crash Location: 13)</li> <li>Capacity (CR 527, between NJ 70 and CR 622)</li> </ul>	N/A 1.50	N/A 1.57	<ul style="list-style-type: none"> <li>Implement traffic signal modifications (\$\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Implement safety improvements/crash mitigation measures (\$\$\$)</li> </ul>	-	-	-	-	-	-	-	-	-	Detail 13
14	Safety; Capacity	NJ 70 and NJ 72, Pemberton Twp., Springfield and Woodland	<ul style="list-style-type: none"> <li>Approximately 45 crashes (High Crash Location: 6)</li> <li>Capacity (CR 646 and NJ 70)</li> <li>Capacity (CR 644, between NJ 70 and Upper Mill Road)</li> </ul>	N/A 1.42 < 1.25	N/A < 1.25 1.40	<ul style="list-style-type: none"> <li>Continue to monitor for capacity issues (\$)</li> </ul>	<ul style="list-style-type: none"> <li>Implement safety improvements/crash mitigation measures (\$\$\$)</li> </ul>	-	-	-	-	-	-	✓	-	-	Detail 14
15	Safety; Capacity	CR 527 and CR 528, Jackson	<ul style="list-style-type: none"> <li>Approximately 44 crashes (High Crash Location: 14)</li> <li>Capacity (CR 527 from CR 528 to study area boundary)</li> <li>Capacity (CR 527 from CR 528 to CR 8)</li> <li>Capacity (CR 527 from CR 8 to CR 527/Whitesville Road)</li> </ul>	N/A < 1.25 < 1.25 < 1.25	N/A 1.31 1.37 1.35	<ul style="list-style-type: none"> <li>Construct/widen south- and northeast corners and move right turn lanes out to accommodate acceleration lanes/merging distances (\$\$\$)</li> <li>Implement additional capacity for northbound through-movement (\$\$\$)</li> <li>Implement bus prioritization to improve bus service and reduce bus travel times and delays(\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Implement signal timing modifications (\$\$)</li> <li>Implement safety improvements/crash mitigation measures (\$\$\$)</li> </ul>	✓	✓	✓	-	✓	✓	-	-	-	Detail 15
16	Safety; Capacity	CR 528 and CR 640, Jackson and Plumsted	<ul style="list-style-type: none"> <li>Approximately 40 crashes (High Crash Location: 9)</li> <li>Capacity (CR 640, between CR 528 and Reed Road)</li> </ul>	N/A < 1.25	N/A 1.44	<ul style="list-style-type: none"> <li>Study traffic signal warrants (\$)</li> <li>If warranted, install traffic signal (\$\$\$)</li> <li>If warranted, construct new exclusive lanes (\$\$\$)</li> <li>Study bus prioritization to improve bus service and reduce bus travel times and delays(\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Implement safety improvements/crash mitigation measures (\$\$\$)</li> </ul>	-	-	✓	-	-	✓	-	-	-	Detail 16

Table 23 (Continued): Advanced Alternatives

Priority Rank	Type	Location	Issue	Volume/Capacity		Solutions		Permitting (Potential)							Farmland and/or Open Space	Area Detail Sheet (Appendix 3)
				2015	2035	Capacity	Safety	NJDEP Flood Hazard Area	NJDEP Wetlands	NJ Pinelands	CAFRA	Sediment Control	T&E Habitat	NJDOT		
17	Safety	CR 530 and Club House Road, Pemberton Twp.	<ul style="list-style-type: none"> <li>Approximately 47 crashes (High Crash Location: 15)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Create by-pass routes (\$\$\$\$)</li> <li>Align Note Boom Ave and Club House Road (\$\$\$\$)</li> <li>Install new traffic signal, if warranted (\$\$\$)</li> <li>Connect Pemberton-Mount Holly Bikeway with New Egypt Bike Trail (\$\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Create by-pass routes (\$\$\$\$)</li> <li>Align Note Boom Ave and Club House Road (\$\$\$\$)</li> <li>Install new traffic signal, if warranted (\$\$\$)</li> <li>Implement safety improvements/crash mitigation measures (\$\$\$)</li> <li>Maximize off-road bicycle facilities within Pemberton-Mount Holly Bikeway (\$\$\$)</li> </ul>	✓	✓	✓	-	✓	✓	-	✓	Detail 17
18	Safety	NJ 70 and CR 2, Manchester	<ul style="list-style-type: none"> <li>Approximately 50 crashes (High Crash Location: 12)</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>Construct realignment of Beckerville Road at 90 degrees to NJ 70 (\$\$\$\$)</li> <li>Use existing and former railway right-of-ways to develop east-west commuter rail service (\$\$\$\$)</li> <li>Develop multi-purpose trails within NJ 70 corridor. Provide connections to Rancocas Creek Greenway and Pemberton-Mount Holly Bikeway (\$\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Implement safety improvements/crash mitigation measures (\$\$\$)</li> </ul>	✓	✓	✓	-	✓	✓	✓	✓	Detail 18
19	Safety; Capacity	US 9 from CR 620 to Monroe Avenue, Toms River	<ul style="list-style-type: none"> <li>Approximately 33 crashes (High Crash Location: 22)</li> <li>Capacity (US 9, between CR 620 and Monroe Avenue)</li> </ul>	N/A 1.31	N/A 1.36	<ul style="list-style-type: none"> <li>Install new traffic signal, if warranted (\$\$\$)</li> <li>Provide non-motorized north-south connections, such as off-road bicycle trails, within US 9 corridor (\$\$\$)</li> <li>Implement MOM rail line plans (\$\$\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>Implement safety improvements/crash mitigation measures (\$\$\$)</li> </ul>	✓	✓	✓	✓	✓	✓	✓	✓	Detail 19
20	Capacity	CR 571, Jackson	<ul style="list-style-type: none"> <li>Capacity (CR 571, between CR 528 and CR 52)</li> <li>Capacity (CR 571, between CR 528 and CR 638)</li> </ul>	< 1.25 < 1.25	1.66 1.76	<ul style="list-style-type: none"> <li>Study bus prioritization to improve bus service and reduce bus travel times and delays(\$\$)</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	-	-	-	-	-	-	-	-	Detail 20

## Cost

To provide an indication of the relative cost for each of the basic and advanced alternatives, ranges were assigned to each of the measures<sup>37</sup> outlined in tables 22 and 23. These ranges account for administrative, legal, design, construction, and inspection costs. They do not account for operating and maintenance costs. The established cost ranges are outlined in Table 24, below.

Code	Range
\$	Less than \$10,000
\$\$	Greater than or equal to \$10,000, but less than \$100,000
\$\$\$	Greater than or equal to \$100,000, but less than \$500,000
\$\$\$\$	Greater than or equal to \$500,000

## Funding

There are a range of external funding opportunities that may be tapped to implement the basic and advanced alternatives that are presented in the Joint Base Regional Transportation Mobility Study. A sample of potential funding opportunities is presented below.

- Municipal Aid Program
  - Funds are appropriated by the Legislature for municipalities in each county based on a formula contained in legislation. Additional funding is allotted for municipalities that qualify for Urban Aid. According to information provided by the New Jersey Department of Community Affairs, Pemberton Township was eligible for Urban Aid in the 2009/2010 funding round of the Municipal Aid Program. Urban Aid is distributed by a formula that is computer by the Department of Community Affairs.
  - This program is administered by the New Jersey Department of Transportation.
- County Aid Program
  - Funds are appropriated by the Legislature annually for the improvement of public roads and bridges under County jurisdiction. Public transportation and other transportation projects are also eligible.
  - This program is administered by the New Jersey Department of Transportation.
- Centers of Place Program
  - Funding is provided to finance non-traditional transportation improvements that advance municipal growth management objectives.
  - This program is administered by the New Jersey Department of Transportation.

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<sup>37</sup> Coded cost ranges are included in parentheses after each of the measures included in tables 22 and 23.

- Local Aid Infrastructure Fund Program
  - Funds are provided to address emergencies and regional needs throughout the State. Any county or municipality may apply at any time, and funds are approved at the discretion of the Commissioner of the New Jersey Department of Transportation. Under this program, a county or municipality may also apply for funding for pedestrian safety and bikeway projects.
  - This program is administered by the New Jersey Department of Transportation.
- Bikeway Program
  - Funding and grants are provided for the construction of new bikeways that are separated from motorized vehicular traffic.
  - This program is administered by the New Jersey Department of Transportation.
- Safe Streets to Transit Program
  - This program provides funding to counties and municipalities to improve access to public transit facilities.
  - This program is administered by the New Jersey Department of Transportation.
- Transit Village Program
  - This program awards grants for non-traditional transportation-related projects to New Jersey municipalities designated as Transit Villages.
  - This program is administered by the New Jersey Department of Transportation.
- Safe Routes to School Program
  - Safe Routes to School (SRTS) is a federal, state and local effort to enable and encourage children, including those with disabilities, to walk and bicycle to school.
  - This program is administered by the New Jersey Department of Transportation.
- Green Acres Program
  - Green Acres funding provides for the acquisition of land and the construction of parks and greenways throughout the State.
  - This program is administered by the New Jersey Department of Environmental Protection.
- Office of Natural Lands Management Grants
  - The Office of Natural Lands Management of the New Jersey Department of Environmental Protection's Division of Parks and Forestry funds trail development by means of an annual grant program, which typically provides up to \$25,000 exclusively for non-motorized trail development and facilities.
  - This program is administered by the New Jersey Department of Environmental Protection.

- Major Capital Investments (New Starts & Small Starts) Program
  - The New Starts program provides funds for construction of new fixed guideway systems or extensions to existing fixed guideway systems. Eligible purposes are light rail, rapid rail (heavy rail), commuter rail, monorail, automated fixed guideway system (such as a “people mover”), or a busway/high occupancy vehicle (HOV) facility, or an extension of any of these.
  - This program is administered by the Federal Transit Administration (FTA).
- Rail and Fixed Guideway Modernization Program
  - The transit capital investment program (49 U.S.C. 5309) provides capital assistance for three primary activities: modernization of existing rail systems, new and replacement buses and facilities, and new fixed guideway systems.
  - This program is administered by the Federal Transit Administration (FTA).
- Bus and Bus Related Equipment and Facilities Program
  - This program provides capital assistance for new and replacement buses, related equipment, and facilities. Eligible capital projects include the purchasing of buses for fleet and service expansion, bus maintenance and administrative facilities, transfer facilities, bus malls, transportation centers, intermodal terminals, park-and ride stations, acquisition of replacement vehicles, bus rebuilds, bus preventive maintenance, passenger amenities such as passenger shelters and bus stop signs, accessory and miscellaneous equipment such as mobile radio units, supervisory vehicles, fare boxes, computers and shop and garage equipment.
  - This program is administered by the Federal Transit Administration (FTA).
- Transportation for Elderly Persons and Persons with Disabilities
  - This program (49 U.S.C. 5310) provides formula funding for the purpose of assisting private nonprofit groups in meeting the transportation needs of the elderly and persons with disabilities when the transportation service provided is unavailable, insufficient, or inappropriate to meeting these needs.
  - This program is administered by the Federal Transit Administration (FTA).

## Permitting

Key permitting issues that may result from the basic and advanced alternatives for each of the twenty target locations are identified in tables 22 and 23. It is important to note that this identification is hypothetical only and indicative of those issues that *may* arise. The *actual* presence of a particular permitting issue will be determined during more advanced stages of conceptualization and design.

In addition to the above, when solutions that may extend into other areas are proposed, permitting issues that may be associated with those areas are indicated in tables 22 and 23. For instance, if a regional trail network that will be located in areas subject to the regulations of both CAFRA and the Pinelands is listed as a solution for a particular target area but said target area is located solely within the jurisdiction of the Pinelands Commission, both CAFRA and Pinelands permitting issues are indicated. In other words, permitting issues are indicated based on the specific solution, and not the specific area.

A brief description of each of the permitting issues that are identified in tables 22 and 23 is provided below.

- NJDEP Flood Hazard Area
  - Flood hazard areas and are regulated topographic features. The New Jersey Department of Environmental Protection issues general and individual permits for construction of all types in flood hazard areas. General permits are issued for well defined regulated activities in a flood hazard area, as provided in NJAC 7:13-8 et seq. Individual permits are issued when the regulated activity does not meet the criteria or definition of the various general permits that may be obtained. Actual project design will, therefore, determine whether a general or individual permit is required.
- NJDEP Wetlands
  - The Freshwater Wetlands Protection Act requires the New Jersey Department of Environmental Protection to regulate virtually all activities proposed in wetlands, including cutting of vegetation, dredging, excavation or removal of soil, drainage or disturbance of the water level, filling or discharge of any materials, driving of pilings, and placing of obstructions, among other activities. The Department issues general permits and individual permits. General permits are issued for the repair of existing facilities or structures, as well as the construction of trails, driveways, and short roadways or similar crossings, among other activities defined in NJAC 7:7A. Individual permits are issued when the regulated activity does not meet the criteria or definition of a general permit, as provided in NJAC 7:7A. Actual project design will, therefore, determine whether a general or individual permit is required.

- NJ Pinelands
  - Virtually all activities that result in land disturbance within the Pinelands National Reserve Require prior approval by the New Jersey Pinelands Commission. Most often, this requires submittal of an Application for Development to the New Jersey Pinelands Commission.
- CAFRA
  - Those projects that meet the definition of regulated activity within the CAFRA zone will require the prior approval of the New Jersey Department of Environmental Protection, Land Use Regulation Program. There are two types of permits: the Costal General Permit; and, the Costal Individual Permit. Coastal General Permits are for those projects that meet the criteria of costal general permits, as defined in NJAC 7:7 and NJAC 7:7E. Coastal Individual Permits are for those projects that do not meet the criteria of NJAC 7:7 and NJAC 7:7E.
- Sediment Control
  - Soil erosion and sediment control permits are issued by county-based soil conservation districts. They are required when more than 5,000 square feet of land area is disturbed.
- T&E Habitat
  - Threatened and endangered species habitat is shown on the area detail sheets contained in Appendix 3. The extent of the habitat shown on these sheets is derived from digital geographic data of the New Jersey Department of Environmental Protection, and is a general indication of where a threatened or endangered plant or animal species *may* be present. The actual presence of a threatened or endangered species must be confirmed through an environmental field study conducted by a qualified professional. In the event that a threatened or endangered species is found to be present, additional consultation with the Endangered and Non-Game Species Program of the New Jersey Department of Environmental Protection is often required. If a federally-listed threatened or endangered species is found, then consultation with the United States Fish and Wildlife Service will often be required.
- NJDOT
  - Virtually all activities that impact state or federal roadways require approval by the New Jersey Department of Transportation. Most often, this requires submittal of an application to the New Jersey Department of Transportation. The type of application depends on the scope of work.

- Farmland and/or Open Space
  - Disturbance of preserved farmland defeats the purpose and intent of local, county, and state preservation programs. Therefore, the design of a particular solution must not disturb preserved farmland. However, in certain limited cases, such as the development of multipurpose trails, the particular solution may be designed in such a manner that agricultural activity is not disturbed. In fact, uses such as multipurpose trails may actually support the cause for agricultural preservation by helping to raise awareness of the importance of agriculture and may be appropriate uses. For any project involving preserved farmland, early consultation with county-based agricultural development boards, the State Agricultural Development Committee, and municipally-based agricultural advisory committees.
  - Properties that are encumbered by open space requirements through the New Jersey Green Acres program must remain as open space properties. However, in certain cases where the use of an open space property is absolutely required for a public purpose, such as to improve roadway safety when there is no other viable alternative, a Diversion Approval from New Jersey State House Commission is required. Application for a Diversion Approval is a lengthy and detailed process, and they can result in requirements for dedication of additional land for open space purposes in a ratio as high as 20:1. The actual set aside ratio will vary based on the type of diversion. Diversions include, but are not limited to: building construction; road widening; and, the sale or use of land for some other type of non-open space purpose.



# Summary

The Joint Base Regional Transportation Mobility Study has examined the impact of regional background growth and mission changes at Joint Base McGuire-Dix-Lakehurst upon the circulation network of the study area. This analysis has been performed with the benefit of a customized transportation model<sup>38</sup> that predicts future traffic conditions, as measured by volume/capacity ratios for the years 2015 and 2035. The impact of mission changes and background growth can be seen in figures 13, 15, and 17, which show volume/capacity ratios for 2010, 2015, and 2035, respectively. Additionally, Table 25 tabulates the change in the total length of roadway segments with a volume/capacity ratio of: less than 0.75; greater than or equal to 0.75, but less than 1.00; greater than or equal to 1.00, but less than 1.25; and, greater than or equal to 1.25. Roadways with a volume/capacity ratio of more than 1.00 are considered to be operating above capacity.

**Table 25: Change in Volume/Capacity Ratio**

Model Run	Portion of Roadways with Volume/Capacity Ratio < 0.75	Portion of Roadways with Volume/Capacity Ratio ≥ 0.75, < 1.00	Portion of Roadways with Volume/Capacity Ratio ≥ 1.00, < 1.25	Portion of Roadways with Volume/Capacity Ratio ≥ 1.25	Study Area Average Volume/Capacity Ratio
2010 – Baseline	60.1%	16.8%	19.1%	4.0%	0.59
2015 – No Build (No Mission Changes)	56.9%	16.3%	20.7%	6.1%	0.61
2015 – Build (With Mission Changes)	56.4%	16.3%	21.7%	5.5%	0.62
2035 – No Build (No Mission Changes)	46.9%	14.0%	26.4%	12.7%	0.75
2035 – Build (With Mission Changes)	46.6%	12.7%	28.2%	12.5%	0.76
Change: 2010 to 2035 Build (With Mission Changes)	-13.5%	-4.1%	9.1%	8.5%	0.17

As can be seen in Table 25, there is nearly 18 percent growth in the proportion of roadways with 2035 volume/capacity ratios of 1.00 or greater. In total, 40.7 percent of the study area roadways will fall within this category in 2035, assuming all mission changes are realized. With mission changes excluded from the 2035 projection of volume/capacity ratio, a total of 39.1 percent of study area roadways will have volume/capacity ratios greater than or equal to 1.00. Thus, planned mission changes result in an additional 1.6 percent of study area roadways with a volume/capacity ratio of greater than or equal to 1.00.

This information, combined with an extensive review of high frequency crash locations and other existing conditions within the study area, was used to identify target locations, for which basic and

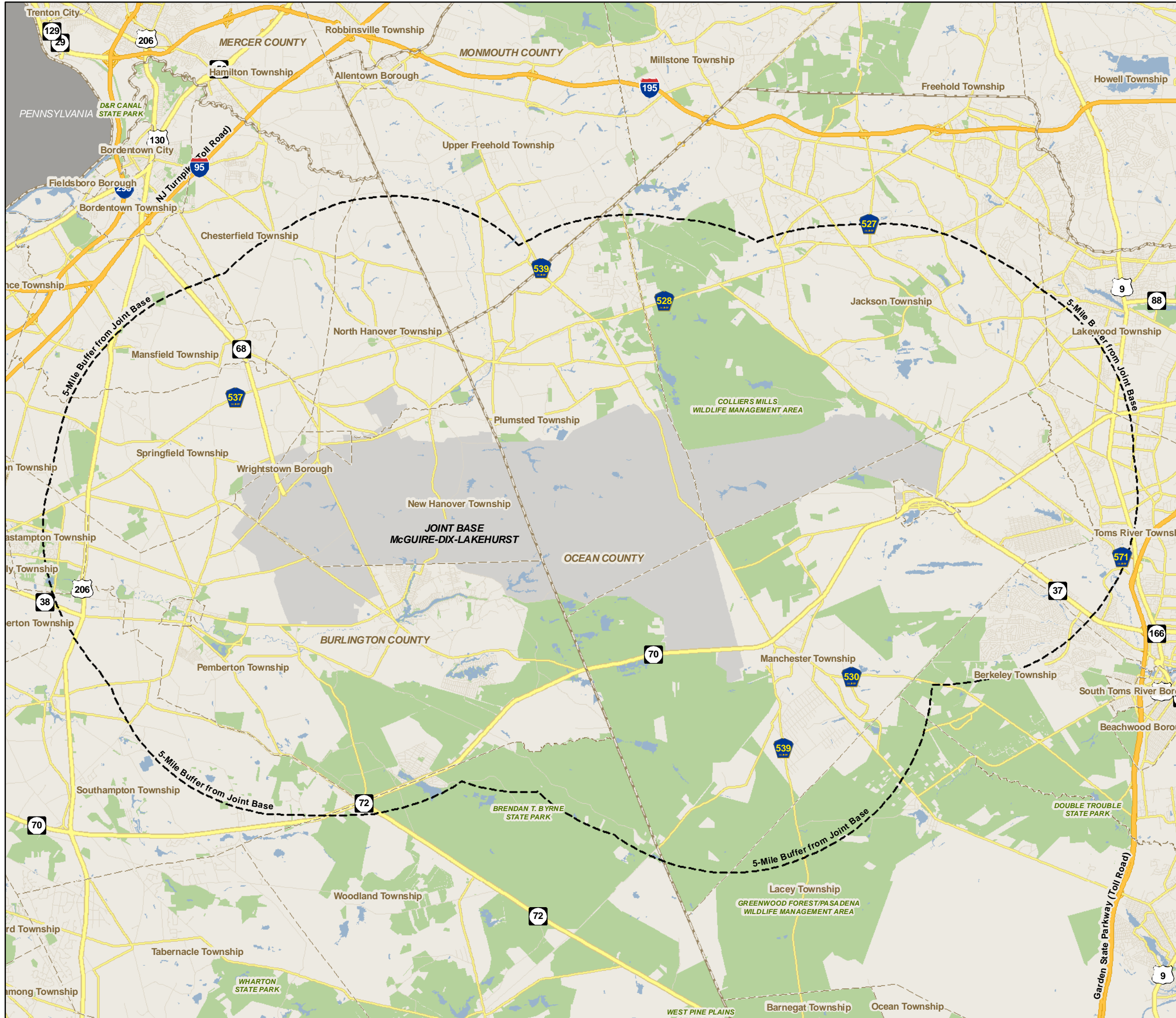
<sup>38</sup> The customized regional transportation model is adapted from regional transportation models of the North Jersey Regional Transportation Planning Authority and the Delaware Valley Regional Planning Commission.

advanced alternatives were proposed to improve mobility and mitigate the congestion foreseen by the customized transportation model. In total, twenty locations were selected. All of these locations were projected to have either a 2035 volume/capacity ratio of 1.25 or greater, were the site of a high-frequency crash location, or both. These locations were selected and prioritized as indicated in the section of this report entitled *Alternatives Analysis*. These locations are mapped in Figure 18. Tables 22 and 23 provide complete details of the solutions that have been proposed for them, their feasibility, and potential permitting issues.

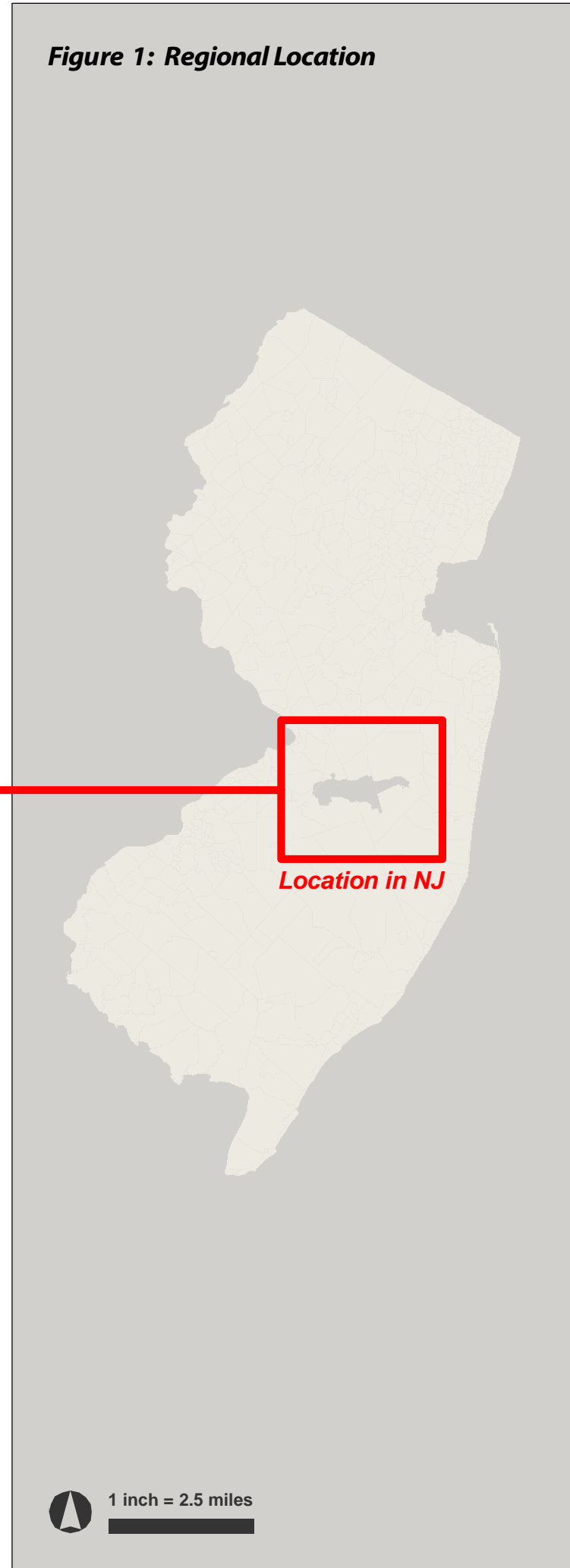
It is intended that this report serve as a guide to focus further review and analysis for targeted transportation improvements within the study area. By pursuing the recommendations presented in the *Alternatives Analysis*, the various jurisdictions within the study area can take a proactive step to facilitate safe and efficient motorized and non-motorized mobility around Joint Base McGuire-Dix-Lakehurst.

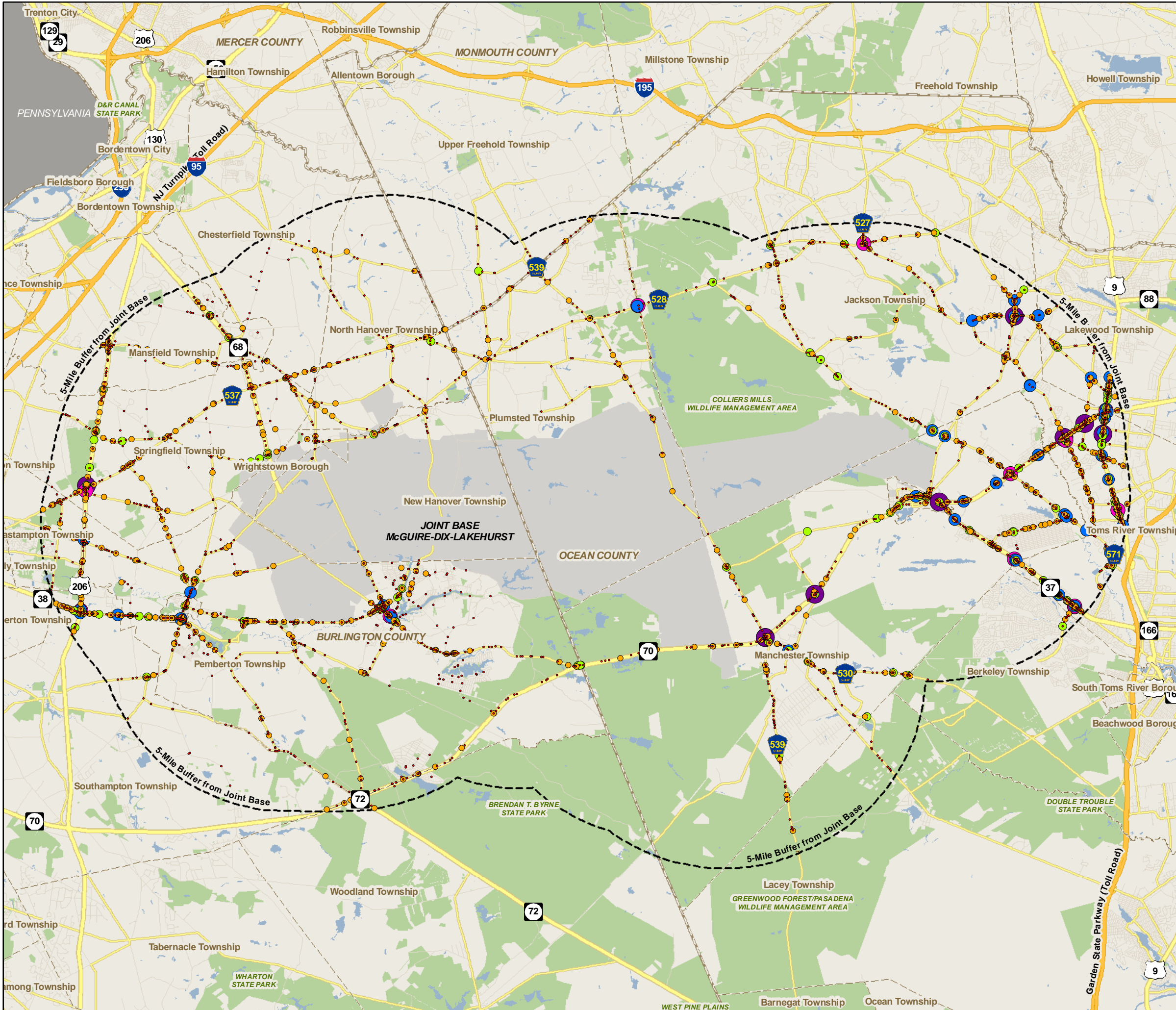
# Figures

- Figure 1: Regional Location
- Figure 2: Crash Overview
- Figure 3: High-Frequency Crash Locations
- Figure 4: Traffic Count Locations
- Figure 5: Public Transportation
- Figure 6: Non-Motorized Transportation
- Figure 7: Survey Respondents by ZIP Code of Origin
- Figure 8: Roadway Use by Survey Respondents
- Figure 9: Roadway Structures
- Figure 10A: Original NJRTM-E Roadway Network
- Figure 10B: Modified NJRTM-E Roadway Network
- Figure 11: 2010-2035 Population Change
- Figure 12: 2010-2035 Employment Change
- Figure 13: 2010 Model Results
- Figure 14: 2015 No-Build Model Results
- Figure 15: 2015 Build Model Results
- Figure 16: 2035 No-Build Model Results
- Figure 17: 2035 Build Model Results
- Figure 18: Target Areas



**Figure 1: Regional Location**



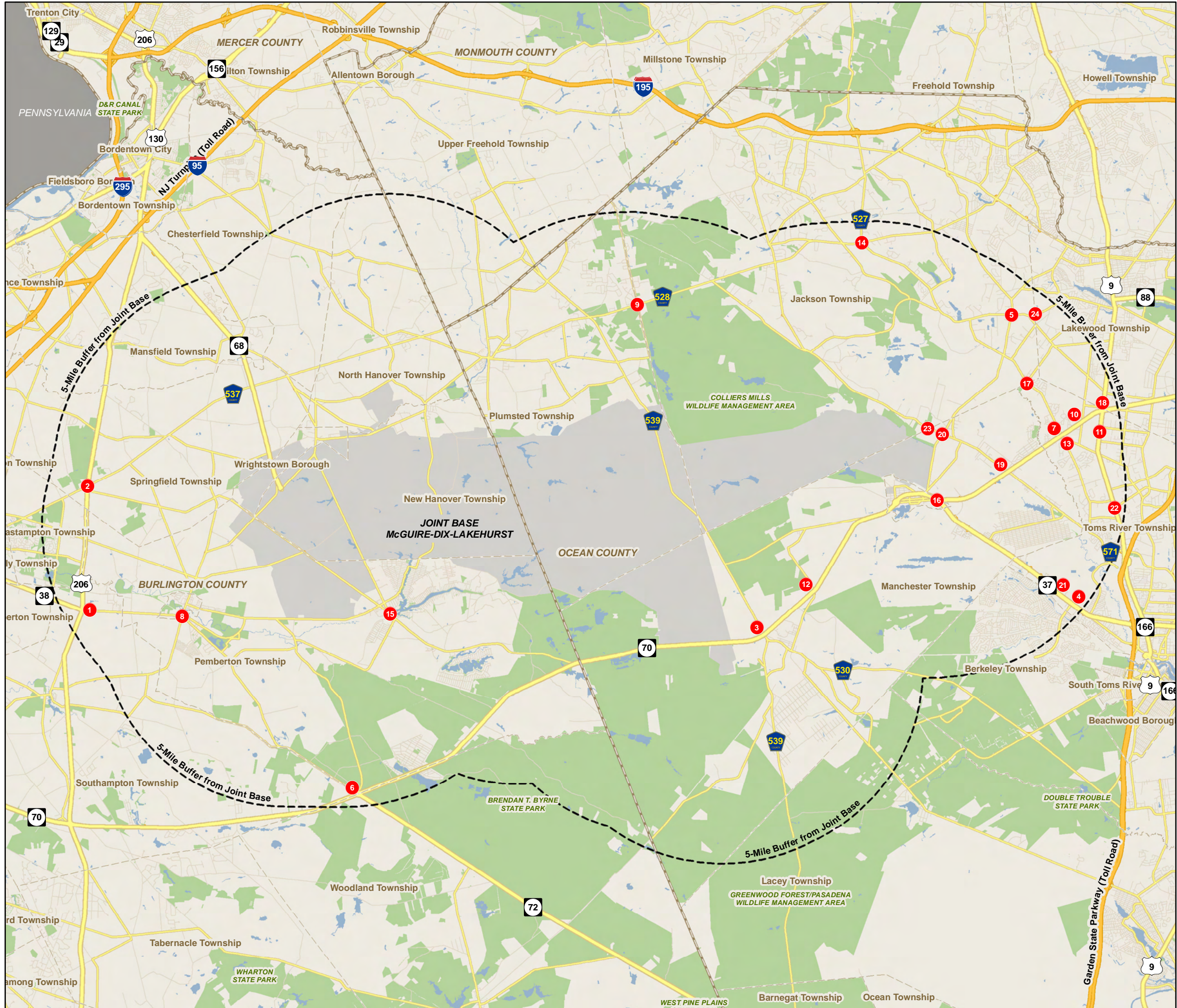


**Figure 2: Crash Overview**

- Location with 1 Crash
- Location with 2 to 5 Crashes
- Location with 6 to 10 Crashes
- Location with 11 to 20 Crashes
- Location with 21 to 30 Crashes
- Location with 31 to 40 Crashes

1 inch = 2.5 miles

**Note:** This map depicts the location of crash incidents of all types within five miles of Joint Base McGuire-Dix-Lakehurst from January 1, 2007 through December 31, 2009. Dot sizes are proportionate to the number of crashes at a particular geographic coordinate.

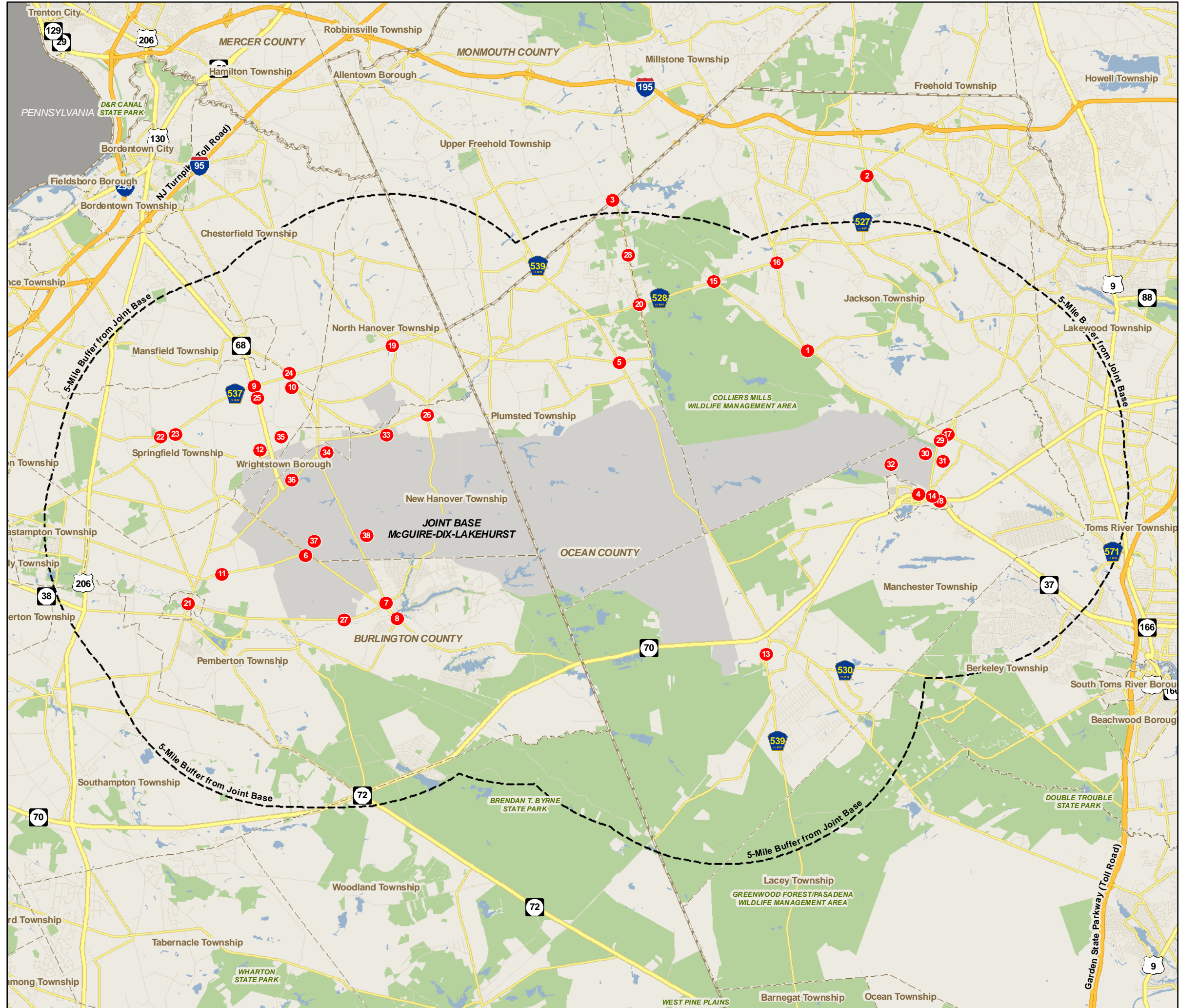


**Figure 3: High-Frequency Crash Locations**

- 1 NJ 38, US206 & CR530, Southampton
- 2 BC 537 & US206, Springfield
- 3 NJ 70 & OC539, Manchester
- 4 NJ37 & OC39, Toms River
- 5 OC 639 & OC 528, Jackson
- 6 NJ 70 & NJ 72, Woodland
- 7 OC 527 & NJ 70, Toms River
- 8 BC 530 & BC 616, Pemberton Borough
- 9 OC 640 & OC 528, Plumsted
- 10 NJ 70 & OC 637, Toms River
- 11 US 9, between OC 84 & 92, Toms River
- 12 NJ 70 & OC 2, Manchester
- 13 OC 527 & OC 622, Toms River
- 14 OC 527 & OC 636, Jackson
- 15 BC 530 & Club House Rd., Pemberton
- 16 NJ 70 & NJ 37, Lakehurst
- 17 OC 527 & OC 59, Toms River
- 18 NJ 70 & US 9, Toms River
- 19 NJ 70 & OC 571, Manchester
- 20 OC 571 & OC 547, Manchester
- 21 NJ 37 & Bananier Dr., Toms River
- 22 US 9 & OC 620, Toms River
- 23 OC 571, between Ridge Ave. & OC 547, Manchester
- 24 OC 528, between Whitesville Rd. & OC 626, Lakewood

1 inch = 2.5 miles

**Note:** This map depicts the location of crash incidents of all types within five miles of Joint Base McGuire-Dix-Lakehurst from January 1, 2007 through December 31, 2009.



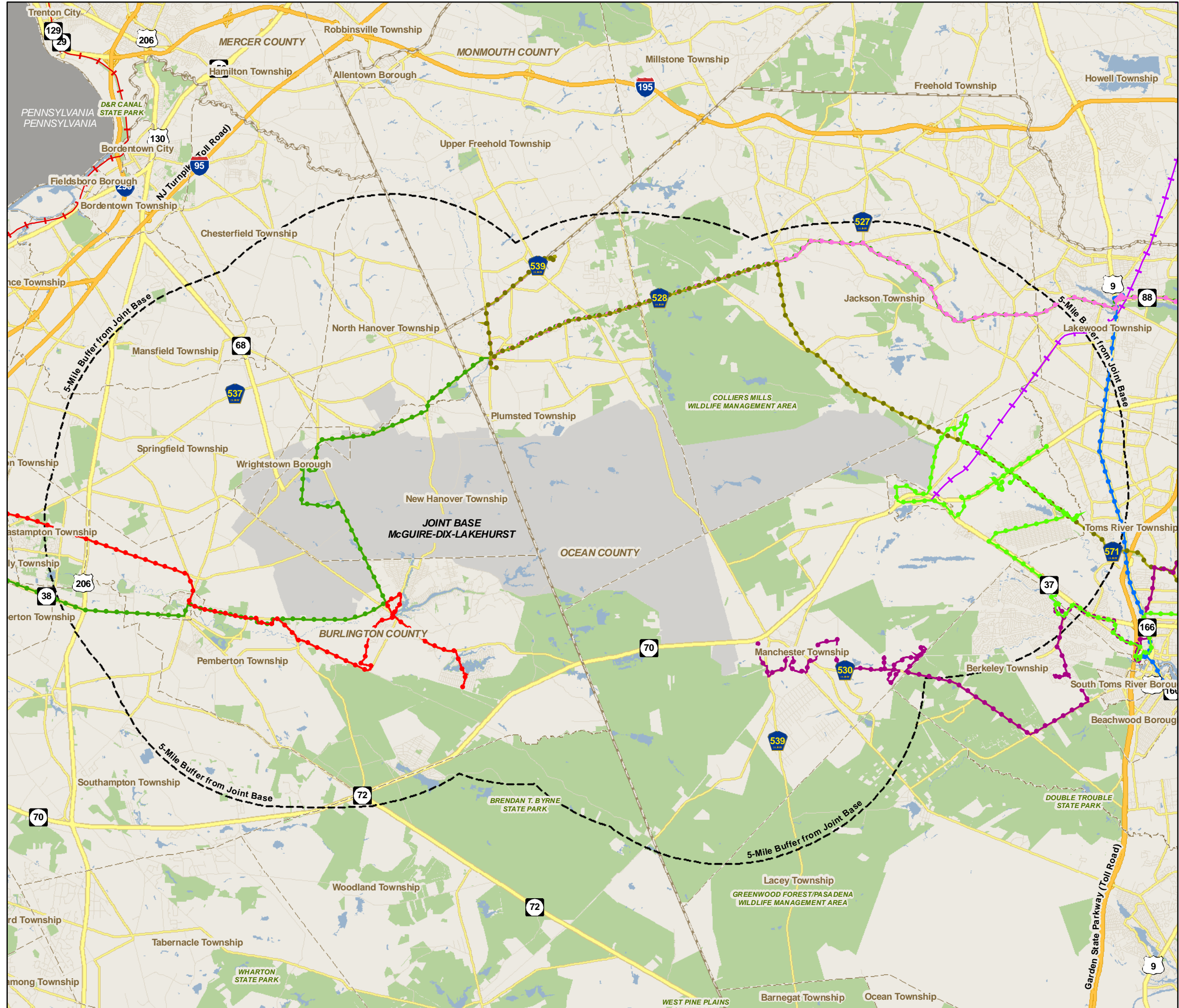
**Figure 4: Traffic Count Locations**

1. South Stump Tavern Road & CR 571 in Jackson; TMC
2. CR 527 & CR 638 in Jackson; TMC
3. CR 537 & CR 640 in Jackson; TMC
4. NJ Route 70 & CR 547 in Lakehurst; TMC
5. CR 539 & CR 640 in Plumsted; TMC
6. CR 669 & CR 630 in Pemberton Township; TMC
7. CR 545 & CR 667 in Pemberton Township; TMC
8. CR 530 & CR 645 in Pemberton Township; TMC
9. CR 537 & NJ Route 68 in Springfield; TMC
10. CR 545, South of CR 537 in Springfield; ATR
11. CR 630, West of the Joint Base in Pemberton Township; ATR
12. CR 670, West of NJ Route 68 in Springfield; ATR
13. CR 539, South of the Joint Base in Manchester; ATR
14. NJ Route 70 West, West of NJ Route 37 in Lakehurst; ATR
15. South Stump Tavern Road & CR 528 in Jackson; TMC
16. CR 528 & CR 571 in Jackson; TMC
17. CR 547 & CR 571 in Manchester; TMC
18. NJ Route 70 & NJ Route 37 in Lakehurst; TMC
19. CR 537 & CR 665 in North Hanover; TMC
20. CR 528 & CR 640 in Plumsted; TMC
21. CR 687 & CR 616 in Pemberton Borough; TMC
22. CR 670 & CR 537 in Springfield; TMC
23. CR 670 & CR 537 in Springfield; TMC
24. CR 537 & CR 545 in Springfield; TMC
25. NJ Route 68, South of CR 537 in Springfield; ATR
26. CR 667, South of CR 616 in New Hanover; ATR
27. CR 530, between CR 645 & CR 545 in Pemberton Township; ATR
28. CR 640, South of CR 537 in Jackson; ATR
29. CR 547, South of CR 571 in Manchester; ATR
30. Gate 1 (Lakehurst Main Gate)
31. Gate 4 (Lakehurst Commercial Gate)
32. Gate 3 (Pinehurst Gate)
33. McGuire Gate (McGuire Main Gate)
34. Wrightstown Gate
35. Checkpoint 9 (Commercial Gate 9)
36. Dix Main/68 Gate
37. Pemberton Gate (Juliestown Gate)
38. Browns Mills Gate (Texas Gate)

**TMC:** Turning Movement Count  
**ATR:** Automatic Traffic Recorder

**Note:** Depiction of traffic count locations is approximate and for illustrative purposes only.

1 inch = 2.5 miles



**Figure 5: Public Transportation**

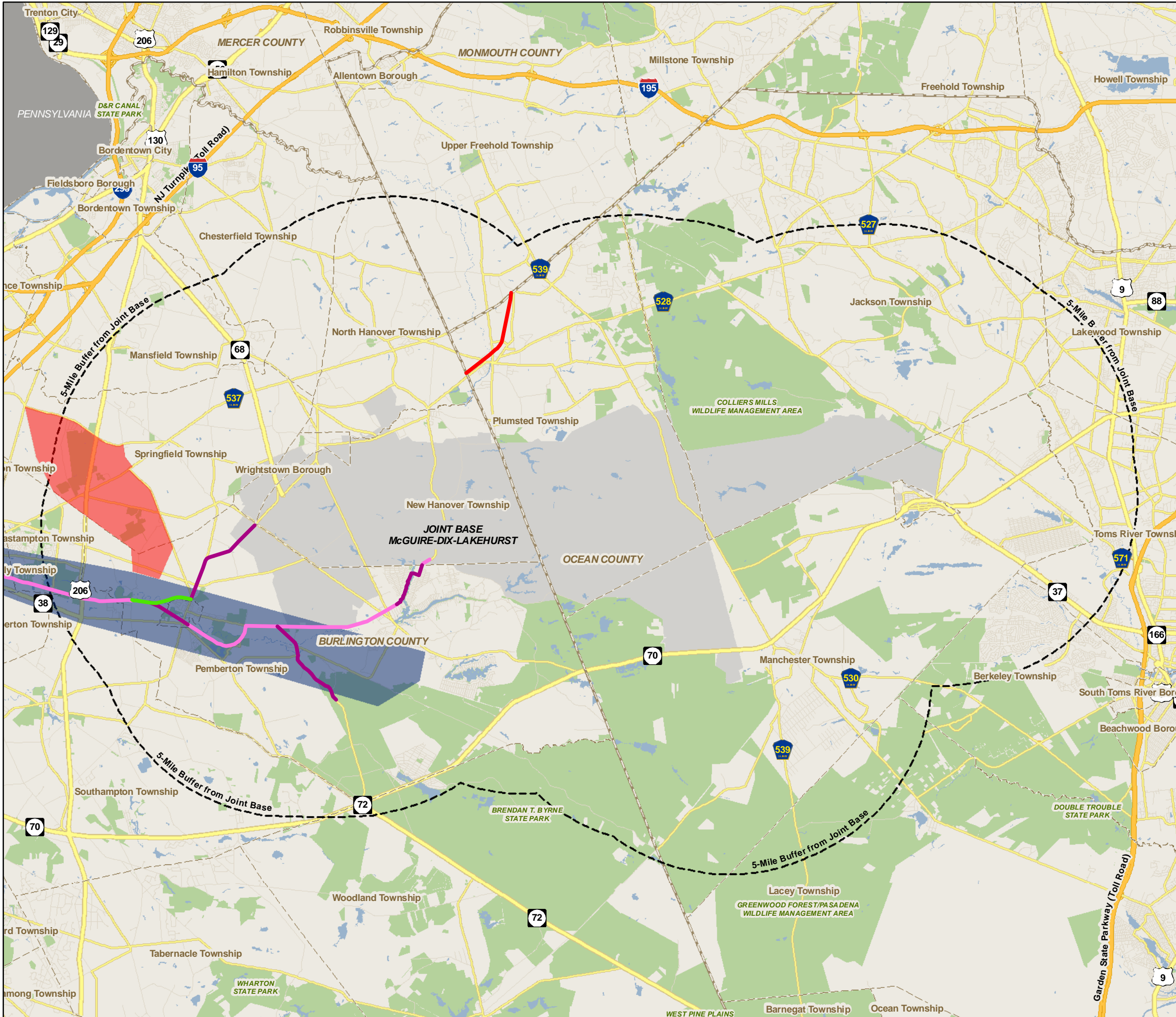
- OceanRide Route 1
- OceanRide Route 10
- OceanRide Route 10 (First Tuesday)
- OceanRide Route 2
- BurLink Route 1
- NJ Transit Route 317
- NJ Transit Route 559
- +— Existing Light Rail (RiverLine)
- +— Existing Commuter Rail Service
- +— Proposed MOM Rail Service

1 inch = 2.5 miles



**Figure 6: Non-Motorized Transportation**

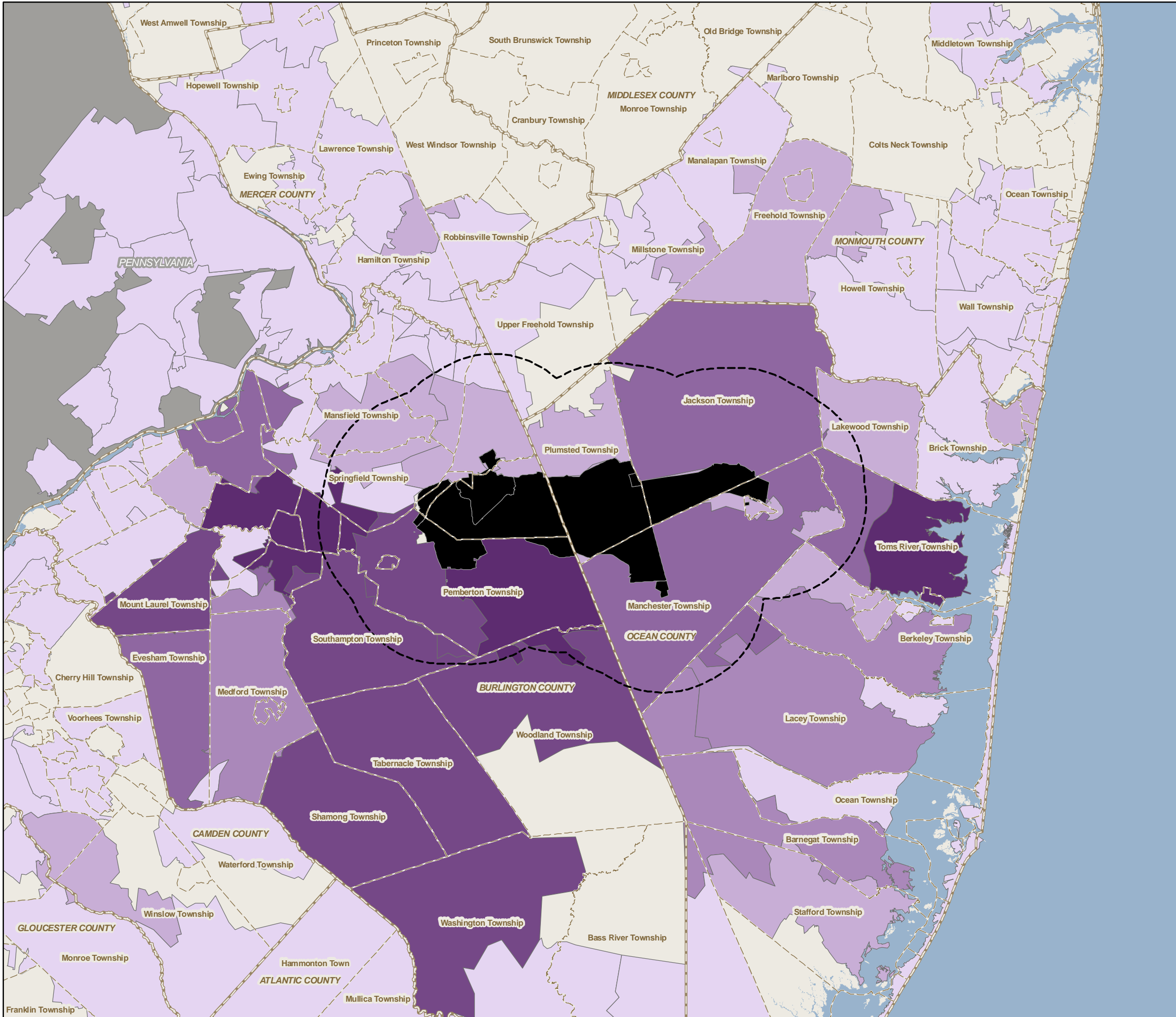
- New Egypt Bike Trail
- Pemberton Rail Trail
- Pemberton-Mount Holly Bikeway (Existing)
- Pemberton-Mount Holly Bikeway (Proposed)
- Barker's Brook Greenway Project Area
- Rancocas Creek Greenway Project Area



1 inch = 2.5 miles


**Figure 7: Survey Respondents by ZIP Code of Origin**

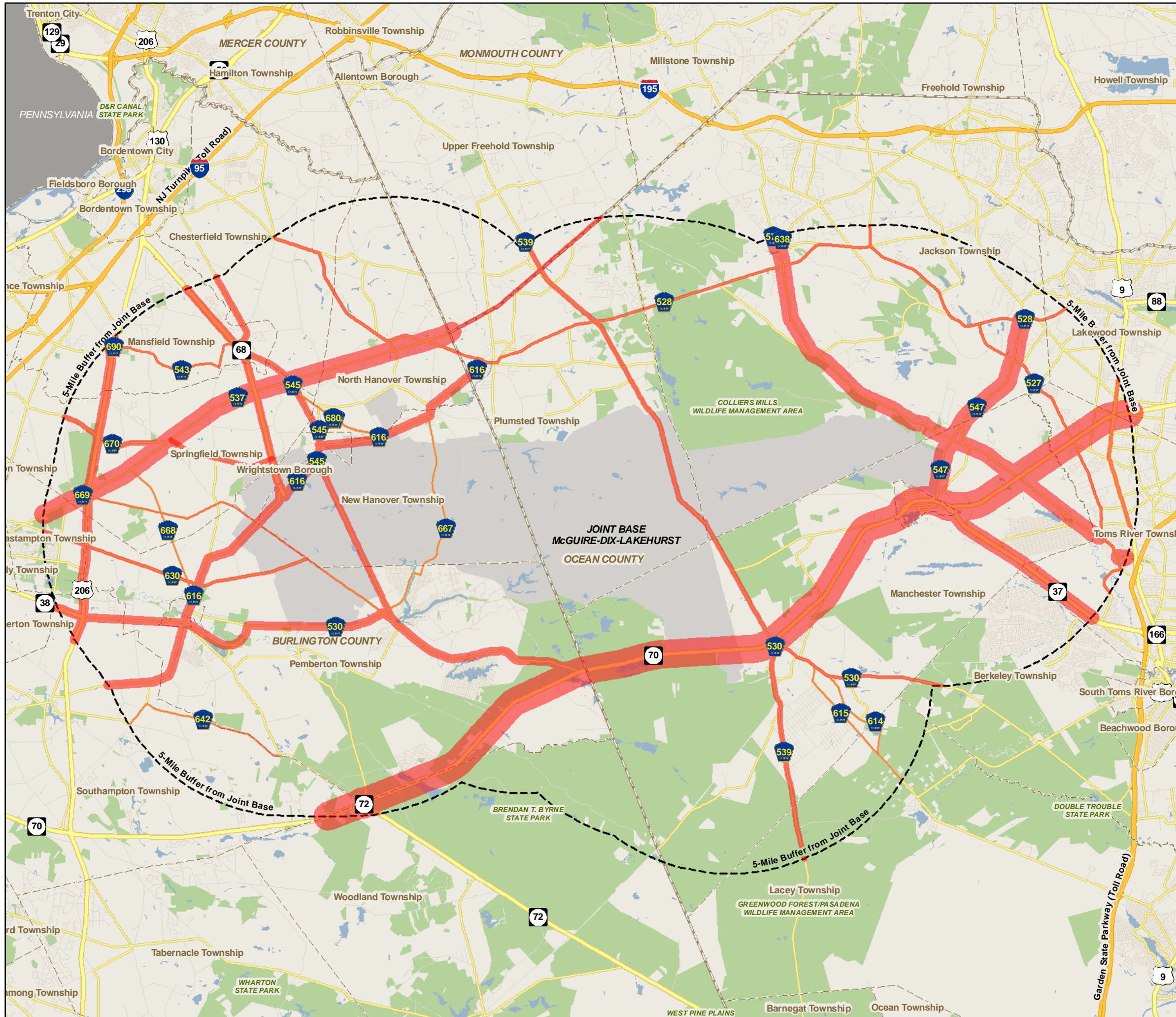
- Area with 1 to 5 Respondents
- Area with 6 to 10 Respondents
- Area with 11 to 15 Respondents
- Area with 16 to 20 Respondents
- Area with 21 to 30 Respondents
- Area with 31 to 60 Respondents
- Joint Base
- Area within 5 miles of Joint Base




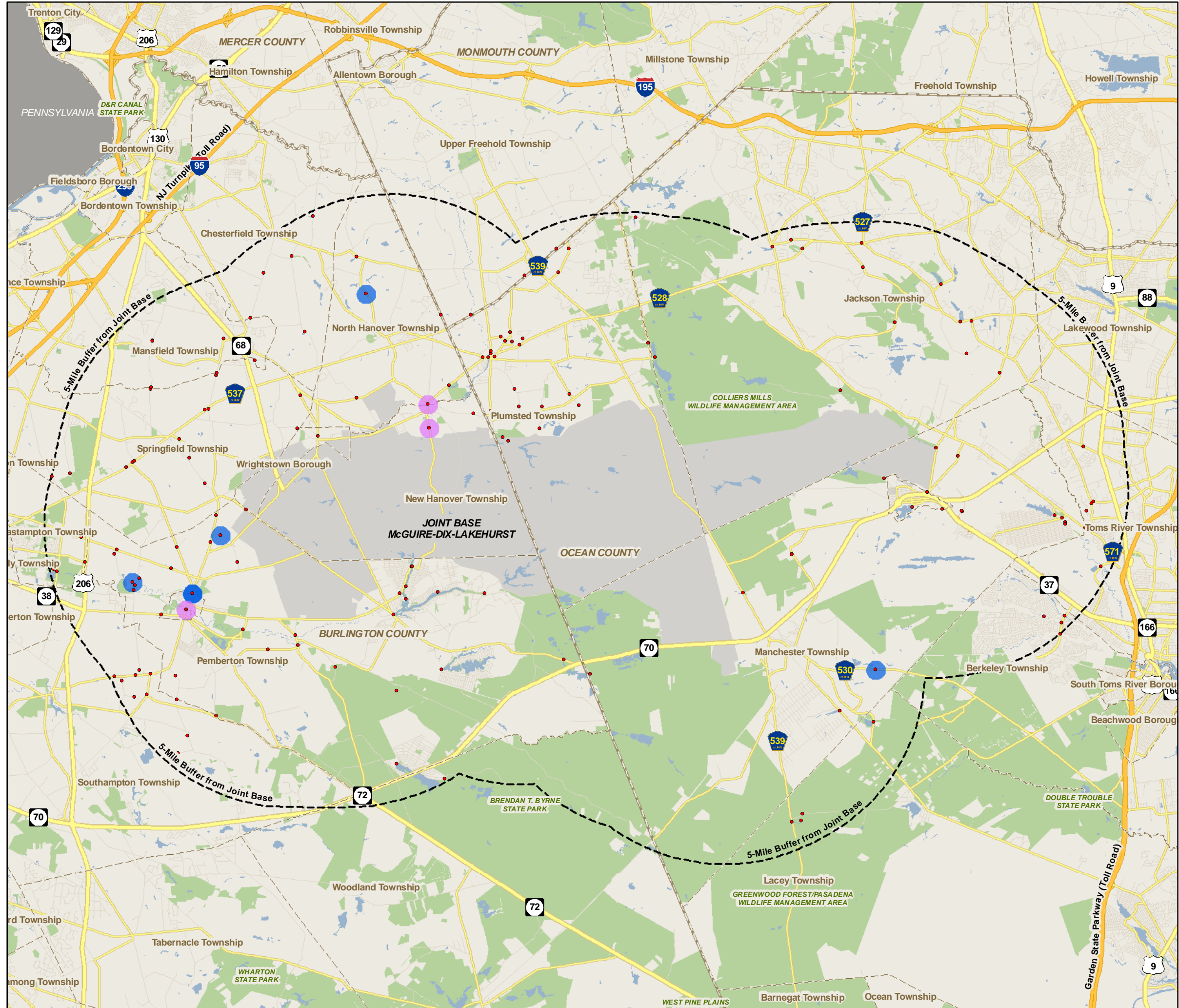
1 inch = 5 miles

**Figure 8: Roadway Use by Survey Respondents**

 Frequently used road (thickness increases with use)



 1 inch = 2.5 miles



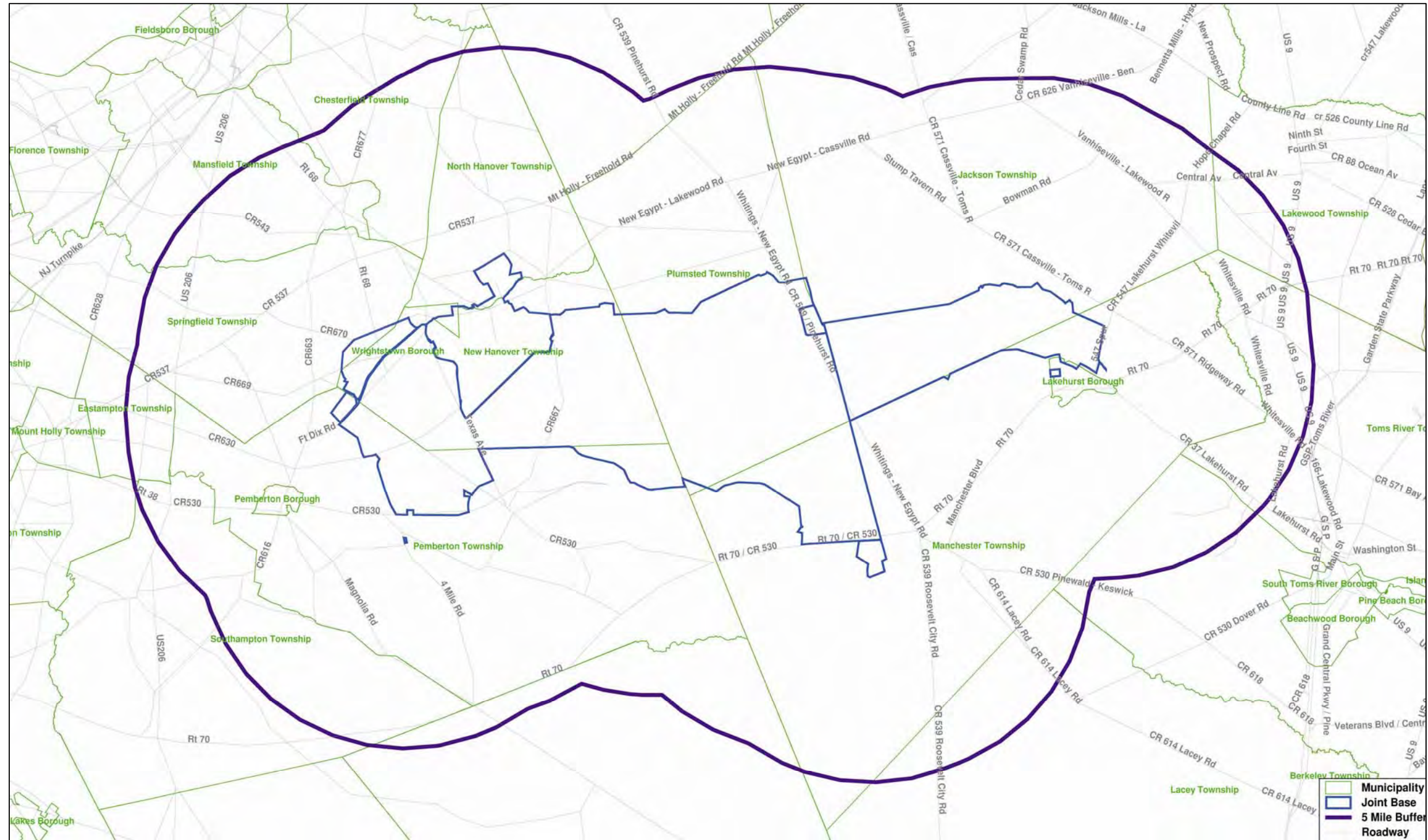
**Figure 9: Roadway Structures**

- Points of Concern selection
- Reported capacity issues associated with structure
- Reported drainage issues associated with structure

1 inch = 2.5 miles

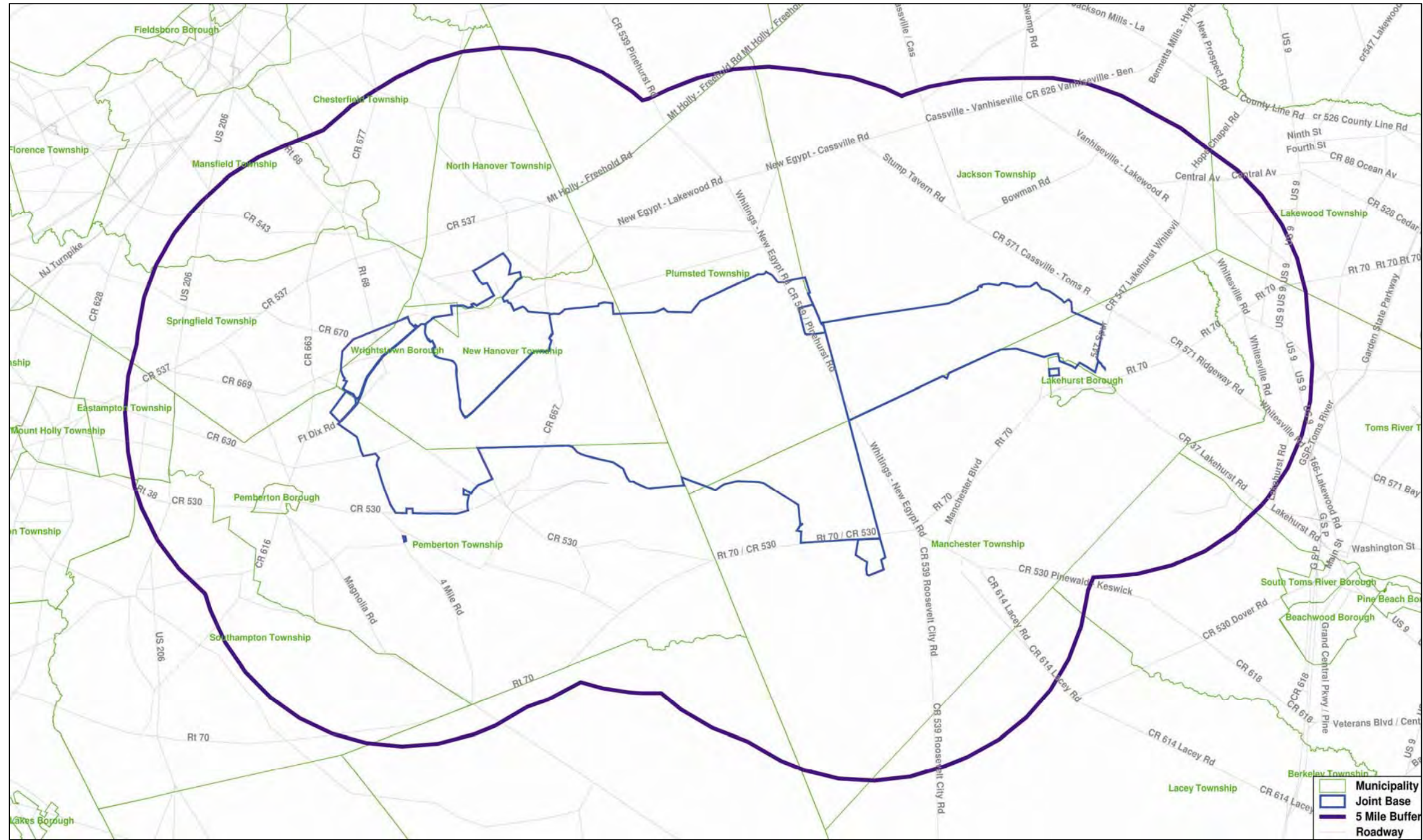
**Figure 10A: Original NJRTM-E Roadway Networks**

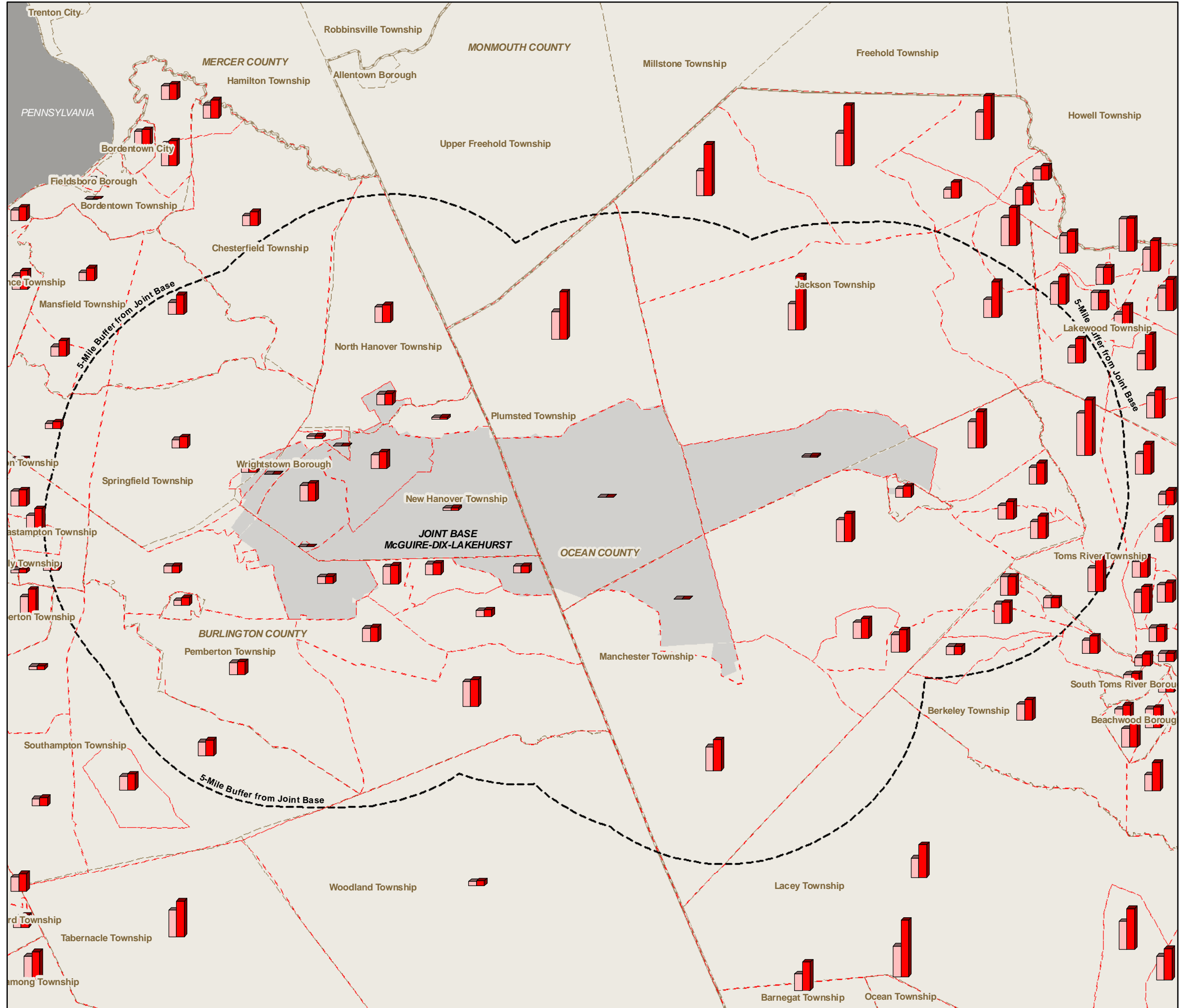
Original Roadway Network:



**Figure 10B: Modified NJRTM-E Roadway Networks**

Modified Roadway Network:








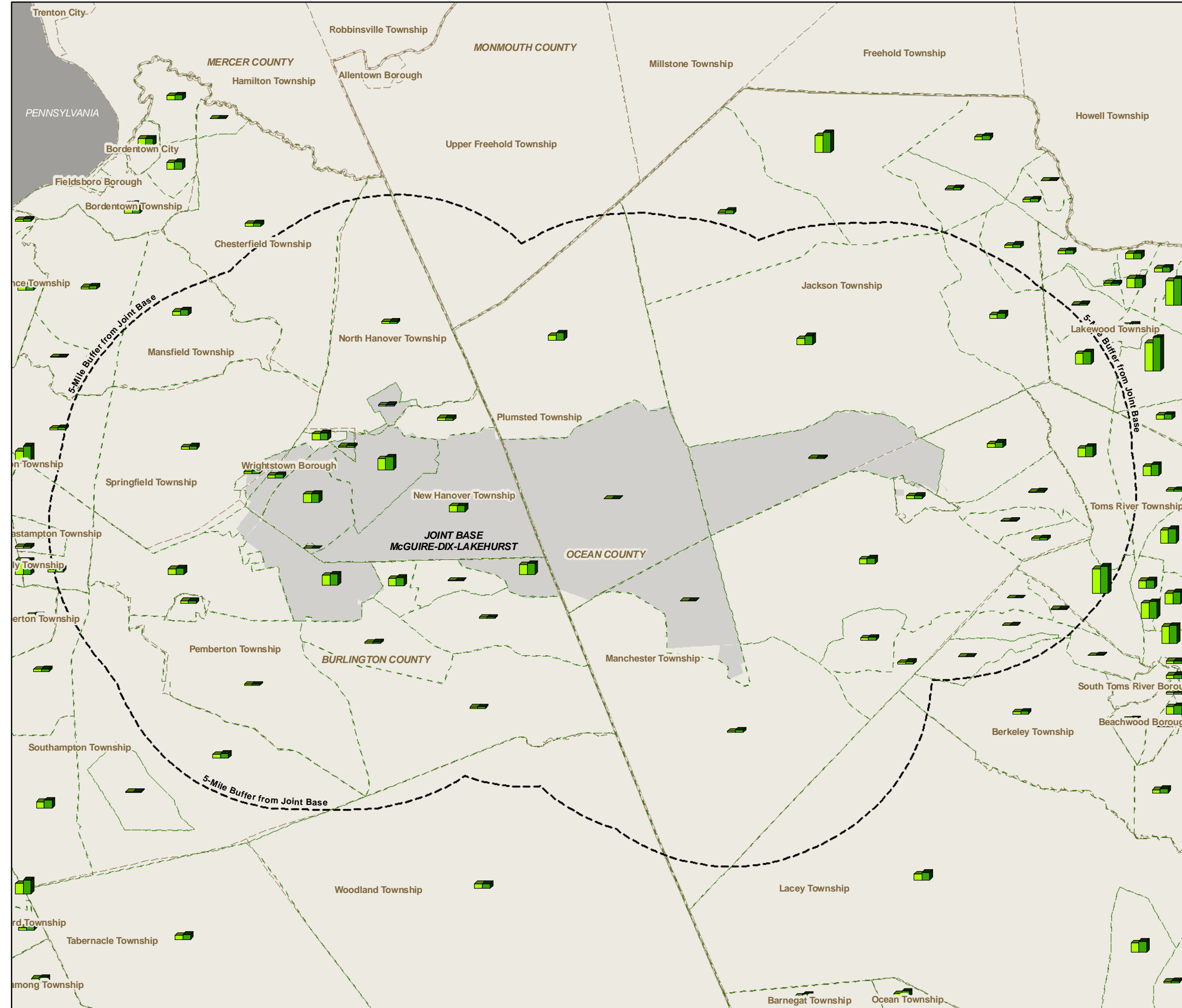
**Figure 11: 2010-2035 Population Change**


- 2010 Population
- 2035 Population
- Traffic Analysis Zone Boundary

1 inch = 2.5 miles

**Figure 12: 2010-2035 Employment Change**

-  2010 Employment
-  2035 Employment
-  Traffic Analysis Zone Boundary

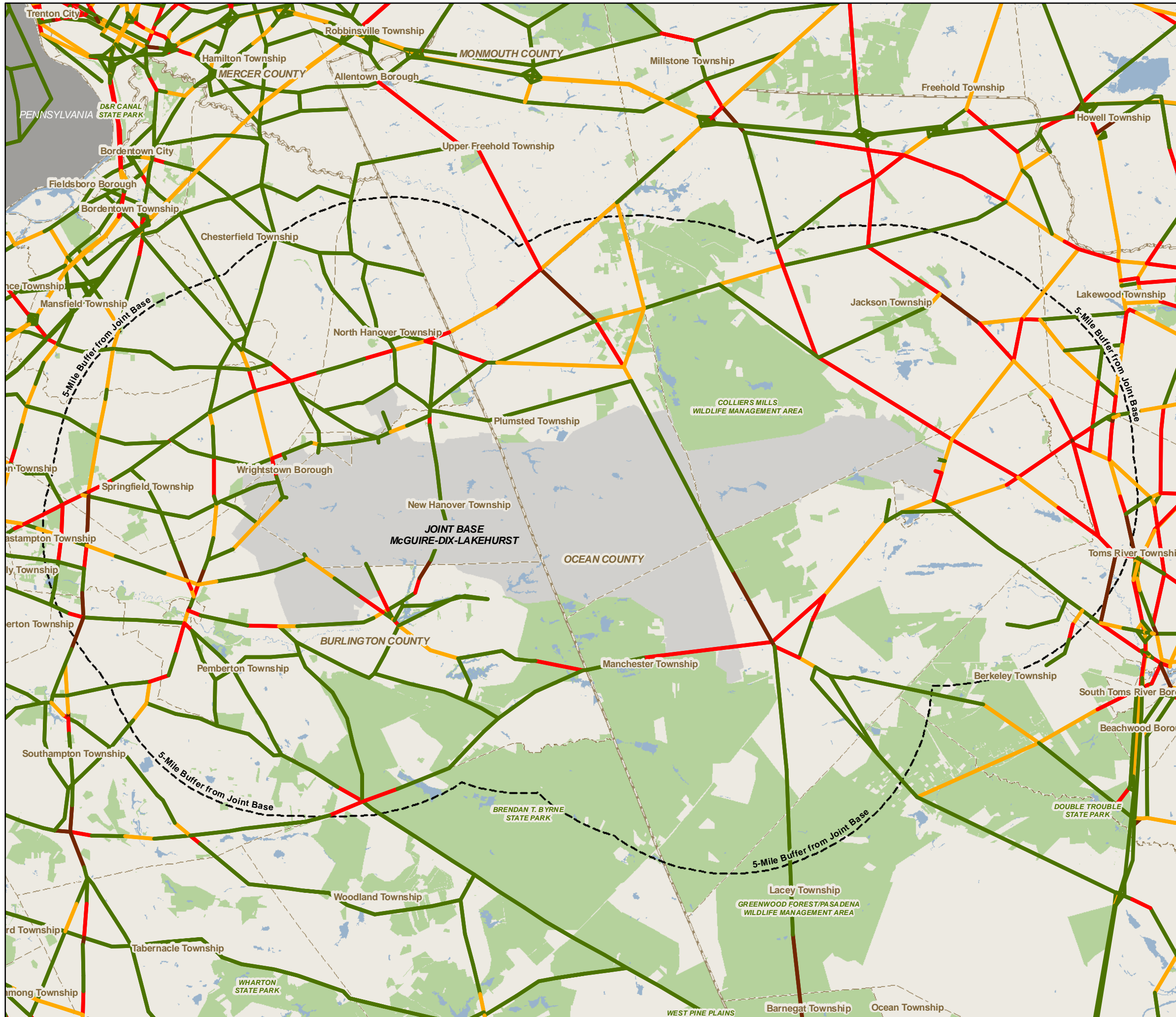


 1 inch = 2.5 miles



**Figure 13: 2010 Model Results**

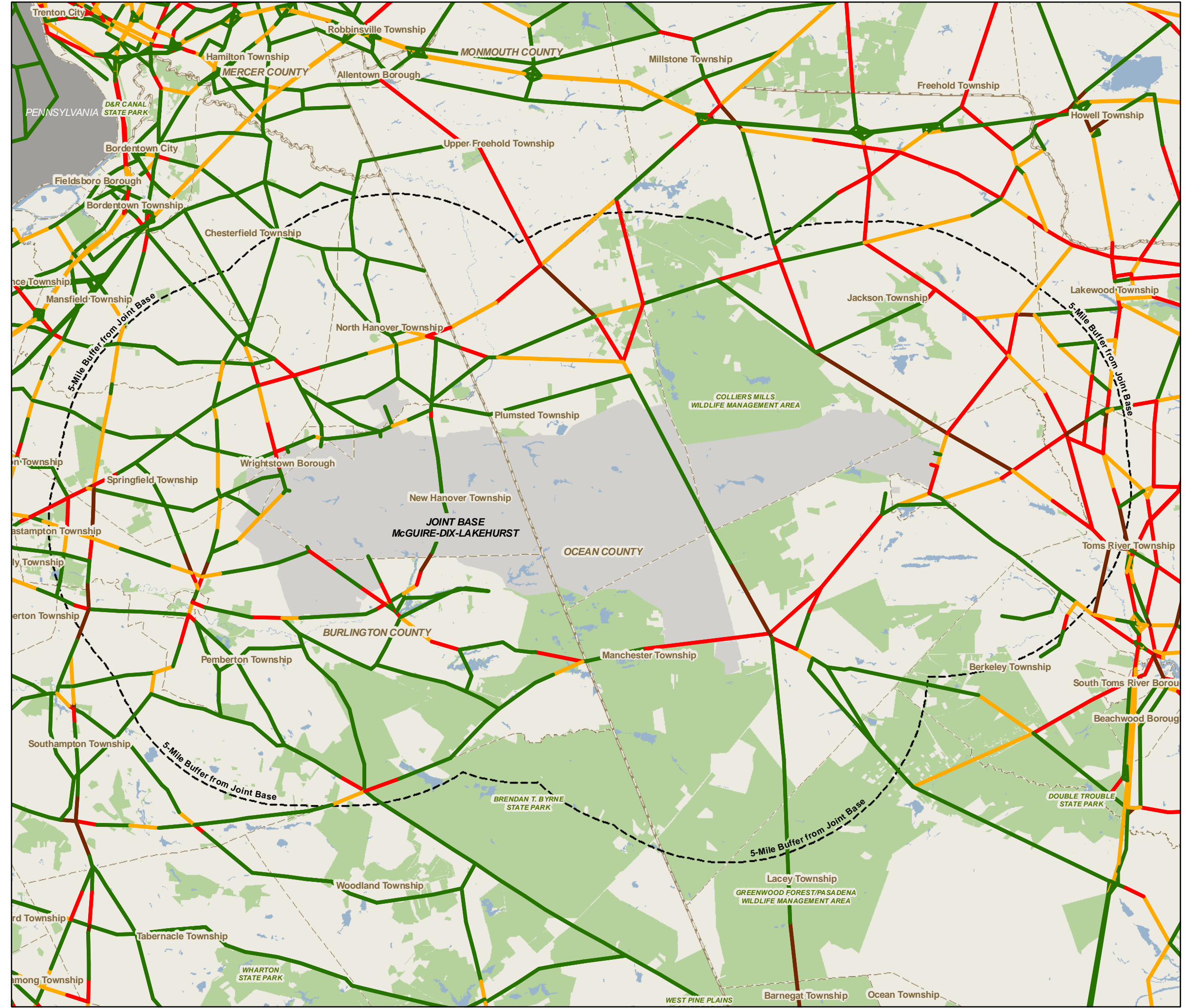
- Volume/Capacity Ratio < 0.75
- Volume/Capacity Ratio < 1.00
- Volume/Capacity Ratio < 1.25
- Volume/Capacity Ratio  $\geq$  1.25



1 inch = 2.5 miles

**Figure 14: 2015 No-Build Model Results**

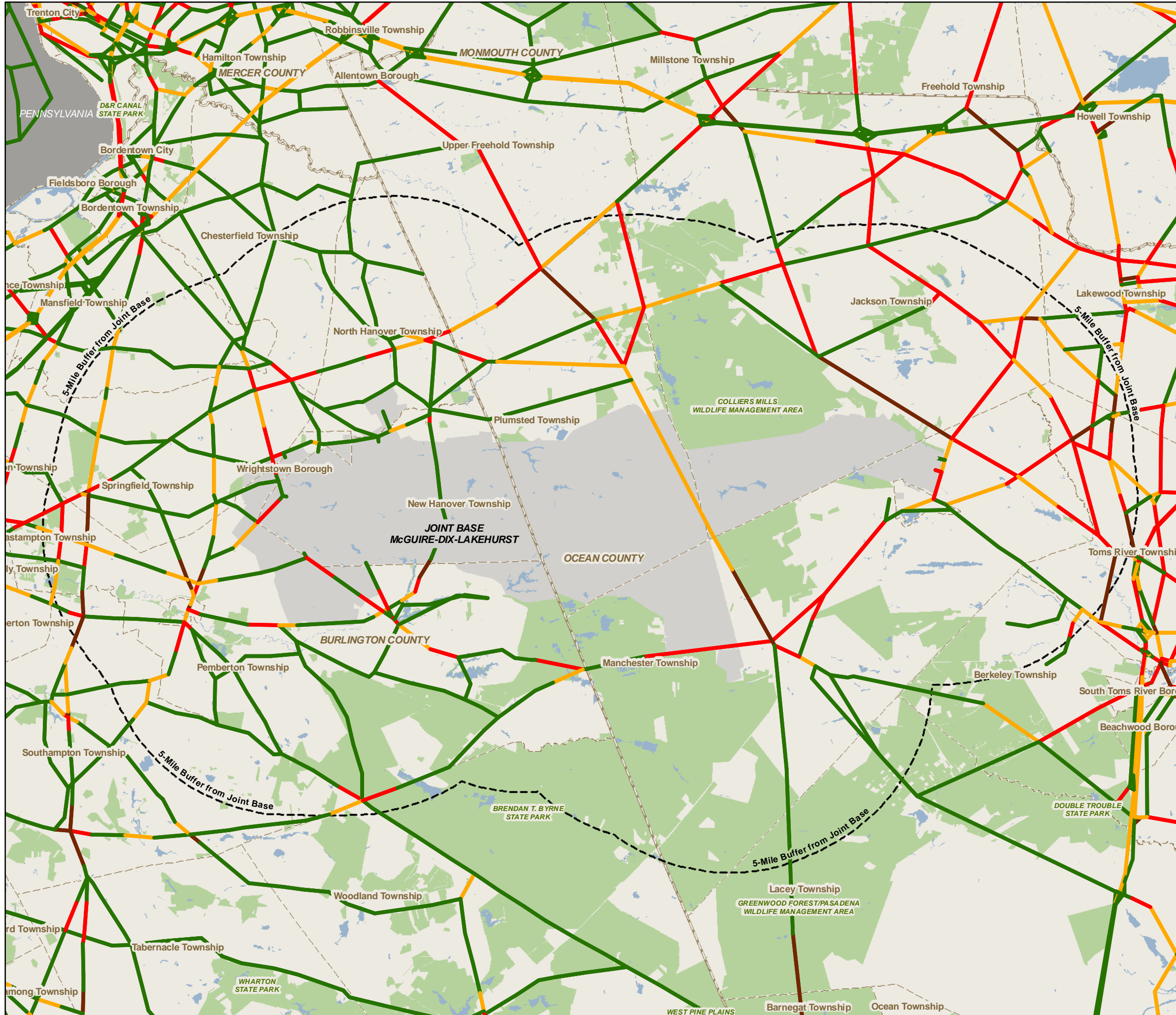
- Volume/Capacity Ratio < 0.75
- Volume/Capacity Ratio < 1.00
- Volume/Capacity Ratio < 1.25
- Volume/Capacity Ratio  $\geq$  1.25



1 inch = 2.5 miles

**Figure 15: 2015 Build Model Results**

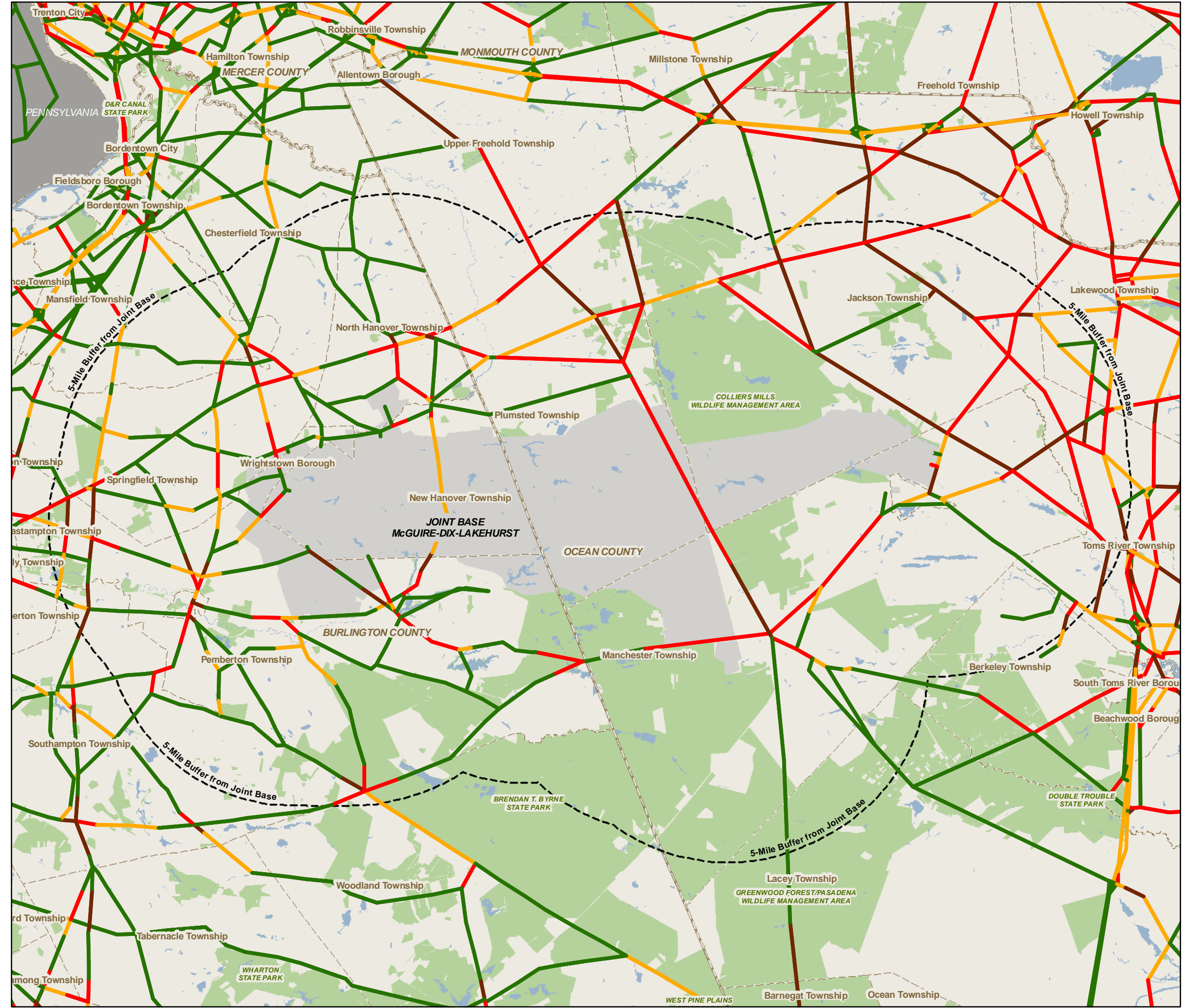
- Volume/Capacity Ratio < 0.75
- Volume/Capacity Ratio < 1.00
- Volume/Capacity Ratio < 1.25
- Volume/Capacity Ratio  $\geq$  1.25



1 inch = 2.5 miles

**Figure 16: 2035 No-Build Model Results**

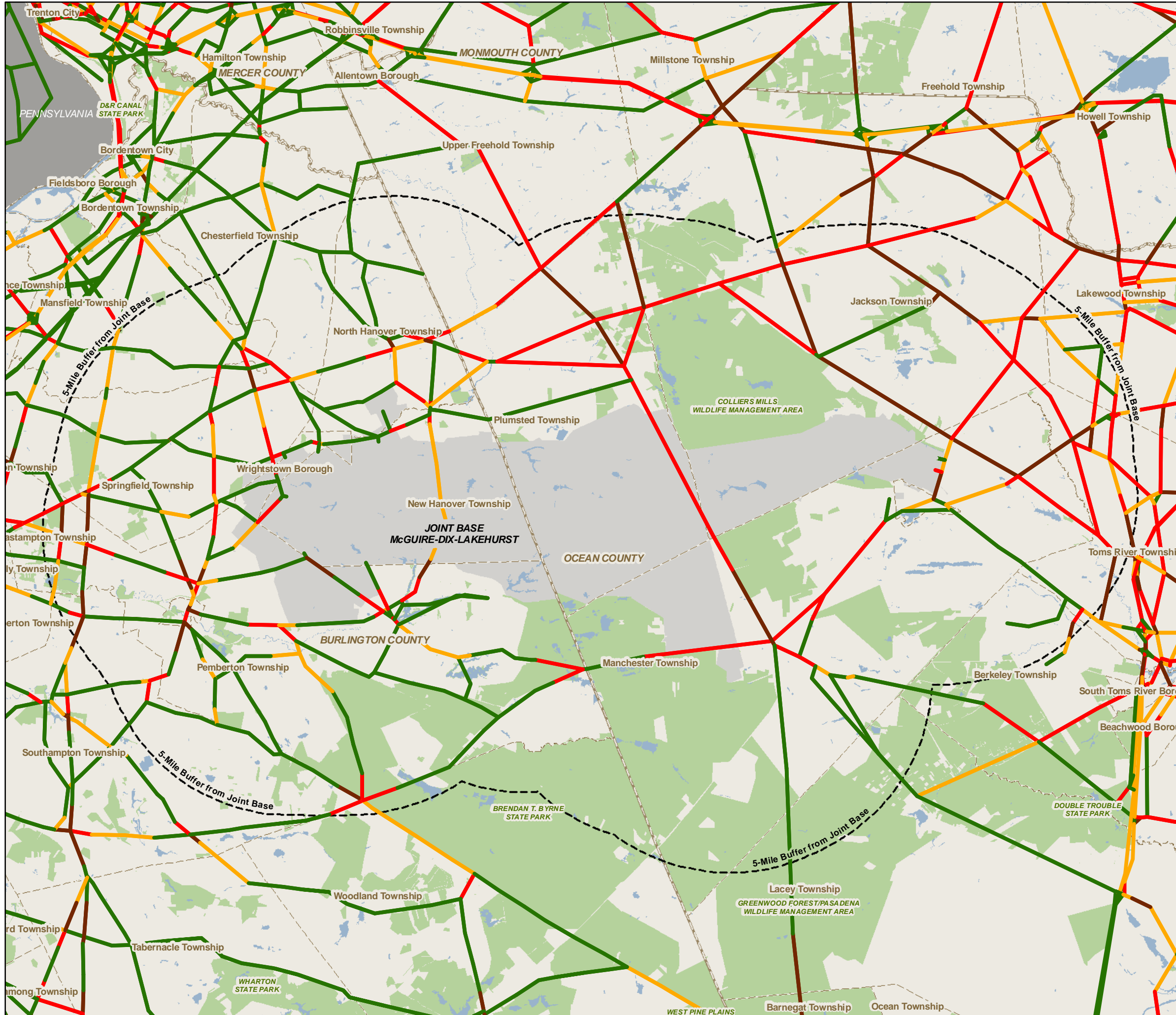
- Volume/Capacity Ratio < 0.75
- Volume/Capacity Ratio < 1.00
- Volume/Capacity Ratio < 1.25
- Volume/Capacity Ratio  $\geq$  1.25



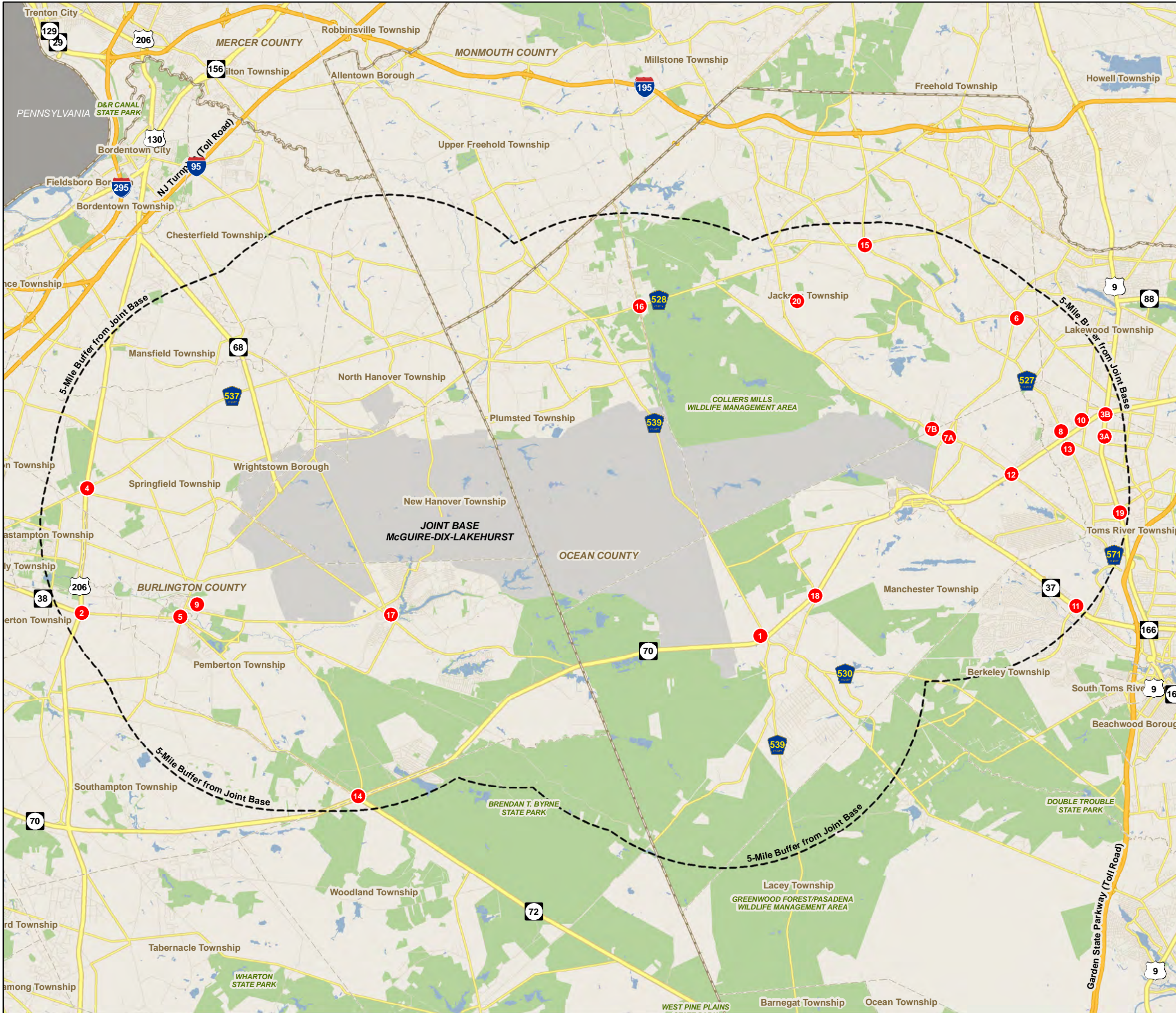
1 inch = 2.5 miles

**Figure 17: 2035 Build Model Results**

- Volume/Capacity Ratio < 0.75
- Volume/Capacity Ratio < 1.00
- Volume/Capacity Ratio < 1.25
- Volume/Capacity Ratio  $\geq 1.25$



1 inch = 2.5 miles



**Figure 18: Target Areas**

- 1 Area Detail 1
- 2 Area Detail 2
- 3A Area Detail 3A
- 3B Area Detail 3B
- 4 Area Detail 4
- 5 Area Detail 5
- 6 Area Detail 6
- 7A Area Detail 7A
- 7B Area Detail 7B
- 8 Area Detail 8
- 9 Area Detail 9
- 10 Area Detail 10
- 11 Area Detail 11
- 12 Area Detail 12
- 13 Area Detail 13
- 14 Area Detail 14
- 15 Area Detail 15
- 16 Area Detail 16
- 17 Area Detail 17
- 18 Area Detail 18
- 19 Area Detail 19
- 20 Area Detail 20

1 inch = 2.5 miles

**Note:** This map depicts the approximate location of areas for which basic and/or advanced alternatives have been developed. It is to be used as a key to Appendix 3.

# Appendix 1

- Data CD
  - Municipal Meeting Notes

# Appendix 2

- Data CD
  - Traffic Count Data
    - Turning Movement Counts
      - Location 1 (a.m. and p.m.)
      - Location 2 (a.m. and p.m.)
      - Location 3 (a.m. and p.m.)
      - Location 4 (a.m. and p.m.)
      - Location 5 (a.m. and p.m.)
      - Location 6 (a.m. and p.m.)
      - Location 7 (a.m. and p.m.)
      - Location 8 (a.m. and p.m.)
      - Location 9 (a.m. and p.m.)
      - Location 15 (a.m. and p.m.)
      - Location 16 (a.m. and p.m.)
      - Location 17 (a.m. and p.m.)
      - Location 18 (a.m. and p.m.)
      - Location 19 (a.m. and p.m.)
      - Location 20 (a.m. and p.m.)
      - Location 21 (a.m. and p.m.)
      - Location 22 (a.m. and p.m.)
      - Location 23 (a.m. and p.m.)
      - Location 24 (a.m. and p.m.)
    - Automated Traffic Recorder Counts
      - Location 10
      - Location 11
      - Location 12
      - Location 13
      - Location 14
      - Location 25
      - Location 26
      - Location 27
      - Location 28
      - Location 29



# Appendix 3

- Data CD
  - Target Area Detail Sheets
    - Area Detail 1
    - Area Detail 2
    - Area Detail 3A
    - Area Detail 3B
    - Area Detail 4
    - Area Detail 5
    - Area Detail 6
    - Area Detail 7A
    - Area Detail 7B
    - Area Detail 8
    - Area Detail 9
    - Area Detail 10
    - Area Detail 11
    - Area Detail 12
    - Area Detail 13
    - Area Detail 14
    - Area Detail 15
    - Area Detail 16
    - Area Detail 17
    - Area Detail 18
    - Area Detail 19
    - Area Detail 20

# Appendix 4

- Data CD
  - Burlington County-Planned Bypasses
    - North Pemberton Bypass
    - Browns Mills Bypass

# Appendix 5

- Data CD
  - Online Travel Survey Question

# Appendix 6

- Data CD
  - Traffic Impact Study for the Consolidated Logistics Training Facility