DELAWARE VALLEY
dvrpc
REGIONAL
PLANNING COMMISSION

MAY 2010

NJ 47
CORRIDOR STUDY

The Delaware Valley Regional Planning Commission is dedicated to uniting the region's elected officials, planning professionals, and the public with a common vision of making a great region even greater. Shaping the way we live, work, and play, DVRPC builds consensus on improving transportation, promoting smart growth, protecting the environment, and enhancing the economy. We serve a diverse region of nine counties: Bucks, Chester, Delaware, Montgomery, and Philadelphia in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer in New Jersey. DVRPC is the federally designated Metropolitan Planning Organization for the Greater Philadelphia Region — leading the way to a better future.

The symbol in our logo is adapted from the official DVRPC seal and is designed as a stylized image of the Delaware Valley. The outer ring symbolizes the region as a whole while the diagonal bar signifies the Delaware River. The two adjoining crescents represent the Commonwealth of Pennsylvania and the State of New Jersey.

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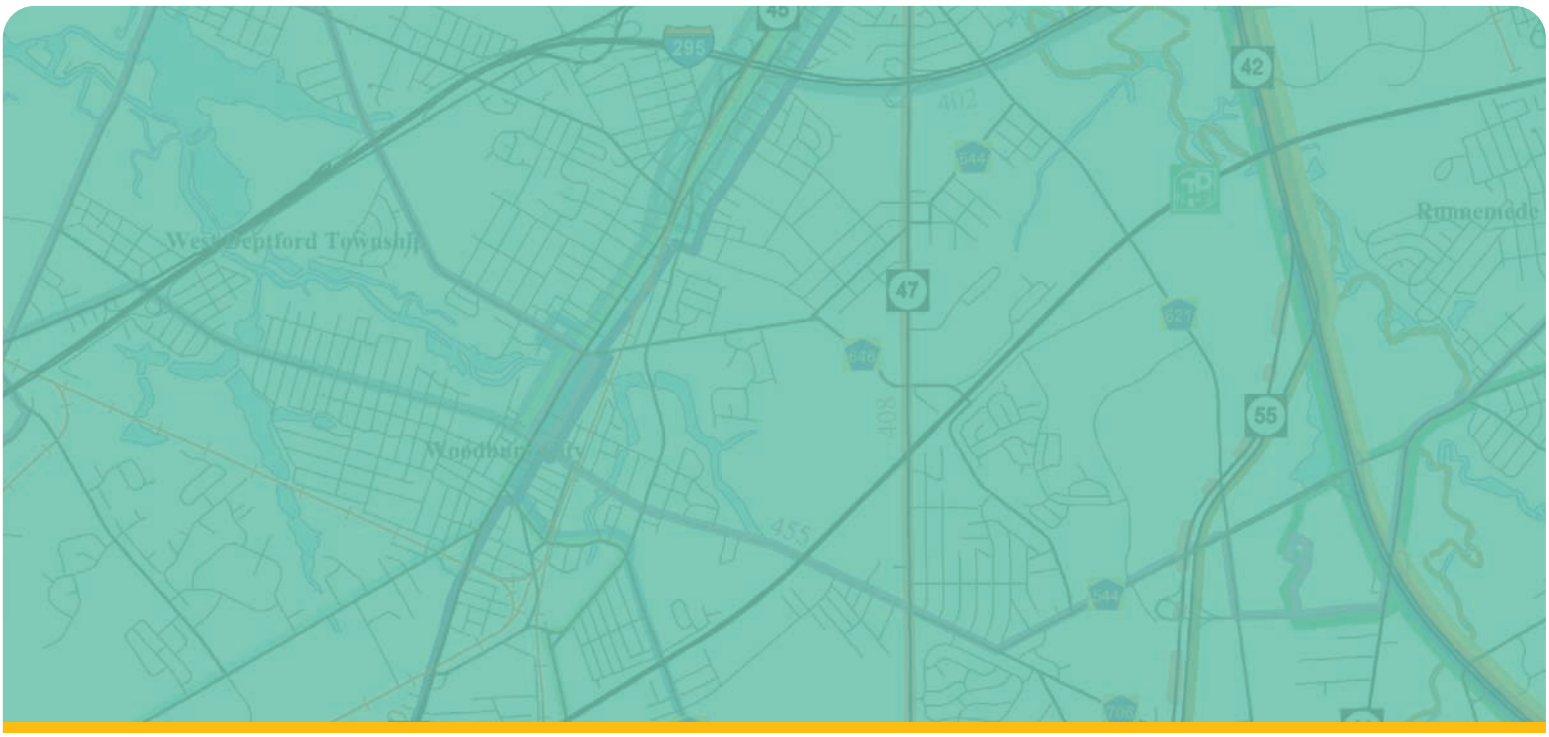


EXECUTIVE
SUMMARY

Executive Summary

Corridor planning is a hallmark of the Delaware Valley Regional Planning Commission's (DVRPC's) annual work program. Identified in DVRPC's Long-Range Plan as an important corridor for moving people and goods, NJ 47, known locally as Delsea Drive, serves Gloucester County as a key north-south state facility.

NJ 47 traverses much of Gloucester County, connecting boroughs and townships as both a local street and a regional highway. This study focuses on the northern-most 10-mile section, which includes Westville Borough and Deptford and Washington townships. The study actively engaged representatives from the three participating municipalities, as well as county and state planning partners.

Much like other state routes, NJ 47 serves many purposes. For example, it is a downtown main street in Westville Borough, an important north-south route in Deptford Township, and the primary means of access to strip retail in Washington Township. With a consistent two-lane cross-section throughout the entire 10-mile stretch, the roadway widens only where it intersects with major facilities, such as I-295, NJ 55, and Cooper Street, to accommodate turning movements.

Several deficiencies along NJ 47 are corridorwide in nature rather than site-specific. One predominant issue is the pedestrian environment. Beyond the downtown neighborhood setting of walkable Westville Borough, the majority of the corridor is missing pedestrian facilities. Where sidewalks do exist, they are typically sited in piecemeal fashion. This issue is especially of concern given the frequency of bus service and strong ridership along NJ 47. This leads to a second pervasive issue: the lack of adequate transit stop accommodations. Information gathered from stakeholder meetings and supported by field observations made it apparent that most transit stops along the corridor consist of little more than a roadside sign. Although good examples of well-designed transit stops can be found along NJ 47, these bus stops are the exception and not the rule, and even some of these lack pedestrian connectivity.

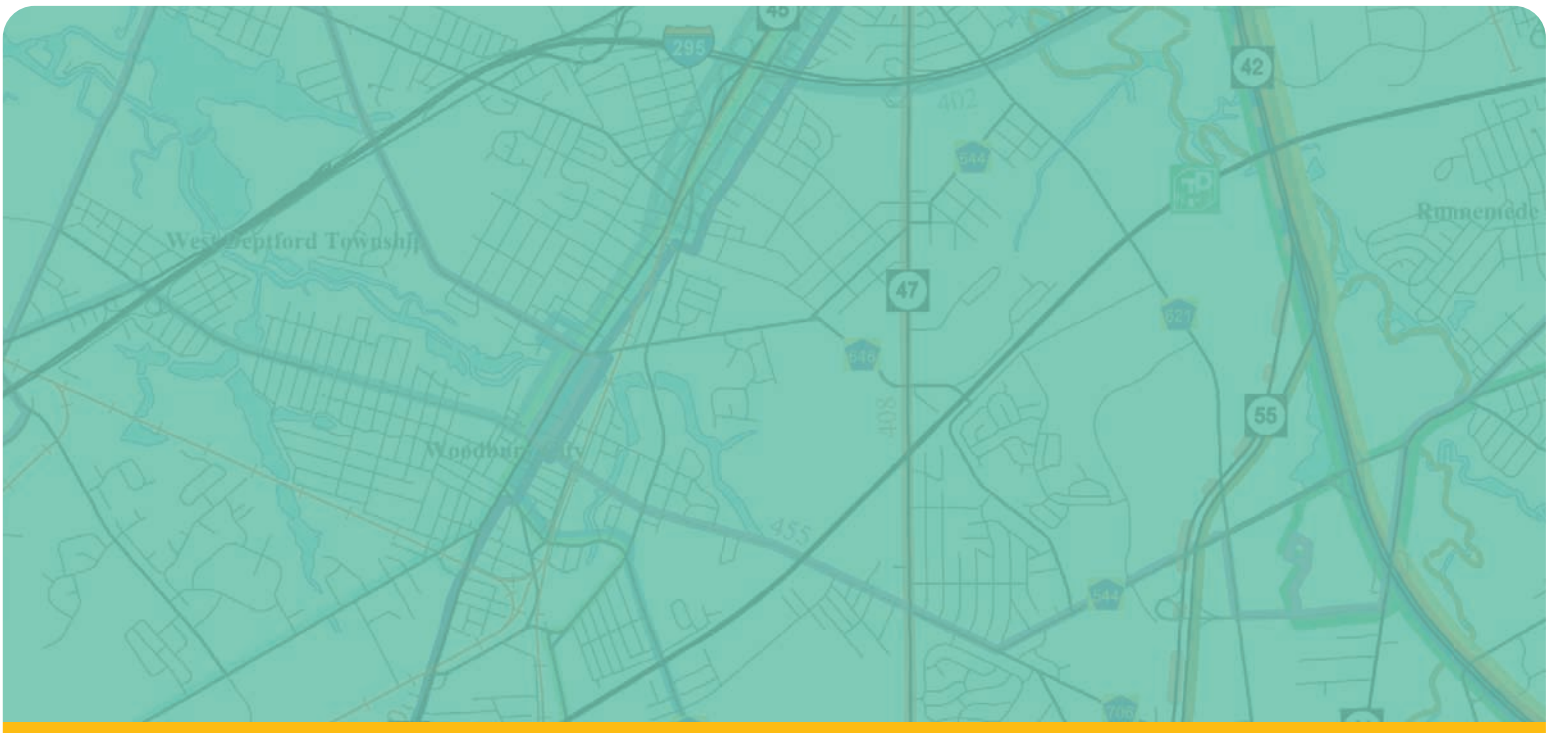
Access management is the most critical and pervasive corridorwide issue in the study section of NJ 47. With so much undeveloped land along the study corridor segments through Deptford and Washington townships, access to existing and future developments will be paramount to the evolution of the corridor and the efficient operation of NJ 47. Properly designed access that provides linkages between developments and adequate spacing of signals will help to maintain mobility and promote safety as development occurrs.

The study recommendations for this corridor are consistent with those found in the *Northeast Region Strategic Plan* of Gloucester County, which was prepared for the Gloucester County Freeholders and completed in January 2005. The Strategic Plan focused on the planning themes of Towns, Corridors, Subdivisions, and Open Space, and emphasized many smart-growth

principles relevant to NJ 47. These included improved circulation and connectivity between developments, transit hub development, and improved bicycling and walking opportunities. The plan also identified access management among the important strategies needed to stop the trend toward “development of isolated and disconnected neighborhoods and inefficient commercial strips” that leave “little remaining open space.” Fortunately, most of the existing NJ 47 frontage is zoned commercial, which strengthens the case for implementing an access management plan.

NJ 47 has the benefit of being aligned with other major facilities like NJ 55 and I-295 that handle the lion’s share of daily commuter traffic. The forecasted population and employment increases will have less of a negative effect on NJ 47 due to the proximity of these major freeways, and the future southern New Jersey light rail line expansion by the Port Authority Transit Corporation (PATCO). However, because market forces could lead to a development boom greater than expected and result in a steady rise in traffic volumes, it is recommended that the state consider including the NJ 47 corridor as a priority corridor in the next update of its ITS Investment Strategy.

Being that NJ 47 is a state facility, the opportunity exists for the county and municipalities to coordinate with the New Jersey Department of Transportation (NJDOT), and specifically the Office of Transportation and Sustainable Communities, in shaping the future of the corridor. The smart-growth principles referred to here and echoed in the *Northeast Region Strategic Plan* of Gloucester County provide a solid foundation of best practices from which to begin this process.



1.0
INTRODUCTION

CHAPTER 1

Introduction

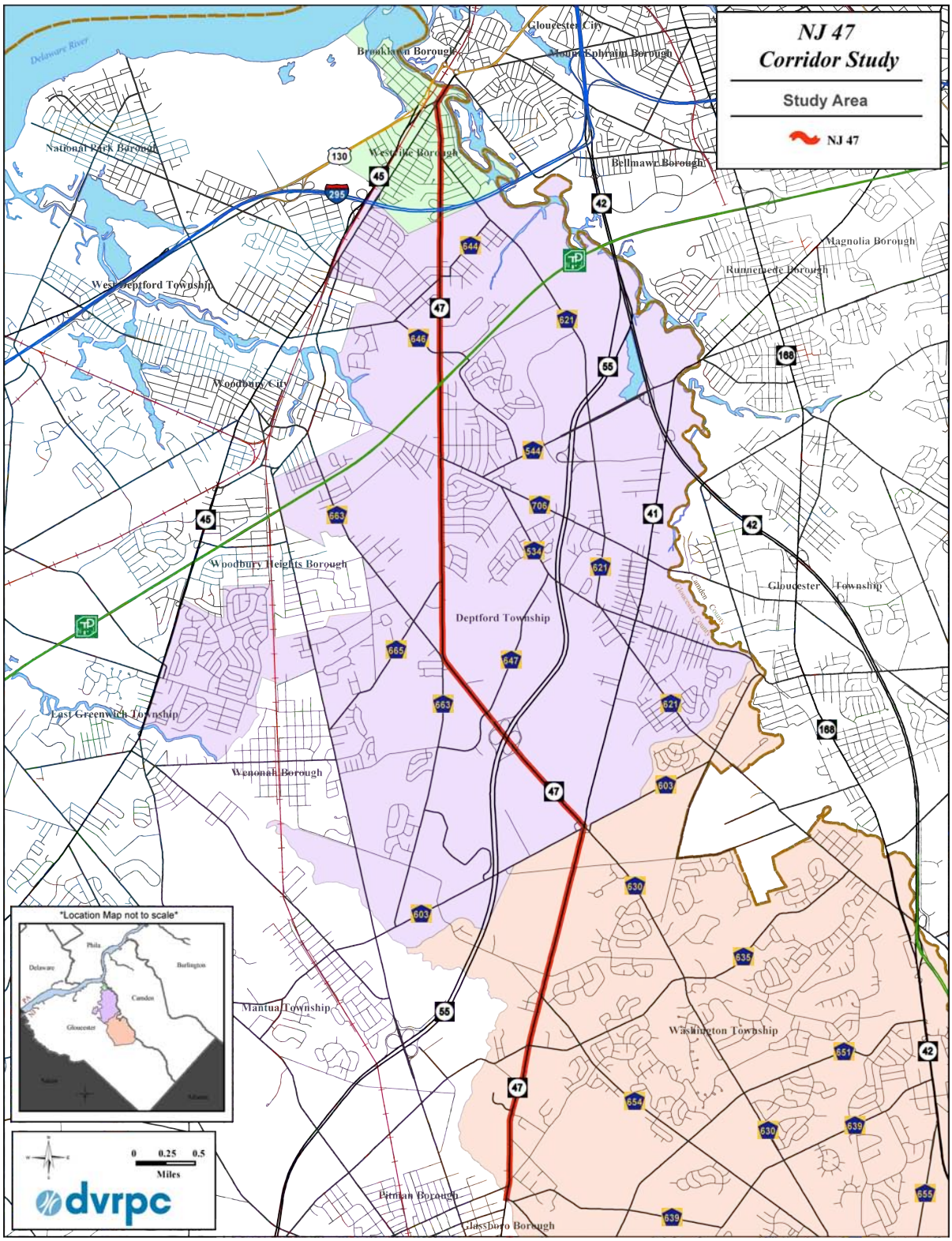
The long-range land use and transportation plan for the Delaware Valley, *Connections: The Regional Plan for a Sustainable Future,* identifies NJ 47 as a priority route. Using a comprehensive approach to identify and evaluate issues that influence operations, safety, and mobility within the NJ 47 corridor, this study provides a detailed analysis of the corridor and helps implement the *Connections* Long-Range Plan.

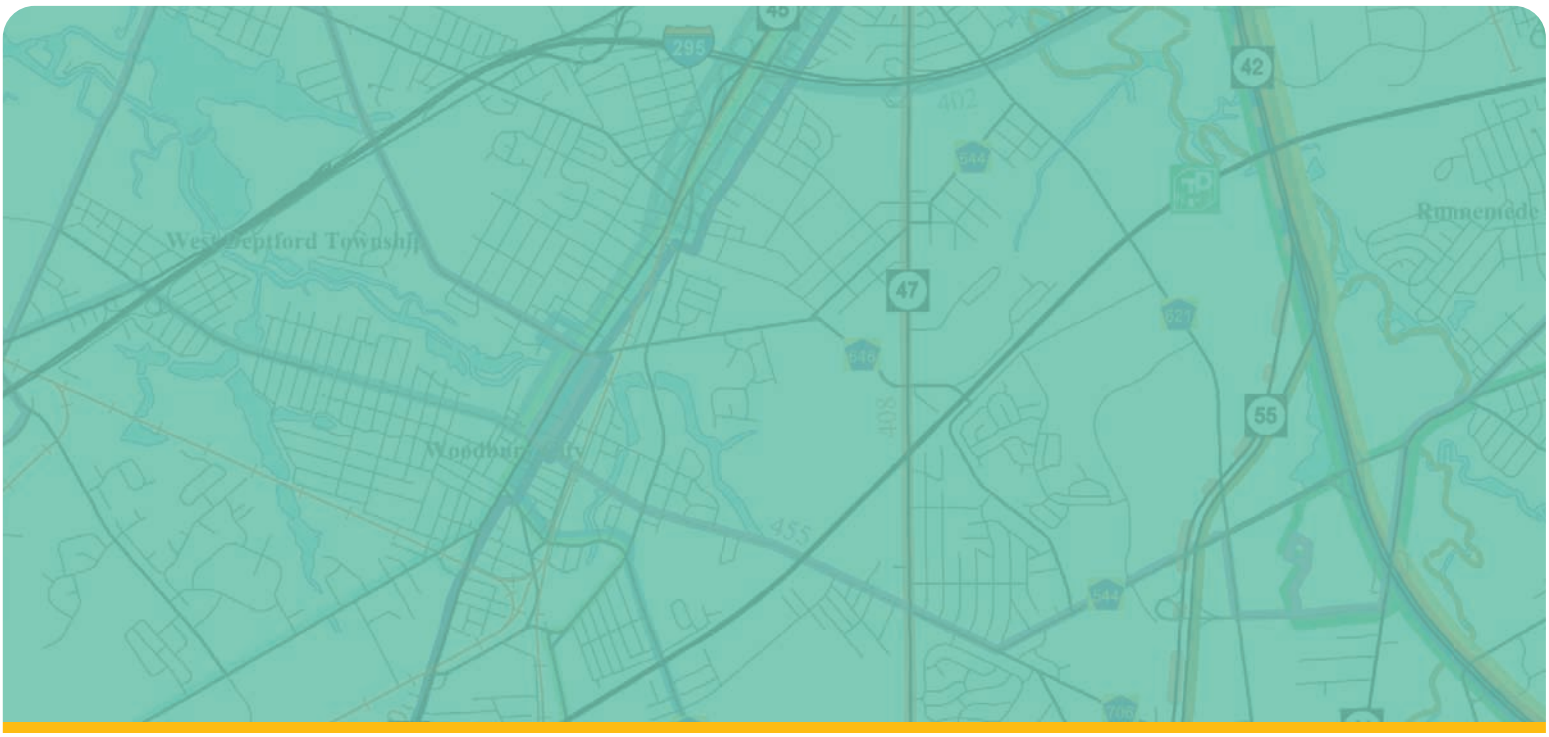
The study examined ten miles of NJ 47 between the Brooklawn Circles to the north and the Pitman Borough municipal line to the south, traversing Westville Borough and Deptford and Washington townships (see Figure1). To guide the study effort, DVRPC collaborated with a task force comprised of municipal, county, and state representatives. The transportation and land use issues discussed herein were identified through meetings with the task force participants, collaborations with the NJDOT and New Jersey Transit, field work, and data analysis. The major concerns of the task force included impacts of future development, peak-period congestion, crash frequency, pedestrian and bicycle accommodations, and access.

The report is divided into eight chapters, plus an executive summary and appendices. The Introduction in Chapter One is followed by a discussion of the Northeast Region Strategic Plan of Gloucester County in Chapter Two. Chapter Three provides a description of the study area, including analysis of demographic characteristics, land use, travel patterns, environmental justice issues, and environmental considerations. Chapter Four describes the transportation system in terms of traffic volume, mass transit, and pedestrian and bicycle mobility. That chapter also includes a discussion of the PATCO southern expansion of light rail passenger service into Gloucester County and its implications for the NJ 47 corridor. Chapter Five concentrates on DVRPC's congestion management process and the subcorridor strategies for NJ 47. Traffic safety is discussed through an analysis of crash data in Chapter Six. Chapter Seven, entitled Transportation and Land-Use Issues, examines both corridor-wide and location-specific transportation problems as they relate to local and regional conditions. Finally, Chapter Eight summarizes the major findings and recommendations.

This planning study considers local and corridor-wide issues affecting transportation mobility for all modes of transportation. Coordination between municipalities and the state regarding access management, smart growth, and safety improvements will determine the viability of NJ 47 to serve local needs and adequately handle regional traffic.

Figure 1: Study Area





2.0
SUPPORTING STUDIES

CHAPTER 2

Supporting Studies

Northeast Region Strategic Plan - Gloucester County, NJ

The *Northeast Region Strategic Plan*, commissioned by the Gloucester County Board of Chosen Freeholders and produced by Schoor DePalma, Inc., was developed to provide a uniform growth strategy for the 14 municipalities in the northeastern corner of Gloucester County, which includes the three municipalities in DVRPC's NJ 47 Corridor Study: Westville Borough, Deptford Township, and Washington Township. Based on analyses of existing conditions and trends and the community's vision, the plan served as a touchstone for each municipality's local efforts toward smart growth. The report identified four common themes, places them into a regional context, and provided strategies and recommendations for addressing each one. The themes were: 1. Towns - historical central districts, 2. Corridors - highways and major arteries, 3. Subdivisions – neighborhoods, and 4. Open Space - farmlands, or otherwise undeveloped land. The Delaware River Waterfront was also given specific attention. Structurally, the report consisted of a Regional Profile, Smart-Growth Principles, Infrastructure Priorities, Indicators and Targets, and a Planning and Implementation Agenda.

The *Northeast Region Strategic Plan* details goals and strategies for each of its themes. Those that apply to corridors—thus being relevant to the NJ 47 corridor study—are highlighted below:

Principles

- Maximizing the development and redevelopment of transit hubs.
- Improving overall circulation and emphasizing public and alternative modes of transit.

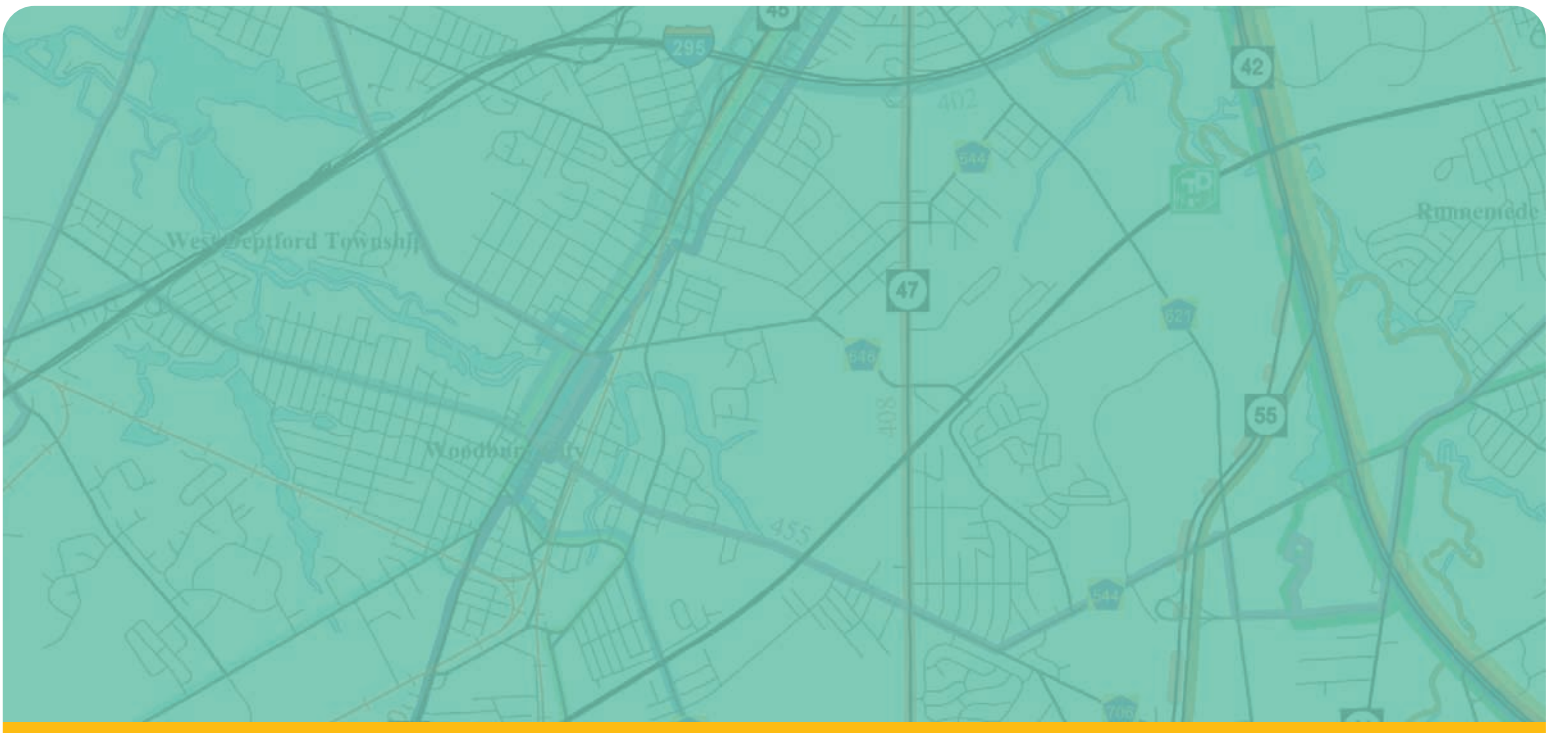
Goals

- Plan new developments so they are linked by walking, biking, and driving routes to adjacent communities.

Strategies

- Discourage commercial development with blank, windowless walls facing the street, oversized parking areas, light pollution, and multiple uncontrolled access points.
- Coordinate municipal, county, and state investments with private investments along the roadways to provide improvements involving streets, curbs, sidewalks, parking, landscaping, and open space.

- Prepare highway access-management plans to govern access points so they are reduced in number and more widely spaced, and to encourage shared parking facilities.



3.0
STUDY AREA DESCRIPTION

CHAPTER 3

Study Area Description

3.1 Regional Setting

Situated between Camden County to the east and Salem County to the west, Gloucester County provides the transition between the more rural parts of southwestern New Jersey and the gateway to Philadelphia via Camden County and the Walt Whitman Bridge. The ten miles of NJ 47 that comprise the study corridor pass through three municipalities at the northern end of the county: Westville Borough, Deptford Township, and Washington Township.

3.2 Demographics

Gloucester County was the second fastest growing county in the Delaware Valley between 1990 and 2000. Analysis of the demographic data contained in Table 1 shows that conditions within the study area were consistent with or exceeded the county's growth. Of the three municipalities, Washington Township had the greatest increases in both percentages and absolute numbers.

Table 1: Population and Employed Residents: 1990 and 2000

Municipality	Area (mi^2)	Population			Employed Residents		
		1990	2000	Change	1990	2000	Change
Deptford Township	17.6	24,137	26,763	10.9%	12,296	13,089	6.4%
Washington Township	21.6	41,960	47,114	12.3%	21,975	24,935	13.5%
Westville Borough	1.1	4,573	4,500	-1.6%	2,154	2,270	5.4%
Study Area	40.3	70,670	78,377	10.9%	36,425	40,294	10.6%
Gloucester County	336.8	230,082	254,673	10.7%	112,964	125,531	11.1%

Source: 2000 US Census

During this time period, the county's population growth was just under 11 percent. The rate for the study area was consistent with this, as almost 8,000 people were added. Growth in Deptford Township was equal to the study area's average. Washington Township's growth was slightly higher and Westville Borough's population was steady.

The number of employed residents rose for all municipalities, and the rate of increase for the study area kept pace with that of the county. Regarding jobs located in each municipality, though Westville Borough's employment fell, employment for the corridor increased 23 percent, which surpassed the county's increase of 15 percent. Washington Township showed the most significant growth in both of these categories, adding over 3,700 of the area's 5,146 new jobs.

Both the study area municipalities and the county have vehicles-per-household numbers above the regional average of 1.51, but below the national average of 2.28 (Table 2). The regional average is lower by comparison due to the influence of transit dependent and car-less populations common in urban areas, i.e.: Philadelphia, Chester, and Camden Cities in the DVRPC region.

Table 2: Study Area Employment and Autos Per Household: 1990 and 2000

Municipality	Area (mi^2)	Employment			Autos/Household	
		1990	2000	Change	1990	2000
Deptford Township	17.6	10,740	12,508	16.5%	1.8	1.7
Washington Township	21.6	8,138	11,875	45.9%	2.0	2.0
Westville Borough	1.1	2,906	2,547	-12.4%	1.7	1.7
Study Area	40.3	21,784	26,930	23.6%	1.8	1.8
Gloucester County	336.8	86,079	99,467	15.6%	1.8	1.8

Source: 2000 US Census

3.3 Future Demographics

Demographic forecasts for the region are developed by DVRPC staff and adopted by the DVRPC Board. These projections show the greatest absolute increase in population for Washington Township, which could gain around 9,300 persons between 2000 and 2030. Over the same period, Deptford Township is projected to show a more modest increase of about 3,500 persons, while Westville Borough is projected to grow by only a few hundred persons. The study area population is projected to increase at about half the rate of Gloucester County's 32 percent.

The greatest employment gains will most likely take place in Washington Township, where 6,500 more jobs are projected. Deptford Township is projected to increase its employment by about 2,000 jobs. Although Westville Borough will experience a slight decline, overall the study area is forecasted to experience an increase of 31 percent in employment—closely tracking the county's increase of 36 percent (Table 3).

Table 3: Study Area Demographic Projections: 2000 and 2025

Municipality	Area (mi^2)	Population				Employment			
		2000	2030	Change		2000	2030	Change	
				Real	%			Real	%
Deptford Township	17.6	26,763	30,240	3,477	13.0%	12,508	14,605	2,097	16.8%
Washington Township	21.6	47,114	56,450	9,336	19.8%	11,875	18,374	6,499	54.7%
Westville Borough	1.1	4,500	4,685	185	4.1%	2,547	2,323	-224	-8.8%
Study Area	40.3	78,377	91,375	12,998	16.6%	26,930	35,302	8,372	31.1%
Gloucester County	336.8	254,673	337,090	82,417	32.4%	99,467	135,627	36,160	36.4%

Source: 2000 US Census

3.4 Land Use

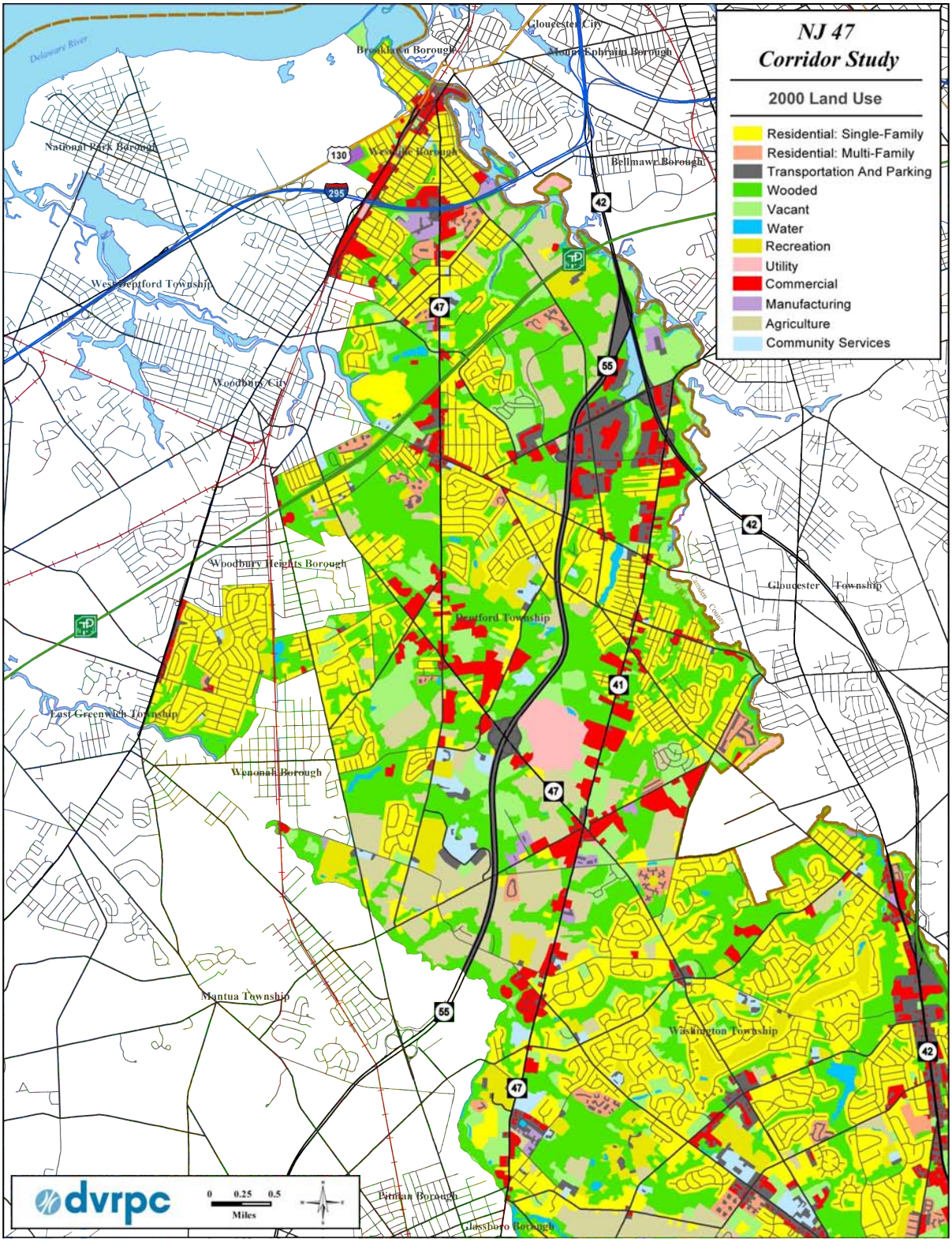
Year 2000 land use for the study area is shown in Figure 3. There are variable land use patterns throughout the three municipalities, with no single type being dominant. There is more open space and agricultural land in Deptford Township, and residential densities are higher in Washington Township and Westville Borough. Almost all residential neighborhoods consist of single-family dwellings. Commercial development is dispersed throughout the corridor, but is found primarily along state routes NJ 47, NJ 42, and NJ 41, near their major cross streets.

Westville Borough is almost entirely built-out. Thirty-two percent of the land is committed to residential, and 34 percent to commercial and infrastructure use, leaving only two percent of developable land vacant. Though space is tight, the municipality had three projects planned which have since been shelved due to the recent economic downturn. Currently on hold are a residential/commercial/park development proposed on the peninsula near the intersection of NJ 47 and US 130, a residential towers development near the same location, and a redevelopment of the business district along US 130 is in the works.

Deptford Township currently has the greatest mix of land uses and the most potential for future development, in addition to the most projects already planned along the corridor. Including vacant land, over half of the township is open space, though it also has one of the area's largest shopping centers, The Deptford Mall, located at NJ 55 and Clements Bridge Road. The municipality is likely to see a large portion its open space developed due to pending projects. At least six projects are planned that will provide over 200 residential units throughout the township and a new shopping center at the intersection of state routes 47 and 41, and another near the intersection of NJ 47 and Cooper Street.

Like Deptford, Washington Township has a dynamic mix of uses along the corridor. Unlike Deptford, one-third of its land use is residential and another one-third could be considered open space. NJ 47 skirts the northwestern corner of the township and contains almost every type of land use. The corridor lacks cohesiveness and its entire length is being designated as a redevelopment zone. Under a redevelopment scenario, the designated land can be reimagined without the bounds of its original zoning designation (i.e., residential can become commercial, etc.) Other significant developments in the area include a new strip mall just south of the Five Points intersection and a new shopping center nearby in Deptford Township.

Figure 2: 2000 Land Use



3.5 Journey to Work

A significant share of all trips made on an average weekday are those involving commuting to and from work (approximately 20 to 25 percent of total trips). Table 4 lists major employers located in close proximity to the study area. Typically, work trips are compressed into two to three hours in the morning and two to three hours in the evening, Monday through Friday. The inclination to use public transportation for completing work trips is higher than for any other purpose. As a result, travel to and from work creates a high temporal demand on highway and transit facilities and contributes significantly to the degree of congestion and delay encountered on those facilities.

Table 4: Major Employers in the Vicinity of NJ 47

Company	Sector	Employees (est.)
Kennedy Health Systems	Healthcare System	700
University Medical Center	Healthcare System	700
Gloucester County College	Education	400
Abilities Center of Southern NJ	Industrial Job Shop	350
Liedtka Trucking, Inc.	Trucking	300
J.E. Berkowitz, L.P.	Glass Fabricator	250
Gloucester Manor Healthcare Center	Health Care Center	200
Sam's Club	Wholesale Warehouse	200
The Arc Gloucester	Non-Profit Advocate Agency	200

Source: Greater Philadelphia Chamber of Commerce, 2003

Table 5 summarizes the data on journey-to-work characteristics for the study area. In 2000, there were 67,850 work trips made to, from, and within the study corridor's municipalities. Regarding mode split, about 82 percent of all worker trips, both to and from the study area, were via single-occupant vehicle. Approximately nine percent of all workers' trips were accomplished through carpool or vanpool. On average, just under three percent of total trips were made using public transit—mostly outbound from the residence municipality—and about one percent of the total trips were accomplished via walking or cycling.

A majority (60%) of the work trips were outbound from the commuters' residence municipalities. None of the municipalities are net trip importers regarding employment, but Deptford Township has the highest inbound ratio, with 47 percent of its total worker trips.

On pages 13 and 14 figures 3 and 4 depict major work trip origin-destination pairings. To establish a baseline, Deptford Township was used to represent average numbers for the study corridor due to it being the geographic center of the study area. Figure 3 shows journey-to-work travel patterns from Deptford Township, and figure 4 shows trips to Deptford Township. A minimum threshold of 100 or more trips was used on the map to show significant patterns between Deptford Township and regional origins and destinations. The number of trips for Deptford Township is the same on both maps (1,785) as it depicts internal circulation.

Table 5: Journey-To-Work Characteristics

Municipality	Total Workers	Workers Traveling FROM Municipality			
		Means of Transportation			
		Drive Alone	Car/Van Pool	Public Transit	Other Mode
Deptford Twp	12,630	10,377	1,515	374	312
Washington Twp	23,676	19,712	2,275	740	282
Westville Borough	4,344	3,296	760	90	196
Total	40,650	33,385	4,550	1,204	790
Municipality	Total Workers	Workers Traveling TO Municipality			
		Means of Transportation			
		Drive Alone	Car/Van Pool	Public Transit	Other Mode
Deptford Twp	11,401	9,363	1,155	406	312
Washington Twp	13,657	11,469	1,033	153	316
Westville Borough	2,144	1,685	194	91	166
Total	27,202	22,517	2,382	650	794

Source: 2000 US Census

Observations about Figure 3:

- Philadelphia receives the greatest percentage of outbound Deptford workers, a close second to the number of internal trips, and 80 percent higher than trips to Burlington County at 975.
- Most of the worker trips remained within Gloucester County, though Camden County, particularly Camden City (630), Cherry Hill Township (459), and Gloucester Township (430) showed noteworthy draws.

Observations about Figure 4:

- Deptford Township mainly attracts workers from within Gloucester County, especially from those municipalities located in the northern and eastern areas of the county.
- Burlington County is a net importer from Deptford Township as it only sends approximately 410 workers as compared to the 975 it receives.
- Gloucester Township is the only major Camden County exporter to Deptford Township sending just over 1000 workers. Figure 3: Journey-to-Work Travel Patterns FROM Deptford Township

Figure 3: Journey-to-Work Travel Patterns FROM Deptford Township

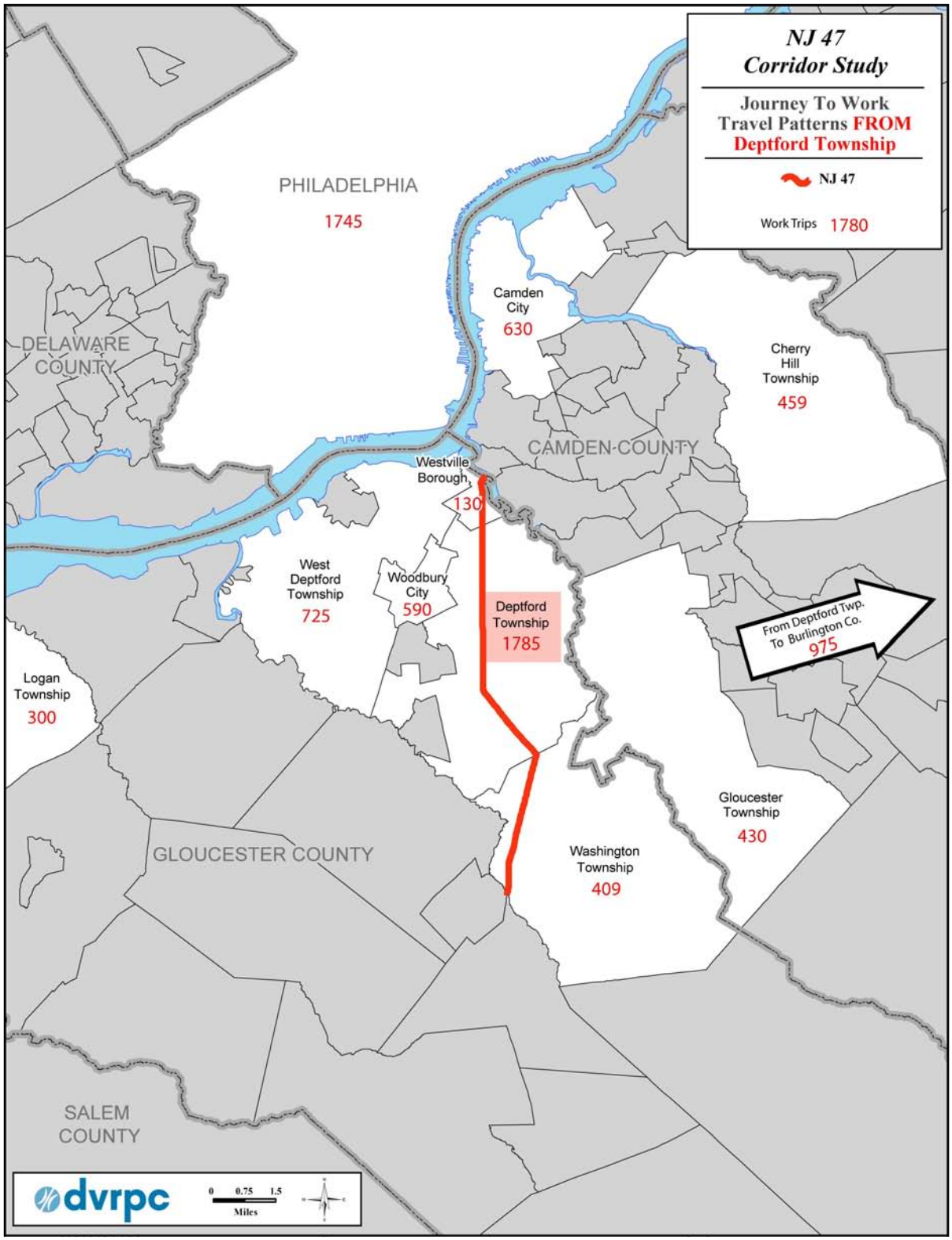
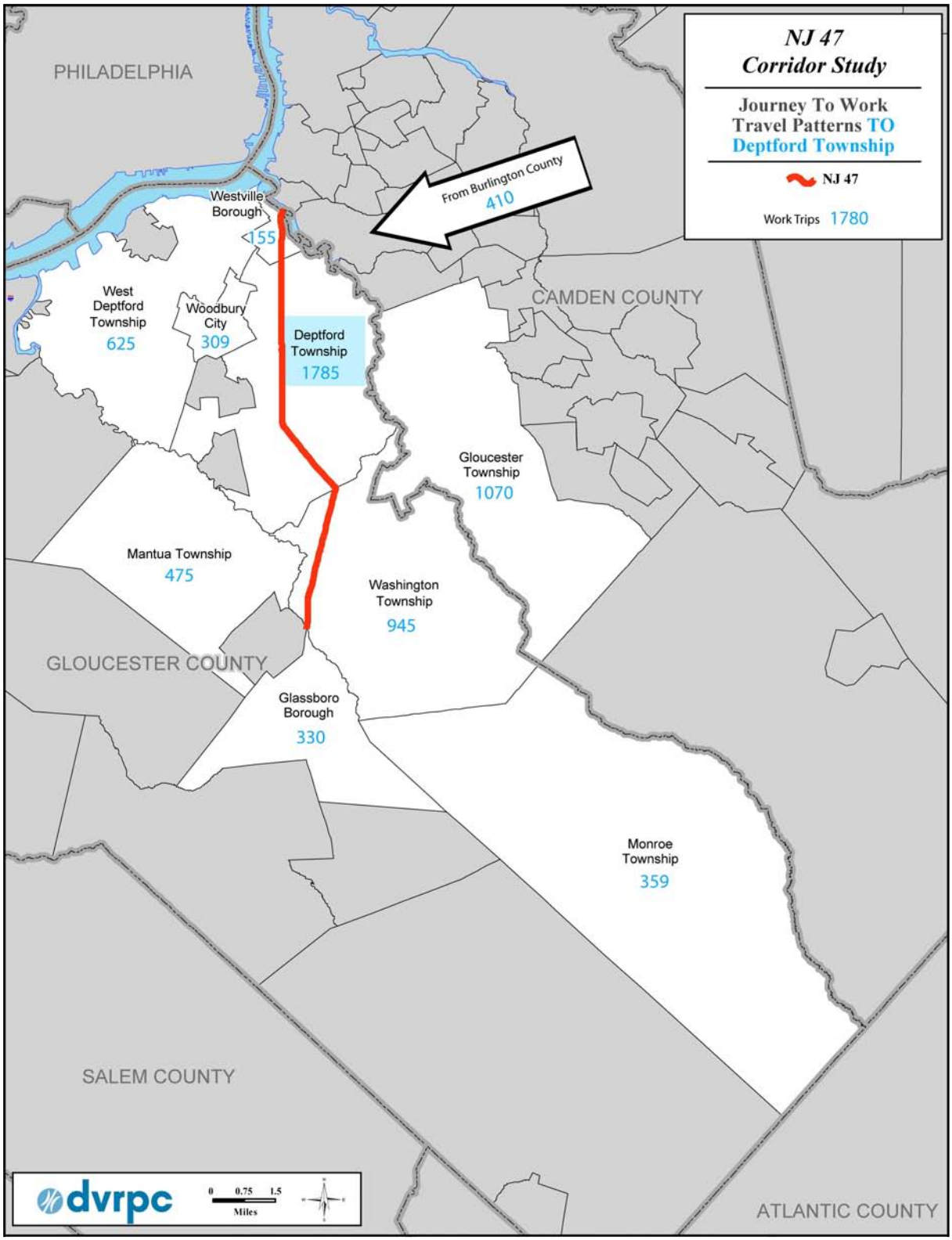


Figure 4: Journey-to-Work Travel Patterns TO Deptford Township



3.6 Environmental Justice

Title VI of the Civil Rights Act of 1964 and the 1994 President's Executive Order on Environmental Justice (#12898) states that no person or group shall be excluded from participation in or denied the benefits of any program or activity utilizing federal funds. Metropolitan Planning Organizations (MPOs), as part of the United States Department of Transportation's Certification requirements, are charged with evaluating their plans and programs for environmental justice sensitivity to identify any disproportionately high and adverse health or environmental effects of its programs on these groups.

Year 2000 Census Data for Degrees of Disadvantage

The quantitative methodology developed in the original report *"…and Justice for All": DVRPC's Strategy for Fair Treatment and Meaningful Involvement of All People* in 2001 and its subsequent updates relies primarily upon U.S. Census data. The methodology analyzes eight criteria that can be considered degrees of disadvantage (DOD) when one or more of them are present in high percentages in a neighborhood. The degrees of disadvantage are: minority population, Hispanic population, elderly people, disabled people, carless households, impoverished households, female heads of household with child, and limited English proficiency households. A regional threshold was determined to assess whether each census tract meets or exceeds the average.

Application to the NJ 47 Corridor

The map of census tracts where there are multiple high degrees of disadvantage in the NJ 47 corridor (Figure 5) is one of many starting points in planning projects. Improvement projects recommended in these areas should be evaluated concerning the extent to which they may impact sensitive populations. This project level review process is governed by National Environmental Policy Act (NEPA) procedures, which now incorporate environmental justice concerns.

Corridor Level Evaluation

For the environmental justice review, nine census tracts from the three municipalities were evaluated, representing 35,048 residents. Only census tracts through which NJ 47 passes were considered. Carless households and poverty DODs were not present in greater than average percentages in the corridor. Degrees of disadvantage by census tract population are summarized in Table 6.

Concentrations of the degrees of disadvantages represented in the study area are:

- Five tracts met the minimum threshold for Disabled persons
- Three tracts met the minimum threshold for Elderly persons
- Two tracts met the minimum threshold for Limited English Proficiency

- Of the six tracts that have two DODs represented, three met the minimum threshold for Disabled and Elderly populations

Table 6: Environmental Justice Degrees of Disadvantage by Census Tract

Tracts	DODs	Combined Population of Tracts	Percent of EJ Study Area Tract Population
2	0	8,331	23.77%
1	1	4,500	12.84%
6	2	22,217	63.39%
		35,048	100.00%

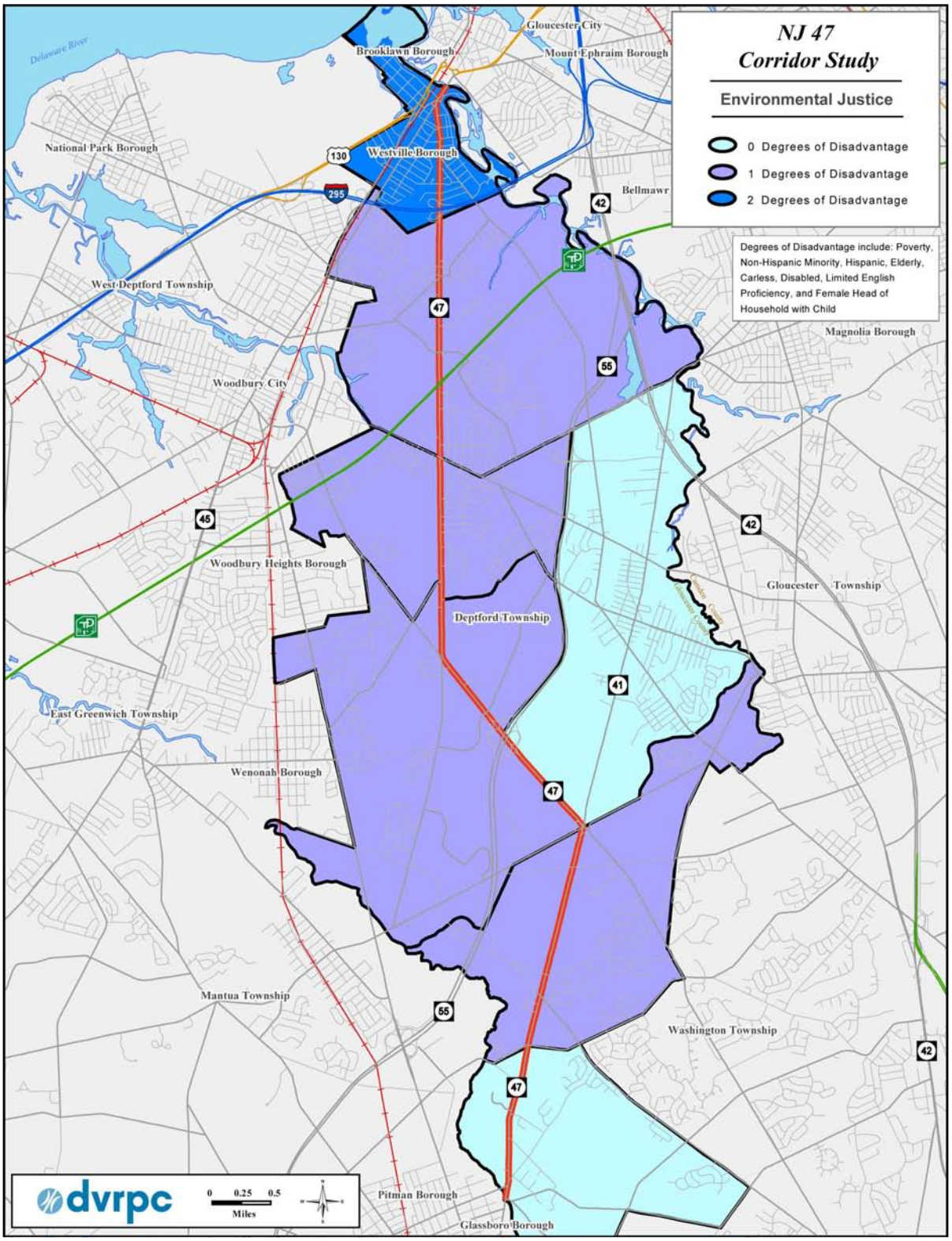
Source: DVRPC 2009

Considerations Regarding the Study Corridor Residents

The most notable demographics identified in the analysis are disabled persons and elderly persons, found in five tracts and three tracts, respectively, and found together in three tracts. The definition of disabled—2000 U.S. Census identifies disabled persons according to the categories of sensory, physical, mental, self-care, and employment capabilities—raises mobility concerns, as this population often relies on alternative modes of transportation. The same applies to the elderly, who in this analysis are defined as people age 85 and above (the very old). As a typically non-driving population, the mobility of these groups is largely dependent on the quality of the transit network, the pedestrian network, the extent and condition of sidewalks, and the availability of services and employment opportunities accessible by foot or bike, or by walking aid (e.g., wheelchair, walker, personal scooter, etc.). Although every special-needs group identified in the study corridor deserves attention and consideration when implementing transportation improvements, these two groups have the greatest concentration in the study area, making their needs more immediate.

In addition to the environmental justice implications for the identified sensitive groups of the study corridor are the implications for those who seek to bike, walk, or take transit. As noted elsewhere in this report, nonmotorized travel is not ideally accommodated along the NJ 47 study corridor, and thus it is much more difficult to get around by bus, bike, or on foot. Since NJ 47 provides the most direct connection between the study area municipalities, it is the most appropriate corridor for sidewalks, bicycle accommodations, and transit amenities. These transportation investments benefit many of the sensitive groups identified, as well as those seeking alternatives to automobile travel. The associated health and environmental benefits of walking and biking should not be discounted.

Figure 5: Environmental Justice Degrees of Disadvantage



3.7 Environmental Screening

Introduction

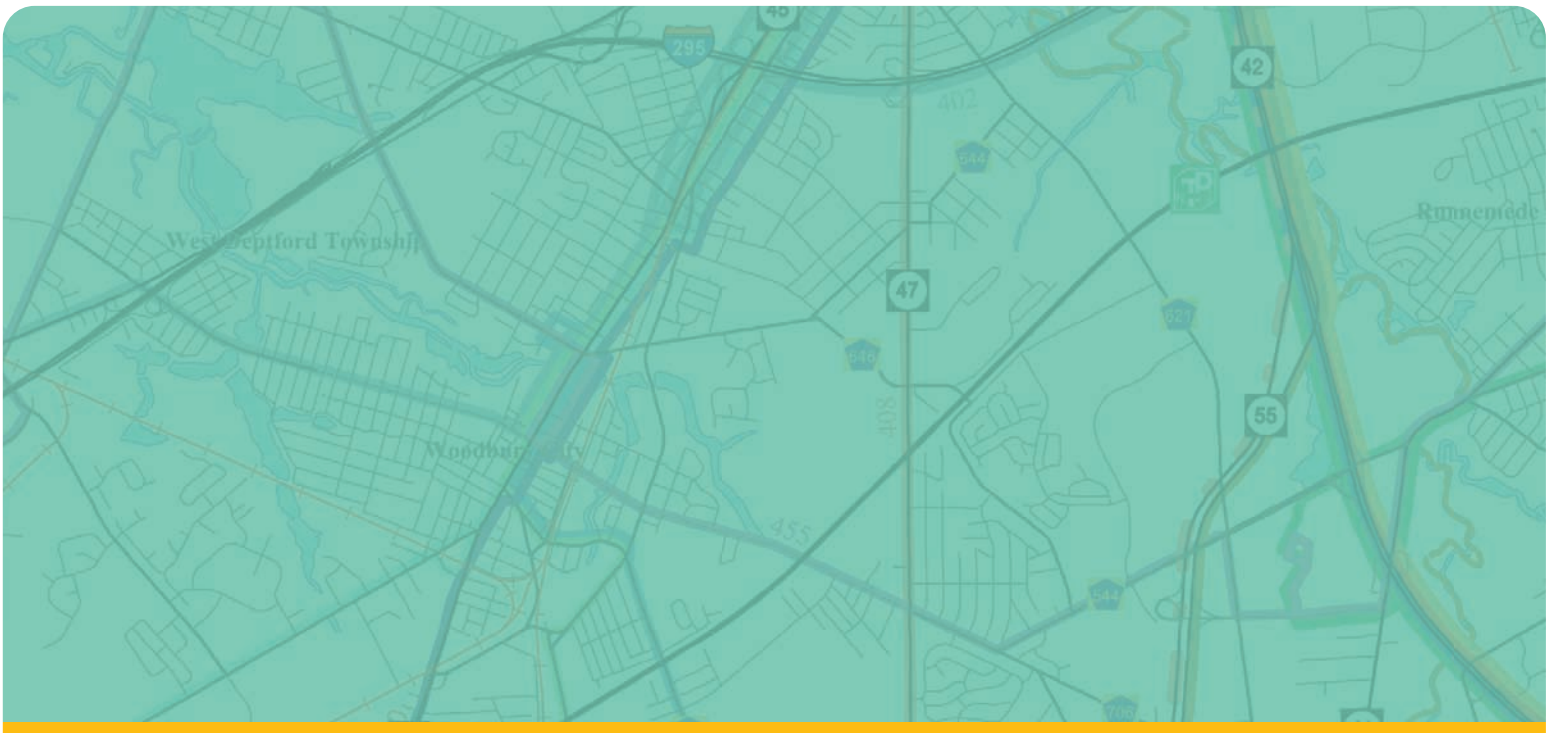
DVRPC includes a top level environmental screening of each corridor study it performs as part of coordinating with NJDOT. The purpose is to expedite the NJDOT project implementation process by completing a required element in advance.

Major Findings for the NJ 47 Corridor Study Area

This section highlights the major findings of the NJ 47 environmental screening covering the following categories: flood hazard areas, landscape project habitat priorities, known contaminated sites, and historic and cultural resources. The full screening analysis and accompanying maps can be found in Appendix B.

The highlights resulting from the environmental review are:

- A significant amount of wetlands, agricultural wetlands, and vernal pools may be within the NJ 47 corridor study area or immediately adjacent to the roadway.
- The NJ 47 corridor appears to have a significant amount of agricultural wetlands, especially at the intersection of state routes 47 and 41.
- At least two vernal pools are within 1,000 feet of the NJ 47 roadway. Vernal pools are bodies of water that appear following snowmelt and during spring rains, but disappear or are dry during the rest of the year.
- The NJ 47 corridor study area starts in a large flood hazard area along the Big Timber Creek in Brooklawn and Westville boroughs. Part of the roadway most likely lies in the floodway.
- A significant area adjacent to the NJ 47 corridor, in Deptford and Washington townships, has land categorized as critical upland forest habitat and critical grasslands habitat. This signifies that a threatened or endangered species was documented near or in these areas.
- Within a mile of either side of the NJ 47 corridor, there are 44 known contaminated sites, none of which are nationally designated superfund sites.
- Within a quarter-mile of either side of the NJ 47 corridor, there are no sites on the national or state Register of Historic Places.



4.0 TRANSPORTATION SYSTEMS

CHAPTER 4

Transportation System

4.1 Road Network

NJ 47 crosses a portion of the state from Westville Borough on the Delaware River to Wildwood on New Jersey's southern shore—hence its name, Delsea Drive. Table 7 lists other important transportation facilities in the study area and provides selected characteristics of each.

At the northern end of the study area, NJ 47 begins at US 130, which connects many municipalities along the Delaware River with central New Jersey. This busy intersection forms a hub for the area, with five main routes heading out from it. One of these, NJ 45, does not meet NJ 47, but connects with it via Crown Point Road (CR 710), and heads southwest. Parallel to this road is Broadway Avenue (CR 551), the main street of Westville Borough's business district. Just south is Almonsson Avenue (CR 621), which connects the borough to the shopping center at the Deptford Mall. At the municipal border between Westville and Deptford Township, NJ 47 crosses Interstate 295 (I-295) at a grade-separated, half-cloverleaf interchange, which limits access from and to I-295. There is no exit to NJ 47 from northbound I-295, nor can NJ 47 traffic access southbound I-295.

As it moves into Deptford Township, NJ 47 intersects Tacoma Boulevard (CR 644) and Deptford Avenue (CR 646), two local roads that provide access to surrounding neighborhoods and municipalities. It then crosses the New Jersey Turnpike, with which it does not have an interchange in the study area. NJ 47 next meets Cooper Street (CR 534), one of two roadways in the corridor classified as a 'principal arterial.' CR 534 is a major thoroughfare for the surrounding communities of Deptford and Woodbury City located to the west, and also connects major county routes in the eastern parts of the township. Cattell Road (CR 665) provides access to areas southwest of the corridor. Brenner Avenue is a short, busy connector to Tanyard Road (CR 663), which is where Gloucester County College is located. Tanyard Road is also somewhat of an alternate north-south route. Bankbridge Road (CR 647) becomes Fox Run Road as it crosses NJ 47, heading from west to northeast. This road experiences significant college-bound traffic. NJ 55 is a four-lane expressway that stretches from its connection with NJ 42 in eastern Deptford Township to its merge with NJ 47 in southern Cumberland County. The interchange here is a grade-separated, full cloverleaf.

Table 7: Characteristics of Important Study Corridor Roadways

Roadway	Ownership	Functional Classification	Lanes by Direction	Posted Speed (mph)
US 130	NJDOT	Urban Principle Arterial	2	40
Creek Rd (CR 753)	Camden County	Urban Minor Arterial	1	25
Crown Point Rd (CR 710)	Gloucester County	Urban Local	1	25
Broadway Ave (CR 551)	Gloucester County	Urban Minor Arterial	1	35
Almonesson Ave (CR 621)	Gloucester County	Urban Minor Arterial	1	25
Interstate 295	NJDOT	Interstate	3	65
Tacoma Blvd (CR 644)	Gloucester County	Urban Collector	1	35
Deptford Ave (CR 646)	Gloucester County	Urban Collector	1	35
NJ Turnpike (No interchange)	NJ Turnpike Authority	Expressway	2	65
Cooper St (CR 534)	Gloucester County	Urban Principle Arterial	2	45
Brenner Ave (Connection to CR 663)	Gloucester County	Urban Minor Arterial	1	45
Fox Run Rd (CR 647)	Gloucester County	Urban Collector	1	40
NJ 55	NJDOT	Urban Expressway	2	65
Blackwood Barnesboro Rd (CR 603)	Gloucester County	Urban Minor Arterial	1	50
Hurfville Rd (NJ 41)	NJDOT	Urban Minor Arterial	1	50
Egg Harbor Rd (CR 630)	Gloucester County	Urban Minor Arterial	2	45
Hurffville Cross Keys Rd (CR 654)	Gloucester County	Urban Minor Arterial	1	NP
Hurffville Grenlock Rd (CR 635)	Gloucester County	Urban Collector	1	45
East Holly Ave (CR 624)	Gloucester County	Urban Minor Arterial	1	30
Chapel Heights Rd (CR 639)	Gloucester County	Urban Collector	1	40

Source: DVRPC 2009

Continuing south, NJ 47 meets three routes at an intersection known as Five Points. This is the future site of a planned retail development complex. Hurffville Road (NJ 41) runs parallel with NJ 55, carrying both regional and local traffic northeast into Camden County. The following list highlights county routes that are important components of the network through which NJ 47 serves as the main artery:

- Blackwood-Barnesboro Road (CR 603) is an important east-west facility.
- Egg Harbor Road (CR 630) is a heavily traveled north-south route serving a large, residential area in Washington Township.
- Hurffville-Cross Keys Road (CR 654) serves retail and residential traffic.
- Hurffville-Grenlock Road (CR 635) connects NJ 47 to other major north-south routes.
- East Holly Avenue (CR 624) and Chapel Heights Road (CR 639) form a heavily used east-west thoroughfare between Washington and Mantua townships.

4.2 Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) is the application of advanced technologies (computers, communications, electronics, and sensors) in an integrated manner for the operation of transportation systems at their optimal safety and efficiency. NJDOT has developed its ITS Investment Strategy 10-Year Program for the fiscal years 2007 to 2016 to meet future transportation challenges facing the state through the deployment of ITS components. The intent of the investment strategy is to advance the design and construction of an ITS infrastructure in New Jersey. The plan outlines the goals and budget for operating and enhancing ITS and establishes priority corridors in the state with the intent of maximizing the benefits of ITS given the limited funding.

DVRPC has also developed an Operations Master Plan that was coordinated with NJDOT and identified future ITS investmenst.

Currently, the NJ 47 corridor within Gloucester County is not designated as an ITS Investment Strategy priority corridor. Within Gloucester County, only I-295 between US 130 in Logan Township and NJ 45 in Deptford has been identified as a priority.

Although there are no planned ITS efforts for NJ 47, there has been significant investment in ITS technologies that have already taken place in southern New Jersey. Along corridors such as I-76, I-295, NJ 42, and NJ 55, there are closed-circuit TV (CCTV) cameras and variable message signs (VMS).

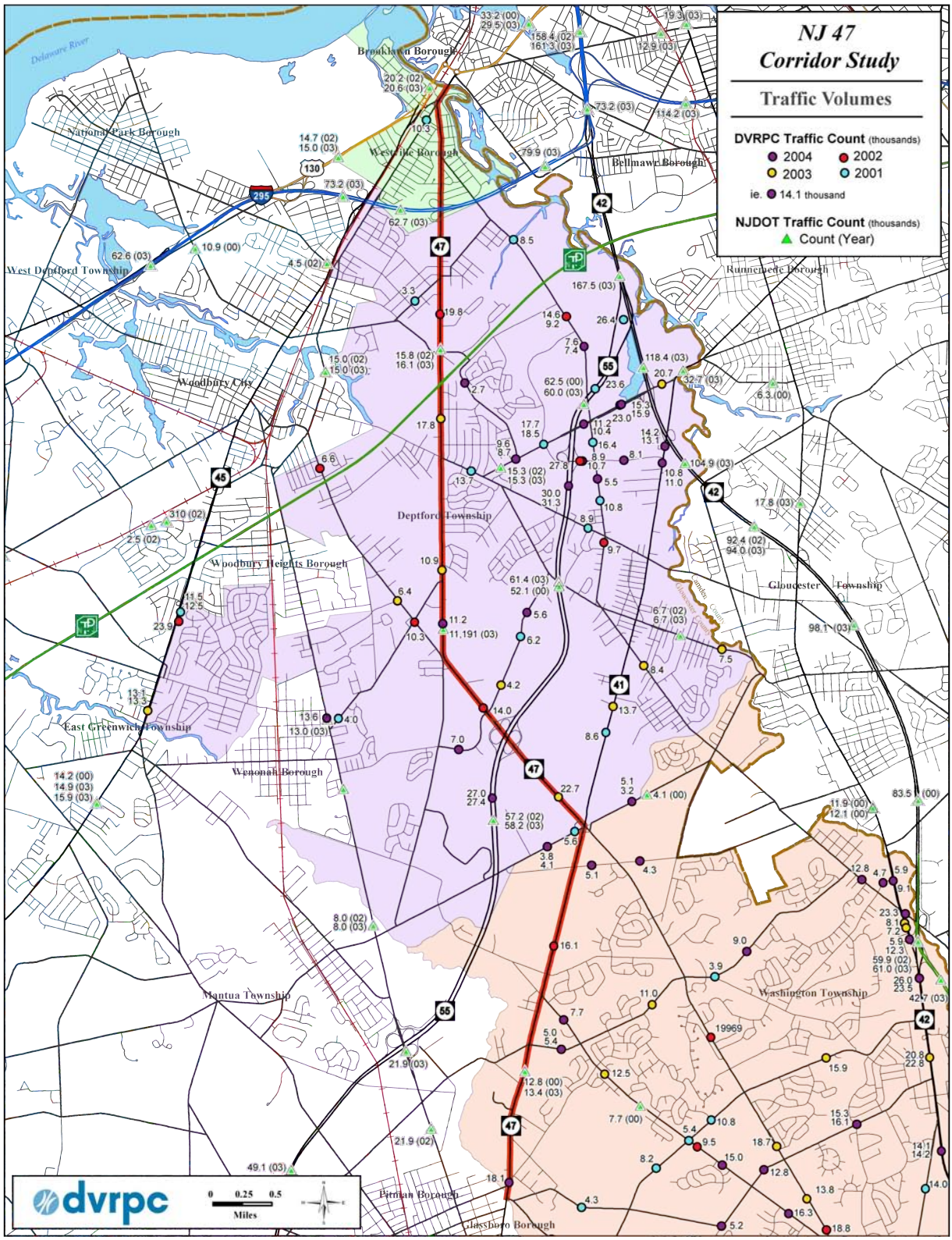
In Cherry Hill, NJDOT's Traffic Operations Center (TOC) is staffed around the clock and serves the 10 southernmost counties in New Jersey. All new ITS systems now include fiber optic installation to the TOC and allow staff to monitor and operate their ITS equipment.

The TOC also assists in incident management by dispatching Emergency Service Patrols (ESP) on major highways; coordinating Incident Management Response Teams (IMRT) that respond to major incidents; and disseminating traveler information to the public. Although ESPs do not operate on NJ 47, they do operate on surrounding highways, such as NJ 42, NJ 55, I-76, I-676, and I-295, by assisting disabled vehicles. ESP operators are equipped to perform minor repairs, such as changing a flat tire. When major repairs are needed, the ESP operators radio a dispatcher, who calls a towing company to remove the disabled vehicle. The program is designed to improve the efficiency of the highway system through the expedited removal of incidents that impact traffic flow and help reduce the risk of secondary accidents by deploying appropriate warning devices.

4.3 Traffic Volumes

Figure 6 illustrates the daily traffic volumes along NJ 47 and throughout the study area. Average Annual Daily Traffic (AADT) volumes were recorded by DVRPC each year from 2001 to 2004 and by NJDOT in 2000, 2002, and 2003. The highest AADT count on NJ 47 was 22,700 vehicles per day (VPD). This was recorded on the stretch of NJ 47 between the NJ 41/Blackwood Barnesboro Road intersection and NJ 55. This is the primary access to NJ 55 for much of northern Washington Township. Other peaks along the corridor were 19,800 VPD just north of Deptford Avenue and 18,100 VPD at East Holly Avenue. This shows that AADT volumes are higher south of NJ 55 and north of Cooper Street, with volumes toward the middle of the corridor dropping to 11,200 VPD. An AADT of 62,700 was recorded along I-295 within the study area. The AADT volumes on NJ 55 were about 62,000 east of NJ 47 and 58,000 to the west. The highest AADT within the study area was recorded on NJ 42, where there were 167,000 VPD passing near the NJ 55 interchange.

Figure 6: Traffic Volumes



4.4 Transit

Route Descriptions

Public transportation within the study area is composed of 15 bus routes run by New Jersey Transit (see Figure 7). Four of these routes pass through the corridor on NJ 42 and NJ 55. Three routes travel along NJ 45, stopping where they meet NJ 47 at Broadway Street in Westville. There are four significant routes serving the corridor: 408, 412, 455, and 463. Figure 7 illustrates all bus routes in the area. Philadelphia or Camden is the primary destination for all but two of the routes. All but one originates outside of the study area.

The Route 408 bus runs from Millville to Philadelphia largely along NJ 47, and serves as the main line along the study corridor. Within the study area it provides service from Glassboro to Westville. During weekdays it makes 21 trips in each direction. Inbound travel time is 57 minutes from Glassboro and 24 minutes from Westville, with service running from 5:30 am to 9:13 pm. Outbound travel time is 37 minutes to Westville and 73 minutes to Glassboro, with service running from Philadelphia starting at 6:35 am until 10:12 pm. There is one express bus each day using NJ 55 from Glassboro to Philadelphia in the morning and a return in the evening. The following routes are important to the study area and connect with the 408 bus:

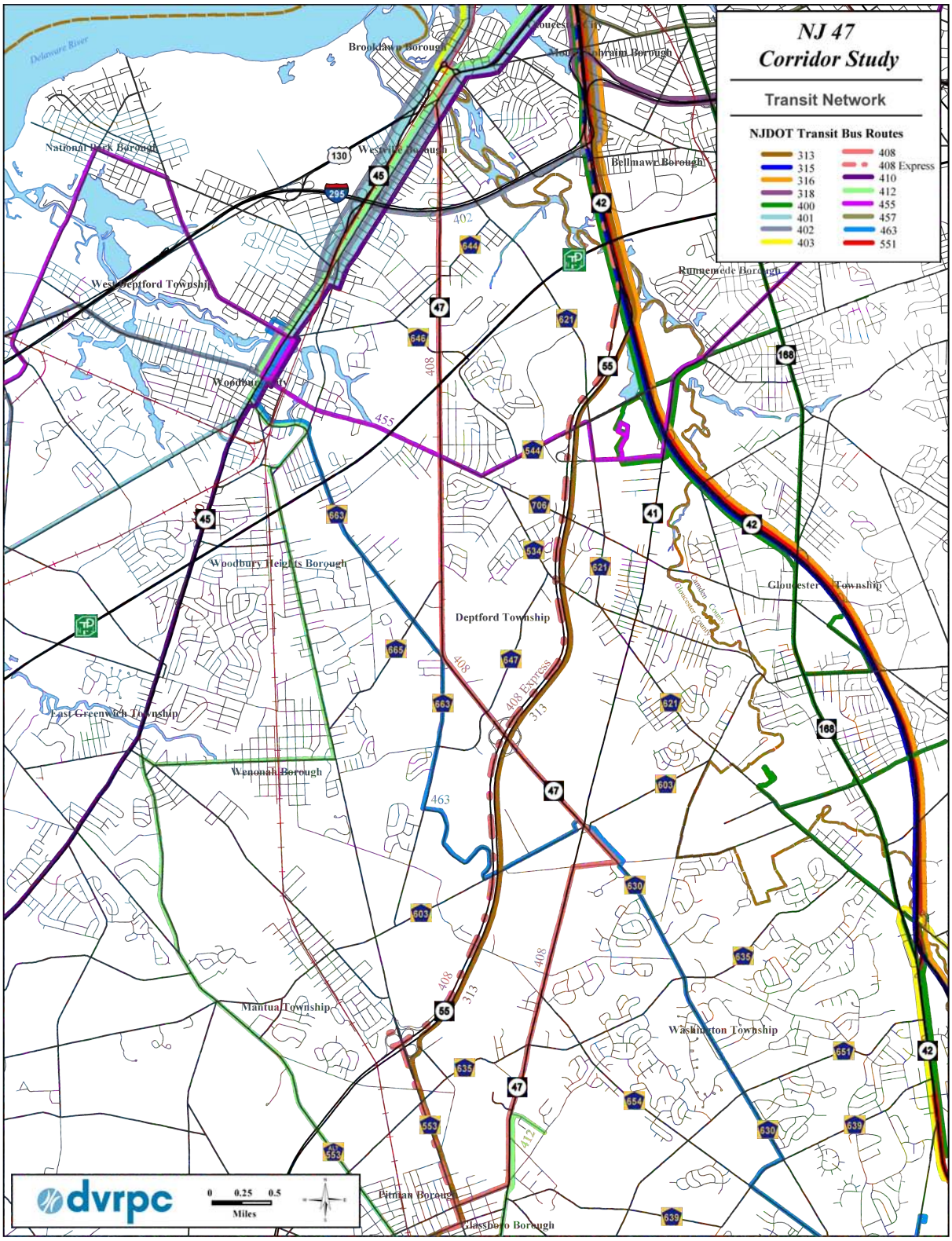
- Route 412 mainly runs west of the study area, but it originates from NJ 47 at Holly Dell Drive in the southern end of the study corridor. It runs to Philadelphia through Glassboro, Mantua Township, and along NJ 45. Service runs between 6:30 am and 10:19 pm.
- Route 455 runs east-west from the Cherry Hill Mall to Paulsboro. It crosses the corridor on Cooper Street (CR 534) and provides service to the Deptford Mall, Haddonfield PATCO station, and JFK Hospital. Service runs from 6:30 am to 10:05 pm.
- Route 463 runs from Woodbury to the Park/Ride lot in Avondale. It travels along Egg Harbor Road (CR 630), Blackwood-Barnesboro Road (CR 603), and Tanyard Road (CR 663), providing service to the Gloucester County Institute of Technology, Gloucester County Community College, JFK Hospital, and the former Gloucester County Health Services Complex. Service runs from 5:00 am to 10:00 pm.

Zonal Trip Distribution

Methodology

By examining transit trips by zone, geographic concentrations of trip origins and destinations are revealed. The transit flows were derived using a three-day sample for each bus route, taken midweek (Tuesday, Wednesday, and Thursday) during May 8-10, 2007 (See Figure 8: Trip Distribution for Transit Route 408). The sample data provides a matrix of trips between zones, occurring inside, outside, and intersecting the study area. If more than one zone fell within the study corridor, they were treated as a single internal zone, and likewise zones falling outside of the study areas were treated as one zone. The aggregated passenger counts from each of the three days were added together and then averaged in order to smooth the data. The inbound and outbound trips were added to provide a single movement number.

Figure 7: Transit in the Vicinity of the NJ 47 Corridor



The diagrams show these numbers as flows between sections and make note of any important zonal anomalies concerning the passenger trips. Inbound or outbound trip references are oriented in the direction toward or away from the Philadelphia/Camden origins.

Route 408

Zones 3 to 5 fell within the study zone. Movements between the study area zones and the external zones representing origins in Camden and Philadelphia greatly outnumbered the rest of the passenger trips in the corridor. Thus, a majority of those using the 408 from the study area are traveling to and from points north. External movements into the study zone make up roughly one-quarter of the total number of trips in the corridor, while trips inside the study zone and through the corridor make up relatively few movements.

Route 412

Zone 5 fell within the study zone. Most movements (75 percent) fell between this zone and the external inbound zones (zone 5 is the southern terminus of route 412). Over half of these trips were between zone 5 and zone 3. Roughly 20 percent of the total movements were within zone 5, and only a fraction of the total movements ran through the entire route.

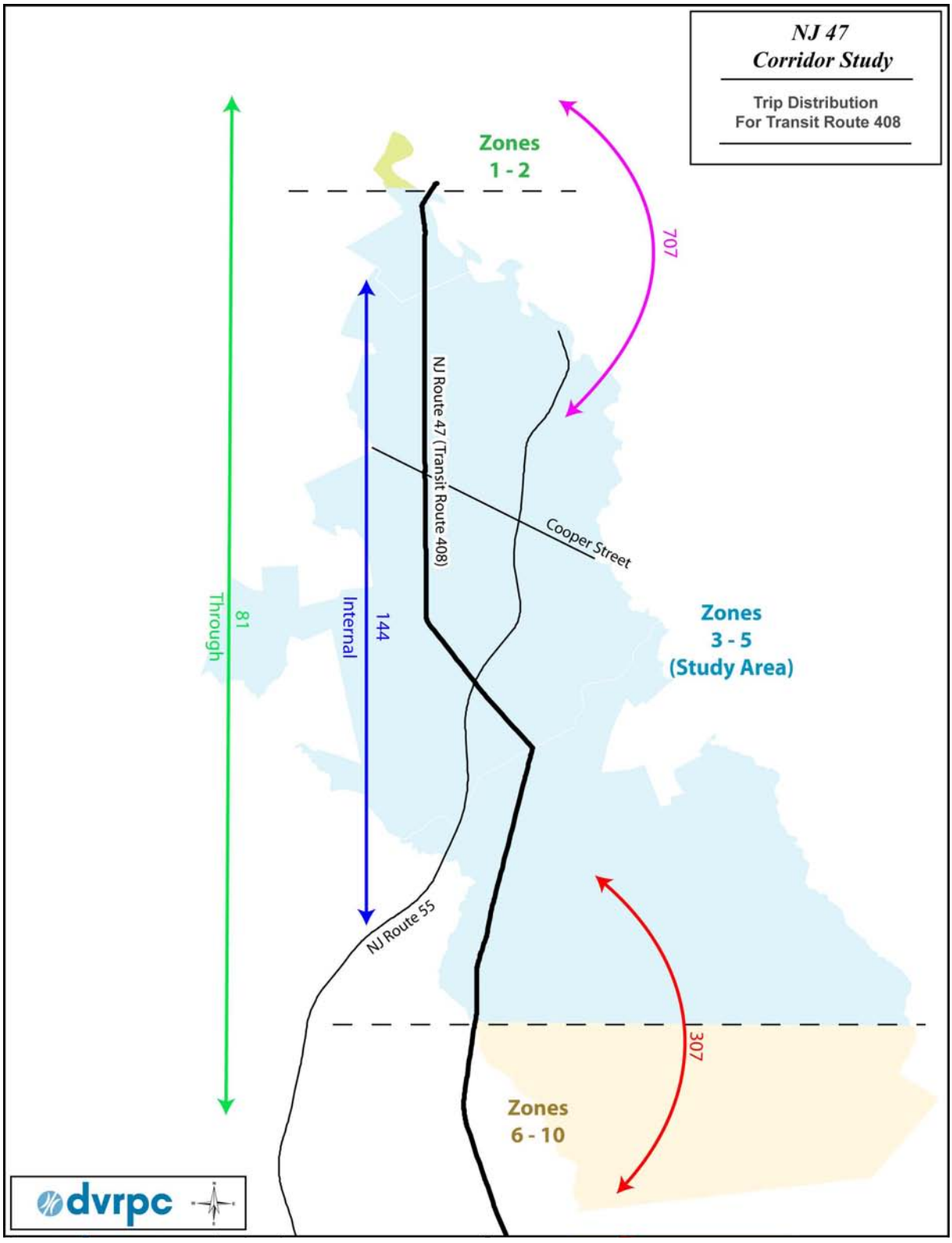
Route 453

Zones 3 and 4 fell within the study zone. Movements within the study zone and from the study one to the external inbound zones were roughly equal, each accounting for roughly 40 percent of the movements. Over 85 percent of the trips between the study zone and the external inbound zones (41 and 42) were between zones 3 and 41. Fifteen percent of the total trips were between the external outbound zones (5 and 6) and the study zones. Very few of the trips ran the length of the route.

Route 466

Zone 4 fell within the study zone. Over 40 percent of the total trips ran through the entire route. The number of trips between the study zone and zones 5 and 3 were roughly equal. A fraction of the trips occurred entirely within the study zone.

Figure 8: Trip Distribution for Transit Route 408



4.5 PATCO Expansion

PATCO recently announced selection of the preferred alternative alignment for the Southern New Jersey Expansion Project, which was endorsed by state officials. The alternatives analysis was a lengthy process that had originally identified three potential alignments to deal with transportation and mobility needs, as well as increased demand for transit. The study examined several transit improvements, including rapid transit on existing railroad alignments, as well as utilizing the medians of either Route 55 or Route 42.

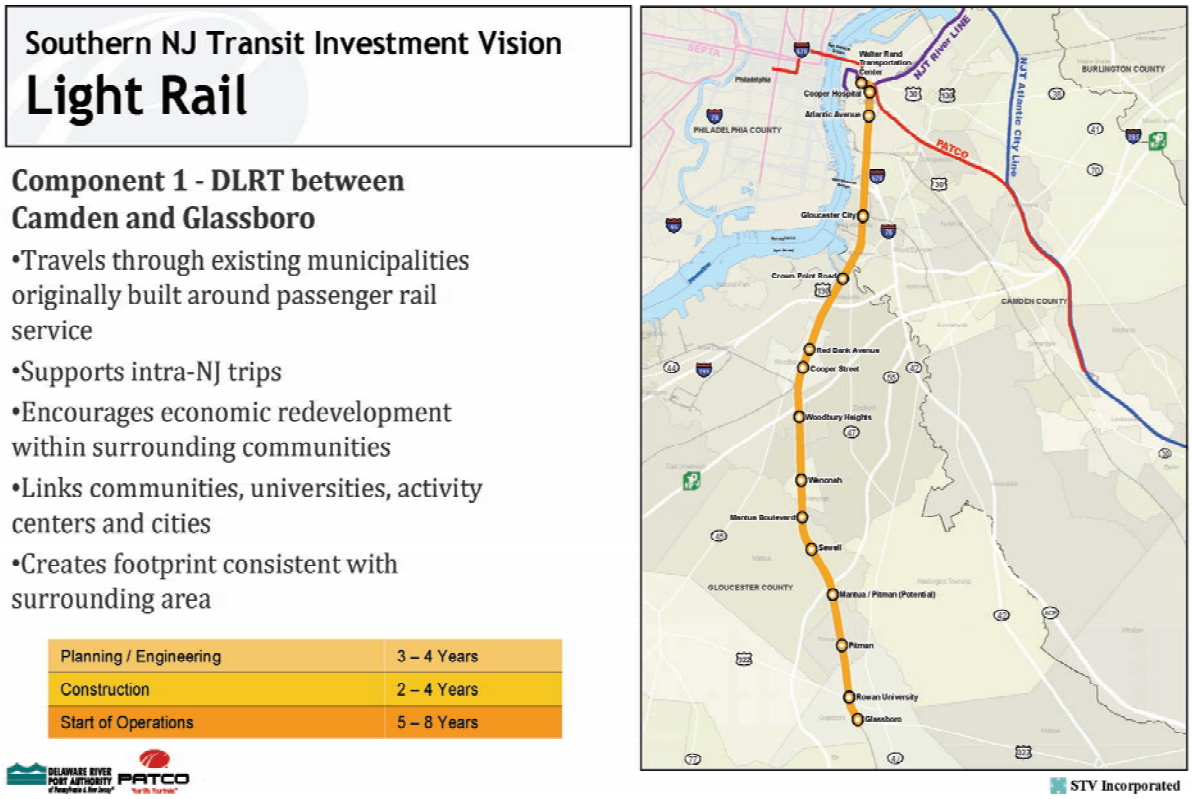
The new service is expected be a light rail system from the Walter Rand Transportation Center in Camden to downtown Glassboro, generally following an existing rail right of way and serving established communities that grew up along the railroad (see Figure 9). According to PATCO's website, this alternative will cost "close to $1 billion dollars less than any of the other alternatives studied" and "can be implemented along with additional improvements for less."

There are several ways in which the proposed alternatives could impact transportation in the study area municipalities. When service begins, commuters that currently rely on NJ 47 enroute to Camden and Philadelphia would be provided with a transportation alternative.

PATCO's chosen alignment is expected to stop in Westville Borough and then generally parallels NJ 47 to the west, but outside of the remaining study area towns. This will likely mean increased traffic through Westville Borough, possibly creating the need for roadway improvements. The proposed stop in the borough is along Crown Point Road, which directly connects with NJ 45—a facility of similar traffic volume to NJ 47.

Traffic will likely increase along the east-west routes that intersect with NJ 47 as a result of the new passenger service. This project is in its early stages, and thus any direct impacts and potential improvements for the roadway network have not yet been identified. It is recommended that impacts to NJ 47 be considered in planning the rail project.

Figure 9: PATCO Southern NJ Expansion



Source: PATCO

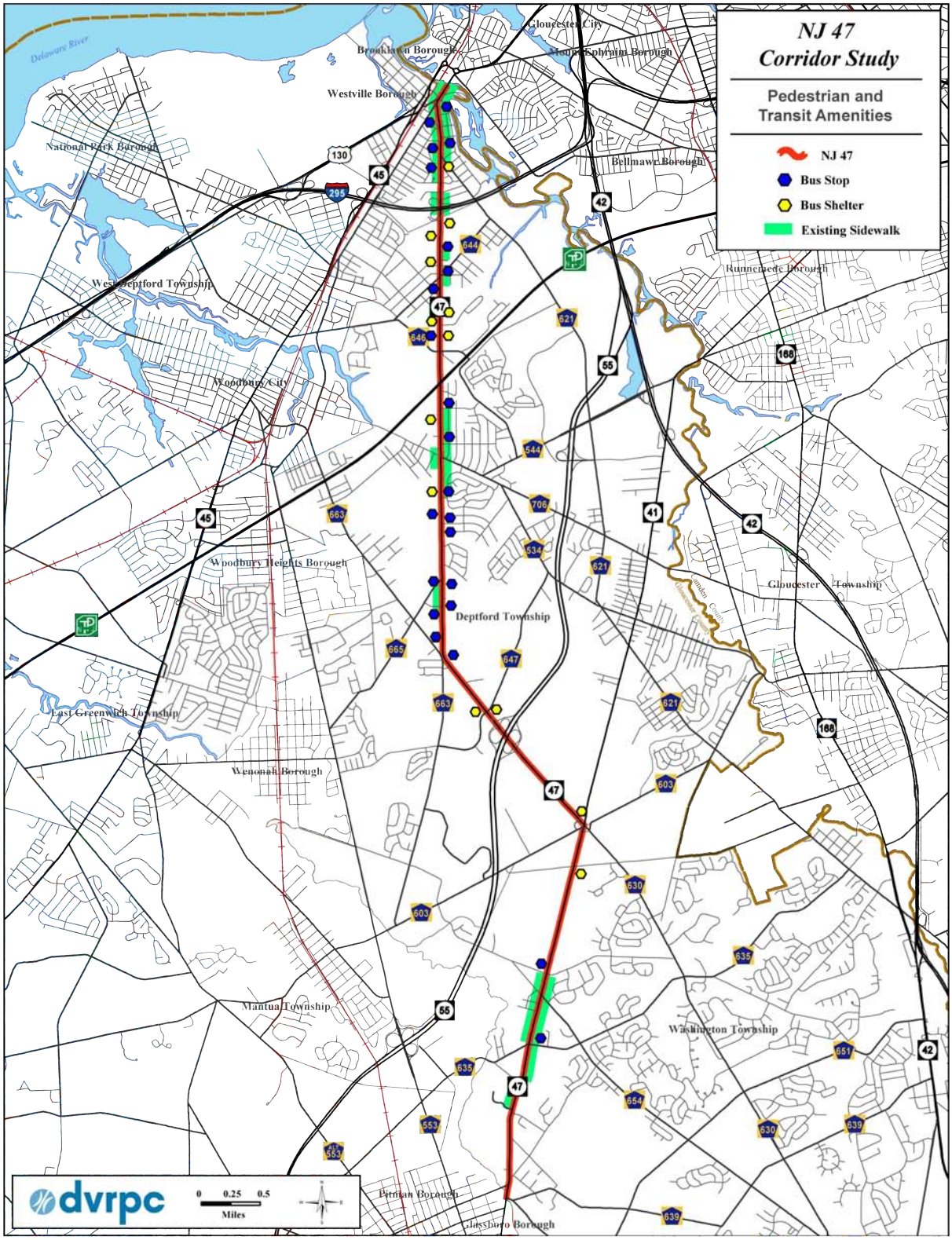
4.6 Bicycling and Walking

Existing Conditions

Pedestrian and bicycle amenities vary greatly among the study area's three municipalities. Corridorwide, sidewalks are generally found as isolated segments. There is no network and no pattern of connections between most bus stops and existing sidewalks. Westville Borough is an exception, as higher residential density has led to greater sidewalk consistency and bus stop frequency. Westville is an established community where short building setbacks and mixed use and pedestrian-accessible business are common. For most of the length of NJ 47 through this borough, consistent sidewalks and crosswalks are present, though a lack of regular maintenance and infrequent pedestrian signals contribute to less than ideal conditions for pedestrians. Parkview Elementary School, just west of NJ 47, contains adequate pedestrian facilities.

Throughout the rest of the corridor, sidewalks are sparse and, in some cases, separated by considerable distances. Generally, sidewalks are found in front of newer commercial properties, and typically the sidewalks end at the property boundaries. This shows a trend toward greater consideration of pedestrians as development of the corridor progresses. The missing connectivity between sidewalks and bus stops is illustrated in Figure 10.

Figure 10: Pedestrian and Transit Amenities



Pedestrian Crossings

There are sufficient crosswalks at Cartaret Avenue (CR 644), but amenities are lacking at every cross street except Cooper Street and Blackwood-Barnesboro Road. Curbs and curb ramps are missing or substandard. There are a great many commercial driveways along much of NJ 47 as it passes through Deptford and Washington townships. The longest section of continual sidewalk outside of Westville Borough is located in Deptford Township. This three-quarter-mile stretch runs on the northbound side of NJ 47 north and south of Cooper Street. Archbishop Damiano Special Education School is served by this sidewalk. Also, there are three crosswalks along this segment of NJ 47, and one is at this school.

One area of particular concern is the pedestrian access through the NJ 55 interchange with NJ 47 in Deptford Township; sidewalks are not available through this section. Freeway interchanges are particularly daunting for pedestrians because the high speed of vehicles accessing the on and off-ramps, combined with the typically longer crossing resulting from the non-perpendicular alignment of the ramp to the main facility, in this case NJ 47. Special consideration should be given to this location when designing pedestrian accommodations along NJ 47.

Bus Stops and Pedestrian Access

There are 36 bus stops along the NJ 47 corridor, and 13 have shelters. Eighty percent of the stops are located north of NJ 55. This density of bus stops is reflective of the corridor's current development density. However, the lack of a pedestrian network leaves most bus stops isolated from any sidewalk or attached to a short stretch that provides little practical convenience. Due to the lower density and somewhat rural character in Deptford and Washington townships, pedestrian traffic is expected to be relatively low. Field observations were consistent with this assumption. However, there are two other schools, and the lack of access to many bus stops are causes for an increased priority of pedestrian amenities.

Bicycling

Suitability and Demand

Bicycle counts in Gloucester County were not available at the time that this study was conducted. In lieu of bicycle counts, the geographic pattern of crashes between vehicles and bicycles over time is the only data available from which to infer where bicycling is most frequent. The NJDOT database of reportable crashes was queried for all crashes involving bicyclists in the county for the years 1997 through 2001 for a separate project. These data should not be interpreted as indicating dangerous locations for bicycling; risk can only be calculated relative to how much bicycling is occurring at a given location (exposure), which is unknown.

A total of 165 vehicle crashes that included a bicycle were recorded in Gloucester County for the specified time period. Deptford and Washington townships and Westville Borough collectively accounted for 35 percent of all these incidents. Only about 65 percent of crashes were able to be identified with a particular route due to insufficient details. Of the 37 state and county routes where incidents were recorded, 14 percent of the crashes were attributed to NJ 47, this includes

the 10-mile study area segment plus the remaining 65 miles. This is the highest percentage of any single route, and represents nine percent of all recorded bicycle incidents in the county. These data indicate that NJ 47 is among the county's most heavily bicycled routes, though specific sections were not mentioned.

New Jersey Statewide Bicycle and Pedestrian Master Plan Phase 2

The state's first bicycle and pedestrian master plan, published in 1995, consisted of a comprehensive set of policies designed to achieve a vision for bicycling and walking. In 2004, the plan was updated. Considered Phase 2, the update revisited the goals and objectives of the policy plan and provided a revised vision statement: "New Jersey is a state where people choose to walk and bicycle; residents and visitors are able to conveniently walk and bicycle with confidence and a sense of security in every community; and both activities are a routine part of the transportation and recreation systems and support active, healthy life styles."

While Phase 1 focused on policies, Phase 2 concentrated on facilities, with the primary goal of providing clear guidance on the most efficient and effective use of federal, state, and local resources to implement bicycle and pedestrian initiatives.

Phase 2 used demand and suitability measures to prioritize segments of the roadway network for bicycle and pedestrian infrastructure improvements. Segments were identified as high priority where demand was high and facilities were least suitable. Details on the analytical methodology used to classify priority segments may be found in the Phase 2 document. The following terms describe the criteria:

- Bicycle Demand is principally a function of demographics and mode split. A younger population, college students, a high transit mode split, and numbers of current bicycle commuters contribute to demand.
- Pedestrian Demand is derived from street network, population, and employment density, and relative balance of land uses.
- Suitability is a level of service measure, a way of quantifying how comfortable a bicyclist or pedestrian would be traveling along or across a given facility.
- Bicycle Suitability is determined by roadway characteristics, such as traffic speed and volume, presence of shoulders, or shoulder lane width.
- Pedestrian Suitability, defined as the ability of a person on foot to cross the roadway, factors in the speed and volume of traffic, the presence of a median refuge, and the spacing of signalized crossings to determine overall delay from waiting for a safe gap in traffic in which to cross.

Application to the NJ 47 Corridor Study Area

The following text details the implications of the Statewide Bicycle and Pedestrian Master Plan (Plan) on the NJ 47 corridor study municipalities. Several sections are rated as low priorities. This is largely due to a combination of favorable conditions and low estimated demand.

- Westville Borough: NJ 47 is identified as low priority for bicycle level of service improvements in the borough, and medium priority for pedestrian crossing improvements, in the Plan.

- Deptford Township: NJ 47 is identified as medium priority for bicycle level-of-service improvements between CR 534 and NJ 55, and from NJ 41 south to the municipal limit, in the Plan. Elsewhere in the township, the route is identified as low priority. For pedestrian crossing improvements, the route is identified as medium priority between the New Jersey Turnpike and NJ 55, and low priority elsewhere in the township.

- Washington Township: In the Plan, NJ 47 is identified as low priority between CR 603 and CR 635, and medium priority elsewhere, for pedestrian crossing improvements, and it receives medium priority for bicycle level-of-service improvements for its entire length through the township.

DVRPC Plans

DVRPC is currently preparing a multiuse trails network plan for Gloucester County. Trail alignments identified for further study intersect with NJ 47 at CR 635 in Washington Township, and at the southern end of the study area. Development of any trails is not anticipated in the near term.

General Recommendations

Minimum five-foot bike lanes are recommended on all sections where the speed limit is 35 mph or greater for the length of NJ 47 within the study area. Shared lanes are acceptable where the speed limit is 30 mph or less. Sidewalks should be retrofitted on all developed parcels and should be included in all development plans. Special consideration should be given to connecting bus stops with neighborhoods and destinations.

Figure 11: Bicycle Level Of Service (LOS) Improvement Priority

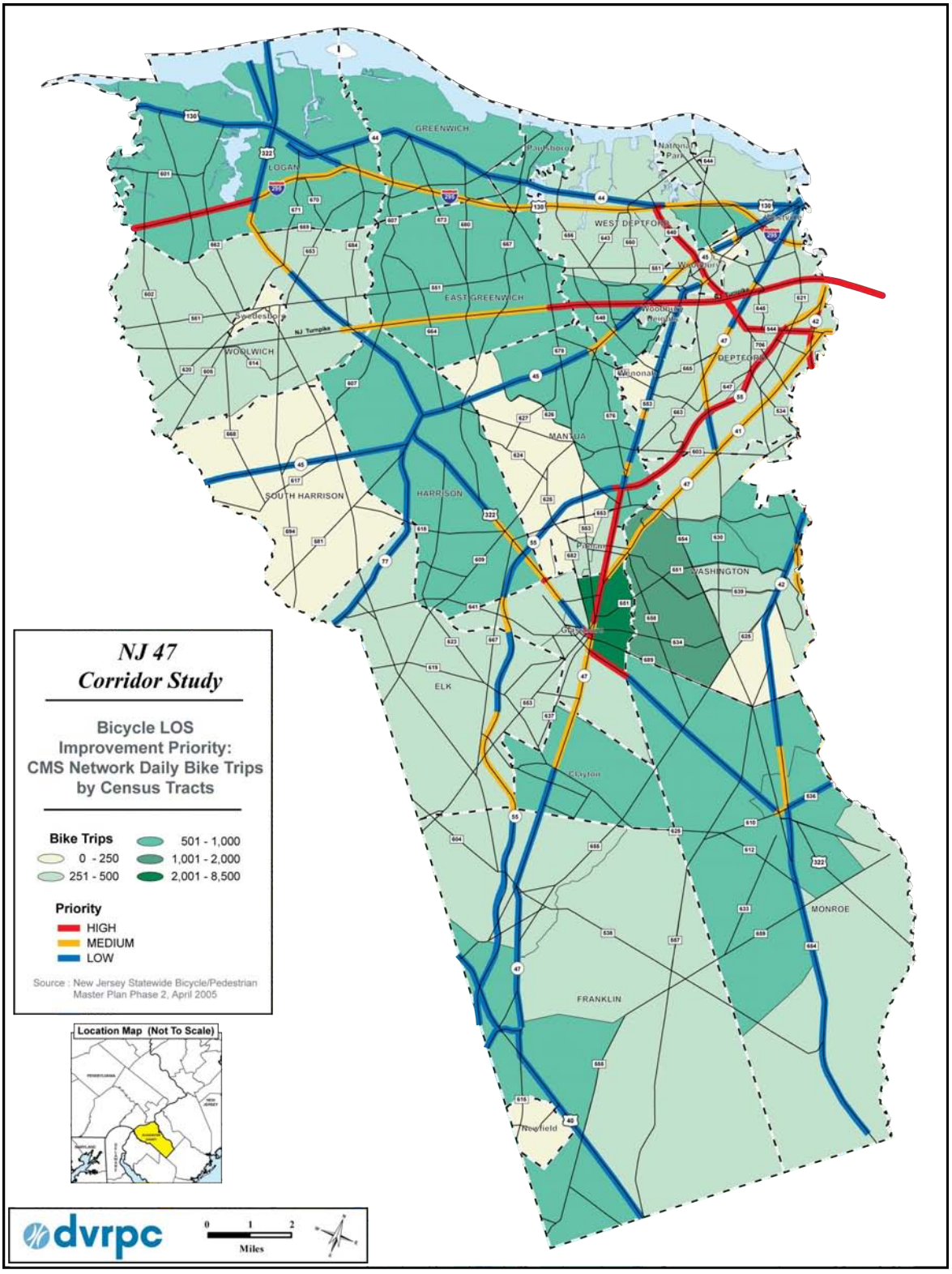
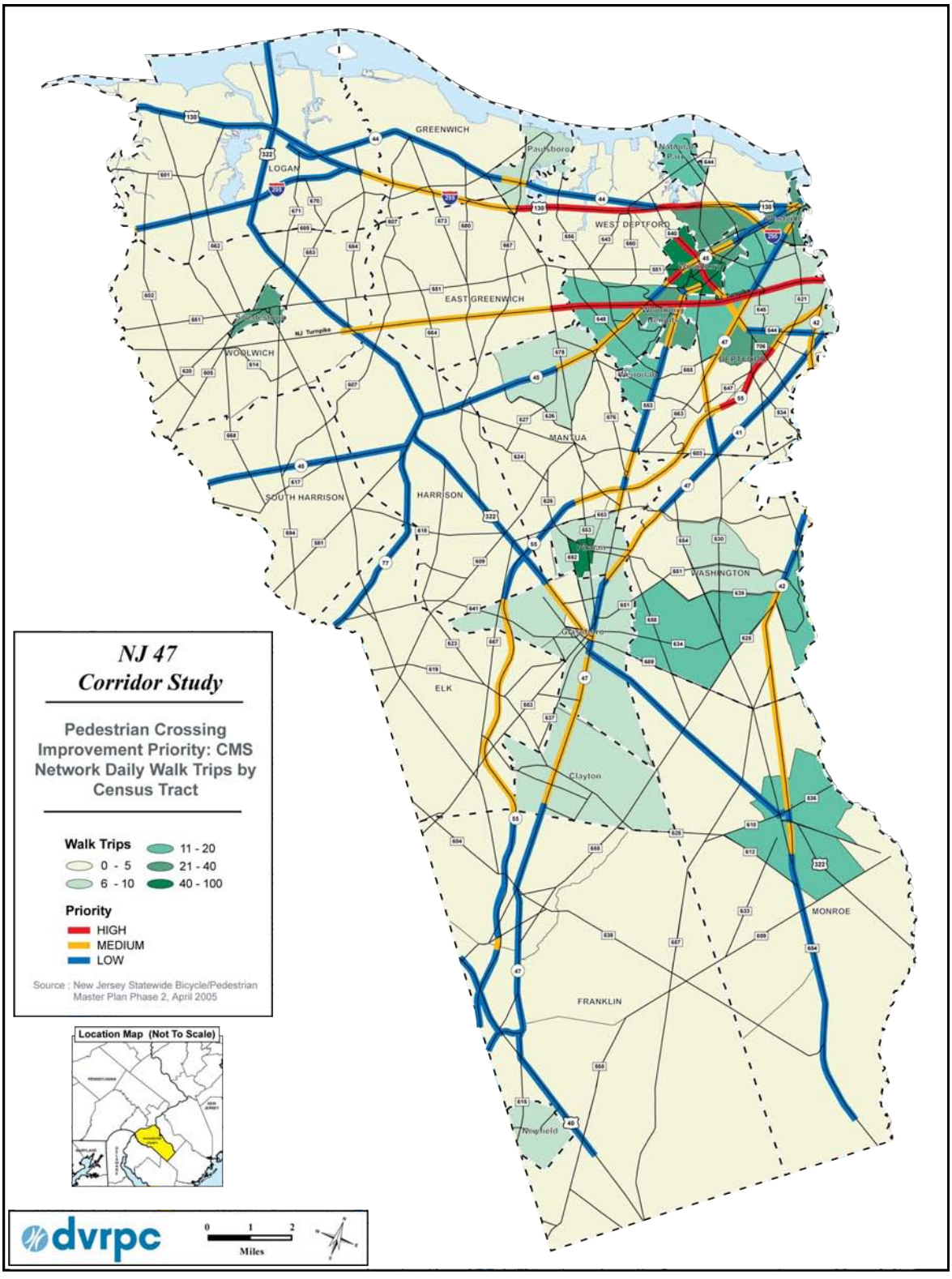
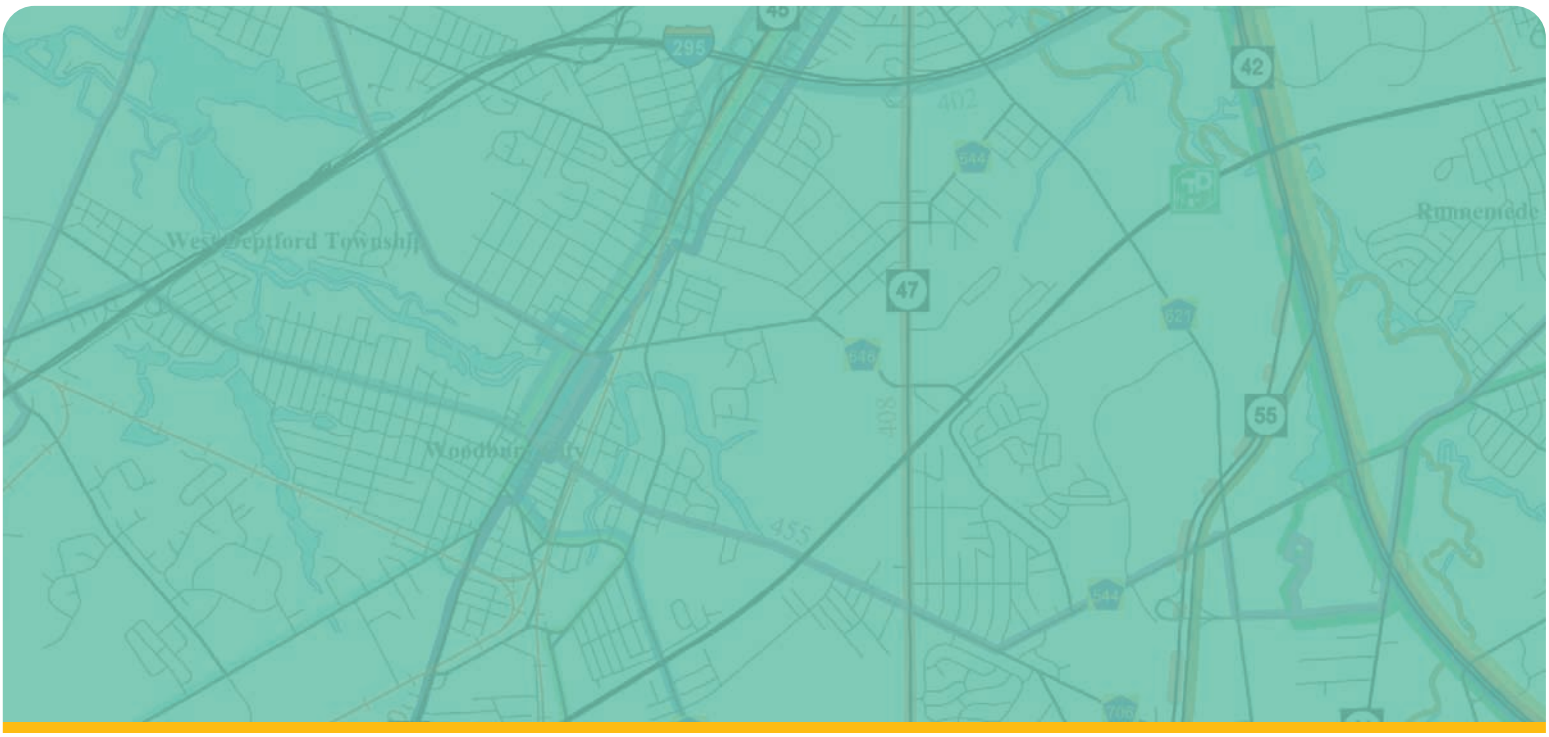


Figure 12: Pedestrian Crossing Improvement Priority





5.0 CONGESTION MANAGEMENT PROCESS

CHAPTER 5

Congestion Management Process

5.1 Introduction

The Congestion Management Process (CMP) is a systematic process for managing congestion that recommends specific multimodal strategies for all locations in the region. The CMP advances the goals of the DVRPC Long-Range Plan and strengthens the connection between the Plan and the Transportation Improvement Program (TIP). Where additions to capacity are appropriate, the CMP includes supplemental strategies to reduce travel demand and improve the mobility of people and goods. For more information, see the Overview of the CMP (DVRPC Publication 09028A) or the full CMP Report (Publication 09028B).

NJ 47 Corridor and the CMP

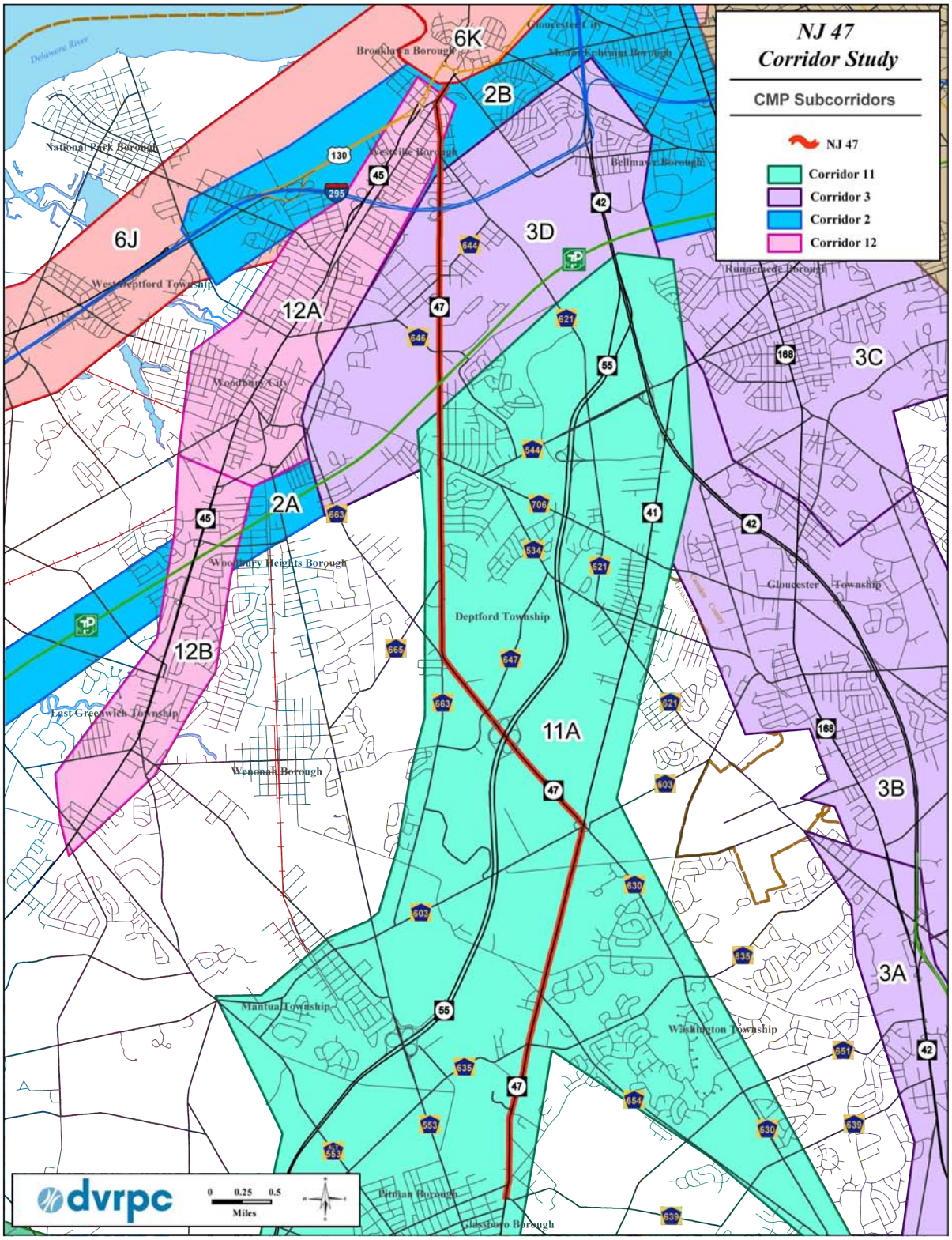
A large portion of NJ 47 is included in a congested corridor, along with several generally parallel facilities. There are four different subcorridors that together account for the total length of the study area considered in this report. Because only a very minor portion of the study area is within subcorridor 2B it was not considered in the analysis. Very Appropriate improvement strategies and strategy notes as available are provided for each of the three main subcorridors, which are described in order from north to south. Refer to Figure 13 for a geographic representation.

Summary of the Principles of the CMP

The CMP recommends strategies in the following order of priority:

- Maintain, optimize, and modernize the existing transportation system and rights of way. This includes optimizing the services delivered by the system, such as options for and convenience of transfers among modes.
- Manage demand for transportation by fostering land-use patterns and other strategies that reduce the need for and length of trips.
- Increase capacity of the existing multimodal transportation system, limiting the addition of through-travel lanes.
- Add new capacity where necessary, limiting the addition of new roads.

Figure 13: CMP Subcorridors



5.2 CMP Subcorridors and the Study Area

The CMP includes specific congested corridors divided into subcorridors, where at a regional planning scale similar strategies are relevant. Following is information on the subcorridors that relate to the NJ 47 study area.

NJ CMP Corridor 12: NJ 45 - Subcorridor A

Subcorridor Name – City of Woodbury and Borough of Westville
Description – This is the main area of congestion in this corridor. Subcorridor characteristics include: high current VC; two or more times the average regional density of households or employment. Served by many bus routes.

Very Appropriate Strategies

- Closed Loop Computerized Traffic Signals
- Transit Signal Priority (TSP)
- Parking Operations
- Economic Development Oriented Transportation Policies
- Transit-Oriented Development (TOD)
- More Frequent Transit or More Hours of Service

Source: 2009 DVRPC CMP Report

NJ 47 Corridor and Subcorridor 12A

The study area component of this subcorridor includes NJ 47 from the northern terminus in Westville Borough to the intersection of NJ 47 and Westville-Almonesson Road (CR 621). NJ 47 is two lanes throughout this subcorridor. The area north of the interchange is comprised of densely developed suburban neighborhoods, including downtown Westville Borough, all of which is sufficiently walkable. In the vicinity of the interchange (north and south sides), development density decreases significantly, as is typical surrounding such infrastructure. Pedestrian access and safety is compromised at this location due to the speed of traffic on and off the interchange ramps and the lack of controls.

The stretch of NJ 47 through Westville Borough experiences some peak-period congestion due to its use as a connector to US 130 to the north and I-295 to the south. Capacity additions to NJ 47 at this location would be out of context due to the housing density. Tidal flooding of NJ 47 in the vicinity of the bridge over Big Timber Creek is a major issue that has been considered by NJDOT, but remains a problem.

NJ CMP CORRIDOR 3: AC EXPRESSWAY / NJ 42 - Subcorridor D

Subcorridor Name – Northern developed part of the corridor
Description – Includes access to I-295. This subcorridor is characterized by high current V/C ratios, existing transit, transit scores indicating the area is highly or medium-highly appropriate for transit in 2035, and two or more times the average regional density of households or employment.

Very Appropriate Strategies

- Closed Loop Computerized Traffic Signals
- Planning and Design for Nonmotorized Transportation
- Expanded Parking/Improved Access to Stations (all modes)
- Park-and-Ride Lots
- Transit Oriented Development (TOD)

Source: 2009 DVRPC CMP Report

NJ 47 and Subcorridor 3D

The study area component of this subcorridor begins just north of the I-295 interchange south ward and ends just below the New Jersey Turnpike (NJTPK) alignment. NJ 47 remains two lanes into and throughout this subcorridor. The land use of the corridor transitions to a lower level of development density with retail dotting the roadside and suburban neighborhoods behind. Though sidewalks can be found intermittently, the frequency is not great enough to consider this section walkable. In the vicinity of the interchange (north and south sides), development density predictably decreases further.

The stretch of NJ 47 between I-295 and Cooper Street is typically uncongested outside of the peak period. During rush hours this section experiences a low level of congestion as traffic to from the interstate increases. As development occurrs along the frontage of NJ 47, access management will play a critical role in managing traffic flow and safety.

NJ CMP CORRIDOR 11: NJ 41, NJ 47, NJ 55 - Subcorridor A:

Subcorridor Name – NJ 41, NJ 47, NJ 55 between NJ 42 and US 322
Description – This subcorridor contains the north-south movement of generally parallel facilities. It is characterized by high current V/C, high growth in V/C in the 2035 travel model, high future V/C, bus ridership of 6,000 or more passengers per day, and two or more times the regional average of elderly people (over age 75).

Very Appropriate Strategies

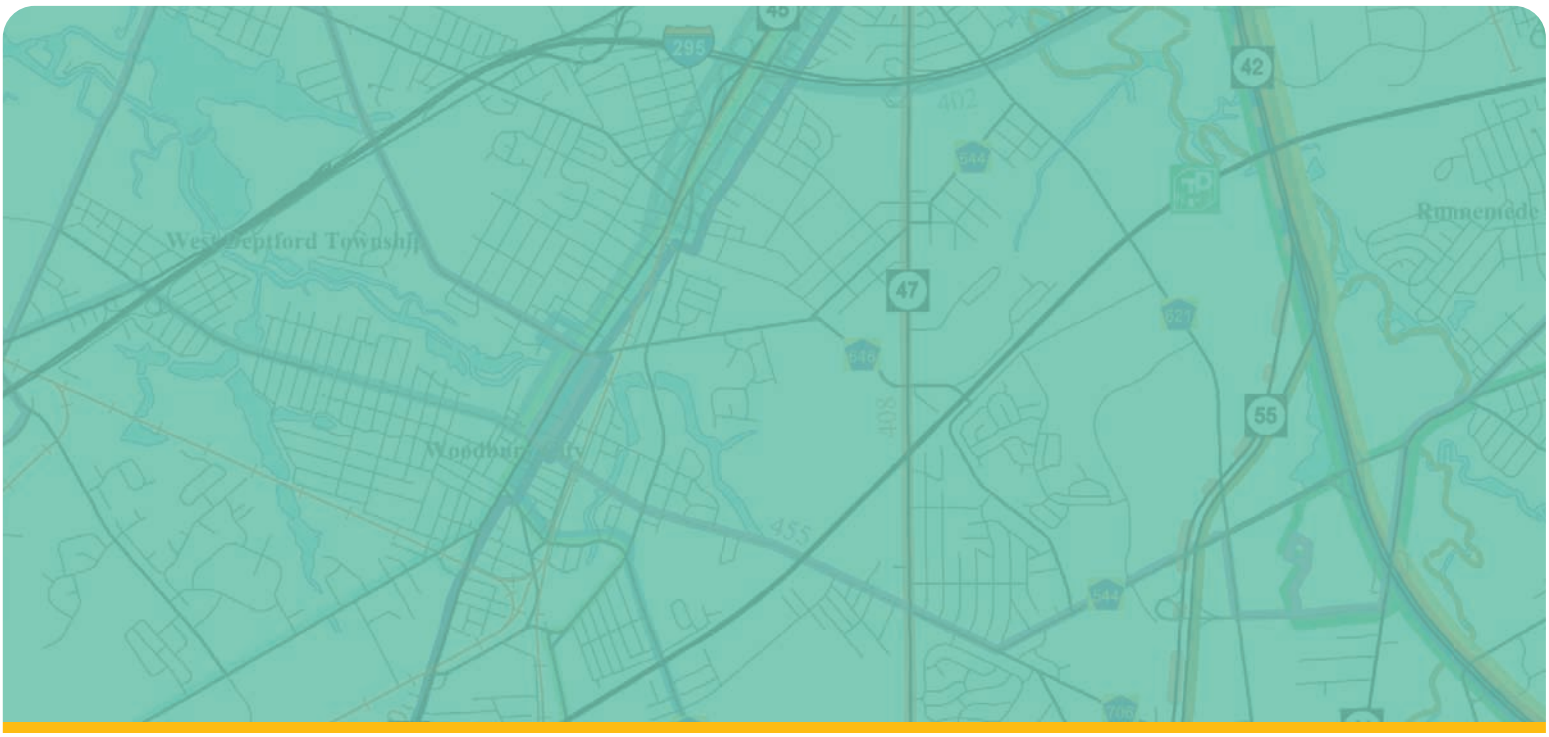
- Closed Loop Computerized Traffic Signals
- Channelization
- Center Turn Lanes
- County and Local Road Connectivity
- Extensions or Changes in Bus Routes

Source: 2009 DVRPC CMP Report

NJ 47 and Subcorridor 11A

Subcorridor 11 A comprises approximately 3/4ths of the NJ 47 corridor study area from just north of the Cooper Street intersection, south to the end of the study area, including most of Deptford and all of Washington Townships. NJ 47 remains two lanes into and throughout this subcorridor. Land use in this section is predominantly retail along the NJ 47 frontage with lower density suburban neighborhoods behind. A few attached condo-style dwellings can also be found. Sidewalks are again intermittent, often found in front of newer developments. Though isolated sections, these sidewalk peices are a sign that pedestrian accommodations are a necessary component of new developments.

Off peak travel through most of the NJ 47 study area is relatively free-flowing. However, some peak period congestion is common at major signalized intersections, namely the 5 Points intersection where NJ 41 meets NJ 47. NJDOT made improvements at this location in the recent past that have made traffic flow better and made left turns safer.



6.0
CRASH ANALYSIS

CHAPTER 6

Crash Analysis

Introduction

The crash analysis is a safety overview of the study corridor using available crash data. The main goals are to evaluate the corridor study area as a whole, and to identify the most problematic locations. Typically, this analysis substantiates safety problems identified by local officials, in addition to identifying previously unrecognized crash locations. Depending on the complexity and/or extent of the crash problem, a more in-depth study may be warranted.

The crash data used in this analysis was obtained from NJDOT's data reference Web page. Data for years 2005 through 2007 were utilized. The crash analysis is divided into two parts: 1) Corridor Crash Summary, and 2) Crash Clusters. According to NJDOT, rear-end and sideswipe collisions involve traffic moving in the same direction. Angle crashes involve angular traffic (e.g. drivers traveling northbound and westbound), while left-turn and head-on events involve opposing traffic. Intersection crashes are defined as crashes that occur within the stop bars of the intersection. Crashes near the intersection that occur outside of the boxes are considered "intersection-related" and are coded as not at the intersection.

6.1 Corridor Crash Summary

As depicted in Table 8, there were 630 crashes along the 10-mile study area section of NJ 47 from mile post 65.03 to 75.18 during 2005 to 2007 (percents in bold signify an overrepresentation in the study corridor as compared to the statewide average). Regarding severity, there were 394 property-damage-only crashes, 231 injury crashes, and five fatal crashes. Rear-end crashes topped the list at 33 percent of the total, with right angle and left turns at 25 and 13 percent, respectively. NJ 47 is an undivided highway, thus allowing midblock left turns, which contribute significantly to the angle and left-turn crash totals. Fifty-four percent of the total crashes (340) occurred between intersections, with the balance occurring at intersections (290 crashes). Seventy-one percent of the crashes occurred during the daytime, which excludes dawn and dusk.

NJ 47 Compared to State System Roads

As published in the NJDOT At/Between Intersections Accident Summary for State System Roads (excluding toll roads and interstates), 64,511 crashes occurred on the state system during 2007. The NJ 47 study corridor exceeds state percentages in the following collision type categories:

- Left turn/U-turn crashes - NJ 47: 13.3 percent; state routes: 3.4 percent

- Right-angle crashes - NJ 47: 25 percent; state routes: 11 percent
- Opposite-direction crashes – NJ 47: 2.4 percent; state routes: 1.8 percent
- Pedestrian crashes – NJ 47: 1.4 percent; state routes: 0.8 percent
- Struck-parked-vehicle crashes – NJ 47: 2.1 percent; state routes: 1.3 percent

Although rear-end crashes were the predominant collision type in the study area, at 33 percent (209), they did not exceed the state threshold of 46 percent. NJ 47 does experience recurring peak-period congestion in select isolated locations, which may be a contributing factor to the rear-end crash total. Table 8 contains the full list of crash categories with comparisons to state averages.

There were nine pedestrian-related crashes on NJ 47 from 2005 to 2007, a relatively high number deserving further investigation as to where the crashes occurred and the current state of pedestrian amenities at those locations. Adjacent land uses and bus stops should be considered. An analysis of NJ 47's pedestrian environment is provided in section 3.5.

Table 8: Comparison of NJ 47 Corridor-wide Statistics to State Averages

	NJ 47 Corridor Crash Summary, 2005-2007 MP 75.18 - 65.03			NJDOT - Bureau of Safety Programs State System Roads Crash Summary, 2007		
		Count	% of Total		Count	% of Total
	TOTAL CRASHES	630		TOTAL CRASHES	64,511	
Collision Type	Same Direction Rear End	209	33.2%	Same Direction Rear End	29,461	45.7%
	Same Direction Sideswipe	62	9.8%	Same Direction Sideswipe	10,644	16.5%
	Right Angle	158	**25.1%**	Angle	7,167	11.1%
	Opposite Direction	15	**2.4%**	Head On	1,176	1.8%
	Struck Parked Vehicle	13	**2.1%**	Parked Vehicle	867	1.3%
	Left Turn/U Turn	84	**13.3%**	Left Turn/U-turn	2,163	3.4%
	Backing	1	0.2%	Backing	521	0.8%
	Encroachment	4	**0.6%**	Encroachment	191	0.3%
	Overturned	2	0.3%	Overturned	488	0.8%
	Fixed Object	47	7.5%	Fixed Object	7,900	12.3%
	Animal	13	2.1%	Animal	1,935	3.0%
	Pedestrian	9	**1.4%**	Pedestrian	541	0.8%
	Pedalcyclist	0	0.0%	Pedalcycle	336	0.5%
	Nonfixed Object	6	**1.0%**	Nonfixed Object	600	0.9%
	Railcar - Vehicle	0	**0.0%**	Railcar - Vehicle	1	0.0%
	Unknown	0	0.0%	Unknown	34	0.1%
	Other	7	**1.1%**	Other	486	0.8%
Intersection	At Intersection	290	46.0%	At Intersection	18,264	28.3%
	Not at Intersection	340	54.0%	Not at Intersection	46,247	71.7%
	At or Near RR Crossing	0	0.0%	At or Near RR Crossing	0	0.0%
Light	Day	448	**71.1%**	Day	45,190	70.1%
	Dusk	16	**2.5%**	Dusk	1,522	2.4%
	Night	156	24.8%	Night	16,595	25.7%
	Dawn	9	1.4%	Dawn	1,033	1.6%
	Other/Unknown	1	0.2%	Unknown	171	0.3%
Severity	Fatality	5	**0.8%**	Fatal	222	0.3%
	Injury	231	**36.7%**	Injury	18,261	28.3%
	Property	394	62.5%	Property Damage	46,028	71.4%
Road Surface	Dry	464	73.7%	Dry	48,517	75.2%
	Wet	155	**24.6%**	Wet Surface	13,179	20.4%
	Snowy	6	1.0%	Snow	1,040	1.6%
	Icy	4	0.6%	Ice	1,114	1.7%
	Other	1	0.2%	Other	661	1.0%

Source: NJDOT 2007

6.2 Crash Clusters

Methodology

For the purposes of this study, a crash cluster is defined as a section of roadway up to one-tenth-mile long, where a minimum of 24 crashes occurred during the three-year period of 2005 to 2007. Seven clusters were identified with totals ranging from 24 to 49 crashes (see Table 9). An examination of the crash data in the GIS environment identified several crash concentration locations of less than 24 that could be the focus of a follow-up study.

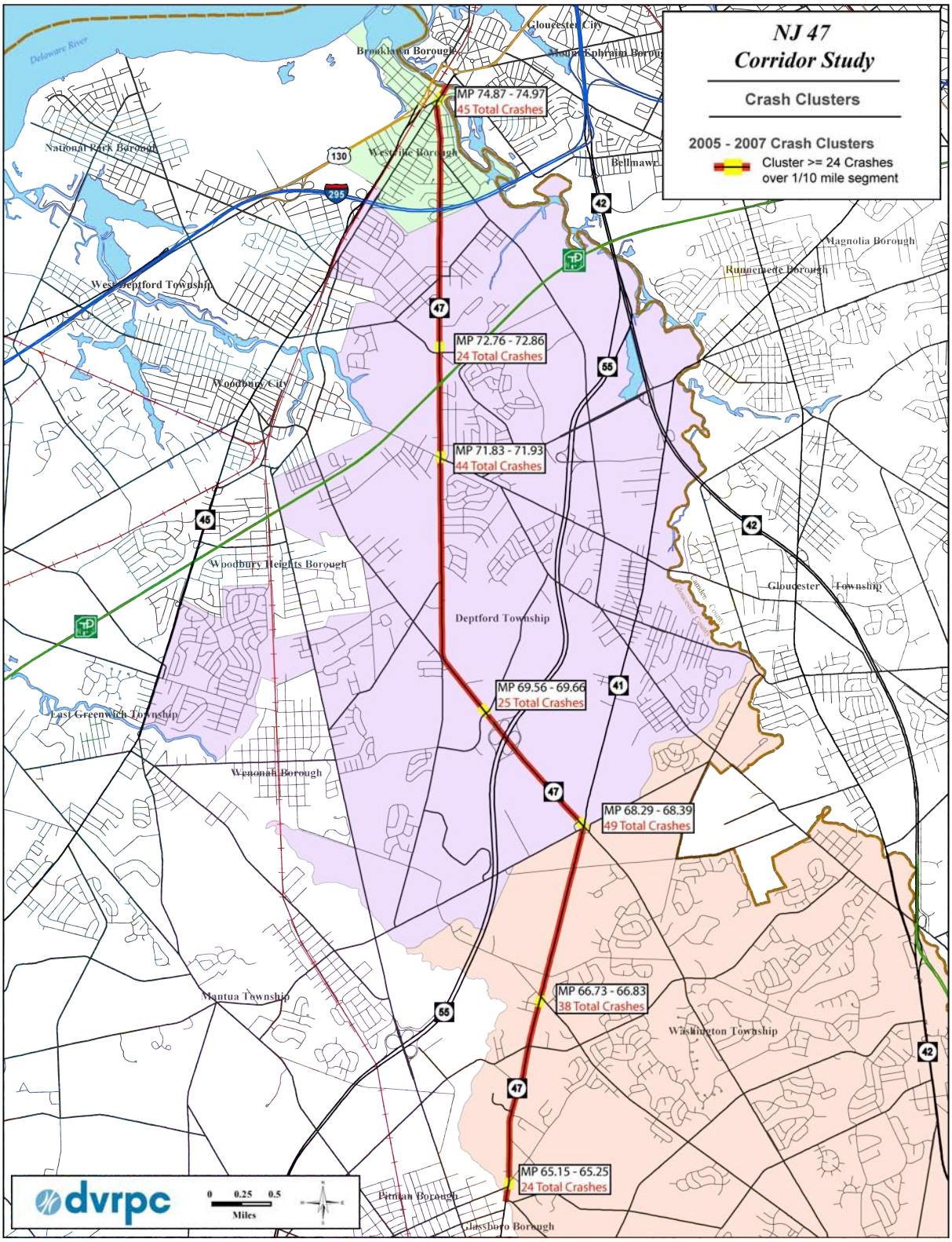
Table 9: NJ 47 Crash Clusters >= 24 Crashes, 2005-2007

#	Mile Post Range		Total Crashes	Total Killed	Total Injured	Property Damage Only	Ped	Predominant Collision Types	Crashes by Collision Type
	Start MP	End MP							
1	74.87	74.97	45	0	13	32	**1**	Left Turn/U Turn	18
2	72.76	72.86	24	0	8	16	**1**	Rear-End	11
3	71.83	71.93	44	0	16	28	**1**	Rear-End / Right Angle	15 / 14
4	69.56	69.66	25	0	9	16	0	Rear-End / Left Turn / HFO	6 / 5 / 5
5	68.29	68.39	49	0	14	35	0	Right Angle / Rear-End	19 / 17
6	66.73	66.83	38	**1**	17	20	**1**	Left Turn/U Turn	10
7	65.15	65.25	24	0	7	17	0	Rear-End	11
			249						50

Source: DVRPC

Combined, the seven clusters total 249 crashes, or 40 percent of the three-year analysis period total of 630. The three highest crash-frequency locations had crash totals of 44, 45, and 49. The cluster statistics were compared to the NJ 47 corridor-wide summary (2007 statewide statistics) in an effort to identify overrepresented categories. The clusters are depicted on Figure 14. Following the map is a dicussion of each location which describes the characteristics of each identified cluster organized by municipality from north to south. Each cluster description provides the milepost limits, the total number of crashes, and the predominant crash type(s). These locations were discussed with the study committee during the project process and were later updated with new data.

Figure 14: Crash Clusters



Westville Borough

Only one one-tenth-mile mile cluster of 24 or more crashes was found in Westville Borough along NJ 47 during the three-year analysis period of 2005 to 2007.

1. MP 74.87 – 74.97: 45 total crashes, 18 left-turn crashes, 1 pedestrian crash.

Crashes at this location are concentrated in the vicinity of Little River Drive and are said to be due to left turns in and out of the side street from NJ 47. This is an unsignalized intersection. At this point in the corridor, NJ 47 transitions from two lanes by direction to one in each direction. Little River Drive provides an important connection between US 130 and NJ 47 on the south side of Big Timber Creek. This road is especially important for truck drivers, who must circumvent the rail overpass height restriction on US 130 between the two traffic circles. Crashes here tend to occur when NJ 47 southbound traffic in the right lane collides with traffic turning left into Little River Drive from NJ 47 northbound.

The recommended strategies are:

- Conduct a signal warrant analysis. If a signal is warranted, continue below. If not, continue to the third bullet.
- Conduct a level-of-service analysis to test the feasibility of adding a dedicated left-turn lane, and possibly dedicated left-turn signal phase. The dedicated turning lane can be added by re-designating the existing through lane. This would have only a minor impact on capacity, since it is at this location where NJ 47 widens northbound. A dedicated left-turn signal phase is the safest of all options because it eliminates permissive left turns. Properly designed signalized intersections also provide safer crossings for pedestrians.
- Consider the following options:
  - Prohibit left turns from NJ 47 and devise an alternate route.
  - Calm traffic through this section of NJ 47 to slow speeds and possibly create more gaps for left turns.

Note: Although the analysis did not identify a crash cluster at Almonesson Avenue, local officials named this intersection for further monitoring.

Deptford Township

There were four one-tenth-mile crash clusters of 24 or more crashes found in Deptford Township along NJ 47 during the three-year analysis period of 2005 to 2007.

2. MP 72.76 – 72.86: 24 total crashes, 11 rear-end crashes, 1 pedestrian crash.

This crash concentration includes the signalized intersection at NJ 47 and CR 646 (Deptford Avenue/Turkey Hill Road). NJ 47 widens to accommodate a dedicated left-turn lane in each direction, and a dedicated left-turn signal phase on NJ 47 northbound only. Pedestrian crosswalks are absent here. This intersection is important because it is a crossroads for traffic connecting with NJ 45 located a short distance to the west via Deptford Road. Turkey Hill Road connects to two sizeable housing developments located just east of the corridor. The rear-end crashes are 45 percent of the total, which is the state average. Left-turn crashes do not meet the

state's required frequency for intervention, but may increase if development comes to the currently forested land in the vicinity.

The recommended strategies are:

- Check signal visibility for Manual on Uniform Traffic Control Devices (MUTCD) compliance and consider installation of 12-inch signal heads, anti-sun glare back plates, and signal-ahead warning signs.

- Install pedestrian crosswalks and pedestrian signal heads for each of the four crossings.

3. MP 71.83 – 71.93: 44 total crashes, 15 rear-end and 14 right-angle crashes, 1 pedestrian crash.

This cluster straddles the intersection at NJ 47 and CR 534 (Cooper Street). This is a major intersection in the corridor. It provides access to an important county route, along which the Deptford Township municipal offices and police department are located. Cooper Street is also the location of several shopping and fast-food destinations, and it provides direct access to the Deptford Mall and to Woodbury. The safety problem at this location may be exacerbated by the increase in traffic volume that will result from the Walmart store planned for the northwest quadrant of the intersection. The crash experience at this location was examined in detail in an intersection road safety audit facilitated by DVRPC in 2008. Study participants included local, county, and state representatives. The full findings and recommendations of this effort can be found in Intersection Road Safety Audit – NJ 47 Delsea Drive And Cooper Street, Deptford Township, Gloucester County (DVRPC Publication 08047).

The recommended strategies are:

- Conduct signal optimization. Evaluate the safety benefits and the impacts to level of service that would result from increasing the clearance phase.

- Consider extending left-turn protected phase and the left-turn lanes for Cooper Street.

- Examine progression and coordination to address traffic flow, considering signals within one-half mile of the intersection.

- Evaluate the pedestrian clearance time and increase, if warranted.

4. MP 69.56 – 69.66: 25 total crashes, 6 rear-end / 5 left turn / 5 hit fixed object crashes.

This cluster includes the signalized intersection of NJ 47 and CR 647 (Bankbridge Road) located approximately one-quarter mile north of the NJ 55 interchange. NJ 47 at this location widens to two lanes per direction to accommodate left-turn lanes and a protected/permitted left-turn phase for NJ 47 northbound only. Bankbridge Road and Fox Run Road are both one lane, and the intersection is signalized. There are bus stops along NJ 47 northbound and southbound, although no sidewalks are provided. The crash history does not indicate an obvious trend, nor was a fixed-object hazard identified. Field visits revealed that sun glare is an issue for southbound drivers during the day.

The recommended strategies are:

- Check signal visibility for Manual on Uniform Traffic Control Devices (MUTCD) compliance and consider installation of 12-inch signal heads, anti-sun glare back plates, and signal-ahead warning signs.

- Conduct follow-up evaluation to identify fixed-object hazard.

5. MP 68.29 – 68.39: 49 total crashes, 19 right-angle and 17 rear-end crashes.

This is the highest frequency crash cluster location in the corridor. It is located at the Five Points intersection of NJ 47, NJ 41, and CR 603 (Egg Harbor Road). The NJ 47 approaches to the intersection were restriped to include a dedicated left-turn lane for northbound through traffic on NJ 47 (at this intersection NJ 47 northbound traffic must turn left to continue northbound, and southbound traffic must turn right to continue southbound). Previously, through traffic on NJ 47 northbound was accommodated via a forward jug handle, which emptied onto CR 630, at which point traffic turned left and followed CR 630 through the signal to NJ 47 northbound. Local police have reported that the new left-turn lane has been effective thus far in reducing crashes, although a longer stacking lane may be needed. On NJ 47 northbound, north of the Five Points intersection, the roadway narrows down from two lanes to one. The crash analysis revealed that 21 of the 49 crashes occurred in 2005, 17 in 2006, and 11 in 2007. This trend suggests that the improvement that was made in 2006 is achieving a safety benefit and should continue to be monitored.

The recommended strategies are:

- Continue monitoring the intersection and note changes in crash experience. A continued drop in crash frequency will reinforce the value of the improvements. Traffic generated by planned new developments in the vicinity of this intersection may cause an increase in crashes.

Washington Township

There were two clusters of 24 or more crashes found in Washington Township along NJ 47 during the analysis period of 2005 to 2007.

6. MP 66.73 – 66.83: 38 total crashes, 10 left-turn/U-turn crashes, 1 pedestrian crash.

This location includes the signalized intersection of NJ 47 and CR 654 (Hurfville Cross-Keys Road/Sewell Road). The roadway alignment is slightly offset at this skewed intersection. Unlike some other signalized locations along the corridor, neither left-turn lanes nor protected signal phasing are provided at this intersection for left turns from NJ 47. Here, there are sidewalks along NJ 47 and crosswalks over the north and west sides of the intersection. Although left-turn crashes account for 26 percent of the total, rear-end and sideswipe crashes are close behind, at 21 percent each. This combination of collision types, combined with the missing left-turn lanes and signal priority suggests that left-turn gaps are hard to come by, thus encouraging drivers to shoot gaps at the beginning and ending of the signal cycle. It also means that through traffic stuck behind the left-turn queue is likely to attempt passing the waiting cars along the right side, which lacks a shoulder but does widen at the approach. This helps to explain the sideswipe crash experience.

The recommended strategies are:

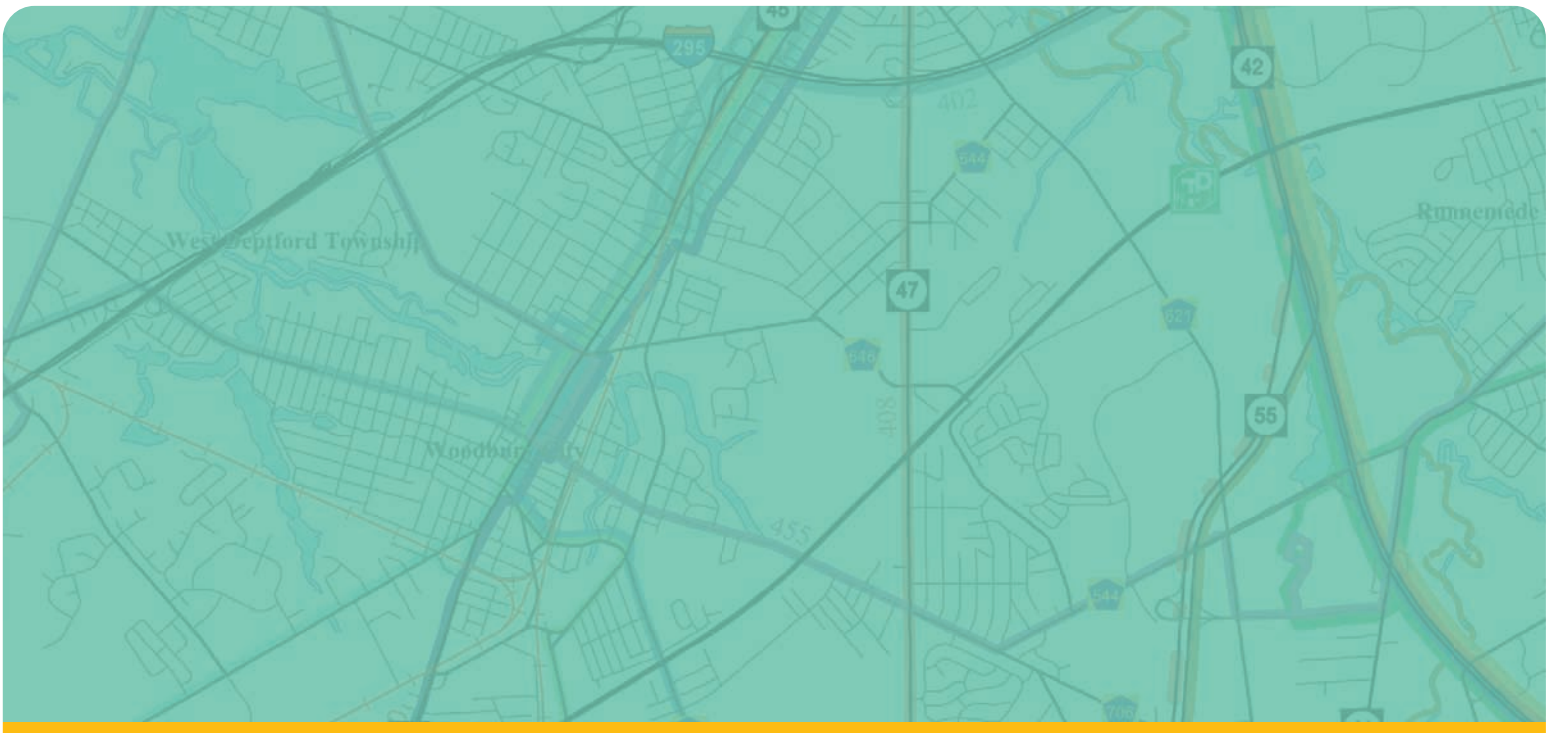
- Conduct a level-of-service analysis to test the feasibility of adding a left-turn lane and a signal phase. The existing roadway width may be adequate to accommodate an additional lane, but a detailed field analysis and review of the signal timing plan would need to be undertaken. The widening may require land acquisition.

7. MP 65.15 – 65.25: 24 total crashes, 11 rear-end crashes.

This location includes the offset signalized intersection of NJ 47 at CR 624 (East Holly Avenue) at MP 65.16 just north of the Washington Township/Pitman Borough municipal line. The overall crash number is on the low end compared to some of the other cluster locations, however the most interesting finding in the crash summary is the light condition split. Almost 42 percent of the crashes occurred at night (10 crashes), exceeding the state route system average of approximately 26 percent. A lighting issue was not mentioned by local representatives, nor was a nighttime field visit conducted to confirm a visibilty issue. Regarding collision type, frequent rear-end crashes typically result from congestion, or poor signal visibility, or both. Lastly, 10 of the crashes occurred at one of the two intersections, and 14 were recorded outside of the intersection boxes.

The recommended strategies are:

- Conduct a nighttime field visit to assess lighting conditions. If deemed inadequate, upgrade lighting as appropriate. Consider upgrading to 12-inch signal heads and adding sun-glare back plates to improve daytime signal visibility.



7.0 TRANSPORTATION ISSUES

CHAPTER 7

Transportation Issues and Recommendations

7.1 Overview

This section summarizes the transportation and land-use issues and the associated considerations gathered from meetings, field visits, and data analyses, many of which have been discussed previously to some degree in this document.

Due to the relatively low level of development density along the study corridor, it is important to consider the current and potential transportation issues in the context of existing and future land use. Because land use patterns shape transportation it is important to take advantage of opportunities to integrate the two in smart growth fashion to balance needs.

7.2 Corridor-wide Concerns

Congestion

Issue:

- Peak-period congestion along select sections of the corridor:
  - Westville Borough - the CR 551 and NJ 47 split
  - Deptford Township – the Cooper Street intersection; the NJ 55 interchange
  - Washington Township – the Five Points intersection; near the Pitman municipal line

Recommendation:

- Congestion issues should be addressed by NJDOT through an examination of the existing signal network to determine if opportunities exist to coordinate and optimize adjacent signals for best performance which may have congestion reduction benefits. Use of NJ 47 as a reliever route when NJ 42 or NJ 55 are congested is an important function that serves regional travel needs. There should be formal consideration of including NJ 47 as a part of a systematic approach to managing regional travel. This could provide an opportunity to actively manage the system during these events.

Safety

Issue:

- There are system-wide safety implications of the two-lane roadway configuration. During the study period, left-turn crashes were three times the state average and right-angle crashes were more than two times the state average. A high frequency of these crash types are

typically related to a lack of access controls and numerous opportunities to make permissive left turns. Frequent and duplicative driveways can be found in areas of clustered retail development.

- Seven clusters of 24 or more crashes each were identified. Combined, the concentration areas total 249 crashes, or 40 percent of the three-year analysis period total of 630.

Recommendation:

- Implementation of an access management plan will play a significant role in maintaining traffic flow and safety as development occurs along the corridor. The Transportation Research Board provides the following definition: “access management seeks to limit and consolidate access along major roadways, while promoting a supporting street system and unified access and circulation systems for development. The result is a roadway that functions safely and efficiently for its useful life, and a more attractive corridor.” It is a process that provides access to land development, while preserving the flow of traffic on the surrounding road system in terms of safety, capacity, and speed. More details on access management are in Appendix D.

- Strategies were recommended for each cluster location examined in the crash analysis. Most recommendations must be advanced by NJDOT, owner of the NJ 47 facility.

Pedestrian Access & Access to Transit

Issue:

- Amenities for pedestrians along NJ 47 are less than ideal. Sidewalks and crosswalks are intermittent which compromises pedestrian travel as well as access to transit stops. Many sidewalks are substandard and require repair and maintenance.

Recommendation:

- Isolated stretches of sidewalk can be found fronting businesses and newer developments. This implies a trend toward inclusion of sidewalks as properties are developed or redeveloped. Although this is a recommended best practice moving forward, it is not the comprehensive solution needed to address the existing problem of intermittently available sidewalks throughout the majority of the corridor. A short-term approach is to identify important pedestrian destinations accessible from residential nodes and prioritize them for upgrade to provide adequate pedestrian access.

Bicycle Accommodations

Issue:

- Formal bike lanes or other bicycle priority improvements are missing from the corridor. Although no bicycle crashes were identified in the crash analysis (which is typically considered an indication of usage), bicyclists were seen during field visits.

Recommendation:

- Existing shoulders are adequate for bike lane additions throughout most of the corridor. Identify stretches of roadway that connect important destinations with neighborhoods or transit stops, and include as part of a plan to advance the bicycle accommodation concept with NJDOT.

7.3 Important Localized Issues

This section provides a brief discussion of issues in each of the three municipalities identified through the project process. Issues are descibed and followed by considerations for improvement.

Westville Borough

Congestion

- Recurring PM congestion occurs along NJ 47 from the US 130 Circle southbound to CR 551 (Broadway). According to local officials, the congestion dissipates south of the CR 551 and NJ 47 split. Conditions are reportedly worse on weekends in the summertime due to shore traffic. This is Westville Borough's most congested section of NJ 47. This stretch of NJ 47 is two lanes per direction for approximately 1,100 feet (between the circle and CR 551).
    - CR 551 meets NJ 47 at the point where southbound NJ 47 transitions from two lanes to one, creating a bottleneck. Widening is not an option as NJ 47 becomes the main street of densely developed downtown Westville Borough. One possible strategy is to better regulate southbound traffic flow between the circle and CR 551 to normalize speed variations; traffic calming should be considered.

Transit

- The Delaware River Port Authority recently selected the final alignment of the PATCO Southern New Jersey Expansion between Camden and Glassboro. The new light rail service will follow an existing freight line that passes through Westville along the western edge of town with a stop along Crown Point Road.
    - Implementation of this project may impact transportation and transit operations in the Westville portion of the NJ 47 corridor study area. New traffic patterns may arise as travelers seek the shortest route to the new station. A station area traffic plan should be incorporated in planning the rail expansion.

Flooding

- There is a recurrent tidal flooding problem along NJ 47 on the south side of the bridge over Timber Creek, which is unrelated to heavy rains. Flooding in this location reportedly creates roadway gridlock in the vicinity on NJ 47 and CR 551 (Broadway). The situation also causes traffic en route to US 130 northbound to detour via Little River Drive.
    - The NJDOT has studied this location and collaborated with the borough on remediation options. Identified improvements at this location involve a detour for an extended period which may exacerbate peak period traffic congestion, but will lead to a long term solution. This study supports the project.

Relevant NJDOT Projects

- There are noted safety and operational problems at the intersection of NJ 47 southbound and Creek Road. Southbound traffic is blocked every time a driver attempts to turn left onto Creek Road, which meets NJ 47 less than 100 feet south of the circle. The NJDOT Capital Program Management Division has scheduled striping and signing improvements to address this problem. At the time of this report's publication, this project was on hold due to funding constraints.

- It is recommended that these improvements be considered a high priority because of their low cost to implement and the purported safety benefits.

Deptford Township

Congestion

- Along NJ 47 between NJ 55 and I-295, congestion results from back-ups on NJ 42 northbound in the morning and southbound in the evening. During the AM peak period, motorists reportedly "jump off" NJ 55 northbound upon sight of congestion ahead and use NJ 47 as a path of lesser resistance. Also, traffic on NJ 47 reportedly uses the shoulder inappropriately to circumvent back-ups when seeking to turn at approaching intersections. Generally speaking, congestion within the study area on I-295, NJ 42, or NJ 55 typically has a negative effect on NJ 47 and on corresponding feeder roads. This project at the I-295/I-76/NJ 42 interchange was identified as a "hyper build" project by state officials and has a prospective construction date of 2012.

  - The improvements slated for this location will address congestion, mobility, and safety issues, and are projected to draw traffic from parallel routes back onto highways NJ 55 and NJ 42 when complete.

- Along NJ 47 between NJ 55 and NJ 41, there is southbound congestion during the evening peak period heading toward NJ 41.

  - NJDOT has concept plans to add a lane at this location, as described in the NJDOT Route 47-Route 41 Intersection Operational Improvements Needs Assessment Study (August 2003).

- Brenner Road is a local facility that experiences a high volume of traffic bound for Gloucester County College. The curve at the intersection of NJ 47 and Brenner Road was reported to be poorly lit with compromised sight distance. A cluster was not identified at this location in the crash analysis.

  - Due to the significant volume of college traffic it is recommended that this location be examined in more detail for opportunities to improve sight distance. Low cost safety measures should be considered to address poor visibility and speed issues.

Safety Concerns (not identified in the crashes analysis)

- The NJ 55 interchange at NJ 47 has a short weave distance. Also, traffic exiting NJ 55 onto NJ 47 commonly disregards yield signs, according to municipal representatives. The roadway here is wide and contributes to higher speeds. A cluster was not identified at this location in the crash analysis.

  - Interchange areas typically induce higher travel speeds given the added capacity and lack of development which can otherwise serve to calm traffic. Opportunities to better regulate acel/decel lanes may yield better compliance; traffic calming may be considered.

Washington Township

Access to Gloucester County College Complex on Tanyard Road

- CR 654 (Hurfville Cross Keys Road) / Sewell Road is a commonly used NJ 47 crossover point for motorists en route to the college. According to local officials, this signalized intersection experiences a high volume of crossing traffic. A shadowing effect is caused when opposing left-turning traffic blocks sight of traffic in the through lanes. Some vehicles

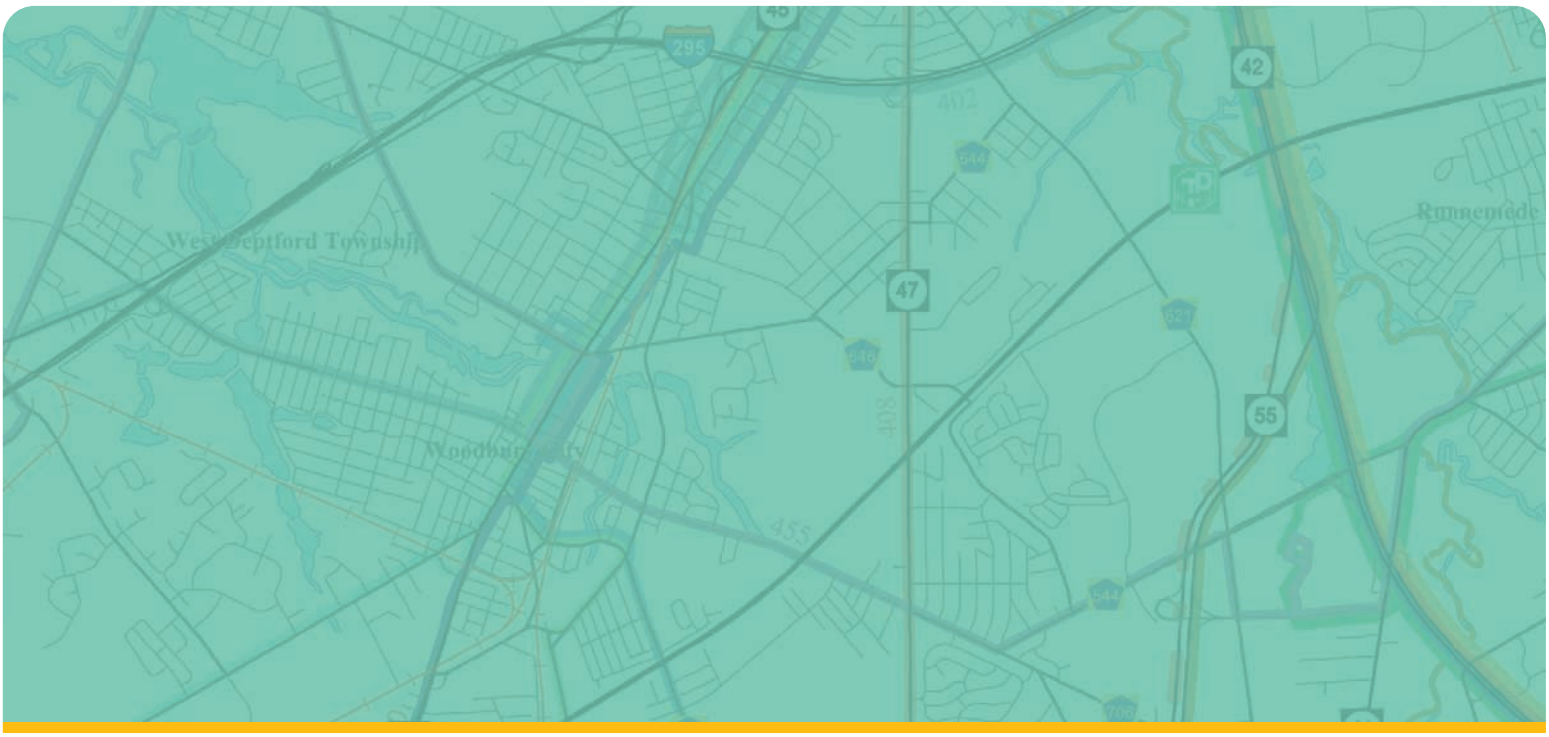
squeeze by the turn queue along the right shoulder, though little room is available. Problems here are complicated by traffic in and out of businesses located at/near the intersection. The following traffic pattern was described by local stakeholders: AM – heavy right-turn movements from CR 654 westbound to NJ 47 northbound; PM – heavy left-turn movements from NJ 47 southbound to CR 654 eastbound; left turns from NJ 47 northbound to CR 654 westbound were described as problematic throughout the day.

- This may be an appropriate location for the addition of dedicated left-turn lanes and signal phases. This requires a left-turn conflict analysis to test the need, and a level of service analysis to test the effects of adding a dedicated signal phase. A protected left-turn phase is the safest left-turn movement, but it requires dedicated time from the signal cycle.

Relevant NJDOT Projects

- The intersections of NJ 47 at Chapel Heights Avenue, and NJ 47 at East Holly Avenue were improved in August 2009. This project's goal was to reduce intersection congestion and improve safety by upgrading NJ 47 to a 12-foot through lane, 10-foot shoulder, and 12-foot left-turn lane in each direction of travel. A four-foot concrete median was to be provided for physical separation of traffic lanes, as well as to control access.

- By the fall of 2009 the NJ 47 structure over Mantua Creek was to be replaced and widened to accommodate a six-foot sidewalk on both sides of the structure. The Holly Avenue structure will be rehabilitated and widened by 15 feet. Intersection improvements include a new signal at NJ 47 and Holly Avenue, along with the provision of auxiliary left-turn lanes at Holly Avenue and at Chapel Heights Avenue.



8.0
CONCLUSION

CHAPTER 8

Conclusion

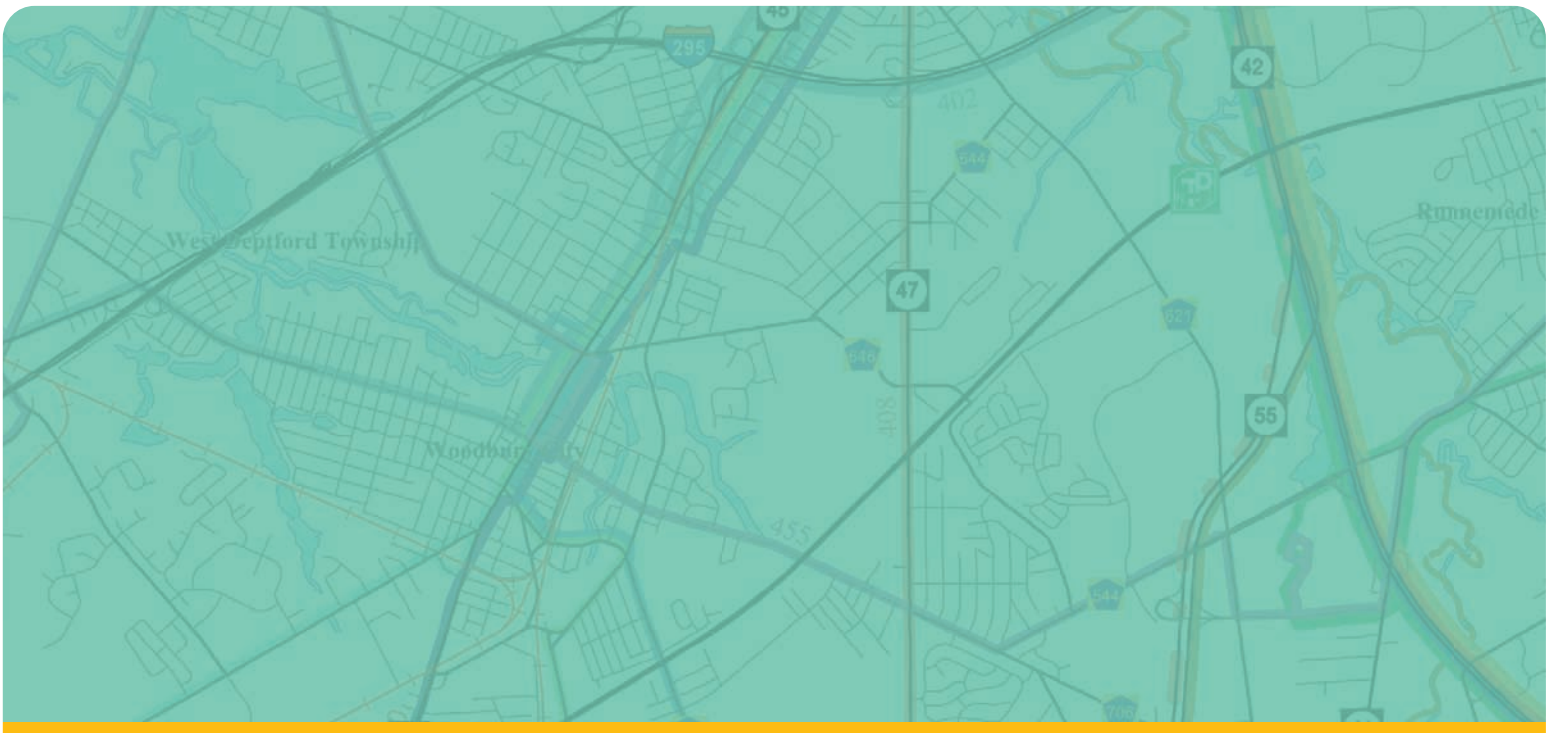
The case study of NJ 47 profiles a corridor that is evolving. Unlike many other state routes in DVRPC's New Jersey counties, NJ 47 is not built out, but development is coming. At this point in time, local and state leaders have an opportunity to examine the corridor and prepare for the future.

Although a few localized issues were highlighted, like the small-scale congestion at the northern end of the study area, corridor-wide issues were more significant. Regarding safety, seven crash clusters were identified accounting for 40% of the crash total. Though this is a significant portion, it tells us that the lion's share of crashes was distributed through the study area in lower concentrations, indicating a need for a systematic approach to safety. In particular better left-turn accommodations are needed as left-turn crashes were overrepresented compared to the state average. A lack of consistent pedestrian accommodations also ranks as a significant corridor-wide issue and with that comes a compromise of access to transit.

With so much of the NJ 47 frontage zoned commercial and still available for development, the opportunity exists to consider the corridor in major sections, or focus areas, to foster coordinated land use development for the benefits of maintaining traffic flow and long-term economic prosperity. As stated in the CMP section, strategies that manage demand for transportation by coordinating land uses, and other strategies that reduce the need for and length of trips are recommended for the NJ 47 corridor study area.

The PATCO commuter rail line planned for Gloucester County may stimulate housing and population growth in southern New Jersey, likely within the NJ 47 corridor study area. Westville will have a stop along Crown Point Road, west of NJ 47 and basically adjacent to their downtown. Though the line itself will be to the west of Deptford and Washington Townships, both municipalities are easily accessible from some of the proposed stations. This may mean an increase in traffic on NJ 47 as well as an increase on east-west routes that intersect NJ 47. The implementation timeline for this project has not been revealed. It is recommended that impacts to NJ 47 be considered in the planning stage of the project.

After addressing the identified local issues regarding safety and mobility, this study recommends developing and implementing an access management plan for NJ 47 as a next step, the benefits of which are discussed in this report.



APPENDIX A

Northeast Region Strategic Plan: Gloucester County, New Jersey

The Northeast Region Strategic Plan—commissioned by the Gloucester County Board of Chosen Freeholders and produced by Schoor DePalma, Inc.—was published in January 2005. As stated in the executive summary, the plan was developed to "provide a uniform growth strategy for the 14 municipalities in the northeastern portion of the county—Deptford, East Greenwich, Glassboro, Greenwich, Mantua, National Park, Paulsboro, Pitman, Washington, Wenonah, West Deptford, Westville, Woodbury, and Woodbury Heights. The strategic plan is based on an analysis of existing conditions in the region; an analysis of trends based on current policy; and a vision statement articulating the community's preferred future for the year 2025. The goal of the strategic plan is to provide all 14 municipalities with a touchstone for their own local efforts to achieve the goals of smart growth." Those that apply to corridors—thus being relevant to the NJ 47 corridor study—are listed below.

Principles

- Concentrating development and redevelopment at strategic locations and linking it to capacity limitations.
- Encouraging redevelopment of obsolete uses.
- Maximizing the development and redevelopment of transit hubs.
- Improving overall circulation and emphasizing public and alternative modes of transit.
- Ensuring coordination with other local and regional planning initiatives.

Goals

- Ensure economic sustainability and compatibility of corridors with the region.
- Incorporate corridors into the networks of towns, neighborhoods, and regional commercial nodes.
- Create compact, focused, mixed-use developments that enable preservation of surrounding open spaces.
- Plan new developments so they are linked by walking, biking, and driving routes to adjacent communities.

Strategies

- Encourage development that emphasizes quality architecture, shared access to parking, transit-friendly facilities, pedestrian circulation, appropriate building density, and extensive landscaping, especially in parking areas.

- Discourage commercial development with blank or windowless walls facing the street, oversized parking areas, light pollution, and multiple and uncontrolled access points.

- Preserve open spaces—fields and forests—along the corridor to balance development, preserve view sheds, and define nodes.

- Integrate residential development into the commercial nodes in both single and mixed-use structures.

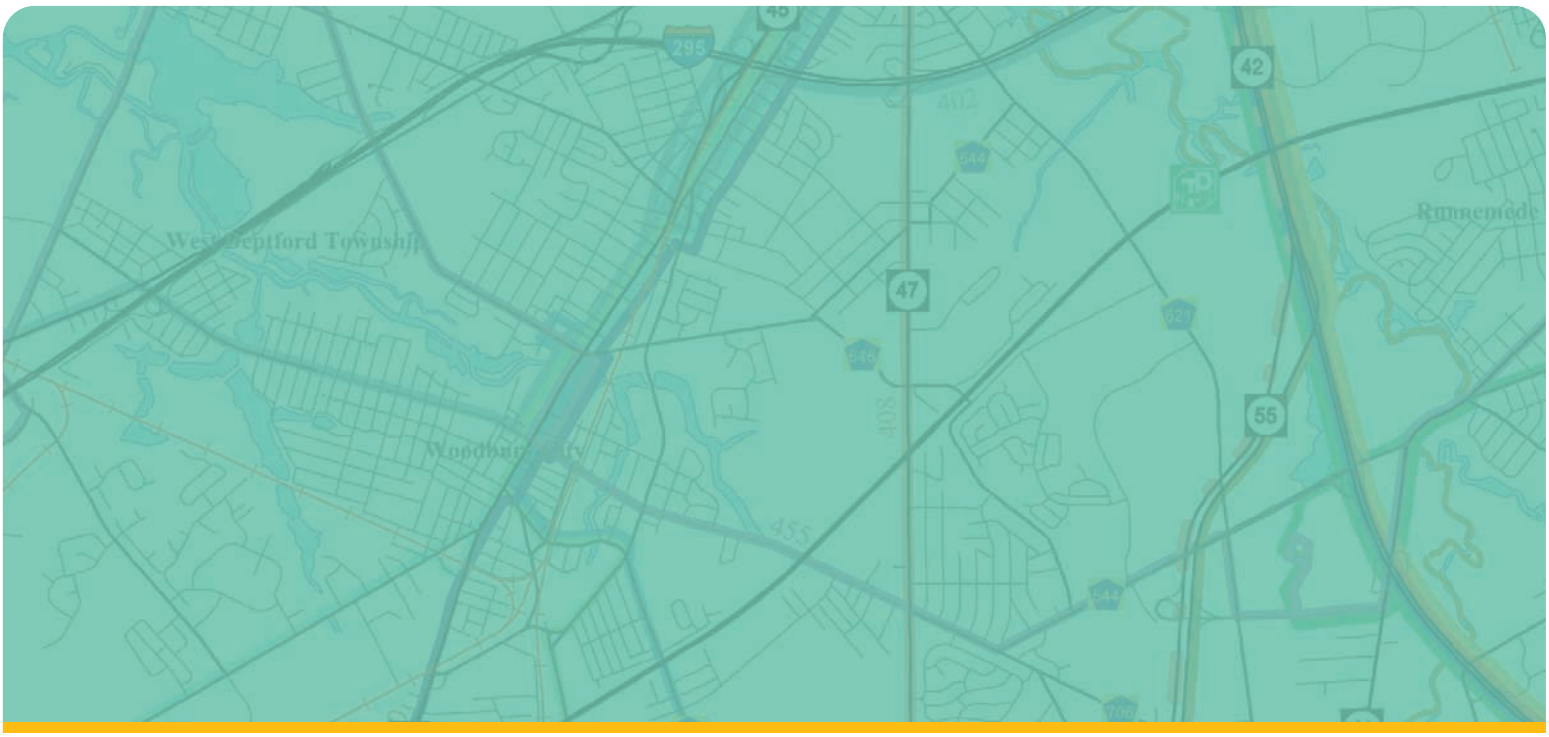
- Provide a healthy balance of land uses and retrofit single-use commercial into accessible, compact, well-designed mixed-use activity nodes with linkages to the surrounding community.

- Coordinate municipal, county, and state investments with private investments along the roadways to provide improvements involving streets, curbs, sidewalks, parking, landscaping, and open space.

- Prioritize infrastructure investments that support development in the defined nodes and centers, and will connect corridors to towns and neighborhoods, while discouraging investments that enable further linear development of the corridor.

- Prepare highway access-management plans to govern access points so they are reduced in number and more widely spaced and to encourage shared parking facilities.

In the Regional Profile, Westville Borough is listed as one of six distressed communities, and the only distressed community of the three NJ 47 corridor municipalities. Declining population, home ownership, and real estate demand are expected to decrease the adjusted value of the borough's tax base by five percent by 2025. In order to address the anticipated fiscal stress of these six communities, an alternative development policy will steer approximately five percent of the county's new housing to these communities. This is expected to stabilize the population, which will minimize the tax base decline and ease fiscal strain.



APPENDIX B

Environmental Screening

In an effort to better coordinate with NJDOT, DVRPC has begun including an environmental screening of each corridor study that it performs. The main purpose is to expedite the project implementation process by assisting in the fulfillment of a required element. The following text highlights the major findings of the NJ 47 environmental screening covering the following categories: flood hazard areas, landscape project habitat priorities, known contaminated sites, and historic and cultural resources.

Major Findings for the NJ 47 Corridor Study Area

Wetlands, Agricultural Wetlands, and Vernal Pools:

A significant amount of wetlands, agricultural wetlands, and vernal pools may be within the NJ 47 corridor study area or immediately adjacent to the roadway.

New Jersey protects freshwater wetlands under the New Jersey Freshwater Wetlands Protection Act Rules (N.J.A.C. 7:7A). The wetlands are depicted on Figure B-1: Surface Water, Wetlands, and Vernal Ponds, which provides general guidance as to where wetlands are, but only a site visit and a "letter of interpretation" from the New Jersey Department of Environmental Protection (NJDEP) can legally determine if wetlands are present. Activities permitted to occur within wetlands are very limited and usually require a permit from NJDEP.

The NJ 47 corridor appears to have a significant amount of agricultural wetlands, especially at the intersection of Routes 47 and 41. Agricultural wetlands are modified former wetlands that are under cultivation and still exhibit evidence of soil saturation. Agricultural wetlands are usually drained by a technique called "tile drainage." Tile drainage was very labor intensive, as it involved installing subsurface drainage pipes throughout a field at a depth of three to six feet. Tile drains were used sparingly–only where there were extremely wet spots. Therefore, the existence of tile drainage strongly indicates a natural wetland hydrology. If these areas are not treated as wetlands, and are instead built-upon, significant drainage issues may arise.

At least two vernal pools are within 1,000 feet of the NJ 47 roadway. Vernal pools are bodies of water that appear following snowmelt and during spring rains, but disappear or are dry during the rest of the year. They are highly important sites for certain rare species of amphibians. Particular types of frogs and salamanders, called obligate breeders, will only breed in vernal pools, which provide their offspring with a measure of protection because the pool's impermanence prevents the residence of predators. Vernal pools are so intermittent that their existence as wetlands has frequently not been recognized. Consequently, many of the pools have disappeared from the landscape or have been substantially damaged.

Flood Hazard Areas

Areas naturally subject to flooding are called floodplains, or flood hazard areas. New Jersey regulations define a flood hazard area as the land area inundated by a flood resulting from the 100-year discharge, increased by 25 percent of additional land area. This type of flood is called the "flood hazard area design flood," and it is the area regulated by NJDEP by the Flood Hazard Area Control Act (N.J.A.C. 7:13-1.1 et seq.).

A floodplain is divided into two parts:

(1) The floodway, which encompasses the channel and portions of the adjacent floodplain that are reasonably required to carry the regulatory flood. Erection of structures and placement of fill within the floodway generally is not permitted.

(2) The flood fringe is the portion of the floodplain outside of the floodway. Flooding with the flood fringe creates a potential for damage due to the presence or ponding of water, but not related to the high-velocity flow of water during a weather event. Development activities in the flood fringe area are regulated, but not prohibited.

Additionally, both FEMA and NJDEP recognize that floodplain and flood hazard areas need to be reevaluated and delineated again. The Delaware River watershed has experienced significant flooding events and damage in the last five to 10 years. The New Jersey Flood Hazard Area Control Act rules were revised in 2006 and were adopted in mid-2007. The new rules address the need to further restrict activity in flood hazard areas to minimize private property losses.

The NJ 47 corridor study area starts in a large flood hazard area along the Big Timber Creek in Brooklawn and Westville boroughs. Part of the roadway most likely lies in the floodway. As Route 47 crosses into Glassboro, the roadway goes through Mantua Creek's flood hazard area. This is not especially known to flood as often as Big Timber Creek or the Delaware River because Mantua Creek's stream buffers tend to have more vegetation. However, many activities within that flood hazard area will require NJDEP permits.

Landscape Project Habitat Priorities

The Landscape Project, developed by the Endangered and Nongame Species Program of NJDEP Division of Fish and Wildlife, documents the value of various types of habitats within New Jersey. Areas deemed "critical" habitat possess two exceptional conditions: (1) a documented occurrence of one or more species on either the federal or state threatened and endangered species list; and (2) a sufficient amount of habitat type to sustain these species. Similarly, "suitable" habitats have either (1) a documented occurrence of a "species of special concern;" or (2) are deemed suitable for species on the federal or state threatened and endangered species list.

A significant portion of land adjacent to the NJ 47 corridor in Deptford and Washington townships has land categorized as critical upland forest habitat and critical grasslands

habitat. This signifies that a threatened or endangered species was documented near or in these areas. It is important to note that both grasslands and upland forests are the hardest types of habitat to protect because they can rarely be protected through either local or state land-use regulations.

Even more land adjacent to the roadway is considered suitable habitat. There are large areas of land that feature emergent wetlands, forested wetlands, upland forest, and grasslands plant species and can support many different rare, threatened, and endangered species.

Known Contaminated Sites

The New Jersey "Known Contaminated Sites List" includes former factory sites, landfills, locations of current or former leaking underground storage tanks; sites where chemicals or wastes were once routinely discharged; and places where accidents have resulted in spills and pollution. Contamination may have affected soil, groundwater, surface water, or a combination of site conditions. The most dangerous sites, from a human health standpoint, can be listed as "Superfund" sites, which makes them eligible for federal and state cleanup funds. Other sites may be remediated by state cleanup funds (via the New Jersey Spill Compensation and Control Act, N.J.S.A. 58:10-23.11 et seq.), and the majority of the sites are remediated by the responsible parties as required by state and federal regulations.

Within a mile of either side of the NJ 47 corridor, there are 44 known contaminated sites, none of which are nationally designated Superfund sites. Fourteen sites are private residences or small commercial properties; twelve sites are active or former gas stations; and five sites are automotive shops or car dealerships. Forty-one of the 44 sites are areas of potential or known groundwater contamination, which means that contaminants originating from that site are affecting a larger area of residents and/or commercial and industrial property owners that obtain potable water and water for other industrial uses from private wells. The remaining three sites are areas where contaminants have only affected soils, but have not penetrated a ground depth deep enough to affect groundwater. The relatively high number of contaminated sites is indicative of the type, timing, and density of development that occurred, and continues to occur, in older suburban municipalities. These types of known contaminated sites are not barriers to possible improvements made to NJ 47 if proper (and routine) site remediation and soil removal efforts are undertaken. Early communication with NJDEP's Site Remediation Program will reduce any land-use conflicts and landownership issues.

Historic and Cultural Resources

According to the New Jersey Register of Historic Places Act, N.J.S.A. 13:1B-15.128 et seq., state agencies cannot undertake any project that will encroach upon, damage, or destroy a site that is included on the Register of Historic Places without application to NJDEP (which encompasses the State Historic Preservation Office). Based on recommendations of the NJDEP commissioner and/or the state Historic Sites Council, a public hearing or set of hearings may be held. The

commissioner has 120 days to consent or deny an application to encroach, destroy, or modify a historic site. If the commissioner does not respond, the applicant receives consent by default.

Within a quarter-mile of either side of the NJ 47 corridor, there are no sites on the national or state Register of Historic Places. There are six archeological sites that span parts of NJ 47. All archeological site surveys and "opinions" are filed with the State Historic Preservation Office. SHPO opinions are issued in response to a federally funded activity that will have an effect on historic properties not listed on the National Register.

Figure 15: Surface Water, Wetlands, and Vernal Pools

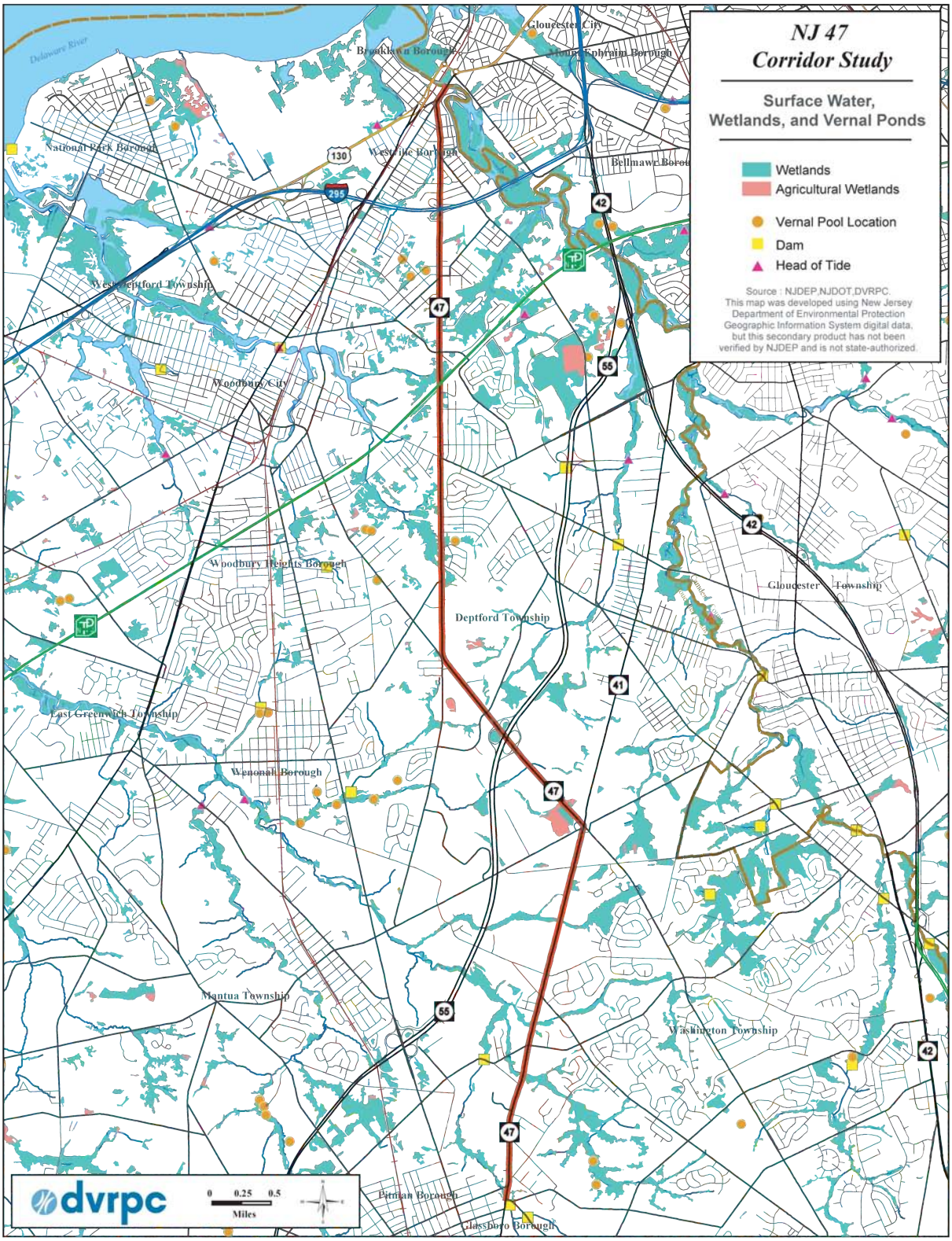


Figure 16: Landscape Project Habitat Priorities (2004)

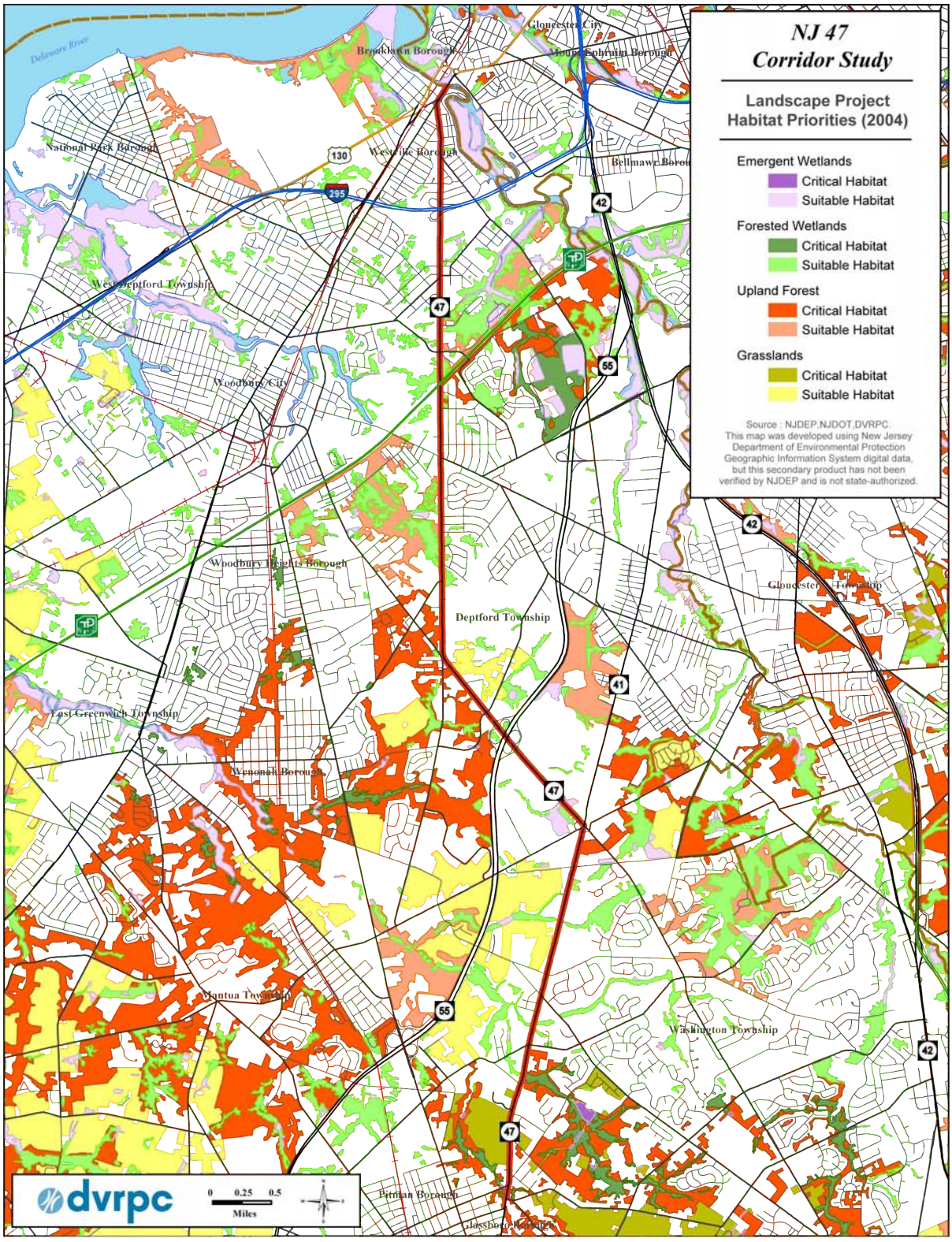


Figure 17: Known Contaminated Sites

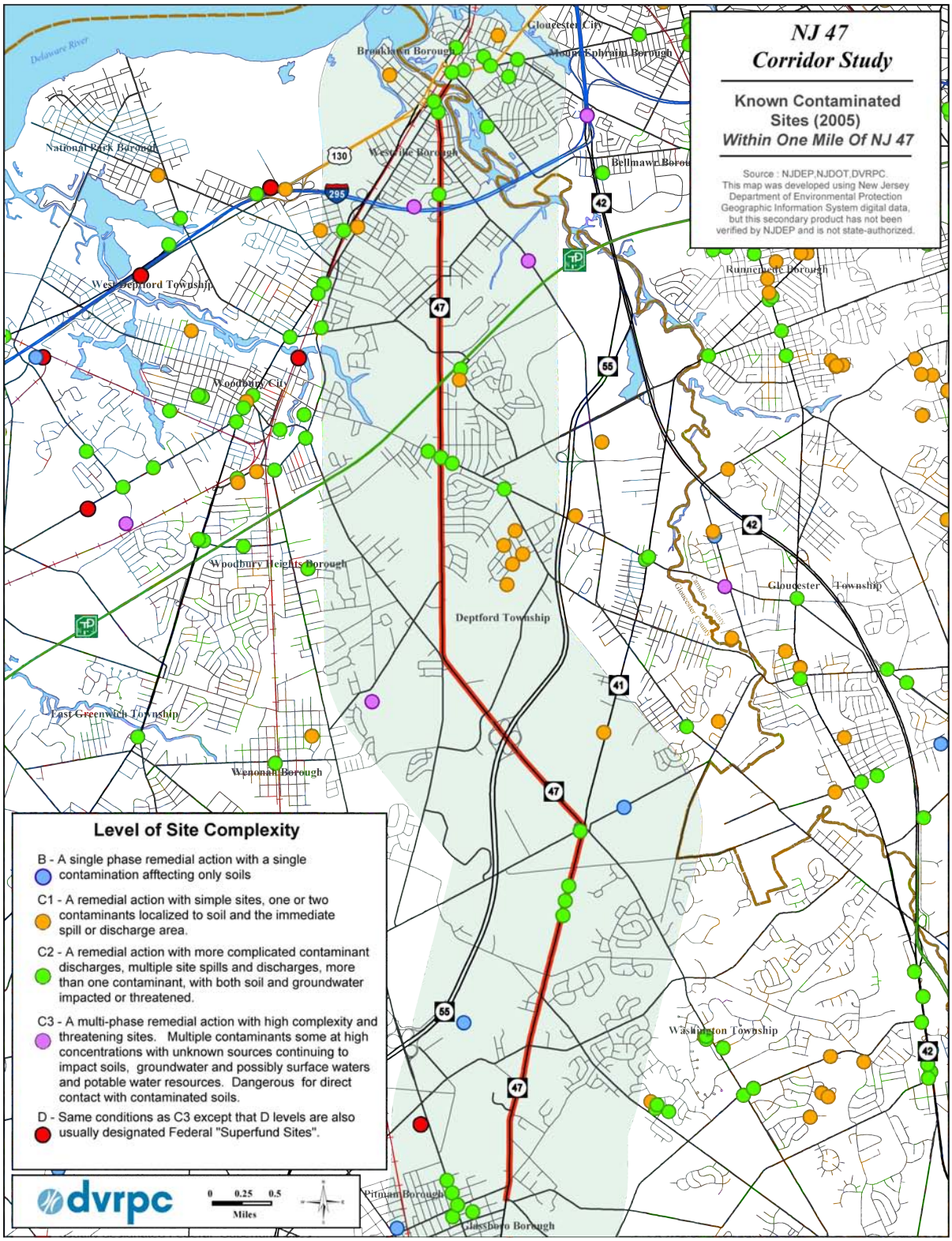


Figure 18: Historic Sites and Churches

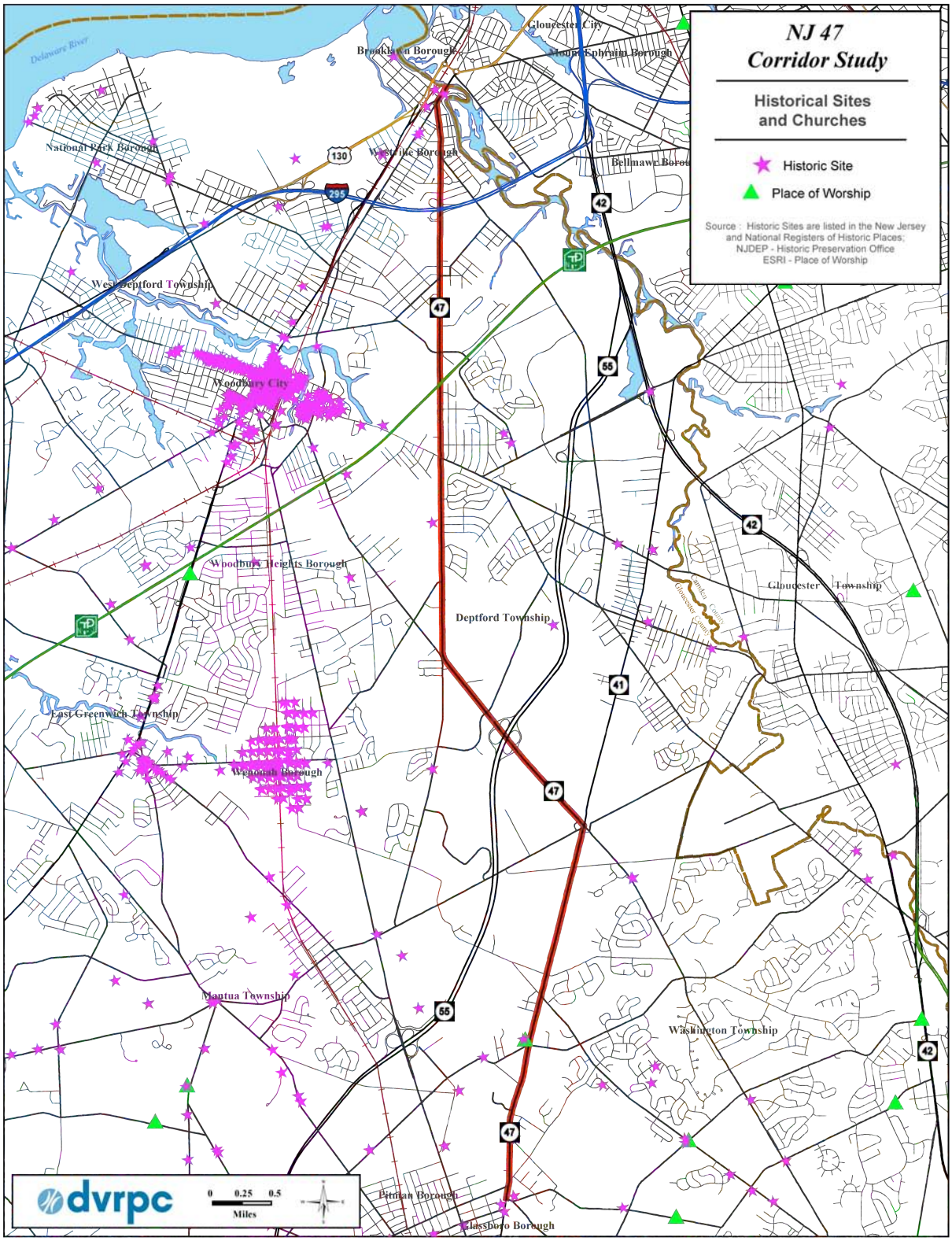
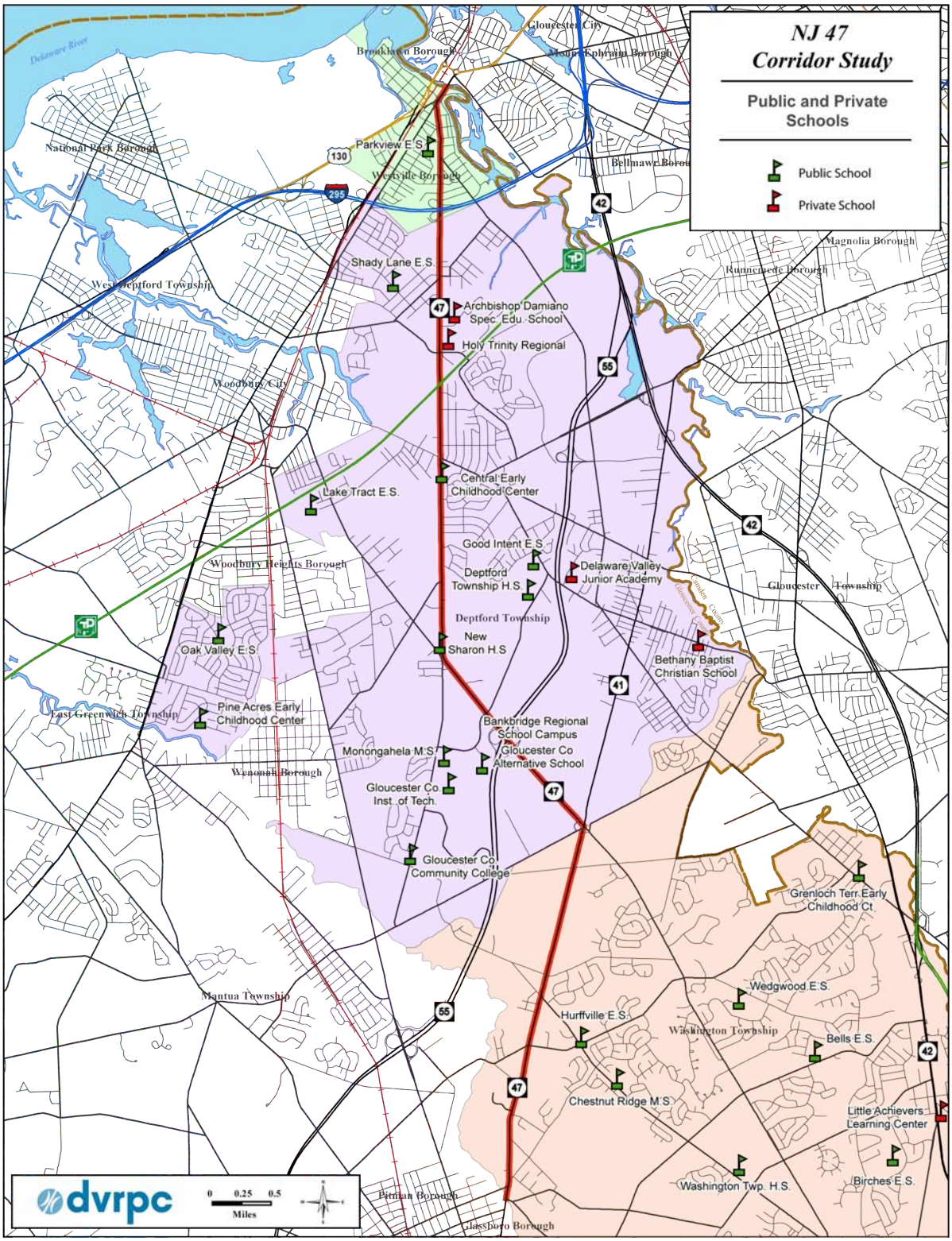
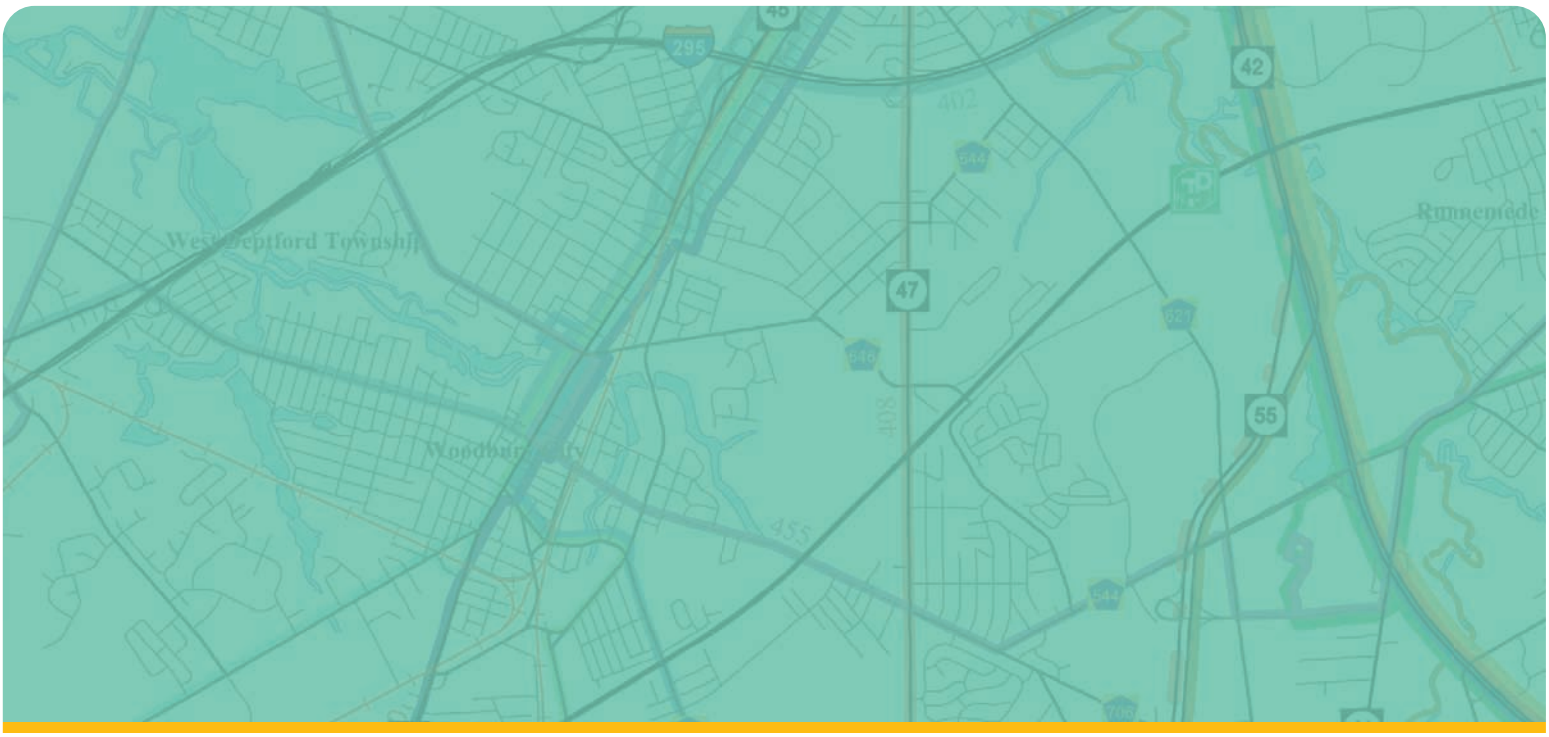


Figure 19: Public and Private Schools





APPENDIX C

Proposed/Planned Development

These are the developments that were reported by local officials during the original study period, some of which have since been completed, others abandoned. Information on changes is noted as an update. Interested parties should check with municipalities if a current update is needed.

WESTVILLE BOROUGH

Proposed/Planned Development

Timber Park (Fieldstone Properties) – A commercial/residential/park development has been proposed for the northeastern section of Westville Borough. The main access will be onto NJ 47 located just south of the nexus between NJ 47 and Broadway—a high-traffic location that is frequently congested. The proposed development will comprise 253 waterfront condominiums, 15,000 square feet of commercial property along NJ 47 (northbound), internal parking, and a public park at the tip of the peninsula with a boat launch. Recently, the borough council voted to authorize the land-use board to review a revised redevelopment plan submitted by the developer. A major component of the project is to remediate the tidal flooding issues at the south side of the NJ 47 bridge over Timber Creek by raising the roadway of NJ 47 by four to five feet. Other issues include:

- NJDOT (access unit) has met with the developer to discuss traffic issues created during the flooding remediation. The municipality feels that detouring traffic off of NJ 47 at this location is problematic due to restricted clearance of the rail overpass on US 130. Also, there are capacity issues regarding the bridges over Timber Creek.

- The plans also call for reconfiguring the intersection of NJ 47 and Broadway. Proposed access to the development would be placed in the vicinity of the new intersection and would be via two right-in/right-out-only driveways.

UPDATE: In 2008, the Timber Park project was withdrawn by the developer due to market conditions.

- Fox View Towers – An age-restricted development of two 10- to 12-story buildings of 65 units each has been proposed. The planned location is on the northwest side of NJ 47 in a parcel near the creek. A developer had plans but later withdrew them due to potential environmental concerns. Currently, the municipality owns the parcel and is seeking an environmental assessment. Implications for the NJ 47 corridor from this development are related to the trips generated and the access to the local network. Municipal officials speculate that this could be tied up for five years.

- Business District Redevelopment – A developer is looking to redevelop a major component of the borough's central business district. Particularly, the developer is focusing on the northwest quadrant, which fronts CR 551 (Broadway) between NJ 47 and Woodbine Avenue.

Although this development does not front NJ 47, it is projected to increase trips through the corridor, which may impact NJ 47.

Improvements

- A streetscape improvement proposal for NJ 47—from the bridge to Poplar Avenue—is currently on hold due to the Timber Creek development.

- A Transportation Enhancements streetscape project was recently completed on CR 551 (Broadway) that included new sidewalks, bulb-outs, and other pedestrian crossing and streetscape amenities.

DEPTFORD TOWNSHIP

Proposed/Planned Development

As of 2006, Deptford Township had a significant number of development projects under review, including: 10 subdivisions (220 lots), an apartment building (96 units), a town home development (20 units), three retirement communities (unspecified details), and several commercial developments, including a shopping center and two Walmart stores. Future developments will have to comply with a maximum square footage ordinance prohibiting any single building larger than 100,000 square feet. This ordinance has been recently adopted by the township. The Walmart stores were approved before this action took effect. Below is a brief description of those developments that were discussed during study meetings.

- Wal-Mart – Two major land developments, both Wal-Mart stores, were implemented in the NJ 47 corridor. Of particular relevance is the store completed on the site of the former Woodbury Plaza near the intersection of NJ 47 and Cooper Street. The second Wal-Mart store is situated on the former RCA site located just outside the study area, at CR 544 Clements Bridge Road at NJ 42.

- Narriticon Residential Complex – There is a commercial development proposed for the southwest quadrant of this property at NJ 47 and Narriticon Parkway, a signalized intersection. In addition, Narriticon has made an application to expand its residential component within the complex.

- Procacci Development – A 52-lot residential subdivision will be sited at the intersection of Salina and Glassboro roads.

- Autism School – Located on Tanyard Road near the intersection of Salina Road, this development is currently under construction and is being built by the school district.

- Five Points Intersection Development – This proposed development will be a promenade-style shopping destination consisting of higher-end retail. Plans include a bypass road from NJ 47 to NJ 41. Driveway access concepts include a roundabout instead of traffic signal onto NJ 47 from the development. This will be a major trip generator in a high-traffic location that serves as a transportation nexus for several state and county routes that carry both local and regional traffic. This development proposal may be affected by the township's recently adopted maximum square footage ordinance for new buildings.

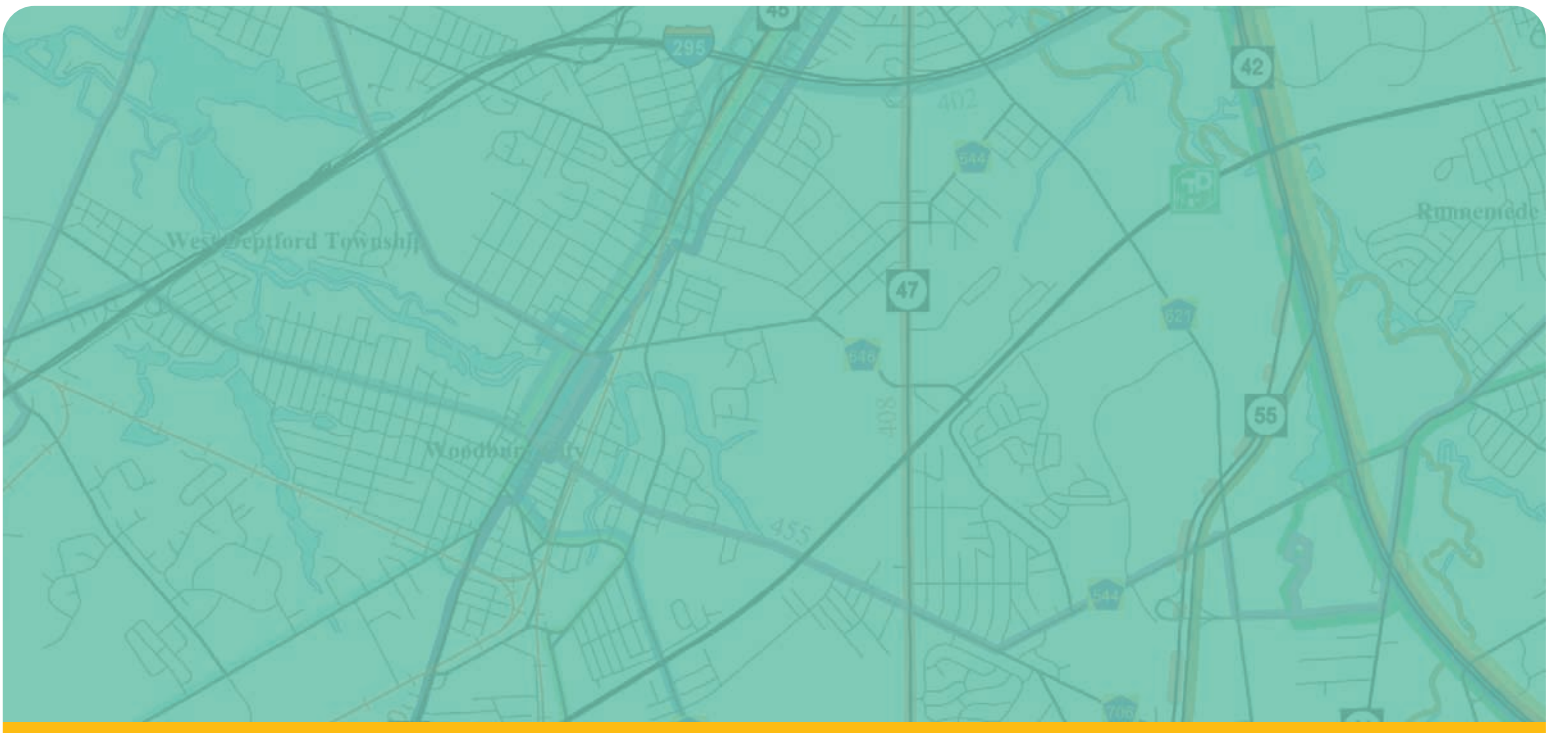
- St. Edmonds Federal Bank -- The former Burger King restaurant located at the Five Points intersection is being redeveloped as a bank.

WASHINGTON TOWNSHIP

Proposed/Planned Development

- Washington Township recently completed a “Preliminary Investigation for Determination of an Area in Need,” also known as a redevelopment zone application, of the NJ 47 (Delsea Drive) corridor. The proposed redevelopment zone includes the entire length of NJ 47 in Washington Township, from the Five Points intersection to the Pitman municipal boundary. As of the field visit date (5/11/06), redevelopment designation had not yet been approved, although the Washington Township Planning Board had voted on select elements of the master plan. This initiative is part of the update to the township master plan.

- A new strip mall development was constructed on CR 630 (Egg Harbor Road), located just south of the Five Points intersection.



APPENDIX D

Access Management

Congestion, cut-through traffic, and crashes are linked to land use. There is a growing awareness that land-use decisions affect the transportation system. The volume of and type of trips generated has a direct influence on traffic and transportation. Land-use patterns dictate every trip we make for work, school, recreation, etc.

Without any amendment to local priorities and plans, the trend of uncoordinated, piecemeal development along NJ 47 will continue. The corridor needs a vision that promotes a vibrant business community, where transportation options accommodate all modes and all users. This is the first step in planning for the future of NJ 47, and setting a new trend. Access management recognizes the relationship between land use and transportation—a key to achieving this vision.

The Transportation Research Board's website provides the following definition: "access management seeks to limit and consolidate access along major roadways, while promoting a supporting street system and unified access and circulation systems for development. The result is a roadway that functions safely and efficiently for its useful life, and a more attractive corridor." It is a process that provides access to land development while preserving the flow of traffic on the surrounding road system in terms of safety, capacity, and speed.

The two main components of access management are coordinated land-use planning and roadway design standards. Together these foster improved mobility and improved safety. Common techniques include:

- clustering development
- creating left-turn opportunities
- limiting the number of driveways and consolidating existing ones
- improving connectivity
- implementing pedestrian and bicycle amenities

Corridor Access Management

Corridor Access Management is an approach that applies the techniques of access management at a corridor level, rather than at a municipal or state level. This can be a useful approach when planning the future of a roadway that spans several municipalities and/or counties, as is the case with the NJ 47 study area.

One implementation technique is to create an Access Management Overlay District. This tool adds special requirements to the existing zoning regulations and can be tailored to suit the specific needs of the subject corridor. These additional regulations will apply only to the corridor and can be more restrictive than the municipal regulations.

Access-Management Techniques

The following text provides a brief overview of the techniques available for inclusion in an access-management plan.

Using Land-Use Techniques to shape the development along a corridor lays the foundation for a well-designed access-management plan. Local comprehensive plans and zoning ordinances are the policy documents that guide future development and conservation for a municipality. Common techniques include:

- designating compact growth areas,
- prohibiting isolated strip development along arterials, and
- including guidelines in a local ordinance to ensure that arterial development will not significantly reduce traffic safety and traffic carrying capacity.

An Official Map, once adopted, is a legal document and can be used in making determinations regarding land developments and public rights of way.

Land Use Intensity – the Institute of Transportation Engineers' (ITE) guide for determining typical trip-generation numbers for specific land-use types based on project size in acres. This guide can be used to determine the appropriate zoning designation desired for an area.

Interconnected Access and Consolidated Access provide access connections between adjacent land developments (i.e., adjacent businesses with connected parking lots and subdivisions by interior connecting roads). Fewer access points on a roadway means fewer conflict points and better mobility.

Preserving the Functional Area of Intersections/Interchange Ramps will prevent the creation of additional conflict points that typically have a history of frequent crashes (i.e., the four quadrants of land where two roads cross, or are in close proximity to an on or off ramp).

Driveway Spacing – according to the Iowa Access Management Handbook, “Encouraging wide spacing between driveways is the single most important step that a municipality can take to ensure safety and maintain the traffic carrying capacity of its arterials.” The benefits include fewer conflict points, fewer crashes, orderly merging of traffic, increased mobility, reduced congestion, and improved access to land developments. The American Association of State Highway and Transportation Officials has developed standards for driveway spacing. They can be found in the publication, *A Policy on Geometric Design of Highways and Streets*.

Use of Exclusive Turning Lanes removes turning vehicles from through lanes and provides a safe queuing area while waiting to turn. Two-way left-turn lanes (TWLTL), which allow turn movements from both directions from a center lane, are very effective in commercial areas where driveways to businesses are frequent.

The purpose of Service Roads, or Frontage Roads, is to provide access to several land parcels via a parallel roadway along an arterial without having individual driveways accessing the main arterial. Instead, these parcels have driveways onto the service road. The service road does not carry through traffic and thus has lower volume and speed than an arterial, where such access points would be more dangerous.

Access Management in New Jersey

New Jersey adopted its State Highway Access Management Code in 1989. This code applies the principles of access management to all state roads. It also allows county and municipal governments to work with the Department of Transportation to develop local access-management plans. Access management must fit into the overall picture of planning, zoning, and land use in order to achieve its goals.

The following excerpt is taken from NJDOT State Highway Access Management Code and New Jersey Administrative Code (Title 16 Chapter 47), which defines an access-management plan as follows:

“'Access management plan' means a plan showing the design of access for every lot on a State highway segment developed jointly by the Department, the municipality in which the highway is located, and the county, if a county road intersects the segment."

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Key Words: Corridor study, corridor-wide transportation issues, access management, safety, crash clusters, land use, light rail, transit, pedestrians, bicyclists

Abstract: This document presents an evaluation of NJ 47 considering transportation and related factors that influence mobility in the corridor. The study area is a 10-mile section of NJ 47 that includes Westville Borough, Deptford and Washington Townships in Gloucester County, New Jersey. This document includes an overview of safety issues, congestion managment considerations, and travel patterns in the study area served by NJ 47. Corridor-wide and localized issues examined during the the study process are discussed and improvement strategies considered.

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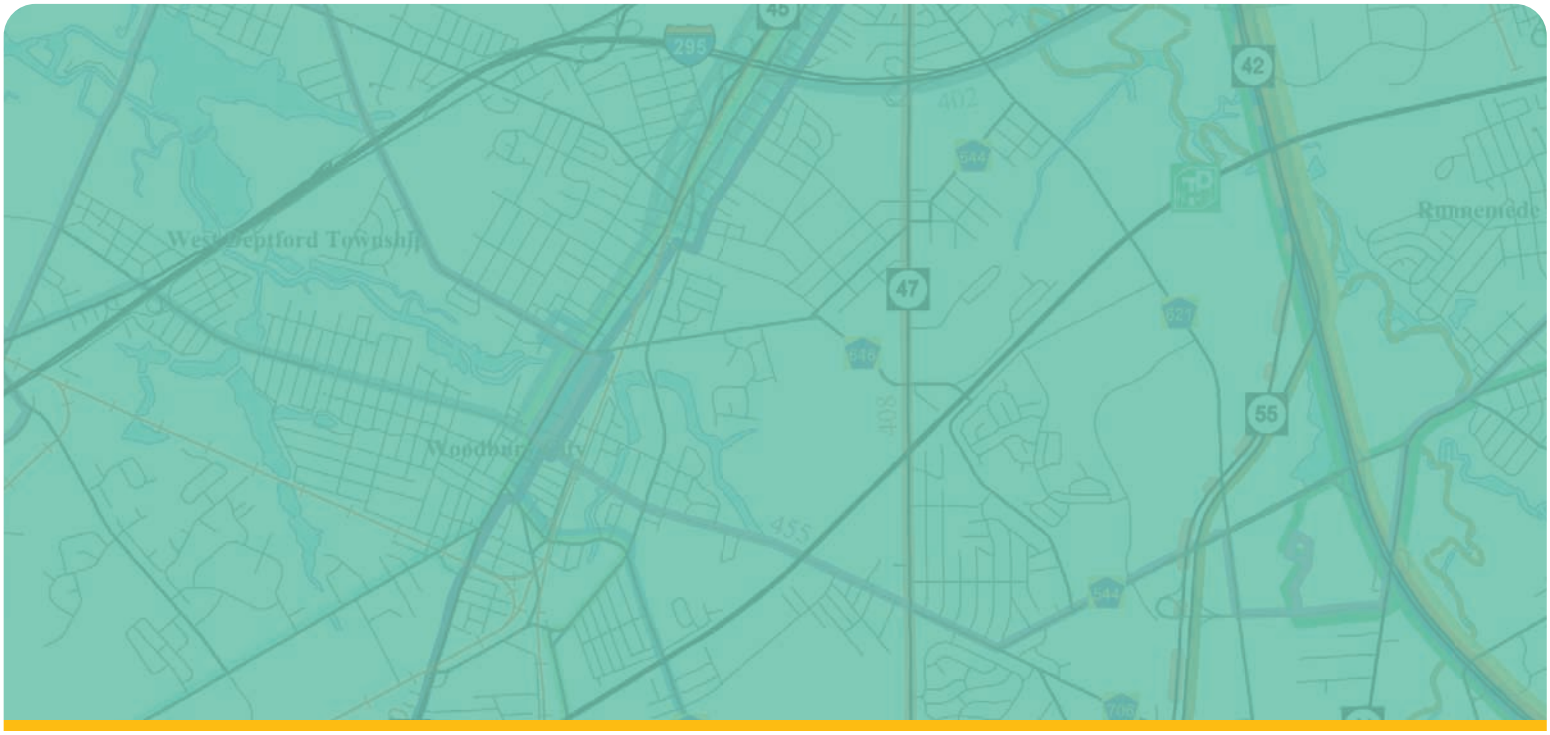

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