

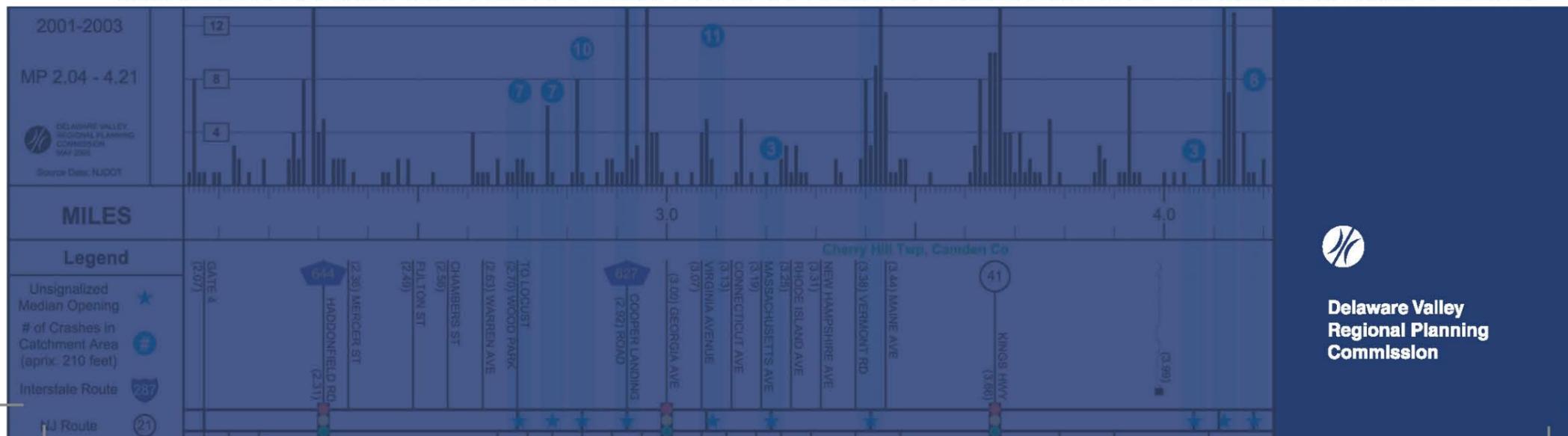
OCTOBER 2005



NJ ROUTE 70 CORRIDOR STUDY

AIRPORT CIRCLE TO MARLTON CIRCLE

NEIGHBORHOODS ► CONGESTION ► CRASHES ► ACCESS / MOBILITY ► IDENTIFIED PROBLEM LOCATIONS ► POTENTIAL IMPROVEMENT SCENERIOS





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Delaware Valley Regional Planning Commission

Created in 1965, the Delaware Valley Regional Planning Commission (DVRPC) is an interstate, intercounty and intercity agency that provides continuing, comprehensive and coordinated planning to shape a vision for the future growth of the Delaware Valley region. The region includes Bucks, Chester, Delaware, and Montgomery counties, as well as the City of Philadelphia, in Pennsylvania; and Burlington, Camden, Gloucester and Mercer counties in New Jersey. DVRPC provides technical assistance and services; conducts high priority studies that respond to the requests and demands of member state and local governments; fosters cooperation among various constituents to forge a consensus on diverse regional issues; determines and meets the needs of the private sector; and practices public outreach efforts to promote two-way communication and public awareness of regional issues and the Commission.

DVRPC is funded by a variety of funding sources including federal grants from the U.S. Department of Transportation's Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), the Pennsylvania and New Jersey departments of transportation, as well as by DVRPC's state and local member governments. The authors, however, are solely responsible for its findings and conclusions, which may not represent the official views or policies of the funding agencies.

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

NJ ROUTE 70 CORRIDOR STUDY - AIRPORT CIRCLE TO MARLTON CIRCLE



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EXECUTIVE SUMMARY

The Delaware Valley Regional Planning Commission (DVRPC) continually programs transportation corridor studies that strive to identify and address problems that impede the efficient and equitable movement of goods and people in the Delaware Valley. The NJ 70 corridor, originally identified in *Direction 2020* DVRPC's long range transportation plan, is the subject of this study.

This report focuses on 8.33 miles of NJ 70 between the Airport Circle in Pennsauken, Camden County, and the Marlton Circle in Evesham Township, Burlington County. Cherry Hill Township accounts for the majority of the study area. In addition to Pennsauken, Evesham, and Cherry Hill, Haddonfield Borough was included in the study area due to its proximity to Cherry Hill and the influence of NJ 70 on the borough's local traffic. A task force comprised of municipal representatives and New Jersey state transportation officials was formed to guide the activities of the study.

This study effort was unique because it was conducted concurrent with the New Jersey Department of Transportation's Route 70 Concept Development Study. DVRPC and NJDOT worked closely, shared resources, and collaborated on the public outreach component. Although the study area was the same, the approach of each study

was different as were the finished products. This is discussed further in section 1.1.

At approximately 60 miles in length, NJ 70 provides a direct connection between the Delaware River (via US 30) and the New Jersey coastline of Ocean County. Throughout its history Route 70 has been used as a city to shore route. Over time the 8.33 miles of NJ 70 that is the focus of this study has seen significant development. The population of Cherry Hill Township, the second largest in Camden County, has grown and subsequently expanded into nearly all available land in the municipality. NJ 70 is the retail and commercial center of the township, providing its economic base. As a result, the NJ 70 corridor generates a significant number of shopping and work trips—both local and regional. In addition, the corridor experiences seasonal volume spikes due to shore traffic.

Through meetings with the study task force, data analysis, and field visits, transportation problem locations were identified within the corridor study area. This report focuses on 15 site-specific problem locations and includes a discussion of corridor-wide problems, i.e. deficiencies that are common throughout the study area. Other problem types discussed include cut-through traffic, deficiencies in signs and lane markings, and mobility issues.

NJ 70 is plagued by three major corridor-wide problems that became recurring themes during the study effort: congestion, access, and accidents. Recurring peak period congestion has reduced traffic flow to stop and go conditions in several sections of the study area. This is common knowledge to regular users of the facility, and was quantified in NJDOT's *Route 70 Concept Development Report*.

NJ 70 is divided by a grass median that limits access opportunities to either signalized intersections or unsignalized median openings, where available. Extra distance and time is added to almost every trip as drivers are forced to turn around via the nearest intersection in order to access the opposite direction of NJ 70. As a result, signalized intersections experience higher demand causing them to be overburdened. Congestion, combined with limited access, also results in cut through traffic—the use of neighborhood streets as short cuts to by-pass traffic congestion from long waits at signals on NJ 70.

Accidents on NJ 70 are largely the byproduct of congestion and access related problems. Rear-end crashes are common on congested facilities, especially where travel lanes transition from 3 to 2 as motorists arrive abruptly on the heels of slower moving traffic. Crash clusters were analyzed using 2001-2003 data. Twenty-two locations were identified where twenty-four or more crashes occurred

along a one-tenth mile stretch during the three-year period. Possible contributing factors and potential counter measures were discussed in the body of the report for the five highest crash cluster locations.

These three problems, congestion, access, and accidents, are most common in the parts of the corridor that have the highest demand due to retail concentrations and/or are proximate to major roadway connections, i.e.: I-295.

This report discusses the issues facing the corridor and presents potential improvement scenarios for each. The findings of this study suggest that no simple, easy, solution is readily available to cure the ills of NJ 70. Nor are these ills solely transportation related. Rather, they are symptoms of the development pattern advanced throughout the corridor over time, exacerbated by a steady rise in automobile ownership.

In order to best address current needs and plan for the future, the municipalities of the study area, namely Cherry Hill, must decide what NJ 70 is to become. Addressing only one of the three major transportation issues affecting NJ 70, i.e. congestion only, may have impacts on other aspects of life for corridor residents and for those who depend on the facility.

1



INTRODUCTION

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1. INTRODUCTION

NJ 70 was identified as one of the many essential routes for moving people and goods in *Direction 2020*, the Delaware Valley Regional Planning Commission's (DVRPC) regional long-range, comprehensive land use and transportation plan. The long-range plan laid the groundwork for a more detailed evaluation of each identified corridor. This report takes a comprehensive look at NJ 70. The purpose of the corridor study is to identify site specific and corridor-wide transportation issues, determine what the contributing factors are, and identify potential improvements.

The study area includes 8.33 miles of NJ 70 facility between the Airport Circle to the west and the Marlton Circle to the east, traversing Pennsauken, Cherry Hill and Evesham Townships. Haddonfield Borough was also considered part of the study area due to the presence of feeder routes that carry traffic from and through the borough to the NJ 70 corridor. Cherry Hill Township, which accounts for the largest part of the study corridor, is an older, densely developed suburban location comprised mostly of single-family detached homes all with access to NJ 70. The frontage of NJ 70 is a mix of retail and professional offices. Industrial developments are located along other select corridors that connect with NJ 70. Throughout the corridor there is very little undeveloped land; new developments come about through infill. One example is the Garden State Park redevelopment project that is currently underway. All study

area municipalities have good highway access with NJ 70 being their main east-west facility.

To guide the study effort, DVRPC collaborated with a task force comprised of municipal and state representatives. The problem locations and corridor-wide issues identified through meetings with the task force formed the basis for the analysis. The major concerns of the task force include congestion, crash frequency, and access.

DVRPC's effort is intended to dovetail with the New Jersey Department of Transportation's Concept Development Study of NJ 70, which was conducted concurrently. The NJDOT study is a technical analysis based on current and future traffic count data. DVRPC's corridor study takes a planning approach that considers transportation problems in the context of the existing land uses and infrastructure. Identified improvements, derived from quantitative and qualitative data and analysis, seek to balance mobility and quality of life issues in a context sensitive manner. A comparison of the two studies is summarized in section 1.1.

To guide the study effort, DVRPC collaborated with a task force comprised of municipal and state representatives.

The report is divided into eight chapters plus executive summary and appendices. Chapter two, Study Area Description, contains an analysis of demographic characteristics, travel patterns, environmental justice issues, and environmental sensitivities. Chapter three describes the transportation system in terms of vehicle, bus, rail, pedestrian, and bicycle movements. Chapter four focuses on safety through an analysis of crash data. Chapter five, entitled Transportation Issues, is divided into five subchapters that focus on corridor-wide and location specific transportation problems. The identified issues were culled from municipal interviews, field visits, and through collaborations with coordinating agencies. Improvement scenarios are provided for all identified problems. Chapters six and seven provide an analysis of intelligent transportation systems and the congestion management.

The report culminates in chapter eight with a matrix of the recommended improvements and a discussion of overall conclusions. The matrix can be used as a punch list by local and state officials for advancing these concepts to the project stage.

1.1 COORDINATION WITH NEW JERSEY DEPARTMENT OF TRANSPORTATION

In July 2003 the Delaware Valley Regional Planning Commission and the New Jersey Department of Transportation began independent studies of NJ 70. To better coordinate efforts, the two agencies collaborated and shared resources including traffic volumes, transit data, and pedestrian amenities data. All meetings with municipal stakeholders and with the public utilized a single presentation combining elements of each study.

In addition, DVRPC provided the Environmental Justice and Environmental Screening components required as part of NJDOT's concept development process. NJDOT also utilized DVRPC's regional model in developing the growth rate and future design year traffic numbers.

The final products of each effort are different and intended to compliment one another. NJDOT's report, published in October of 2004, identified short-term breakout projects to be advanced. The following comparison highlights the elements of each study.

NJDOT: NJ 70 Concept Development Study

- ▶ One-year effort conducted during fiscal year 2004.
- ▶ Study limits: Airport Circle to Marlton Circle (8.33 miles).
- ▶ Engineering analysis of NJ 70 utilizing level of service and future year traffic volumes.
- ▶ Predominant issues identified include congestion, failing level of service at signalized intersections, and crashes.

DVRPC: NJ 70 Corridor Study

- ▶ Two-year effort conducted during fiscal years 2004 and 2005.
- ▶ Study limits: Airport Circle to Marlton Circle (8.33 miles).
- ▶ Planning analysis of the transportation and land use issues of NJ 70.
- ▶ Predominant issues identified include access deficiencies, crashes, land use and transportation incompatibility, and congestion.

1.2 RECENT HISTORY OF ROADWAY IMPROVEMENTS ON NJ 70

Recent History

In 1986 the New Jersey Department of Transportation (NJDOT) finished a Feasibility Assessment (FA) of the NJ 70 corridor between NJ 38 and NJ 73. The purpose of the study was to evaluate the existing and future transportation problems of the facility, and to develop and assess various design schemes for improving the corridor on an operational, engineering, and cost-effectiveness basis. One build-alternative with eight schemes plus the no-build alternative were considered to alleviate this project's present and future traffic problems.

In 1991 the Federal Highway Administration and the New Jersey Department of Transportation completed an Environmental Assessment (EA) for four intermittent sections of NJ 70 that were recommended for reconstruction as part of NJDOT's comprehensive plan to improve the facility. These four sections were known as Alternative H, the preferred alternative. This work was the next step needed to advance the recommendations of the 1986 Feasibility Assessment. The objective of this EA was to identify and evaluate any potential social, economic, or environmental impacts associated with the proposed action.

According to the Project Need section of the EA, the conditions on NJ 70 at the time were described as "inadequate

and inefficient for accommodating its associated traffic demands." The text continues, "the original intent of this roadway (NJ 70) was to provide a high-speed arterial route connecting the suburban areas of Camden and Burlington Counties to the urban Camden-Philadelphia metropolitan area. However, increased development along this route has caused a reduction in traffic speeds."

According to the EA "The no-build alternative was rejected because it did not fulfill the goals and objectives of the proposed project." The report states that with no changes to

DVRPC 1980: Aerial View of Race Track Circle



the capacity of NJ 70, the expected increases in traffic growth would cause levels of service for the roadway to decrease to breakdown conditions.

Proposed and Completed Improvements to NJ 70

Improvements to the four intermittent sections of NJ 70 were to be preceded by the elimination of the Race Track Circle

and Ellisburg Circle, and by improvements to NJ 70 between I-295 and Springdale Road. As of the completion date of this report (10/05) only these three projects were undertaken and completed. The improvements proposed for the four

NJ 2002: Aerial View of Race Track Circle



intermittent sections, described below, were never realized.

Section one includes NJ 70 from the NJ 38 junction to what was formerly know as the Race Track Circle, presently known as the intersection of NJ 70 and Haddonfield Road.

Completed improvements include the creation of an eastbound left turn/u-turn near side jug handle utilizing Penn Avenue and Park Boulevard to tie in with Grove Street and the circle elimination improvements.

Section two covered from the Race Track Circle project to the Ellisburg Circle project. The major proposals for this section included closing all median openings except at the fire station and at the signalized intersection of Georgia and Edison Avenues. Other improvements to accommodate left and u-turn movements as part of the median closures were also proposed. These projects were not advanced due to a legal confrontation between local residents and the New Jersey Department of Transportation and the Federal Highway Administration.

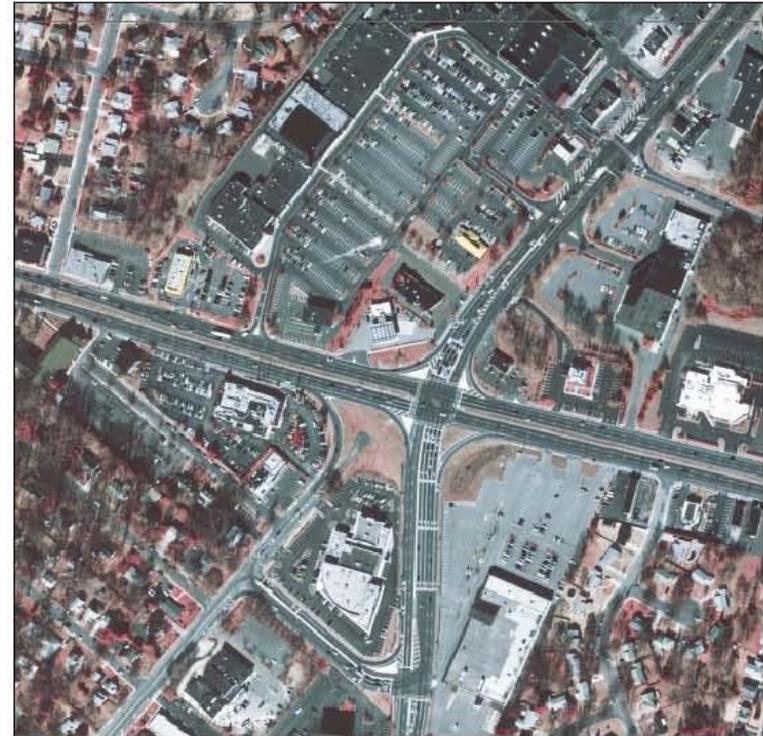
Section three covers NJ 70 from the Ellisburg Circle to I-295. The major proposals for this section included closing all median openings except for two existing signalized intersections, and a westbound left turn slot for access to a large shopping center (Barclay Shopping Center). These proposals were not advanced due to a legal confrontation between local residents and the New Jersey Department of Transportation and the Federal Highway Administration.

Section four runs from Springdale Road to NJ 73. The largest proposal in this section was to close all median openings that were not signal controlled. These proposals were not advanced.

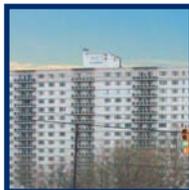
DVRPC 1980: Aerial View of Ellisburg Circle



NJ 2002: Aerial View of Ellisburg Circle



2



STUDY AREA DESCRIPTION

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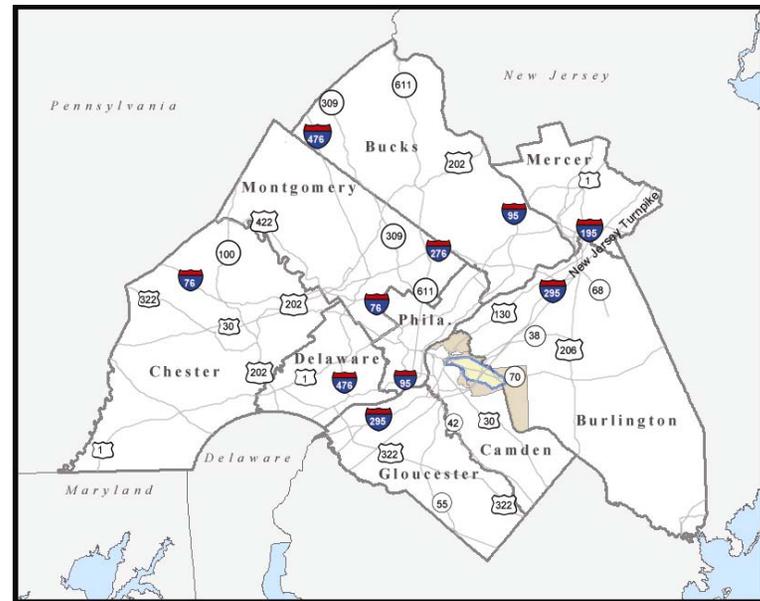
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2.1 REGIONAL SETTING

NJ 70 is a primary arterial facility located in the New Jersey portion of DVRPC's region. Traversing Camden, Burlington, and Ocean Counties, this roadway is oriented radially to the region's core providing a direct connection between Camden City and the New Jersey shore. The study area is 8.33 miles long and covers NJ 70 from NJ 38 in the west to NJ 73 in the east, essentially from the Airport Circle to the Marlton Circle. The study area municipalities are Cherry Hill Township, Evesham Township, Haddonfield Borough, and Pennsauken Township. The corridor study area is depicted in Figure 1.

Cherry Hill Township accounts for a wide majority of the frontage along NJ 70, approximately seven linear miles. Throughout Cherry Hill and Evesham Township land uses along NJ 70 are a mix of retail, professional office, and a few institutional uses, some located in strip malls or in stand-alone fashion. Most of the residences along NJ 70 have been converted to professional offices; only a few remain as homes. In the land areas behind the commercial frontage along the facility is a dense network of residential developments. This is where a large portion of the local traffic on NJ 70 is generated.

DVRPC's nine county region

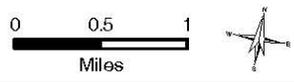
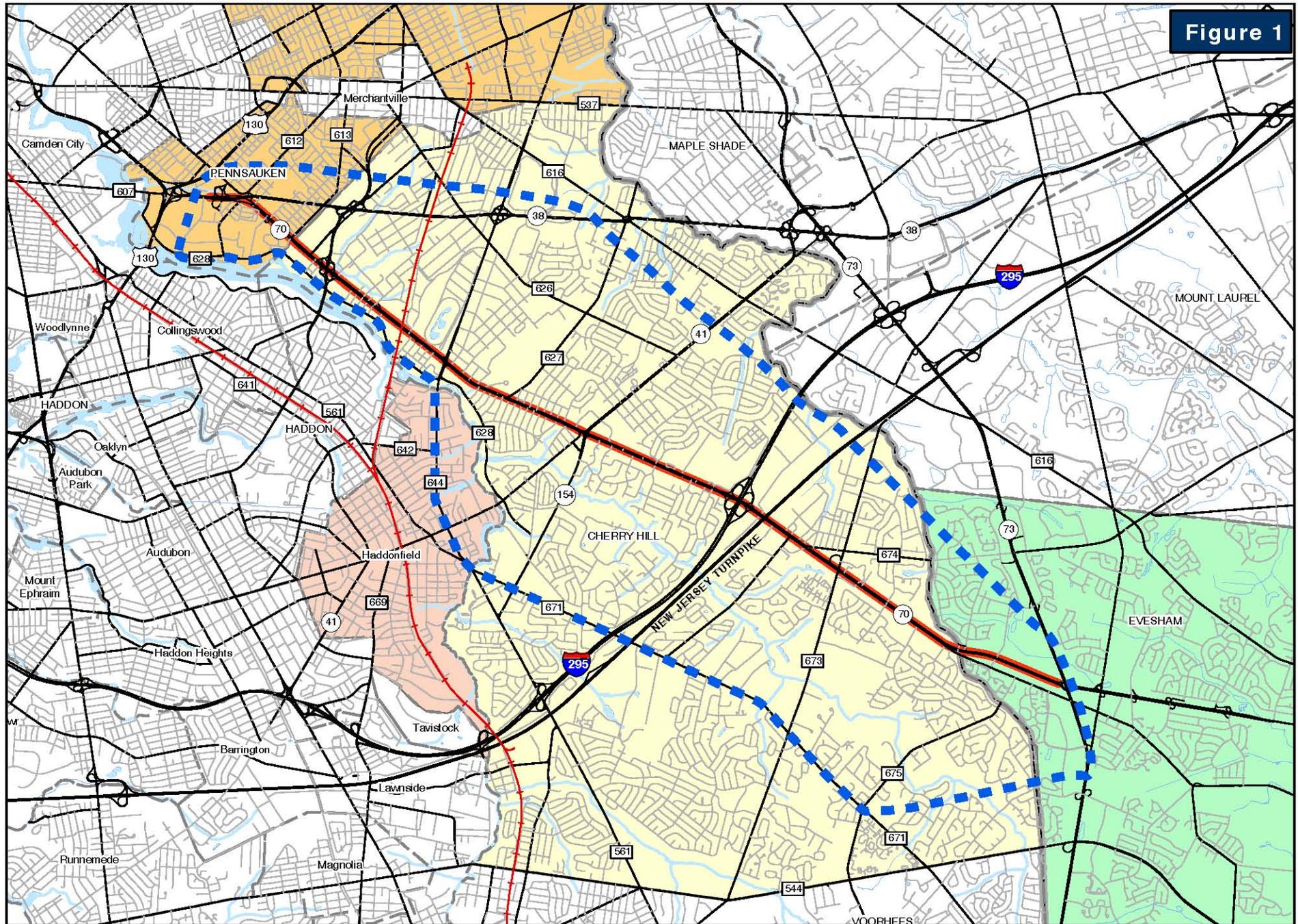


DVRPC 2005

NJ 70 Corridor Study

Study Area

Figure 1



 Study Area  NJ 70

2.2 DEMOGRAPHICS

Camden County was the second slowest growing county in the Delaware Valley Region between 1990 and 2000. Analysis of the demographic data contained in Table 1 shows that conditions within most of the study area were consistent with or lagged behind the county's growth. Evesham, located on the east end of the study corridor in Burlington County, was an exception to the trend.

Between 1990 and 2000, Camden County experienced a population growth of one percent, about the same rate of growth that Cherry Hill, Haddonfield, and Pennsauken experienced. Employed residents within the county have decreased from about 240,100 to about 235,800, a

drop of two percent. In Cherry Hill, Haddonfield, and Pennsauken, employed residents also fell between two and six percent. The drop in employment was even more significant. Throughout the county, a five percent drop in employment took place between 1990 and 2000. In the study corridor, the drop in employment ranged from about five percent (Haddonfield and Cherry Hill) to 22 percent (Pennsauken).

As noted, the experience of Evesham contrasted with that of the rest of the study corridor. Between 1990 and 2000, the population grew 20 percent. In addition, the number of employed residents increased by 12 percent and employment increased by 33 percent. Evesham outpaced Burlington County, which experienced moderate rates of growth in all of these categories.

**TABLE 1
STUDY AREA DEMOGRAPHIC CHARACTERISTICS: 1990 AND 2000**

Municipality	Area (mi ²)	Population			Employed Residents			Employment			Autos / Household	
		1990	2000	Percent Change	1990	2000	Percent Change	1990	2000	Percent Change	1990	2000
Cherry Hill Township	24.2	69,348	69,960	0.9%	35,965	34,261	-4.7%	50,709	48,044	-5.3%	1.9	1.8
Evesham Township	29.7	35,309	42,275	19.7%	20,329	22,826	12.3%	16,189	21,334	31.8%	1.9	1.8
Haddonfield Borough	2.8	11,628	11,661	0.3%	5,828	5,718	-1.9%	6,380	6,126	-4.0%	1.8	1.7
Pennsauken Township	12.2	34,738	35,737	2.9%	16,935	15,972	-5.7%	29,529	23,117	-21.7%	1.6	1.6
Camden County	227.5	502,824	507,889	1.0%	240,113	235,770	-1.8%	227,933	216,931	-4.8%	1.6	1.6
Burlington County	829.0	401,191	423,397	5.5%	212,226	212,370	0.1%	195,781	202,535	3.4%	1.8	1.8

Source: 1990 Census, DVRPC 2000 and 2025 Municipal Population Estimates (based on 2000 Census), and DVRPC Preliminary 2000 and 2025 Municipal Employment Estimates (based on 2000 Census)

2.3 LAND USE

Figure 2 illustrates land use conditions in the corridor in 2000. Residential neighborhoods, in which single-family dwellings predominate, occupy much of the study area. Most commercial development lies adjacent to Route 70 or to perpendicular facilities including Kings Highway, Old Cuthbert Road, and Springdale Road. There is almost no undeveloped land in the study area. Most of the vacant or wooded land is located along the I-295 and New Jersey Turnpike right-of-way, or along the North Branch of the Cooper River. The last developable parcel of land was the Garden State Park property, but construction is under way to convert it to a mixed-use (residential and retail) center.

By stripping away the lower intensity uses from the existing land use map, concentrated nodes of commercial, industrial, and higher density residential use are revealed. Figure 3 executes this and displays the activity or development centers

in and around the study area. Table 2 lists a sampling of major employers in the study area.

The following list is a list of major development centers located within, and immediately adjacent to, the study area:

STUDY AREA DEVELOPMENT CENTERS

Access Via NJ 70:

- Airport Industrial Park, Pennsauken
- Cherry Hill Executive Campus, Cherry Hill
- Garden State Pavilions, Cherry Hill
- Garden State Park, Cherry Hill
- Ellisburg Circle Shopping Center, Cherry Hill
- Barclay Shopping Center, Cherry Hill

Access Via Springdale Road:

- Cherry Hill Industrial Park, Cherry Hill

Access Via NJ 73:

- Route 73 Retail Corridor, Evesham

**TABLE 2
MAJOR EMPLOYERS IN THE VICINITY OF NJ 70**

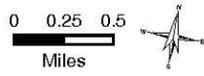
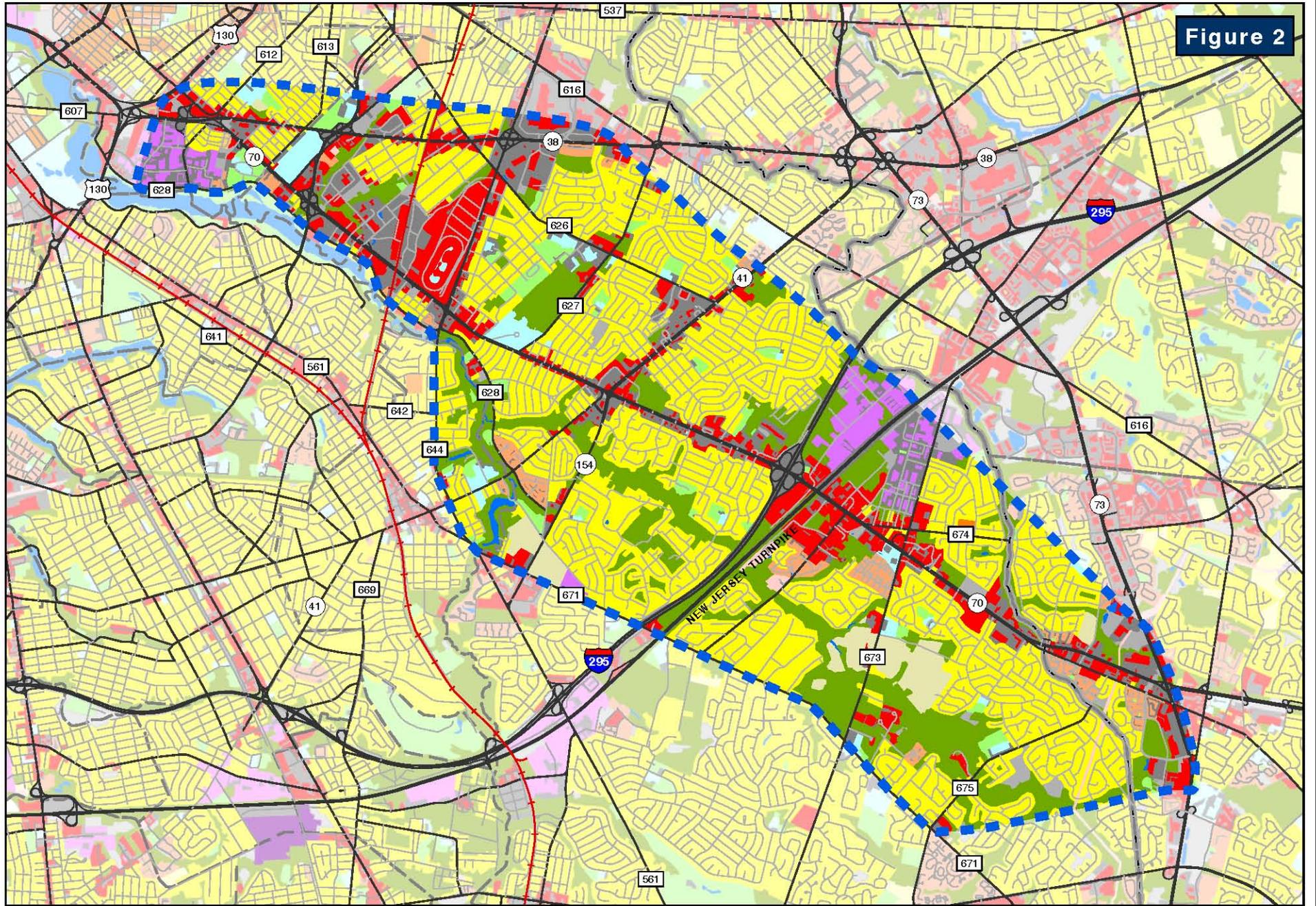
Fig. ref. #	Company	Product / Services	Full-Time Employees
1	Cooper River West	Office Building	650 employees
2	Courier-Post Newspaper	Newspaper Publisher	700 employees
3	Stone and Webster Engineering	Engineering and Construction	500 employees
4	GE Capital Mortgage Services	Mortgage Banking	500 employees
5	Subaru of America	Executive Offices	600 employees
6	Kennedy Health Systems	Hospital, General Medical and Surgical	890 employees
7	Bancroft NeuroHealth	Executive Offices	600 employees
8	West Jersey Health and Hospital	Hospital, General Medical and Surgical	850 employees

SOURCE:
D&B MarketPlace 2002
Harris Infosource 2002
www.camdencounty.com
Philadelphia Business
Journal, Book of
Business Lists 2003

NJ 70 Corridor Study

2000 Land Use

Figure 2



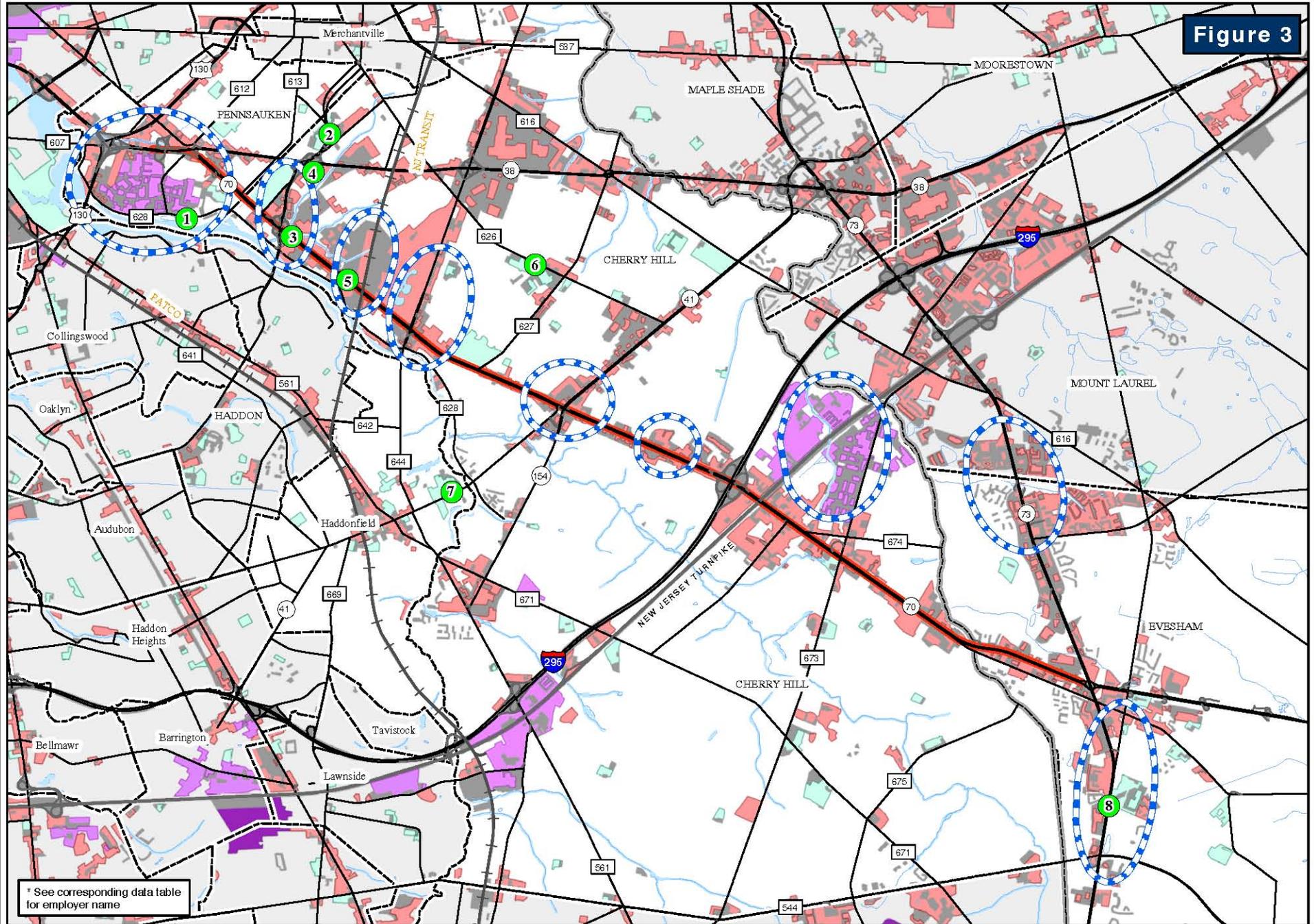
Land Use Categories for Study Area

- Residential - Single Family (Detached)
- Residential - Multi-Family
- Manufacturing - Light
- Utility
- Community Service
- Wooded
- Residential - Row Home
- Manufacturing - Heavy
- Recreation
- Vacant
- Residential - Mobile Home
- Parking / Transportation
- Agriculture
- Water

NJ 70 Corridor Study

Development Centers - 2000

Figure 3



* See corresponding data table for employer name

0 0.25 0.5 Miles		Development Center	Major Employers * 500 - 1,000 Employees	Existing Land Use (2000) Commercial	Manufacturing	Light Manufacturing	Community Services	Transportation	Delaware Valley Regional Planning Commission November 2005
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2.4 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). Typically, work trips are compressed into just two to three hours in the morning and two to three hours in the evening on any given workday. The inclination to use public transportation in completing work trips is higher than for any other trip 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.

In order to gain a better understanding of these conditions within the corridor, detailed evaluations of Journey-to-Work data from the 2000 Census were conducted. Table 3

summarizes some of the information pertinent to the study corridor. At the time the Census was conducted (April 2000) there were about 161,500 work trips made to, from and within the study corridor's municipalities. Somewhat less than one-half of the corridor's work trips were outbound to job sites (74,835), and somewhat more than one-half were inbound (86,640).

Cherry Hill and Pennsauken are net trip importers – 54 percent of worker trips in Pennsauken and 56 percent of worker trips in Cherry Hill are inbound. Evesham and Haddonfield are net exporters of work trips – between 51 and 53 percent of worker trips in these municipalities are outbound.

About 84 percent of all worker trips, both to and from the study corridor, were accomplished by driving alone in a private vehicle. Nine percent of all workers' trips were accomplished

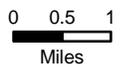
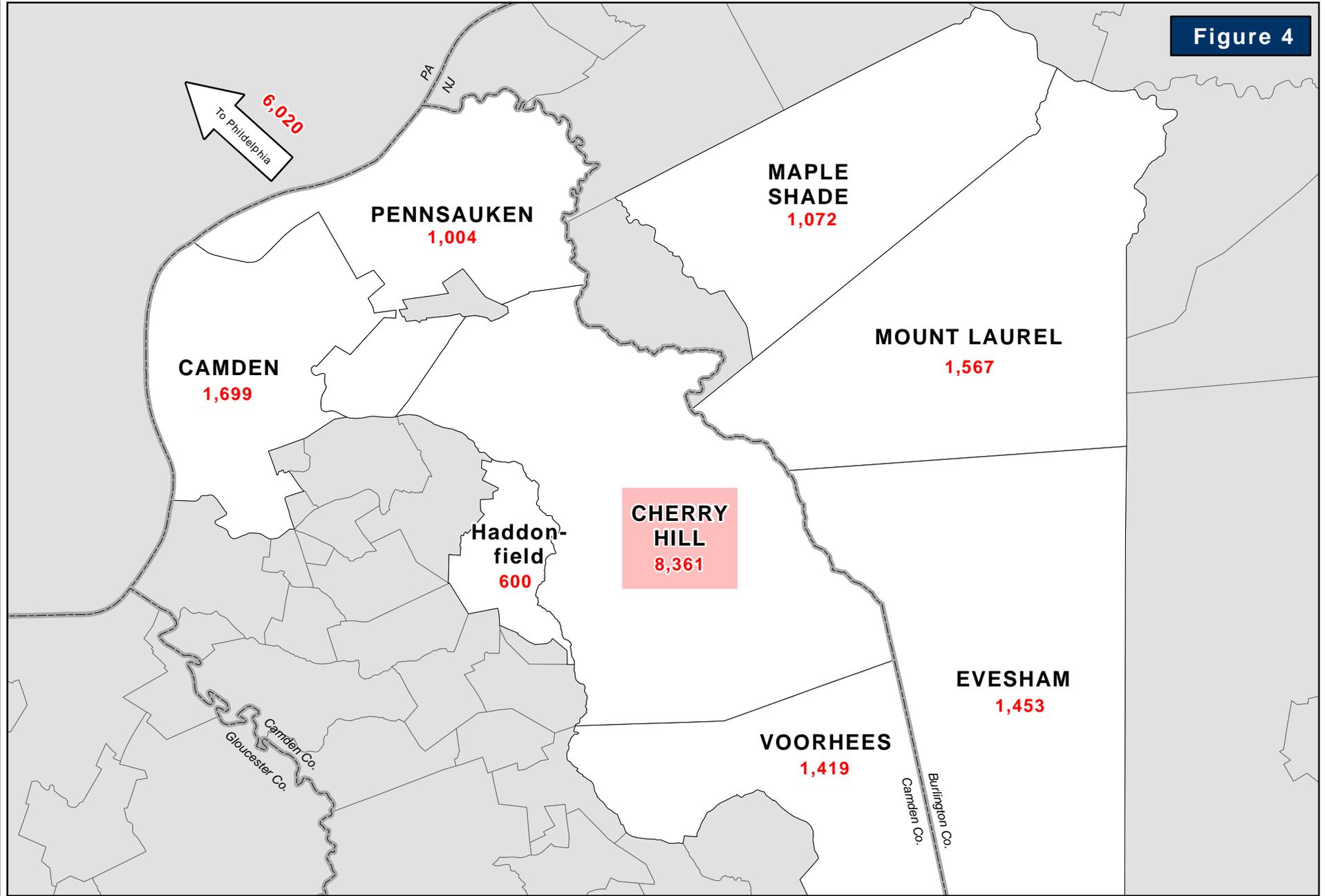
**TABLE 3
JOURNEY-TO-WORK CHARACTERISTICS**

Municipality	Workers Traveling From Municipality					Workers Traveling to Municipality				
	Total Workers	Means of Transportation				Total Workers	Means of Transportation			
		Drive Alone	Car/Van Pool	Public Transit	Other		Drive Alone	Car/Van Pool	Public Transit	Other
Cherry Hill	32,450	26,930	2,635	1,505	1,375	41,600	35,425	4,165	1,160	850
Evesham	21,825	18,740	1,670	595	825	19,120	17,070	1,550	119	380
Haddonfield	5,345	4,125	279	495	440	5,110	4,500	335	75	200
Pennsauken	15,215	11,750	1,960	865	640	20,810	16,255	2,690	980	890
Total	74,835	61,545	6,544	3,460	3,280	86,640	73,250	8,740	2,334	2,320

NJ 70 Corridor Study

Journey-to-Work Travel Patterns
FROM Cherry Hill

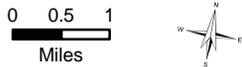
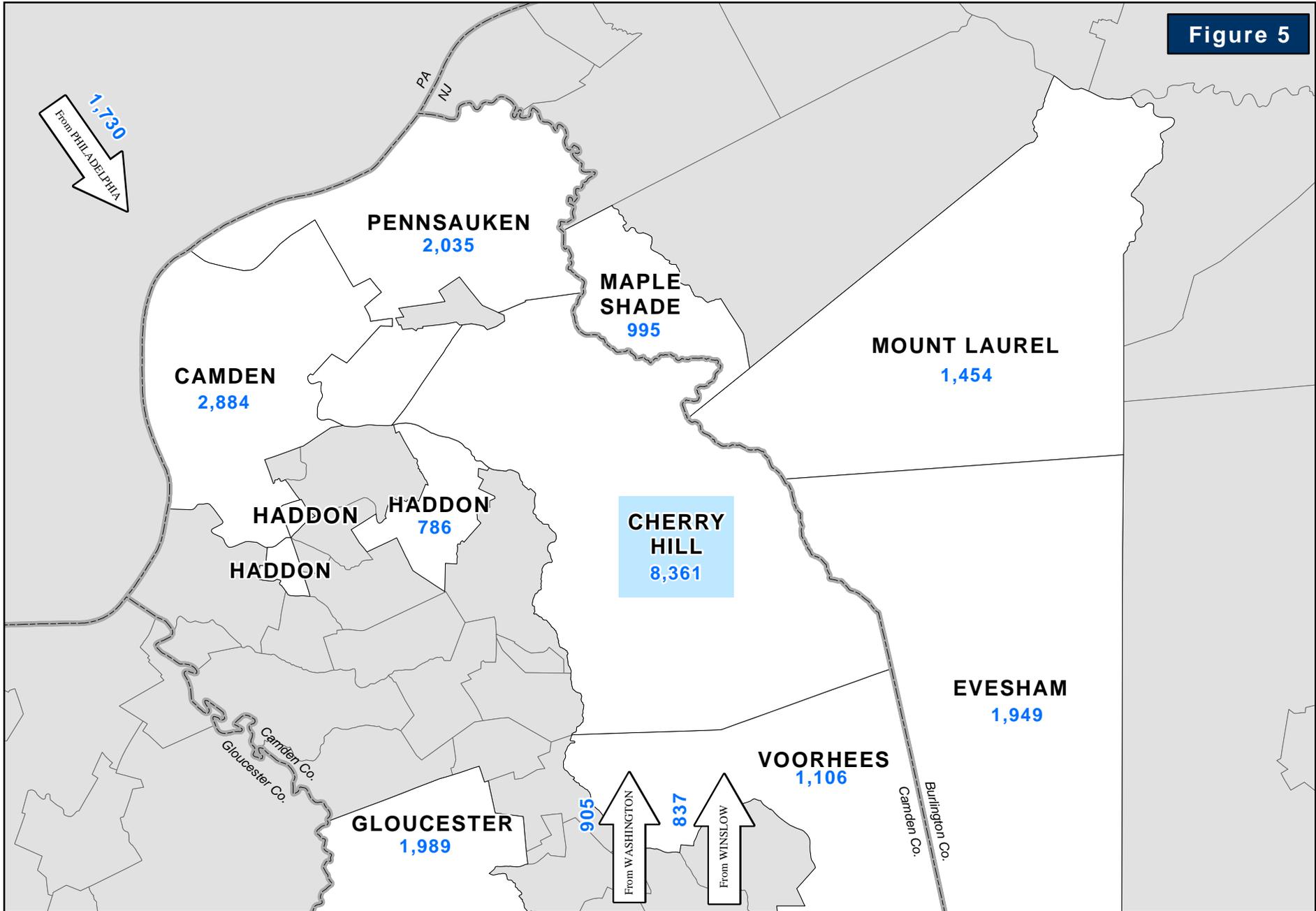
Figure 4



NJ 70 Corridor Study

Journey-to-Work Travel Patterns
TO Cherry Hill

Figure 5



through car-pooling or vanpooling. On average, four percent of total worker trips were accomplished by using public transportation (mostly outbound from the corridor) and three percent were accomplished by other means, for example by walking or riding a bicycle.

Major work trip origin-destination pairings (desire lines) to / from the corridor municipalities were determined and are shown in Figures 4 and 5. For analytical purposes work trip pairings between municipalities were identified as “major” when a threshold of 600 or more one-way worker trips, between municipal pairs, was equaled or exceeded. Figure 4 shows outbound work trips and Figure 5 illustrates inbound

Observations about the desire lines shown on the figures, are:

- ▶ There are multi-directional trips to, from, and through Cherry Hill. Although the largest trip pairing is between Cherry Hill and Philadelphia, trips pairings between Cherry Hill and westbound locations or southbound locations, are numerous.
- ▶ There is intense travel activity within Cherry Hill itself, and between Cherry Hill and adjacent municipalities.
- ▶ The trips pairing between Gloucester Township and Cherry Hill Township is another notable trip pair in the corridor.

work trips. Only trips for which Cherry Hill is a trip end are shown, but these include almost all major trip pairings. On each figure, the major work trips desire lines, those exceeding 600 work trips, are identified, with the number of trips shown in red or blue. The value in the center of the municipality, which is common to both figures, is the number of worker trips that begin and end in Cherry Hill.

2.5 FUTURE DEMOGRAPHICS

The greatest absolute increases in population are projected for Evesham Township, which shows gains of around 8,300 persons between 2000 and 2025. Over the same period, population is projected to drop in the other three municipalities, from a loss of almost 4,900 persons in Pennsauken to a loss of about 1,100 persons in Haddonfield.

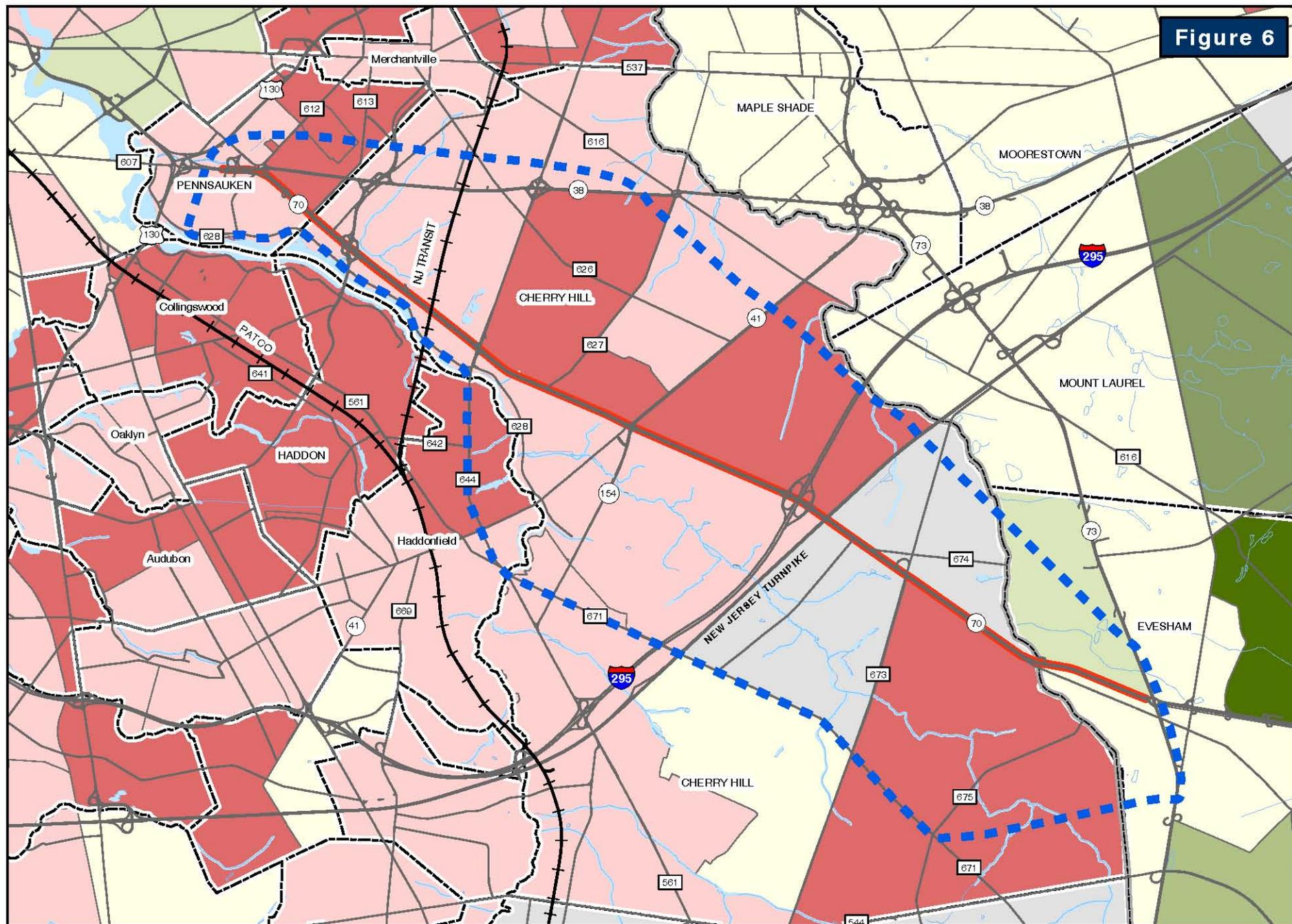
The greatest employment gains will also take place in Evesham Township (6,900 jobs), followed by Haddonfield Borough (1,500 jobs) and Cherry Hill Township (900 jobs). Only Pennsauken is projected to lose employment. It should be noted that the population and employment projections for Cherry Hill do not take into account the large mixed-use (residential and retail) development project at Garden State Park, which is currently under construction.

The total population of the study area municipalities will stay about the same, but with a significant geographical shift west.

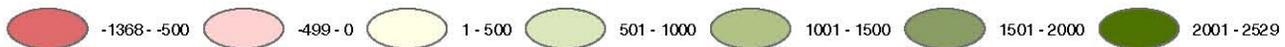
NJ 70 Corridor Study

Projected Change in Study Corridor Population 2000-2025

Figure 6



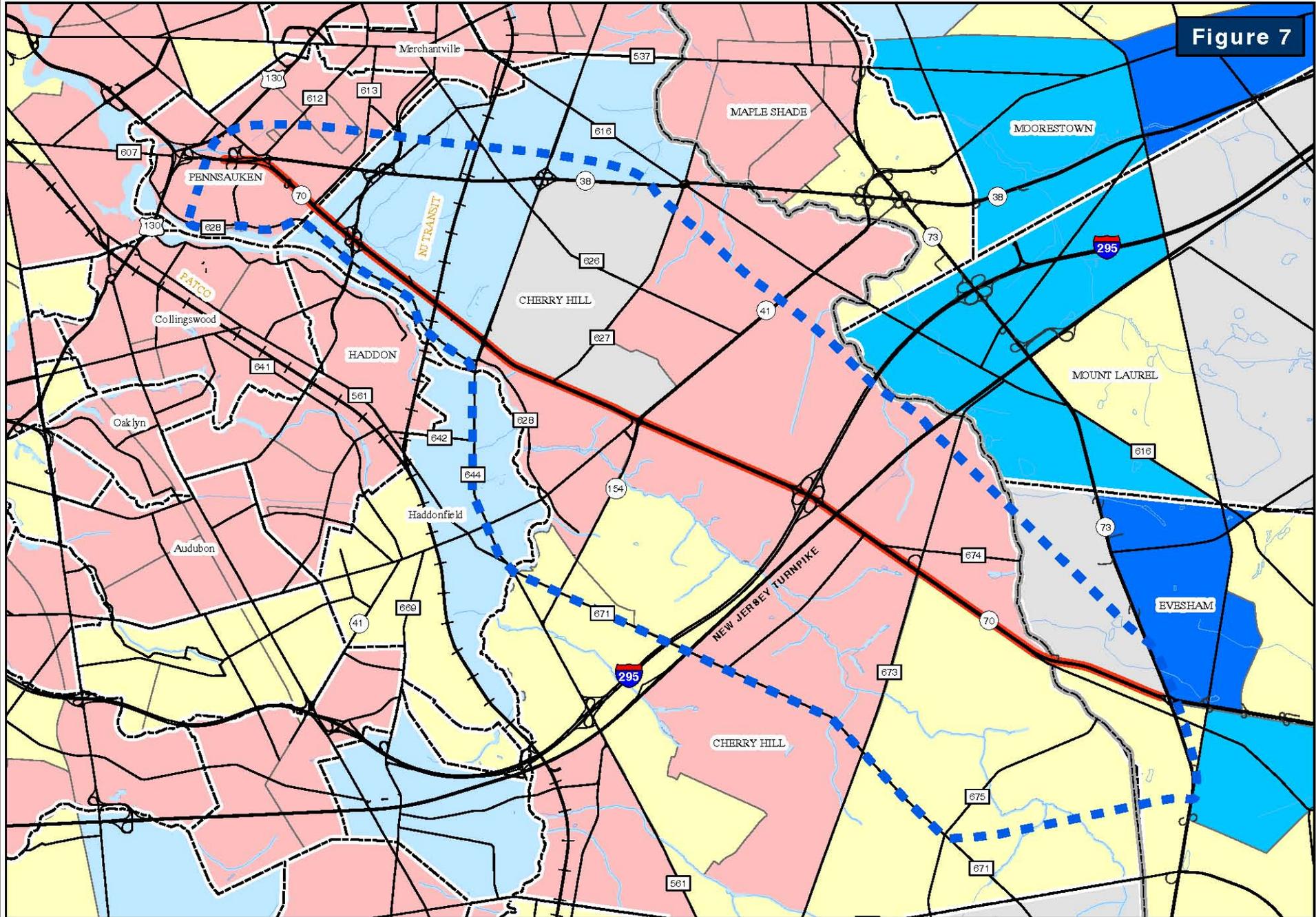
0 0.25 0.5
Miles



NJ 70 Corridor Study

Projected Change in Study Corridor Employment 2000-2025

Figure 7



0 0.25 0.5
Miles



-471 - 0 1 - 500 501 - 1000 1001 - 1500 1501 - 2000 2001 - 2099

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Municipality	Area (mi ²)	Population				Employment			
		2000	2025	Change		2000	2025	Change	
				Abs.	%			Abs.	%
Cherry Hill Township	24.2	69,960	67,050	-2,910	-4	48,044	47,155	-889	-2
Evesham Township	29.7	42,275	50,610	8,335	20	21,334	28,248	6,914	32
Haddonfield Borough	2.8	11,661	10,500	-1,161	-10	6,126	7,649	1,523	25
Pennsauken Township	12.2	35,737	30,880	-4,857	-14	23,117	21,627	-1,490	-6
Total	68.9	159,633	159,040	-593	0	98,621	104,679	6,058	6
Camden County	227.5	507,889	513,506	5,617	1	216,865	241,885	25,020	12
Burlington County	829.0	423,397	513,450	90,053	21	202,535	236,001	33,466	17

The total employment of the study area municipalities between 2000 and 2025 is projected to rise by 6 percent. Figures 6 and 7 show the magnitude of the changes by TAZs. Table 4 summarizes the projected changes to municipal population and employment.

2.6 ENVIRONMENTAL JUSTICE

A. Demographic Characteristics of the Study Area Communities

Introduction

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. Each federal agency is required to identify any disproportionately high and adverse health or environmental effects of its programs on minority populations and low-income populations. In turn, 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, including expanding their outreach efforts to low-income and minority populations.

Year 2000 Census Data for Degrees of Disadvantage

As environmental justice (EJ) is concerned with the impacts of disparate funding and disparate services on defined minority

and low-income groups, locating and mapping these groups in the region, at the smallest geographic units possible (either census tract or municipality), is important. 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 September 2001, and subsequent updates rely primarily upon available U.S. Census data. The first update expanded the categories of disadvantage by two, thus there are now eight degrees of disadvantage. These are: minorities, Hispanics, the elderly, the disabled, car less households, impoverished households, female head of household with child households, and limited English proficiency households.

Regional Threshold

A regional threshold, or average, was determined to assess whether each census tract meets or exceeds this average. A total of all persons in the specified demographic group in the nine-county region is divided by the total nine-county population to obtain this average. Each census tract that meets or exceeds the regional average is considered an “environmental justice area,” and is highlighted on the corresponding map. These tracts are areas of concern and sensitivity based on their population composition. The number of these factors that apply in a given census tract represent the “Degrees of Disadvantage (DOD).”

Application to the NJ 70 Corridor

The purpose of the NJ 70 Corridor Study is to identify transportation problem areas and provide potential

improvement scenarios. These improvements may include a wide range of options and associated costs. If a potential improvement scenario were to evolve into a project, it could possibly have environmental justice implications, irrespective to the extent of the project’s scope or cost.

The purpose of this environmental justice analysis is to identify sensitive populations within the study area. Specifically, the Degrees of Disadvantage Map can be used as an “early warning indicator” of EJ-sensitive areas. Improvement projects recommended in these areas should be evaluated concerning the extent to which they may impact neighboring communities. Although an individual project may traverse only a portion of a larger, multi-census tract area, project impacts may be felt throughout a community or even in several communities (with or without areas of disadvantage). This project level review process is governed by National Environmental Policy Act (NEPA) procedures, which now incorporate EJ concerns.

Tracts	DODs	Combined Tract Population	Percent of Total Tract Population
5	0	22,183	26%
10	1 or 2	44,154	52%
5	3 or 4	13,169	16%
2	5 or 6	5,172	6%
0	6 to 8	0	0%

Corridor Level Evaluation

The study area involves two counties, four municipalities, and twenty-two census tracts, representing 84,678 residents. These census tracts are either wholly contained within the study area or intersect its boundary. Tracts that share an outside boundary with the study area were not included. The degrees of disadvantage are shown Figure 8.

The NJ 70 corridor is linear and runs west to east from Pennsauken Borough to the western edge of Evesham borough, with Haddonfield to the south. Cherry Hill Township comprises the largest part. This corridor is a prime example of suburban sprawl out from the urban core, in this case

Camden and Philadelphia. The land is most densely developed at its western edge (Pennsauken into Cherry Hill), and becomes less densely developed at its eastern edge (Evesham). Among the census tracts in the western portion of the study area there is a higher concentration of DODs. This is not uncommon among first generation suburbs.

Of the 10 tracts that contained one or two DODs, the demographics that did not exceed the regional threshold include female headed households with children at home, impoverished households, and zero car households. Seven of these ten tracts exceeded the regional threshold of 2% for limited English proficiency, with the highest tract at 6%.

Environmental Justice Categories of Disadvantage

Poverty, or low-income, concentrations include persons whose household income is at or below the Department of Health and Human Services poverty guidelines.

“Limited English Proficiency” is defined in the U.S. Census as “Primary Language Spoken At Home Other Than English” and “Speak English Not Very Well.”

Car less households are defined in the U.S. Census as having zero vehicle availability. This population is often referred to as “transit dependent,” i.e., those who must rely on public transit for their daily travel needs and who have limited mobility.

Although no generally accepted definition of *disabled* exists in this country, the 2000 U.S. Census identifies disabled persons according to the categories of sensory, physical, mental, self-care, and employment capabilities.

In assessing elderly populations, DVRPC has chosen to define *elderly* as only those considered extremely old, age 85 and older.

Non-Hispanic minority status is derived from the year 2000 Census, for which 98 percent of respondents in the U.S. population reported only one race.

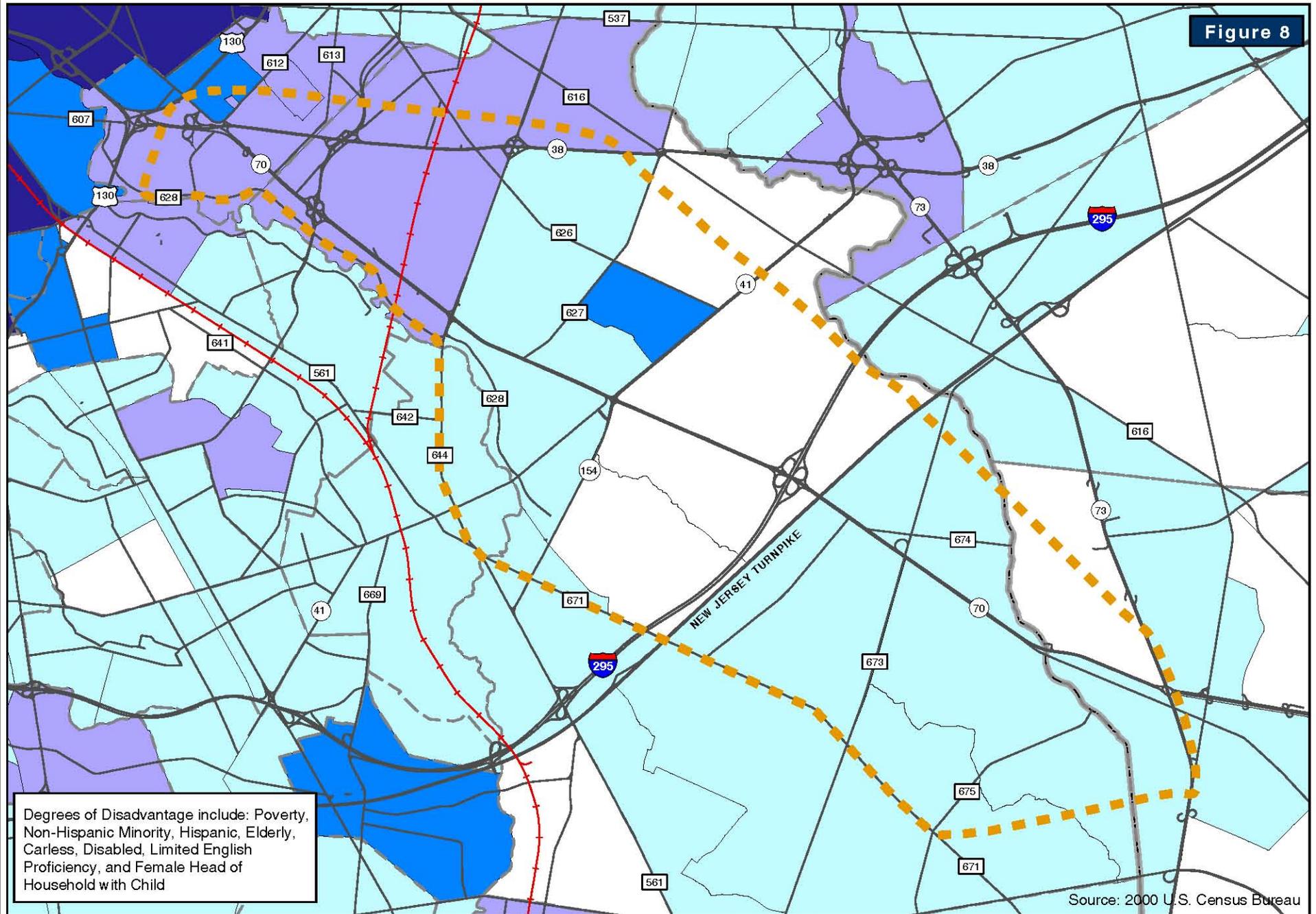
Hispanic defines persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.

“Female Head of Household with Child” is defined in the 2000 Census as a female maintaining a household with no husband present, and with at least one child under 18 years old who is a son or daughter by birth, marriage (a stepchild) or adoption residing in the home.

NJ 70 Corridor Study

Environmental Justice Degrees of Disadvantage

Figure 8



0 0.25 0.5
Miles



2000 Census Tract

○ 0 Degrees of Disadvantage

○ 1 - 2 Degrees of Disadvantage

○ 3 - 4 Degrees of Disadvantage

○ 5 - 6 Degrees of Disadvantage

○ 7 - 8 Degrees of Disadvantage

The next highest demographic represented was the elderly. Six of these 10 tracts exceeded the 2% regional threshold for elderly population, with the highest at 5%.

Concerning the 5 tracts with 3-4 degrees of disadvantage, only zero car households was not represented. Four of these five tracts are located in Pennsauken Township, the other in Cherry Hill Township.

Census tract 3400733.03, located in Cherry Hill Township on the north side of NJ 70 in the vicinity of the Windsor Park neighborhood, is the only tract wholly within the study area that contains 5 degrees of disadvantage, making it somewhat of an anomaly compared to adjacent tracts. The 5 demographics include limited English proficiency at 3% (region = 2%), disabled persons at 15% (region = 7%), zero car households at 22% (region = 16%), poverty at 12% (region = 11%), and an elderly population of 10% as compared to the regional threshold of 2%. This tract had 2,572 people in 2000.

The other tract with five DODs is number 3400725.03, located in Pennsauken Township. This tract, also over represented in five demographic categories, does not exceed the regional thresholds for elderly population, zero car households, or impoverished households. Of most significance are this tract's minority populations. In 2000, it had a non-Hispanic minority population (53%) more than double the regional threshold of 24%. Also significant is the tract's Hispanic population of 25%, which is five times the regional threshold of 5%. This tract had 2,600 people in 2000.

B. EJ Implications for Users of Alternative Transportation Modes within the Study Area

The first part of this analysis considered the degrees of disadvantage for the census tracts within the study area. In less detail here the demographics of the non-motorized traveling public are considered, i.e.: transit riders, pedestrians, and bicyclists.

The concern is that NJ 70 has evolved more as an auto-oriented facility, and not a multi-modal facility. Non-motorized travelers on NJ 70 in the study area are subject to inadequate, inconsistent, and many times unsafe facilities. This is particularly true when making connections between bus and destination, i.e. pedestrian and bicycle amenities.

This information is a finding from the transit analysis in section 3.3 Public Transportation. The zonal transit boardings data reveals that nearly two-thirds of all bus trips in the corridor (65%) originate west of the study area in Camden or Philadelphia. The densely developed urban areas of Philadelphia and Camden serve as a primary point of origin for employees or shoppers who take transit to the study area. Only five percent of the riders are originating from areas east of the study area where new residential developments are found.

When examining the degrees of disadvantage map it is clear that the census tracts located east of the study area typically

The densely developed urban areas of Philadelphia and Camden serve as a primary point of origin for employees or shoppers who take transit to the study area.

experience more degrees of disadvantage, and have higher concentrations of poverty, and of zero car households. These are two demographics common among the transit dependent population, a population that is characteristic of Camden City and of certain neighborhoods in Philadelphia.

Although proposed transportation improvements to NJ 70 may not pose a particular hardship to the study area census tract populations, the improvements may negatively impact the non-motorized users of the corridor. Improvements to automobile environment on NJ 70 already make these already inadequate facilities worse, i.e.: longer pedestrian crossings, higher vehicle speeds, compromised safety.

Planned roadway improvements must be evaluated in terms of the negative impacts they pose to the users of alternative modes of transportation, i.e. pedestrians, bicyclists, and transit riders.

2.7 ENVIRONMENTAL SCREENING

The New Jersey Department of Transportation's concept development study process requires an environmental screening to identify/evaluate environmentally sensitive features located within the study area. The Delaware Valley Regional Planning Commission completed this task for the Route 70 corridor as part of the coordinated study effort between the two agencies. This information is included in both the NJDOT and the DVRPC studies. This evaluation is necessary so that potential impacts resulting from proposed improvements will be considered. The screening includes data on the following environmental sensitivities: wetlands, floodplains, open space, potential hazardous waste sites, threatened and/or endangered species, historic sites and community facilities.

Environmental data, community facilities data, and wetlands and open space data are depicted on corridor-level maps. Details of these data, plus additional data not included on the maps are provided in accompanying tables. The complete environmental screening with associated tables and maps is included in the appendix.

Data was gathered from the following agencies and sources in compiling the environmental sensitivities inventory:

- U.S. Fish and Wildlife Service
- New Jersey Office of State Planning

- DVRPC's Open Space Inventory
- US Environmental Protection Agency's Superfund Sites
- New Jersey Register of Historic Places
- National Registers of Historic Places
- New Jersey Department of Environmental Protection
 - Known Contaminated Sites for New Jersey, 2001
 - Natural Heritage Database and Landscape Project
 - Historic Preservation Office

Environmental Screening - Major Findings:

- ▶ No historic sites are located on or adjacent to NJ 70.
- ▶ While there are no wetland areas that are immediately adjacent to NJ 70, there are four locations that fall within flood prone areas.
- ▶ Contaminated sites, mostly service stations, were identified in the vicinity of the following intersections: Haddonfield Road, Greentree Road, Georgia Avenue, Springdale Road, Kings Highway, Conestoga Drive, Kingston Road, and Cropwell Road.

3



TRANSPORTATION SYSTEM

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NEIGHBORHOODS ► CONGESTION ► CRASHES ► ACCESS / MOBILITY ► IDENTIFIED PROBLEM LOCATIONS ► POTENTIAL IMPROVEMENT SCENERIOS

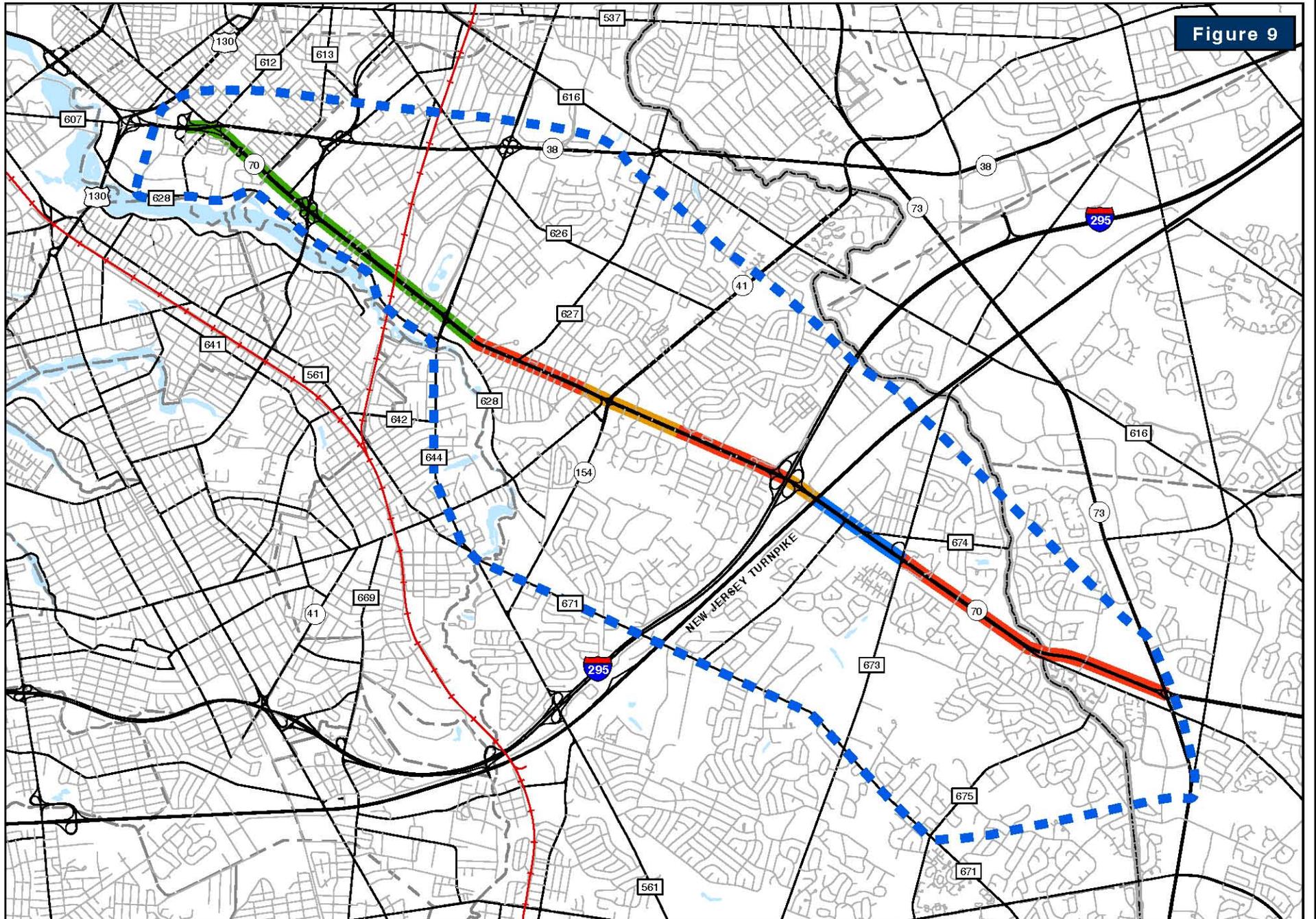


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NJ 70 Corridor Study

Road Network and NJ 70 Lane Configurations

Figure 9



0 0.25 0.5
Miles



Lanes: 4
Median Type: Unprotected
Shoulder: YES

Lanes: 6
Median Type: Unprotected
Shoulder: YES

Lanes: 6
Median Type: Unprotected
Shoulder: NO

Lanes: 8
Median Type: Unprotected
Shoulder: NO



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3.1 ROAD NETWORK

The NJ 70 corridor is well connected to the regional highway system, the county route system, and the local street network (see Figure 9 on preceding page). Table 6 lists the major study corridor facilities and selected characteristics of each. At the western end of the study area NJ 70 connects with US 130 and US 30 via NJ 38. US 130 follows the Delaware River and connects Delaware State with central New Jersey. US 30, known as the White Horse Pike, is a long established route between the Ben Franklin Bridge and Atlantic City. NJ 38 parallels NJ 70 and connects with US 206 in central Burlington County.

Between NJ 38 and NJ 41 Kings Highway, several county routes connect with NJ 70 providing north-south access to surrounding neighborhoods and municipalities. Cuthbert Boulevard (CR 636) is the only county facility that meets NJ 70 at a grade separated, full cloverleaf interchange. Cuthbert is the primary access facility to NJ 70 and NJ 38 for residents of Haddon Township, and Collingswood and Audubon Boroughs. It also provides access to the Cherry Hill Executive Campus and the NJDOT State Inspections Station. Other important north-south routes in this section include Haddonfield Road/Grove Street (CR 644), Cooper Landing Road (CR 627), NJ 41 Kings Highway, and NJ 154 Brace Road. Park Boulevard (CR 628) and Chapel Avenue (CR 626) are heavily traveled east-west routes that parallel NJ 70.

I-295 is a six-lane interstate highway serving both local and regional traffic needs of southern and central New Jersey, and carries traffic from Delaware. Through the study area, I-295 parallels the New Jersey Turnpike (NJTPK) and interchanges with NJ 70 near the Barclay section of Cherry Hill Township. The turnpike is a four-lane toll freeway carrying traffic from the Delaware state line to the New Jersey/New York border serving higher density population centers in northern New Jersey. North of exit 7 the turnpike is designated as I-95. Interchange four of the turnpike is north of the study area at NJ 73. The turnpike does not have an interchange at NJ 70.

Kresson Road (CR 671) and Greentree Road (CR 683) are east-west facilities serving retail and residential destinations in the NJ 70 corridor area. Greentree Road is a heavily utilized connector between NJ 70 and NJ 73. Springdale Road (CR 673) is the main access facility into the Cherry Hill Industrial Park, located east of I-295 on the north side of NJ 70. Cropwell Road (CR 675) carries both regional and local traffic between Old Marlton Pike and Voorhees Township. Both Springdale Road and Cropwell Road are north-south facilities.

Located at the eastern end of the study area, NJ 73 is a regional facility that connects the Tacony-Palmyra Bridge to Philadelphia with the Atlantic City Expressway in southeastern Camden County near the Atlantic County border. NJ 73 and NJ 70 meet at a modified traffic circle that incorporates traffic signals. The New Jersey Department of Transportation plans to reconstruct this junction as a grade-separated interchange in three to five years.

**TABLE 6
CHARACTERISTICS OF MAJOR STUDY CORRIDOR ROADWAYS**

Roadway	Limits	Ownership	Functional Classification	Lanes by Direction	Posted Speed (mph)
NJ 70	NJ 38 to Curtis Ave.	NJDOT	Principal Arterial	3	45
	Curtis Ave. to Maine Ave.	NJDOT	Principal Arterial	2	45
	Maine Ave. to Sawmill Rd.	NJDOT	Principal Arterial	3	45
	Sawmill Rd. to I-295	NJDOT	Principal Arterial	2	45
	I-295 to NJTPK	NJDOT	Principal Arterial	3	45
	NJTPK to Springdale Rd.	NJDOT	Principal Arterial	4	45
	Springdale Rd. to NJ 73	NJDOT	Principal Arterial	2	45
NJ 38	NJ 70 to NJ 73	NJDOT	Principal Arterial	2-3	50
Cuthbert Boulevard	Haddon Ave. to NJ 38	Camden County (CR 636)	Principal Arterial	1-2	25
Park Boulevard	US 130 to Kings Highway	Camden County (CR 628)	Minor Arterial	1	35
Haddonfield Rd./Grove St.	Kings Highway to NJ 38	Camden County (CR 644)	Principal Arterial	1-2	25-30
Chapel Avenue	NJ 38 to Old Cuthbert Rd.	Camden County (CR 626)/Cherry Hill Twp.	Minor Arterial	1	25
Cooper Landing Road	NJ 70 to NJ 38	Camden County (CR 627)	Minor Arterial	1	40
NJ 41 Kings Highway	Haddon Ave. to N 73	NJDOT	Minor Arterial	1-2	40-45
NJ 154 Brace Road	Haddonfield-Berlin Road to NJ 70	NJDOT	Principal Arterial	1	40
Interstate 295	Exit #34	NJDOT	Interstate	3	65
New Jersey Turnpike	Exit #3	NJ Turnpike Authority	Freeway / Expressway	2	65
Kresson Road	Haddonfield-Berlin Rd. to Cropwell Rd.	Camden County (CR 671)	Minor Arterial	1	35-40
Greentree Road	NJ 70 to NJ 73	Camden County (CR 683)	Minor Arterial	1	40
Springdale Road	Kresson Rd. to Church Rd.	Camden County (CR 673)	Minor Arterial	1-2	25-40
Old Marlton Pike	NJ 70 to NJ 73	Camden County (CR 600)	Minor Arterial	1	35
Cropwell Road	Kresson Road to Old Marlton Pike	Camden County (CR 675)	Minor Arterial	1	25-45
NJ 73	Church St. to Greentree Rd.	NJDOT	Principal Arterial	4	50

3.2 TRAFFIC VOLUMES

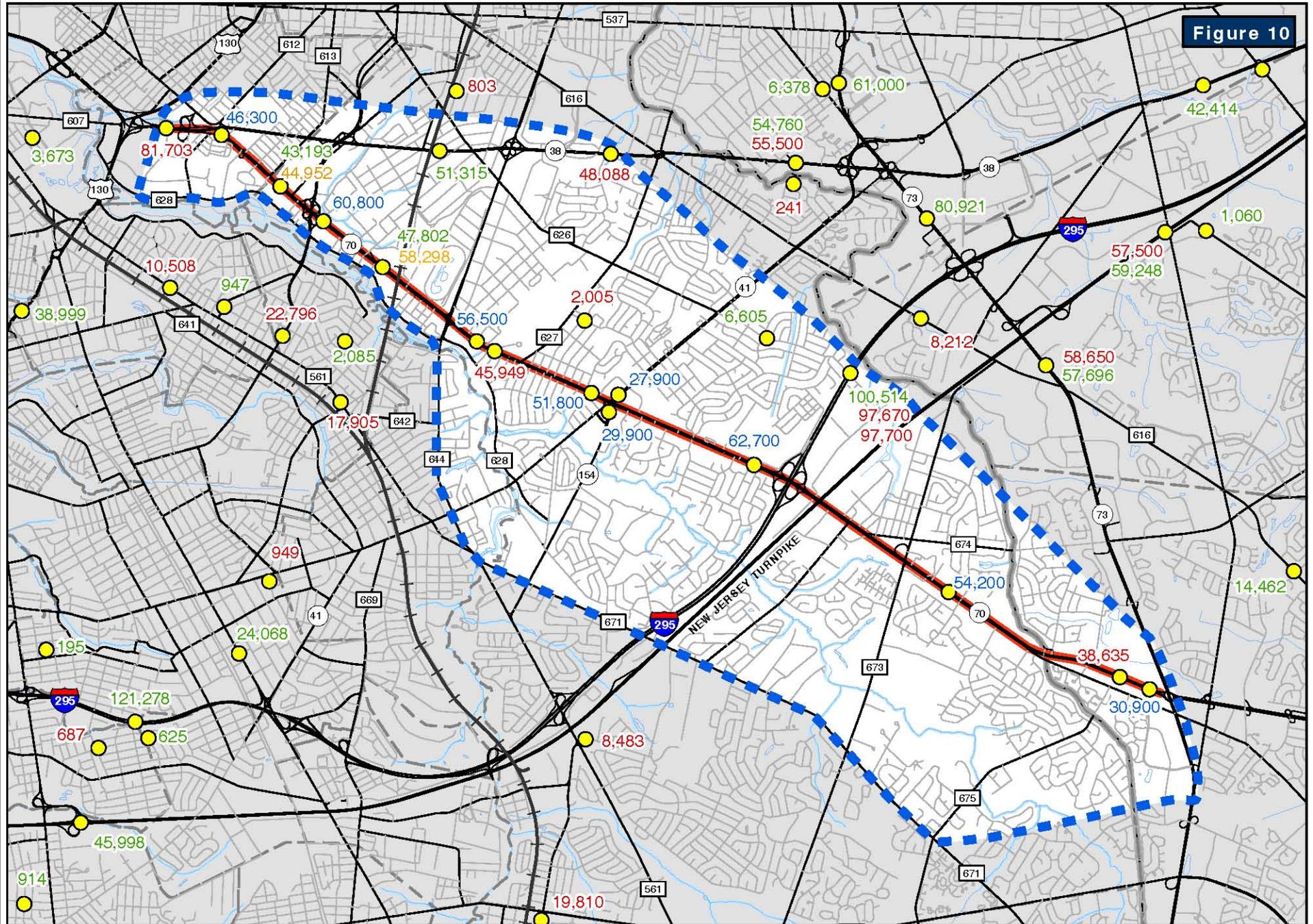
Figure 10 illustrates daily traffic levels occurring along Route 70 and the rest of the study area highway network since 1999. Daily demand peaks at two locations on Route 70: 1) the I-295 / New Jersey Turnpike corridor, and 2) Cuthbert Boulevard. The traffic volume is 73,000 vehicles per day near I-295 and around 71,000 vehicles per day at Cuthbert Boulevard. Between these two locations, at Kings Highway, volume drops to around 60,000. East of Cuthbert, near the nexus with

Route 38, volume drops further, to 54,000. West of I-295, traffic falls off sharply at Old Marlton Pike (Route 600), a parallel facility. At the intersection with Route 73 at Marlton Circle, volume subsides to 36,000 vehicles per day. Other major facilities within the corridor include I-295 and the New Jersey Turnpike. Daily traffic volumes on I-295 are around 99,000 vehicles per day (2000). The New Jersey Turnpike carries approximately 52,000 daily vehicles, to the east of the Route 70 interchange, and 66,000 vehicles, to the west of Route 70.

NJ 70 Corridor Study

Traffic Volumes

Figure 10



0 0.25 0.5
Miles



Average Annual Daily Traffic (AADT)

● Traffic Count Location

15254 1999 Traffic Count
15254 2000 Traffic Count
15254 2002 Traffic Count
(Source: NJDOT)

15254 2003 Traffic Count
(Source: Michael Baker Corp.)

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3.3 PUBLIC TRANSPORTATION - BUS

Public Bus Transportation in the Corridor

Bus transportation within the study area is composed of six bus routes, they are routes 405, 406, 413, 450, 455, 457. Only the Route 406 runs along NJ 70 while the other five either cross or parallel NJ 70. These are illustrated in Figure 11. Philadelphia and/or Camden are the primary origins for these services and their destinations lie just outside the study area at either the Cherry Hill or Moorestown malls (including East Gate Business Center and Mount Laurel Corporate Park).

Bus service also runs through employment centers and industrial parks along Route 70, such as the Airport Industrial Park and Cherry Hill Industrial Park. These are significant developments. The other site of note requiring comment is the Garden State Park development project. This is a 223-acre tract being developed as a suburban center with existent access to New Jersey Transit's Cherry Hill railroad station and two other bus routes.

Within the study area there are two rail stations with connections to buses: the PATCO Haddonfield station and New Jersey Transit's Cherry Hill station on the Atlantic City rail line. Both of these have service into Philadelphia. The Haddonfield station has connections with the 455 and 457 buses, while the Cherry Hill station has connections with the 450 and the 406 buses.

Bus Routes Serving the Study Area

Route 405 service runs from Philadelphia to the Cherry Hill Mall via Merchantville, largely running along Maple Avenue (CR 537) to Chapel Avenue (NJ 626) to Haddonfield Road (CR 644) north to the Cherry Hill Mall. Eight trips per day go from the mall along Chapel Avenue to Kingston Estates, which lies just inside the study area. The travel time between Philadelphia and the mall is about 50 minutes per trip while the return trip varies between 33 to 40 minutes.

There are 20 trips to the mall arriving between 7:10 am and 10:19 pm for a 15-hour span of service. There are 21 trips departing the mall between 8:14 am and 11:30 pm for a 15-hour span of service. Both outbound and inbound service to the Camden Housing Authority ceases at 5:22 pm, consequently shortening the trip time by about seven minutes. There are nine arriving trips to Kingston Estates and eight departing trips during the typical morning and afternoon peaks. There is also a single midmorning trip leaving 10:26 am and arriving 10:53 am.

Route 406 service runs from Philadelphia to Marlton with variations outside the study area to Berlin and Medford Lakes. The bus runs along Marlton Pike (NJ 70) from the intersection of Marlton Pike and Roosevelt Avenue to Marlton Circle (NJ 70 and NJ 73) through the length of the study area. Within the study area there is service from 5:11 am to 1:06 am for a 20-hour span of service. The 406 bus makes about 39 runs per day along the main portion of NJ 70 with eight morning and four evening trip variations to include the Cherry

Hill Industrial Park. The 406 bus will be discussed in further detail below.

Route 413 runs service from Philadelphia to Burlington via Mt. Holly. It runs through the study area along Kaighn Avenue (NJ 38), with a loop in Pennsauken through the Airport Industrial Park (3 in the morning and 2 in the afternoon), a stop near the Cherry Hill Mall and another loop through the Moorestown Mall. The bus runs from 5:52 am to 1:11 am for a 19-hour span of service. Route 413 makes about 21 trips along the NJ 38 corridor passing through the western portion of the study area.

Route 450 runs from Camden to Cherry Hill Mall, passing through the study area in a north-south direction. Buses travel on Cuthbert Road (CR 636) crossing Marlton Pike (NJ 70) and circulating through the Garden State pavilion Shopping Center and making a stop at the Cherry Hill train station (NJT). The bus then exits onto Cuthbert Road again and travels east on Kaighn Avenue (NJ 38) to Haddonfield Road to the Cherry Hill Mall.

The first service (from Audubon) commences at 4:40 a.m. with the last bus arriving in Camden at the Walter Rand Transportation Center at 11:08 pm for a 19-hour span of service. There are eighteen outbound and nineteen inbound trips, not including some short-run variations in the morning between Audubon and Camden. There is half-hour service at the Cherry Hill train station during the peak periods between 6

am and 9 am, and 4 pm and 7 pm, and hourly service during the off peak.

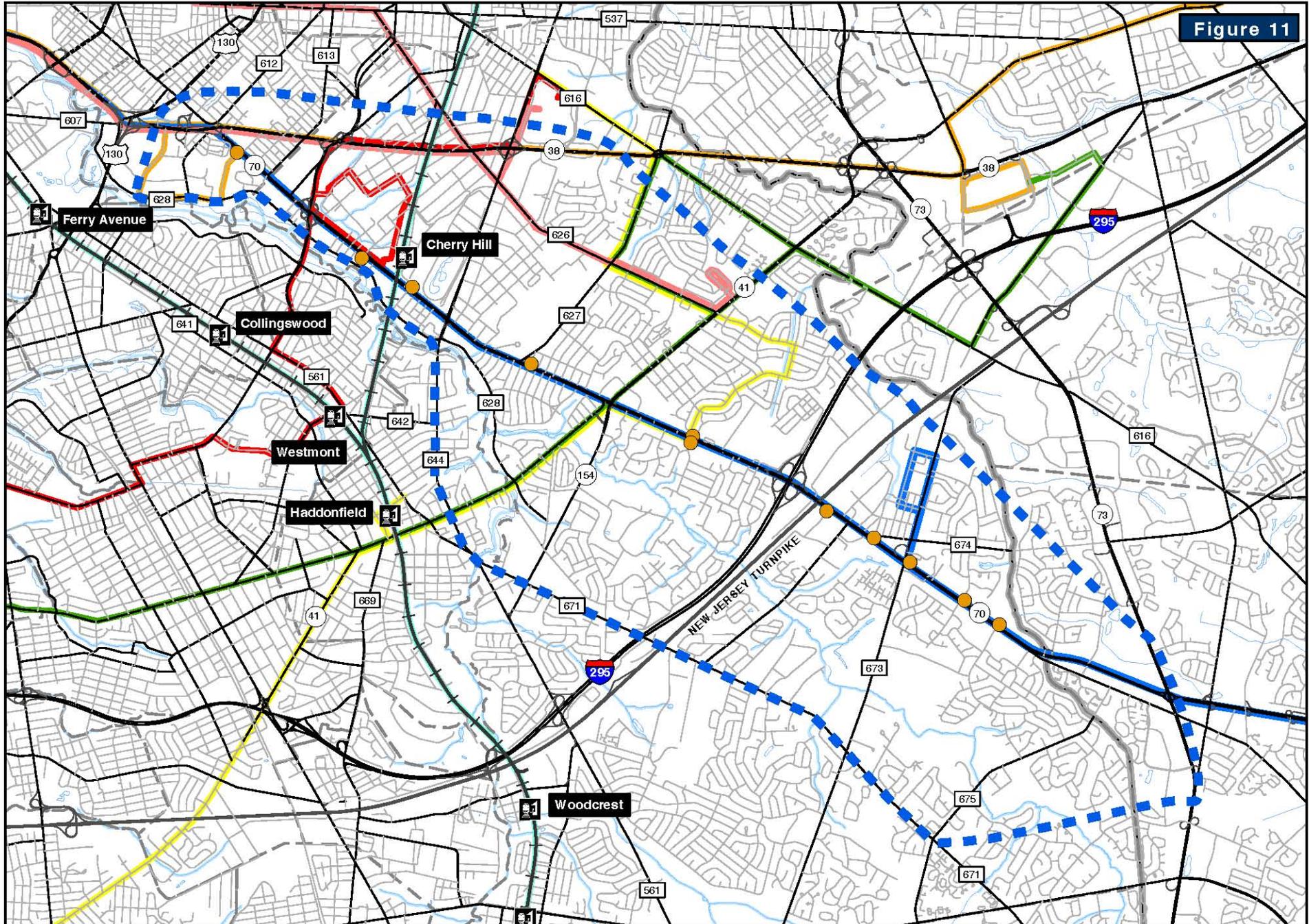
Route 455 runs from Paulsboro to the Cherry Hill Mall, passing through the study area along a north-south axis. Buses travel north on Clements Road (NJ 41) to Kings Highway (NJ 41) connecting with the Haddonfield train station (PATCO), then back onto Kings Highway to Marlton Road (NJ 70) east to Kingston Drive and then west on Chapel Avenue (CR 626), then circling into Cherry Hill Mall via Cooper Landing /Church / Haddonfield roads. The first bus out leaves National Park at 5:47 am while the final bus arrives in Paulsboro at 11:22 pm, for a service span of about seventeen and one half hours. Service runs hourly all day in each direction with eighteen outbound and seventeen inbound trips daily.

Route 457 runs from Camden to Moorestown Mall traveling north on Kings Highway (CR 551), to loop around the Haddonfield Train Station (PATCO) where it continues on Kings Highway (now NJ 41), turning east on Church Road (CR 616) and north again on Fellowship Road (CR 673) looping back at Harper Drive into the Moorestown Mall.

The first bus departs the Haddonfield train station inbound to Camden at 5:52 am and arrives in Camden at 11:08 pm for about a seventeen hours span of service. There is hourly service during the off peak and half-hourly service in the peak periods. There are twenty inbound and nineteen outbound trips daily.

NJ 70 Corridor Study

Figure 11



0 0.25 0.5
Miles



- Study Area
- Rail Station
- Bus Shelter

Transit Routes

- 405 - Philadelphia/Merchantville/Cherry Hill Mall
- 450 - Camden/Audubon/Cherry Hill Mall
- 406 - Philadelphia/Berlin/Marilton
- 413 - Philadelphia/Mt. Holly/Burlington
- 455 - Cherry Hill Mall/Woodbury/Paulsboro
- 457 - Camden/Moorestown Mall
- PATCO / NJ Transit



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Bus Route Boardings

Table 7 provides figures for the daily boardings on each route in the corridor. The level of service (LOS) provided by the buses through the corridor is largely west the New Jersey Turnpike where the concentrations of population and employment are located. As noted in the route descriptions, most of the bus service along the corridor connects Philadelphia/Camden with the two regional malls, Cherry Hill and Moorestown.

The daily bus boardings are highest for the 406 bus (2,058 daily) and lowest for the 455 and 457 buses with 792 and 782 boards respectively. The other buses, 406, 413, and 450 have the greatest average boardings. The 413 and 450 buses have the highest average boardings, due in part to frequent connections between Camden and Cherry Hill Mall. The 413 also loops though the Airport Industrial Park and passes the

Route	Daily Boards	Total Trips	Avg. Boards Per Trip	Peak Trips *AM / PM	Peak As % of Total Trips
405	1,049	45	23	8 / 9	38%
406	2,058	75	27	20 / 15	47%
413	1,554	48	32	9 / 10	40%
450	1,299	41	32	8 / 7	37%
455	792	35	23	6 / 7	37%
457	782	38	21	10 / 8	47%

Source: New Jersey Transit, Median Ridership Report, May 2003
 * Peak periods are between 6 am and 9 am and between 4 pm and 7 pm.

Moorestown Mall. The 450 includes a stop at the Garden State Park site, which is currently being redeveloped, and New Jersey Transit’s Cherry Hill Station, where transfers between the modes are minor.

The trip frequency for all bus routes is about every 30 minutes, though the frequency increases in the peak hours. Peak hour service in the morning and the evening accounts for between one-third and one-half the total service provided.

Patterning of Bus Ridership in Study Corridor

The transit customers’ pattern of movement through, inside, and between the study area and adjoining areas provides insight as to how transit is used. Using New Jersey Transit zonal farebox data matched to the study area, one may generalize about origins and destinations of bus riders in the study area. This information also provides insight into how this movement relates to the corridor.

The method samples ridership on the identified bus routes: 405, 406, 413, 450, 455, 457. Three-day samples were taken midweek Tuesday, Wednesday, and Thursday on the 4th, 5th and 6th of November in 2003. Geography inside and outside the study corridor were matched with the NJ Transit zones. Ridership was tabulated between these zones. The counted trips include through the corridor, within the corridor, and internal-external trips. Trips occurring entirely outside the study corridor were not tabulated. These totals were averaged to provide a representative daily travel movement. The ridership numbers in Table 8 assume symmetry, meaning that

the numbers shown express ridership only in one direction. The results are shown numerically in Table 8 below.

Table 8 shows the distribution of transit trips along the Route 70 study area. As stated above, these are drawn from fare box counts in November 2003 and are not the same dataset as the average daily boards shown in Table 7.

Route	Through Trips	Internal Trips	Phil/Camden Ex – In	Other Ex-In	Totals	Route %
405	na	35	270	na	305	15%
406	13	113	663	9	798	40%
413	246	7	177	33	463	23%
450	na	25	106	na	131	7%
455	na	82	30	na	112	6%
457	25	72	54	55	206	10%
Totals	284	334	1300	97	2015	
% Trip Type	14%	16%	65%	5%		

Source: New Jersey Transit Farebox Passenger Count, November 2003

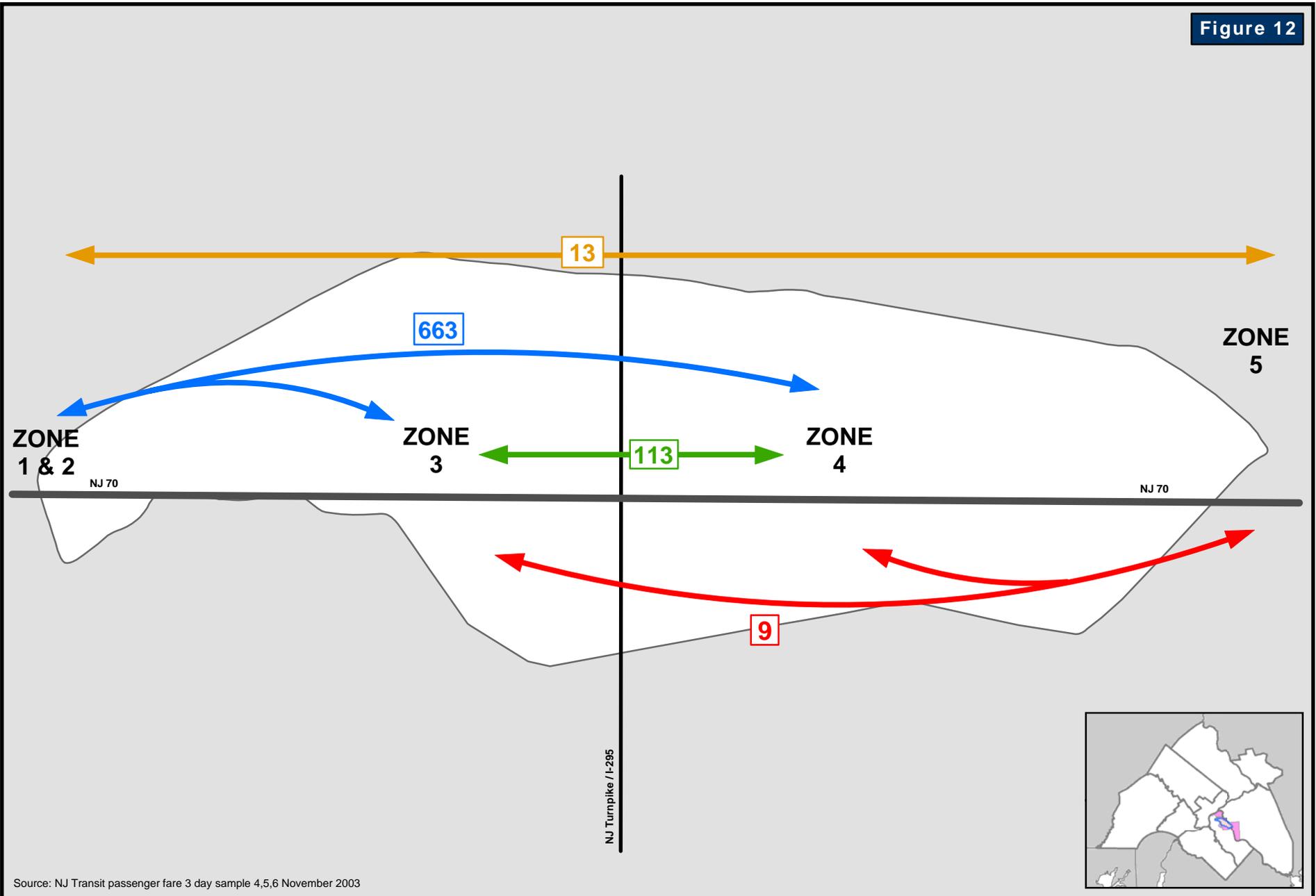
There are about 2,015 total riders traveling in and about the corridor in this sample. About 40 percent of these trips are on the 406 bus which travels along Route 70 through the study corridor. The distribution of 406 bus trips through the study area is depicted on Figure 12. The other bus services generally cross the Marlton Pike with destinations at either the Cherry Hill or Moorestown Malls, rather than along the corridor (see Figure 11). The 405 bus, ending at the Cherry Hill Mall and the 413 bus with stops at the Cherry Hill Mall and

Moorestown Mall, have other destinations within the study corridor at Kingston Estates and Airport Industrial Park respectively. The large number of through trips on the 413 bus may be explained by the attractiveness of the twin mall destinations. The distribution of trips on other bus routes is somewhat smaller than the total trips shown in Table 7. In these cases the study corridor is not a destination but a through-way, between points with little passenger pick up in between.

Table 8 shows nearly two-thirds of all trips in the corridor (65%) originate in the western side of the study area in Philadelphia/Camden. This densely populated area serves as a primary point of origin for employees or shoppers who take transit to the Route 70 corridor. The Walter Rand Transportation Center in Camden is also a transportation hub collecting and distributing trips between north/south bus routes and service to the east. Only 5 percent of the riders are originating to the east of the study area, an area of new growth and residential development, but currently less developed than the urban west side of the study area.

The remaining 30 percent of trips move through the corridor and within the corridor. These trips make up about 14 and 16 percent portions, respectively. A number of the bus routes (405, 450, 455) do not have routings or zonal designations which permit through trips to be counted. The through trips generally originate in Philadelphia or just over the Delaware river with about 87 percent of the through trips carried on the 413 bus.

Figure 12



Source: NJ Transit passenger fare 3 day sample 4,5,6 November 2003



The breakdown of the 246 through trips has about 70 percent, or 172 trips, between Philadelphia and Pennsauken to the Moorestown Mall. Internal trips originating and arriving within the study corridor make up about 16 percent of the trips. The 455 bus has the greatest route portion of trips within the study area, 73 percent, while the 406 bus has the greatest number of internal trips with 34 percent. Some of these trips may be outside the study area due to zonal anomalies in the tabulations, such as Cherry Hill Mall being included as internal.

From the analysis it can be surmised that public transit is not currently being used as a means to travel within the corridor but rather as a means to gain access to employment or shopping from outside the corridor. Public transit is not being used as a mobility option for those residing within the corridor.

Transit Issues And Recommendations For NJ 70:

- ▶ Transit service along NJ 70 is inhibited by congestion. Dedicated bus lanes would make transit more efficient.
- ▶ Infrequent headways due to circuitous routing of the 406 bus make it an unrealistic alternative for Philadelphia-bound commuters.
- ▶ Sidewalks are missing or inadequate in many locations, making the connections between bus stops and destinations difficult and unsafe.
- ▶ At some locations, excessive highway width is a problem for pedestrian crossing.
- ▶ Access management will improve efficiency for buses.

3.4 PASSENGER RAIL TRANSIT

Passenger Rail Transit in the Corridor

The broad study area is served by regional train service oriented radially to Center City Philadelphia. The PATCO Speedline, operated by the Port Authority Transit Corporation (PATCO) is a regional rail line providing service between Lindenwold and Central Philadelphia via Camden City. Speedline station stops, within the broad study area, are at Woodcrest, Haddonfield, and Westmont. Commuter bus service is available to these stations. The New Jersey Transit Atlantic City Line also stops in Cherry Hill. The station is located near the Garden State Park behind The Pavilions Shopping Center; connecting bus service is provided. It is possible to transfer between the Speedline and the Atlantic City Line at Lindenwold Station.

Rail Boardings

Data for boardings at the two rail stations within the corridor are shown in Table 9. The Cherry Hill station is part of a commuter rail service running between Philadelphia's 30th Street Station and Atlantic City, New Jersey. The Cherry Hill station is located at what formerly was the Garden State Park Race Track, just off Route 70. This site is currently being redeveloped into a mixed residential/commercial use. The station is at the western end of the study area. The Haddonfield station is part of the PATCO high speed line. It is located south and west of the study area just off Kings Highway. The Haddonfield station is noted due to its

connections with two bus lines (Routes 455 and 457) crossing the corridor.

The Cherry Hill and Haddonfield stations are different in boardings, with stops at Cherry Hill about one-tenth the number at Haddonfield. This may be attributed in part to the size of the available parking present at each station. There are 328 parking slots at Cherry Hill, which is one-third the 1,021 parking slots at Haddonfield station. Neither lot, however, is fully used. The parking usage at Cherry Hill is 111 slots (34% of capacity) and at Haddonfield is 960 slots (94% of capacity). When parking use is tabulated, the Cherry Hill station is about 11 percent of Haddonfield's total. The almost 1-to-10 proportion is constant between the two stations in both parking and boardings. Discretionary boards are one-tenth at Cherry Hill station than at Haddonfield, and neither of these is constrained by parking at this time.

TABLE 9

AVERAGE BOARDINGS AT RAIL STATIONS

Station	Daily Boards	Total Stops	Peak	Peak As	Parking / % Usage
			Stops AM/PM*	% of Total Trips	
Cherry Hill	159*	28	6 / 7	46%	328 / 34%
Haddonfield	1,818**	244	58 / 54	46%	1,021 / 94%

Sources:*New Jersey Transit Quarterly Ridership Trends, October 2001

** PATCO Weekday Ridership Averages, October 2000

This may be attributed to the higher level of peak hour service provided at the Haddonfield station, which is about ten times more frequent than at Cherry Hill Station. The frequency of stops in the peak affects the number of boards at the station. About 46 percent of the service at both stations occurs during the morning and evening peaks, which is not surprising.

There are no timed transfers between buses and trains at either of the stations. Timed transfers is inconsequential at the Haddonfield station given the 4-12 minute train headways during the peaks. A traveler could expect a short wait for the train at the Haddonfield station for either the 455 or 457 buses during the a.m. peak period. The Cherry Hill station has less frequent bus and train service, thus making connections with the 450 bus possible, but not convenient. The 406 bus does not stop at the Cherry Hill station, so a walking time penalty may be seen as hampering any sort of transfer.

3.5 BICYCLE AND PEDESTRIAN

This section begins with a characterization of current bike and foot travel along the corridor. Discussion will then follow regarding existing conditions for the two modes, the corridor's status in the recently updated Statewide Bicycle and Pedestrian Master Plan, and the design implications of bicyclist and pedestrian needs for capacity enhancement projects on NJ 70. The section concludes with a summary of issues and recommendations.

Bicycle and Pedestrian Travel within the Corridor

No counts of bicyclists or pedestrians are known to exist for Route 70. Casual observation and both physical and statistical evidence indicate, however, that non-motorized use of the highway right-of-way occurs along the entire length of the corridor. Crashes involving pedestrians are over represented at four intersections widely spaced from each other. Field surveys conducted by Michael Baker Jr. Inc., consulting engineers for the New Jersey Department of Transportation, found worn footpaths at several locations where sidewalks were absent. Research at the national level indicates that areas similar to the corridor in population and employment density in large metropolitan areas generate a small but consistent percentage of trips by bicycle.

Nearly 800 daily boardings and alightings of New Jersey Transit's 406 bus line occur along the corridor, generating a like number of walking trips as well as some bicycle trips involving use of the bus bike carrier. More than 80 percent of these trips originate from west of the study area, an overwhelming majority of which start as transfers at the Walter Rand Transportation Center or from East Camden neighborhoods. The ridership of the 406 can be characterized as belonging to minority and disadvantaged populations dependant on the bus for reverse-commuting to the job-rich corridor. Therefore, any measure that would diminish the pedestrian level of service or degrade pedestrian safety would raise a legitimate environmental justice concern.

Existing Conditions for Bicycling and Walking

A comprehensive inventory of pedestrian and bicycle deficiencies along the corridor was performed by Michael Baker Jr. Inc. for NJDOT in 2004. This inventory found that sidewalks are present along less than 50 percent of the study corridor length, and in many locations are substandard or in poor repair; curb ramps are missing or substandard; crosswalks and pedestrian signal heads were found lacking at several intersections; and, in general, opportunities for crossing NJ 70 are few and far between.

The most onerous feature of Route 70 is its width. Typical of the highway is the 96-foot crossing distance at Markkress Road. The center median that runs the length of the highway through the study area mitigates crossing difficulty by providing a refuge, enabling the pedestrian to accept gaps in one direction at a time, thereby facilitating the crossing task.

With the exception of a gap extending between the New Jersey Turnpike and Springdale Road, the highway has adequate shoulders for bicycling. Just west of this gap is the I-295 interchange. The expressway ramps present a hazard to both pedestrians and bicyclists, as the attentions of merging motorists are focused on finding acceptable gaps, and not on bicyclists and pedestrians.

Numerous commercial and residential driveways and a lack of ongoing sidewalk maintenance serve to degrade safety and comfort for both bicyclists and pedestrians throughout the

corridor. The Baker study also documented a shortage of bus shelters as well as a lack of sidewalks serving existing shelters in some locations.

Land use and urban form within the corridor discourage trips by foot. The highway is fronted to a large degree by auto-oriented commercial uses. Commercial access is unregulated. By contrast, access to residential areas is highly regulated. With the singular exception of the Erlton neighborhood, residential neighborhoods are located away from the highway, accessed from Route 70 by only one or two streets

Barriers are natural or man-made features that break the street pattern preventing or impeding easy non-motorized travel between nearby origins and destinations. Route 70 itself is a barrier. The I-295/NJ Turnpike corridor and the North Branch of the Cooper River are also significant barriers criss-crossing the corridor. These two barriers, in combination with a third, the South Branch of the Pennsauken Creek, effectively bar bicycle and pedestrian access to the Cherry Hill Industrial Park.

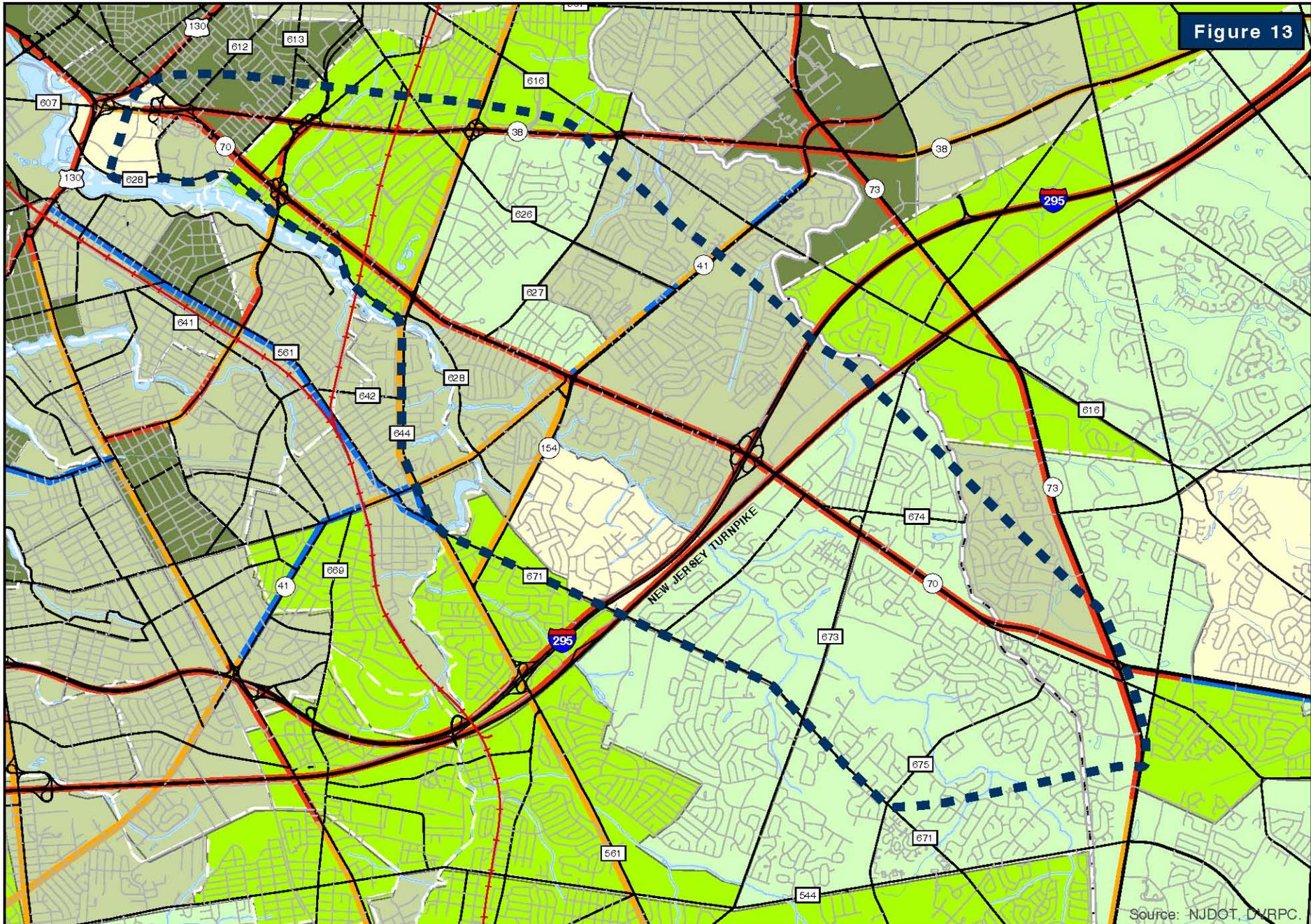
NJ 70 - Statewide Bicycle and Pedestrian Master Plan

In 2004 NJDOT released Phase 2 of the Statewide Bicycle and Pedestrian Master Plan. The plan vision states: 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

NJ 70 Corridor Study

Pedestrian Crossing Improvement Priority/
CMS Network Daily Walk Trips by Census Tract

Figure 13



Source: NJDOT, DVRPC.

0 0.25 0.5
Miles



Walking Compatibility	
0 - 5	21 - 40
6 - 10	41 - 100
11 - 20	

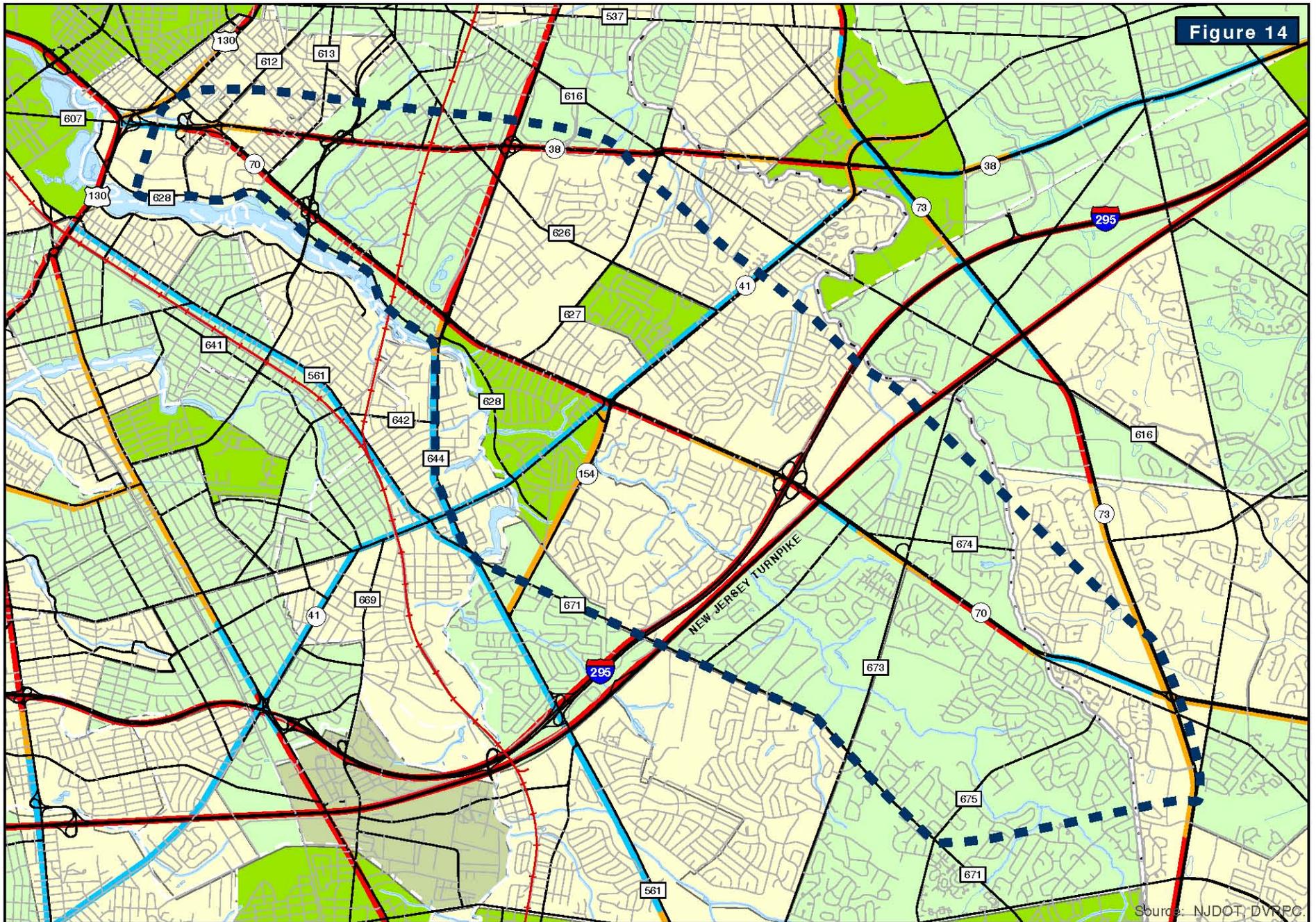
Pedestrian Crossing Improvement Priority		
High	Medium	Low

Delaware Valley
Regional Planning Commission
November 2005

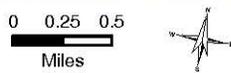
NJ 70 Corridor Study

Bicycle LOS Improvement Priority/
CMS Network Daily Bike Trips by Census Tract

Figure 14



Source: NJDOT, DVRPC



Daily Bike Trips			
	0 - 4		29 - 58
	5 - 13		59 - 144
	14 - 28		

Bicycle LOS Improvement Priority			
	High		Medium
	Low		

transportation and recreation systems and support active, healthy lifestyles.

While Phase 1 focused on policies, Phase 2 concentrates on facilities. This emphasis is the result of heightened interest in developing bicycle and pedestrian accommodations to the extent that funding requests for such projects far exceed available funds. Phase 2 is intended to provide clear guidance on prioritization of state investment in bicycle and pedestrian facilities.

Phase 2 accomplished this prioritization using analytical methods involving measures of demand and suitability applied to the CMS roadway network. Segments of the CMS network were identified as high priority where demand is high and facilities are least suitable.

Bicycle demand is principally a function of demographics and mode split, where 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 densities and the 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 spacing of signalized crossings to determine overall delay from waiting for a safe gap in traffic in which to cross. Details on the analytical methodology used to classify priority segments may be found in the Phase 2 plan document.

The Statewide Bicycle and Pedestrian Master Plan Phase 2 indicates Route 70 as high priority for pedestrian improvements from MP 1.03 to 3.2, from MP 4.35 to 5.74, and from MP 7.22 through the eastern end of the study area at Route 73 (see Figure 14). Indicated by the plan as high priority for bicycling improvements are sections between MP 2.34 and 3.0, 3.2 and 4.35, and from 5.08 to 5.4 (see Fig. 15).

Design Considerations For An Improved Route 70

The addition of lanes on Route 70 and selected cross streets is a central feature of all alternatives explored to date to alleviate congestion and delay and reduce crashes along Route 70 as discussed in NJDOT's NJ 70 Concept Development Report (October 2004). This feature will increase pedestrian crossing distances, thereby increasing pedestrian discomfort and crash exposure. In addition, turning lanes, channelized right turns, and jug handles may all further degrade pedestrian safety if not designed carefully.

Close attention must be paid to details of design geometrics and traffic controls in order to mitigate pedestrian hazards. Ramp and corner geometries must be designed to moderate vehicle speeds and enhance pedestrian visibility. Signal

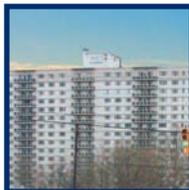
progression must allow the pedestrian adequate crossing time and protection from turning vehicles. Signage and pavement markings must alert motorists to the presence of pedestrians. Access management and the retention of shoulders are recommended to reduce conflicts between bicyclists and motorists, and improve pedestrian safety and comfort. Sidewalks should be completed and maintained along the length of the highway.

Current design guidance includes AASHTO's Guide to the Development of Bicycle Facilities (1999) and Guide for the Planning, Design, and Operation of Pedestrian Facilities (2004).

BICYCLE AND PEDESTRIAN ISSUES AND RECOMMENDATIONS FOR NJ 70:

- ▶ The corridor has small but consistent levels of bicycling and walking
- ▶ Many pedestrians on Route 70 are disadvantaged who use the bus to get to their jobs from Camden neighborhoods.
- ▶ The street network pattern restricts bike and pedestrian travel within the corridor.
- ▶ At some locations, excessive highway width is a problem for pedestrian crossing.
- ▶ Adequate shoulders for bicycling are found along most of the length of the corridor; marking them as bike lanes would increase the profile of bicyclists and may improve safety.
- ▶ Sidewalks are missing or inadequate in many locations, and particularly around bus stops.
- ▶ Capacity improvements must be balanced with pedestrian safety needs, including the moderation of vehicle speeds.
- ▶ Access management will improve safety for bicyclists.

4



CRASH ANALYSIS

4.1 Corridor Crash Summary, 2003	50
4.2 Crash Clusters	53
4.3 Crashes at Unsignalized Median Openings	57



Introduction

The crash analysis is a comprehensive 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. In many cases the results of this analysis substantiated safety problems identified by local officials. More in-depth study will be required to develop the most appropriate improvements.

The crash data used in this analysis was obtained from the New Jersey Department of Transportation's (NJDOT) data reference Web page. Data for years 2001 through 2003 were utilized. The crash analysis is divided into three parts: 1) Corridor Crash Summary, 2) Crash Clusters, and 3) Crashes at Unsignalized Median Openings. According to NJDOT, rear-end and sideswipe collisions involve traffic moving in the same direction. Angle crashes involve angular traffic (i.e. northbound and westbound), left turn and head-on events involve opposing traffic.

4.1 CORRIDOR CRASH SUMMARY, 2003

During 2003 there were 636 crashes along the 8.33 miles of NJ 70 (see Tables 10 and 11). Regarding severity there were 445 property damage only crashes, 190 injury crashes, and one fatality. Combined, rear-end and sideswipe collisions accounted for 77% of the crashes. This is likely because NJ70 is a divided highway. Forty-seven percent (300)

occurred at intersections, with the balance occurring within the mid-block (336 crashes). Seventy-four percent of the crashes occurred during the daytime, which excludes dawn and dusk.

NJ 70 Compared to State System Roads

As published in the NJDOT At/Between Intersections Accident Summary for State System Roads (excluding toll roads and interstates) 67,013 crashes occurred on the state system during 2003. Concerning collision type the NJ 70 corridor exceeds state percentages in two categories, rear-end crashes (state: 44%, NJ 70: 55%) and sideswipe crashes (state: 16%, NJ 70: 22%). Same direction-rear end crashes was the most predominant collision type in the study area. Recurring peak period congestion is likely a contributing factor to the higher than average rear-end collisions. Frequent stopping and starting combined with multiple access points along the roadway creates an environment that is conducive to rear-end crashes.

Regarding the over representation of sideswipe type crashes, multiple unsignalized median openings found along NJ 70's four lane cross sections may be a contributing factor. During field observations, vehicles were witnessed queuing in the passing lane for entry into the median opening. Other vehicles were then seen weaving around the queue, an inherently unsafe movement. Although these unsignalized median openings create situations that compromise safety as they encourage the crossing of live lanes of traffic, they also provide access to retail, employment, and neighborhoods on

the opposite side of NJ 70. They are also used to make U-turns. A comprehensive approach which creates multiple safe access points should be considered. A summary of all collision types and other select data items are included in Tables 10 and 11.

There were five bicycle-related crashes on NJ 70 during 2003 accounting for 0.79% of the total. This percentage is significantly higher than the state percentage of 0.47%. Although biking is not prohibited on NJ 70, the biking environment is undesirable, i.e.: multiple lanes of fast moving traffic and lack of bike lanes.

There were four pedestrian related crashes on NJ 70. Although the percentage did not exceed the state average (ped crashes: NJ 70, 0.63%; state, 0.78%), this is still a relatively high number deserving further investigation as to where the crashes occurred and the current state of pedestrian amenities at those locations. Generally speaking, most of NJ 70 is pedestrian unfriendly and only a few safe crossing opportunities exist. One exception is NJ 70 through the Erlton neighborhood. An analysis of NJ 70's pedestrian environment is provided in section 3.5.

TABLE 10				
NJ 70 CORRIDOR CRASH SUMMARY, MILE POST 0 - 8.33, 2003				
NJ 70 Total Crashes = 636			State Total = 67,013	
Collision Type	NJ 70 Count	% of Total	State Count	% of Total
Same Direction - Rear End	350	55.03%	29663	44.26%
Same Direction - Sideswipe	141	22.17%	11142	16.63%
Angle	66	10.38%	8563	12.78%
Head-On	2	0.31%	1000	1.49%
Left Turn	11	1.73%	2490	3.72%
Struck Parked Vehicle	1	0.16%	987	1.47%
Other/Unknow	20	3.14%	2319	3.46%
Overturn	1	0.16%	268	0.40%
Pedestrian	4	0.63%	524	0.78%
Fixed Object	32	5.03%	7849	11.71%
Animal	3	0.47%	1896	2.83%
Pedacycle	5	0.79%	312	0.47%
Intersection	NJ 70 Count	% of Total	State Count	% of Total
Not at Intersection	336	52.83%	37,780	56.38%
At Intersection	300	47.17%	29,233	43.62%
At or Near Railroad Crossing	0	0.00%	0	0.00%
Light	NJ 70 Count	% of Total	State Count	% of Total
Unknown	5	0.79%	236	0.35%
Daylight	475	74.69%	46675	69.65%
Night, Dawn, Dusk	156	24.53%	20102	30.00%
Severity	NJ 70 Count	% of Total	State Count	% of Total
Fatal	1	0.16%	190	0.28%
Injury	190	29.87%	20539	30.65%
Property	445	69.97%	46284	69.07%
Surface Condition	NJ 70 Count	% of Total	State Count	% of Total
Unknow/Other	7	1.10%	302	0.45%
Dry	465	73.11%	46451	69.32%
Wet	151	23.74%	16836	25.12%
Snowy/Icy	13	2.04%	3424	5.11%

During year 2003, the study area portion of NJ 70 exceeded the state threshold for rear-end and sideswipe crashes.

TABLE 11		
NJ 70 CRASHES BY DIRECTION, MILE POST 0 - 8.33, 2003		
Direction of Travel	Count	% of Total
Unknown	5	0.79%
North	30	4.72%
East	238	37.42%
South	31	4.87%
West	332	52.20%

4.2 CRASH CLUSTERS

Methodology

For the purposes of this study, a cluster is defined as a section of roadway up to one-tenth-mile long where a minimum of 24 crashes occurred during years 2001 to 2003. Analysis sections were determined by graphing all crashes for

the three year period and qualitatively examining the concentrations along the corridor. Eight crashes per year over a 0.4 mile section is the minimum threshold for analysis as stated in the New Jersey Department of Transportation's annual safety report. Using DVRPC's method, twenty-two clusters were identified within the 8.33 mile study area on NJ 70 during the analysis period (see Table 12).

TABLE 12
NJ 70 CRASH CLUSTERS >= 24, 2001-2003 (West to East)

#	Mile Post Range	Total Crashes	Total Killed	Total Injured	Property Damage Only	Predominant Collision Types (# of crashes)			Predominant Direction of Travel (# of crashes)	
1	0.01 - 0.11	45	0	17	28	Rear End (27)	Sideswipe (9)	East (26)	West (15)	
2	0.32 - 0.42	45	0	14	31	Rear End (24)	Sideswipe (12)	West (21)	East (19)	
3	0.99 - 1.09	29	0	11	18	Rear End (13)	Sideswipe (10)	West (19)	East (9)	
4	1.50 - 1.60	56	0	25	31	Rear End (37)	Sideswipe (7)	West (32)	East (20)	
5	2.24 - 2.34	63	0	17	46	Rear End (41)	Angle (10)	West (33)	East (26)	
6	2.88 - 2.98	68	0	25	43	Rear End (40)	Sideswipe (11)	West (34)	East (17)	
7	3.39 - 3.49	48	0	16	32	Rear End (25)	Sideswipe (11)	West (31)	East (14)	
8	3.61 - 3.71	76	0	19	57	Rear End (48)	Sideswipe (17)	East (42)	West (29)	
9	4.11 - 4.21	44	0	19	25	Rear End (24)	Angle (10)	East (29)	West (7)	
10	4.30 - 4.40	57	0	14	43	Rear End (38)	Sideswipe (10)	West (31)	East (23)	
11	4.58 - 4.68	87	0	33	54	Rear End (58)	Angle (14)	West (46)	East (27)	
12	4.77 - 4.87	45	0	12	33	Rear End (27)	Angle (9)	East (26)	West (8)	
13	5.03 - 5.13	71	0	26	45	Rear End (38)	Sideswipe (22)	West (56)	East (14)	
14	5.26 - 5.36	105	0	49	56	Rear End (71)	Angle (14)	West (83)	South (10)	
15	5.42 - 5.52	26	0	9	17	Rear End (17)	Sideswipe (5)	East (13)	West (11)	
16	5.57 - 5.64	61	0	19	42	Angle (22)	Rear End (20)	East (23)	South (20)	
17	5.69 - 5.76	87	0	33	54	Rear End (48)	Sideswipe (22)	West (38)	East (27)	
18	6.09 - 6.19	67	0	24	43	Rear End (37)	Sideswipe (13)	East (29)	West (26)	
19	6.86 - 6.96	72	1	19	52	Rear End (54)	Sideswipe (9)	East (44)	West (24)	
20	7.40 - 7.50	27	0	6	21	Rear End (21)	Sideswipe/Angle (2)/(2)	East (13)	West (11)	
21	7.65 - 7.75	50	0	11	39	Rear End (27)	Sideswipe (12)	East (23)	West (18)	
22	8.29 - 8.33	250	0	38	212	Sideswipe (99)	Rear End (96)	West (101)	East (73)	

Combined, the 22 clusters total 1,479 crashes, or 78% of the three year analysis period total of 1,892. Figure 15 shows a graphic representation of crash frequency by mile post on the NJ 70 straight line diagram.

The frequency of crashes within the clusters ranges from 26 to 250. The cluster frequency average is 67, and 77% of the clusters had between 44 and 87 crashes. Three locations had crash totals below 44, and only two locations had more than 87 crashes. The cluster statistics were compared to 2003 statewide statistics in an effort to identify over-represented categories. These comparison tables are located in the Appendix.

Next is a brief discussion regarding the characteristics of the top five cluster locations. The following observations were made:

Mileposts 8.29 - 8.33: 250 crashes, 73 eastbound, 101 westbound, 40 southbound, 36 northbound

The Marlton Circle is at the location of this crash cluster. This confluence of NJ 70 and NJ 73 is a high priority location for the State of New Jersey due to poor operations and high accident numbers. With 250 crashes, the Marlton Circle is the most dangerous location in the study area exceeding the next highest cluster total by 145 crashes (105 crashes were recorded in the vicinity of Old Cuthbert Road). The New Jersey Department of Transportation is moving forward with an improvement project for this location which calls for the elimination of the circle and replacement with a grade separated interchange. The new interchange was designed

to address congestion, mobility, and safety while retaining access.

Mileposts 5.26 - 5.36: 105 crashes, 8 eastbound, 83 westbound

This crash cluster is at the eastern end of the most congested section of NJ 70 and has the second highest total crash number at 105. With 83 of the accidents having occurred on NJ 70 westbound it is clear the problem is particularly acute in that travel direction of the facility. The intersection of NJ 70 westbound at Old Cuthbert Road is at the center of this cluster location. NJ 70 has four westbound lanes to which Old Cuthbert has single lane right-in right-out access. No access to NJ 70 eastbound is provided. There were 71 rear-end crashes, 50% more than the state average (NJ 70-67%, state-44%). Westbound back-ups during the morning peak period congestion often times stretch into this location, most likely contributing to the higher number of rear-end crashes. Angle crashes are also over represented 13% versus the state average of 12%. Angle crashes generally do not involve same direction traffic. Thus, the high number (14 angle crashes during 2001-2003) may be a result of inaccurate crash coding.

Mileposts 5.69 - 5.76: 87 crashes, 27 eastbound, 38 westbound, 14 northbound

This cluster includes the intersection of NJ 70 and CR 674 Greentree Road at milepost 5.75 situated at the eastern end of the catchment area. Greentree Road meets NJ 70 at an oblique angle. Left turns from NJ 70 (both directions) to

Greentree Road are accommodated via jug handles that utilize Marlkrass Road. Rear-end and sideswipe crashes each exceed state averages at 55% (state-44%) and 25% (state-16%) respectively. Local officials reported frequent conflicts between the Greentree southbound traffic merging via channelized right turn with NJ 70 westbound through traffic. In examining the data the highest concentration within the cluster, 65 crashes, is located at milepost 5.74 which is approximately 53 feet east of the intersection. This is the spot where the channelized right turn from Greentree Road and NJ 70 westbound meet. Problems with this merge may be contributing factors to the high number of rear-end and sideswipe crashes. Sight distance is commonly compromised in this type of alignment forcing motorists to rely on the rearview mirror. Also in this cluster a side street meets NJ 70 just west of the merge from Greentree Road, possibly further exacerbating the problem. One pedestrian related crash was also recorded in this cluster.

Mileposts 4.58 - 4.68: 87 crashes, 27 eastbound, 46 westbound

At the center of this cluster East Gate Drive intersects NJ 70 eastbound. In addition there are two unsignalized median openings, one located on the east side of the intersection and the other on the westside, roughly 250 feet apart. This cluster is also within the most congested section of the corridor study area which likely contributes to the over representation of rear-end crashes (NJ 70 - 66%, state - 44%). Angle and left turn crashes also exceed statewide percentages at 16% and 4% respectively. These collision types are common where

traffic is turning left, most likely utilizing the unsignalized median openings. Between Kingston Road and Covered Bridge Road intersections, which are approximately one half mile apart, there are three median openings and one left turn only opening for NJ 70 westbound traffic. The highest concentration of crashes is in the vicinity of milepost 4.61, which is the location of the west side median opening. This opening appears to be the most unsafe. Because there are additional opportunities to cross NJ 70 in this area, the median opening at milepost 4.61 should be closed or replaced by a safer left turn/u-turn opportunity. The high number of crashes at this location is most likely an indication of frequent use of the opening by left and u-turning traffic. Closing this median break may result in shifting the problem to another location. Clearly there is a need for access in this densely developed retail area.

Mileposts 3.61 - 3.71: 76 crashes, 42 eastbound, 29 westbound

At this location NJ 70 meets NJ 41 Kings Highway at a multi-lane signalized intersection. Left turns from NJ 70 are accommodated via forward jug handles. Rear-end, sideswipe, head-on, and pedacycle crashes are over represented. This is a location of heavy volume and complex turning movements, possibly contributing to the high number of rear-end crashes.

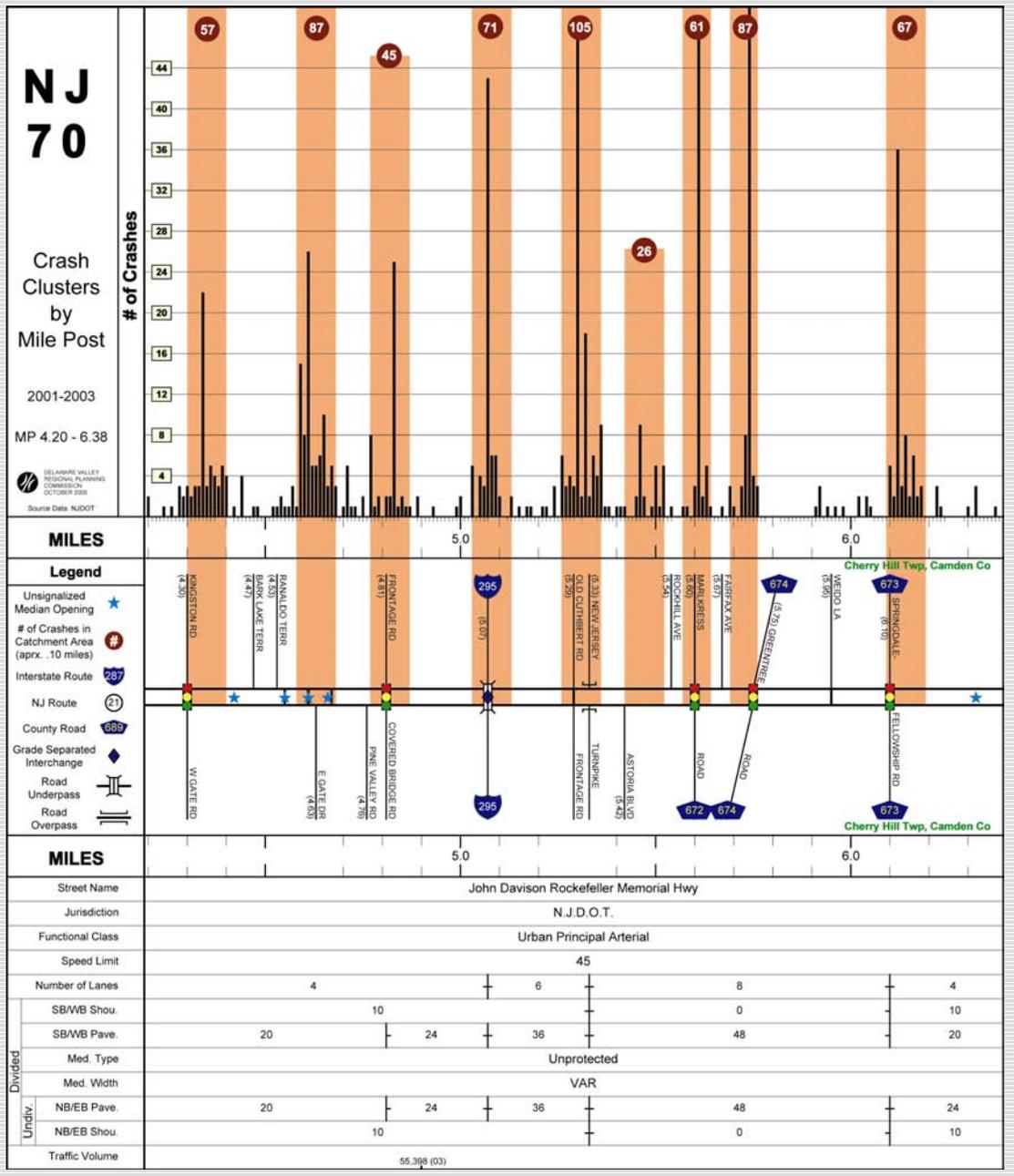


FIGURE 15:
Crash Clusters by Mile Post

This graphic depicts crash frequency by mile post along a two-mile section of NJ 70 for years 2001-2003. The orange bands represent the cluster catchment area of less than or equal to one tenth mile. The encircled number at the top of each band is total number of crashes within the catchment area during the period.

Graphics representing the entire NJ 70 study area are included in the appendix.

4.3 CRASHES AT UNSIGNALIZED MEDIAN OPENINGS

In an effort to quantitatively examine the safety concerns associated with the 21 unsignalized median openings or “cut-throughs” within the study area, crashes in the vicinity of each location were analyzed. The New Jersey Department of Transportation’s State Highway Access Management Code defines a median opening as “a paved area bisecting opposite directions of a divided roadway. A median opening is designed to permit traffic to cross at least one direction of travel.” Also known as cross-overs or median-breaks, along NJ 70 these are found only in the four lane cross sections of the facility. One exception exists along a six lane cross section in the western portion of the study area near Delaware Avenue and the former Gate 4 entrance to Garden State Park (mile post 2.07).

Field observation revealed three types of openings along the corridor. The most common is the two-way median opening that can accommodate roughly two vehicles, usually entering from opposing directions. The second is also two-way, but is wider and can accommodate several vehicles. The third variety serves traffic from one direction only, is typically curved to channel vehicles for left turns or U-turns, and includes a stacking lane. There are five of these openings within the study area.

Purpose of Median Openings

The purpose of these unsignalized median openings is to provide motorists with additional access opportunities to supplement the signalized intersections. Since NJ 70 is a divided highway, left turns and U-turns would otherwise be restricted to the signalized intersections as is the case in the six and eight lane cross sections where these opening are not provided. In particular, the openings provide the motoring public with more opportunities to reach commercial, employment, and residential destinations— land uses that are characteristic of the four lane cross sections of NJ 70.

Methodology

The crash analysis method utilized NJDOT’s straight line diagram to identify the approximate milepost location for each opening and used that location as the center point of a 210 foot total swath (4/100 of a mile). This length was considered the catchment area in an effort to include crashes that were a result of vehicles queuing to enter the opening, and crashes involving vehicles leaving the opening. Data were drawn from years 2001 - 2003. Table 13 lists each location, total crashes by milepost, and other selected crash characteristics. Figure 16 shows crash frequency by milepost along the NJ 70 roadway cross section using NJDOT’s straight line diagram. On this graphic median openings are marked and their corresponding catchment crash totals are labeled.

Identified Problems

Access opportunities is the up side to the unsignalized median opening. Compromised safety is the downside. In the case of NJ 70 these openings allow motorists to cross or enter two live lanes of traffic in an unprotected movement—a potentially dangerous situation.

There are several things to consider regarding median openings. When traffic volumes on the main line are low, gaps in the oncoming flow equate to more opportunities to cross or enter the opposing lanes of traffic. Although on NJ 70, low volumes allow for higher average speeds due to its multi-lane cross section. As speeds increase, turning time is reduced and the probability of a more serious collision increases.

When volumes are higher the situation is reversed—fewer gaps are available. If volumes grow to the level of congestion causing traffic to move at a stop and go pace, motorists using the openings may find opportunities to cross or enter via the courtesy of drivers in the through traffic stream. On the contrary, motorists in the congestion may be frustrated and don't want to be further delayed by allowing another vehicle in front of them. Although the potential for collisions is moderate in this situation, the severity is reduced because the speed of main line traffic is reduced.

TOP 5 CRASH LOCATIONS

The following five locations had the highest crash frequency of the 21 median openings. Of the 5, the lowest crash total

was 27, more than double the next highest location of 11 crashes.

(west to east)

1) Cooper Landing Road, MP 2.92

- Total Crashes: 31 crashes
- Direction: 13 WB, 9 SB, 7 EB, 1 NB
- Collision Type: 17 rear-end, 7 sideswipe, 3 angle
- Severity: 0 fatalities, 10 injury, 21 property damage

This opening serves eastbound traffic only with a left turn stacking lane. It is the first opportunity to cross the highway from the eastbound direction after the Haddonfield Road intersection. Also, Cooper Landing Road serves a dense network of residential streets and carries traffic northeast to Maple Shade Township.

2) Maine and Vermont Avenues, MP 3.41

- Total Crashes: 36 crashes
- Direction: 22 WB, 11 EB, 2 SB, 1 NB
- Collision Type: 18 rear-end, 8 sideswipe, 6 angle
- Severity: 0 fatalities, 14 injury, 22 property damage

This opening is located just approximately ¼ mile west of the Kings Highway intersection where NJ 70 westbound narrows from 3 to 2 lanes. It is a narrow two-way median break. Westbound NJ 70 traffic commonly races from the intersection to avoid merge problems at the transition. This, combined with vehicles utilizing the opening, and in some cases vehicles queuing to get into the opening, creates a safety hazard.

3) Between Sawmill Road and Kingston Road, MP 4.12

- Total Crashes: 36 crashes
- Direction: 23 EB, 6 WB, 4 SB, 3 NB
- Collision Type: 19 rear-end, 5 sideswipe, 9 angle
- Severity: 0 fatalities, 18 injury, 18 property damage

This opening location allows NJ eastbound traffic to make a U-turn to get into the Sawmill Village retail strip mall. In addition, this opening can be utilized by local drivers from Saw Mill Road enroute to NJ 70 westbound. This location is also within close proximity to the lane transition (3 to 2) on NJ 70 eastbound.

4) Between Ranaldo Terrace and East Gate Drive, MP 4.61

- Total Crashes: 59 crashes
- Direction: 41 WB, 13 EB, 2 SB, 2 NB
- Collision Type: 44 rear-end, 5 angle, 3 sideswipe
- Severity: 0 fatalities, 26 injury, 33 property damage

This opening is off-set from East Gate Drive, Ranaldo Terrace and the entrance into The Barclay retail center. It is also between two other openings, all of which are situated within one tenth of a mile. At these three locations combined there were 94 crashes. With the majority of crashes occurring westbound, it may involve traffic exiting Barclay shops then using this median opening to access NJ 70 westbound.

5) Between East Gate Drive and Pine Valley Road, 4.66

- Total Crashes: 27 crashes
- Direction: 14 EB, 5 NB, 4 WB, 4 SB
- Collision Type: 13 rear-end, 9 angle, 2 sideswipe

- Severity: 0 fatalities, 7 injury, 20 property damage

This opening is the last of four (eastern most) in this section located between MP 4.42 and MP 4.66 between Kingston Road and Covered Bridge Road intersections. Motorists may use this opening more frequently because it is the last opportunity to make a u-turn from NJ 70 eastbound before the signal at Covered Bridge Road.

Observations from the Median Openings Crash Summaries, 2001-2003:

- ▶ Five locations had crash totals of 27 or higher, and the highest had 59 crashes. All other locations had 11 or fewer crashes, and one location had no crashes.
- ▶ Rear-end crashes were the most common collision type accounting for 60% of all crashes.
- ▶ Sideswipe and angle crashes accounted for 13.5% each.
- ▶ Forty five percent of the crashes occurred in the westbound lanes and forty percent occurred in the eastbound lanes.
- ▶ Six median openings are within crash clusters identified in section 6.2 (Crash Clusters) of this report. Five of the six locations are the openings where 27 or more crashes were identified.
- ▶ High crash numbers at a location may be an indication of usage, i.e. more crashes take place at openings where higher demand exists.

**TABLE 13
CRASHES IN THE VICINITY OF UNSIGNALIZED MEDIAN OPENINGS ALONG NJ 70, 2001-2003**

Location of Unsignalized Median Opening (west to east)	Mile Post (aprx.)	Left Turn Stacking Lane/ Direction	Opening Width in Car Lengths (aprx.)	Catchment Area = 210 feet (aprx.)					Total Crashes	Major Crash Type	Direction Of Travel
				Mile Post # of Crashes							
1 At Delaware Avenue and Garden State Park Gate 4 # of crashes	2.07	No	1	2.05	2.06	2.07	2.08	2.09	11	Rear-end	East (4), West (7)
2 At Entrance to Locustwood Park # of crashes	2.70	Yes / Eastbound	1	2.68	2.69	2.70	2.71	2.72	7	Rear-end	East (5), West (2)
3 At Whitman Avenue # of crashes	2.77	No	1	2.75	2.76	2.77	2.78	2.79	7	Angle	East (4), West (2)
4 At Conwell Avenue # of crashes	2.83	No	1	2.81	2.82	2.83	2.84	2.85	10	Rear-end	East (3), West (5)
5 At Cooper Landing Road # of crashes	2.92	Yes / Eastbound	1	2.90	2.91	2.92	2.93	2.94	31	Rear-end	East (7), West (13) South (9)
6 Between Virginia Avenue and Connecticut Avenue # of crashes	3.09	No	4	3.07	3.08	3.09	3.10	3.11	11	Rear-end	East (4), West (7)
7 Between Madison Avenue and Harrison Avenue # of crashes	3.21	No	2	3.19	3.20	3.21	3.22	3.23	3	Rear-end	East (1), West (2)
8 Between Vermont Avenue and Maine Avenue # of crashes	3.41	No	1	3.39	3.4	3.41	3.42	3.43	36	Rear-end	East (11), West (22)
9 Between Brookmeade Drive and Sawmill Road # of crashes	4.06	No	2	4.04	4.05	4.06	4.07	4.08	3	Rear-end	East (3)
10 Between Sawmill Road and Kingston Road (west) # of crashes	4.12	No	2	4.10	4.11	4.12	4.13	4.14	36	Rear-end	East (23), West (6)
11 Between Sawmill Road and Kingston Road (east) # of crashes	4.18	No	2	4.16	4.17	4.18	4.19	4.20	8	Rear-end	East (6), West (1)
12 Between Kingston Road and Bark Lake Terrace # of crashes	4.42	No	1	4.40	4.41	4.42	4.43	4.44	9	Rear-end	East (3), West (6)
13 Between Ranaldo Terrace and East Gate Drive (east) # of crashes	4.55	Yes / Westbound	1	4.53	4.54	4.55	4.56	4.57	8	Rear-end	East (1), West (6)
14 Between Ranaldo Terrace and East Gate Drive (west) # of crashes	4.61	No	2	4.59	4.6	4.61	4.62	4.63	59	Rear-end	East (13), West (41)
15 Between East Gate Drive and Pine Valley Road # of crashes	4.66	No	2	4.64	4.65	4.66	4.67	4.68	27	Rear-end	East (14), West (4) North (5)
16 Between Springdale Road and Birchwood Drive (west) # of crashes	6.32	No	1	6.30	6.31	6.32	6.33	6.34	4	Rear-end	West (3)
17 Between Springdale Road and Birchwood Drive (east) # of crashes	6.39	No	1	6.37	6.38	6.39	6.40	6.41	1	Rear-end	East (1)
18 At Birchwood Road # of crashes	6.61	Yes / Eastbound	1	6.59	6.60	6.61	6.62	6.63	10	Rear-end	East (4), West (5)
19 Between Birchwood Road and Old Orchard Road (west) # of crashes	6.74	No	1	6.72	6.73	6.74	6.75	6.76	3	Rear-end	East (2), West (1)
20 Between Birchwood Road and Old Orchard Road (east) # of crashes	6.8	No	2	6.78	6.79	6.80	6.81	6.82	3	Rear-end	East (3)
21 Between Old Orchard Road and Split Rock Drive # of crashes	7.09	Yes / Westbound	1	7.07	7.08	7.09	7.10	7.11	0	NA	NA

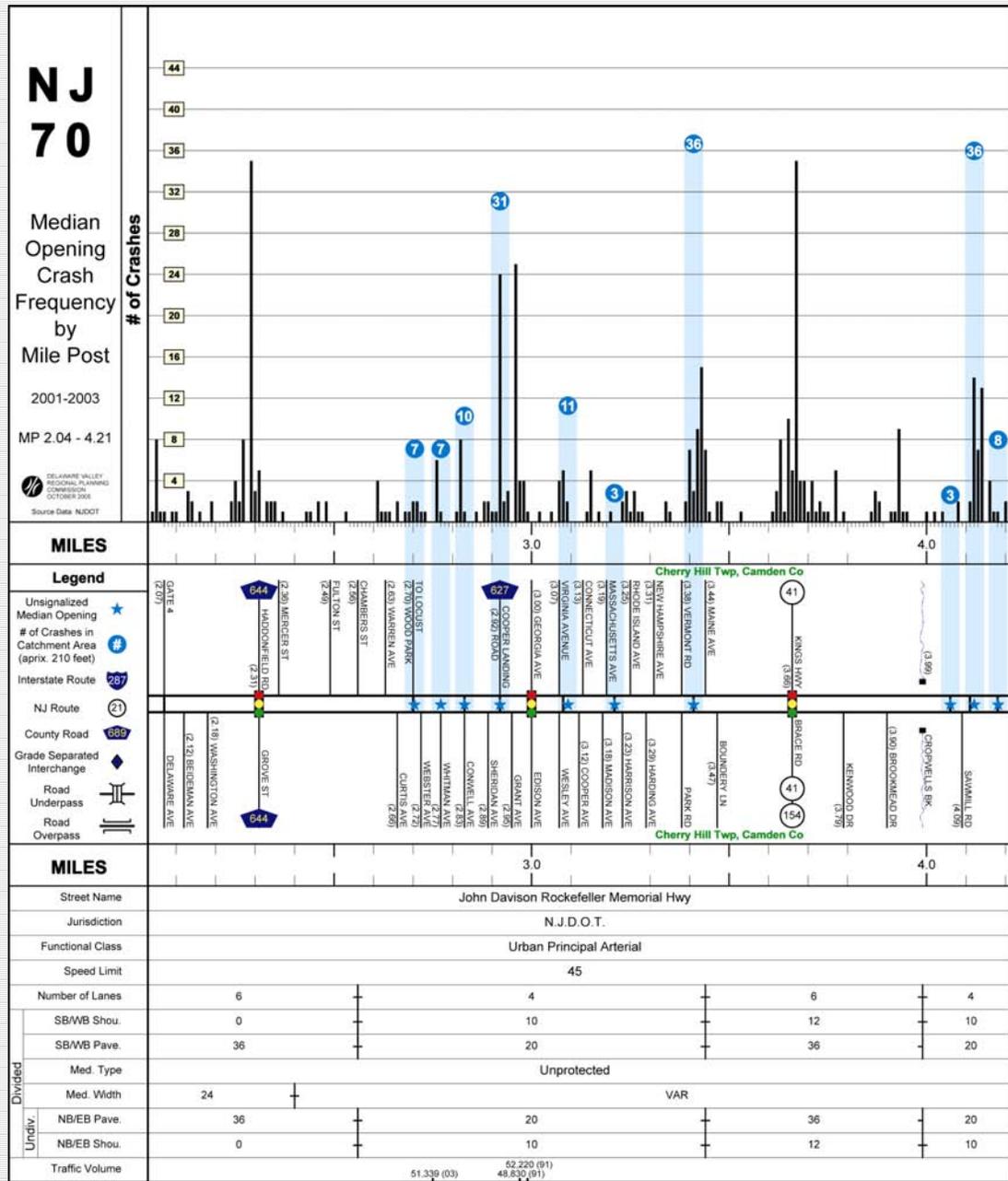


FIGURE 16:
Crash Frequency by Mile Post at Median Openings

This graphic depicts crash frequency by mile post along a two-mile section of NJ 70 for years 2001-2003. The blue bands represent the cluster catchment area, centered on the median openings, which are marked by a blue star. Each catchment area is approximately 210 feet or five 1/100ths of a mile.

The encircled number at the top of each band is total number of crashes within the catchment area during the period.

Conclusions

The purpose of the openings is increased access, mainly to businesses. Retail and commercial development is predominant along NJ 70 in both locations where the median openings are found. Thus, there is clearly a need for access across NJ 70. Congestion is also common in these same locations, specifically during the peak periods in the Erlton and Barclay neighborhoods. High levels of congestion are undesirable and tend to produce low severity crashes. Although, the most unsafe situation regarding use of the openings is when travel speeds are high. This is because judging the velocity of oncoming traffic is difficult for everyone, especially for younger and older drivers, and during dusk, dawn, and bad weather conditions. This situation is compounded when crossing multiple lanes.

Peak period congestion typically occurs during the a.m. and p.m. rush hours. Retail establishments—barring convenience stores, coffee shops, and the like— typically keep hours that begin and end outside of the peak commuting times. This suggests a weak correlation between median opening related crashes and congestion. Albeit, congestion delays due to automobile accidents are inevitable.

This analysis found that not all median openings are dangerous in terms of accident frequency. That is, actual crashes during the three year period, not potential for accidents (which was not measured). Five of the twenty one median openings met or exceeded the criteria of twenty four crashes during 2001-2003. As stated earlier it is likely these

locations are highly utilized, thus increasing the probability for crashes.

Two locations of note, one near Maine Avenue and the other near Sawmill Road, are in the vicinity of lane transition areas, i.e: where lanes narrow from three to two. These openings may be more frequently used because they provide the first opportunity to cross NJ 70 following the three lane sections. This is clearly the case at Maine Avenue. At Sawmill Road, the median opening in question is actually the second from the lane transition, located approximately 500 feet east of the first. Sawmill Road enters NJ 70 eastbound between the two openings. The second opening is likely used by residents traveling on Sawmill Road as an access to NJ 70 westbound.

Recommendations

A comprehensive evaluation that considers access needs, local circulation, and safety concerns should be undertaken. A wholesale closing of all median openings will not address these issues. Instead it will greatly compromise access and create congestion at nearby signalized intersections as turning traffic is forced to those locations. A full scale re-evaluation of these treatments may recommend a greater number of signalized intersections to accommodate turns, better designed median openings that are more appropriately located, and stricter access management provisions. The improvement scenario must utilize a multi-pronged approach.

5



TRANSPORTATION ISSUES

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NEIGHBORHOODS ► CONGESTION ► CRASHES ► ACCESS / MOBILITY ► IDENTIFIED PROBLEM LOCATIONS ► POTENTIAL IMPROVEMENT SCENERIOS



Delaware Valley
Regional Planning
Commission

Introduction

The transportation issues identified in the NJ 70 Corridor Study have been divided into five categories for the purposes of this report, they are: Corridor-wide Issues, Identified Problem Locations and Potential Improvement Scenarios, Cut-through traffic, Signs, and Access Management/ Mobility Considerations.

5.1 CORRIDOR-WIDE ISSUES

NJ 70 is a state facility that serves both regional and local traffic, a mix of work commuters and consumers. As well, some sections of NJ 70 are considered a default main street for its adjacent neighborhoods. In response to these diverse and varied needs NJ 70 has been developed to accommodate higher volumes and higher average speeds while still providing access to service, retail, and residential developments. As traffic volumes have steadily risen over time, the regional needs of the corridor seem to have been given priority over the local needs. The result, generally speaking, has become free-flowing traffic movement in the 6 and 8 lane sections, while the 4 lane sections have become the location of traffic bottlenecks.

When examining typical conditions on NJ 70 one finds motorists slowing down from 40-45 mph as they transition into the 4 lane sections from the 6 and 8 lane sections, and speeding up dramatically when leaving the four lane sections. For traffic traversing the length of the study area on a regular

basis (commuters), an expectation of maintaining a higher average speed has been created in the 6 and 8 lane sections. A problem occurs when this expectation is not met as commuter traffic must deal with the additional traffic generated by the significant land developments that are accessed primarily via NJ 70. Limited access across NJ 70, a compromise inherent in a divided highway configuration, further exacerbates this problem as intersections and jug handles fail to provide enough capacity during peak periods. This is due to both land constraints and relatively wide spacing of signalized intersections.

At present, many of the 17 signalized intersections within the study area are performing poorly, some are failing. Cherry Hill Township is densely developed with in-fill development ongoing, and to the east the municipalities served by NJ 70 are growing rapidly. NJ 70 cuts through the heart of Cherry Hill. Cherry Hill's various neighborhoods and business owners perceive NJ 70's function and purpose is differently. Without being able to recreate this landscape from scratch to accommodate everyone, no single tool will meet all the needs of those who use NJ 70.

The bullet point items listed on the following page are intended to encapsulate the larger issues that currently plague operations on NJ 70.

IDENTIFIED CORRIDOR-WIDE ISSUES ON NJ 70

- ▶ Recurring peak period congestion.
- ▶ Limited number of signalized intersections providing direct access across NJ 70.
- ▶ Inconsistent intersection configurations throughout the corridor compromise driver expectation, i.e.: forward jug handles, reverse jughandles, and traditional intersections.
- ▶ Poorly placed signage exacerbates intersection inconsistency.
- ▶ Densely populated neighborhoods isolated from the larger road network causes their few access points to become overburdened due to lack of connectivity, funneling effect.
- ▶ Automobile oriented developments reduce suitability for mass transit options.
- ▶ Unrealistic driver expectation of high average speeds, akin to that of interstate facilities, is incompatible with the retail and residential dominated landscapes characteristic of the study corridor.
- ▶ Multiple crash cluster locations indicating safety problems related to poor operations.

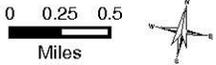
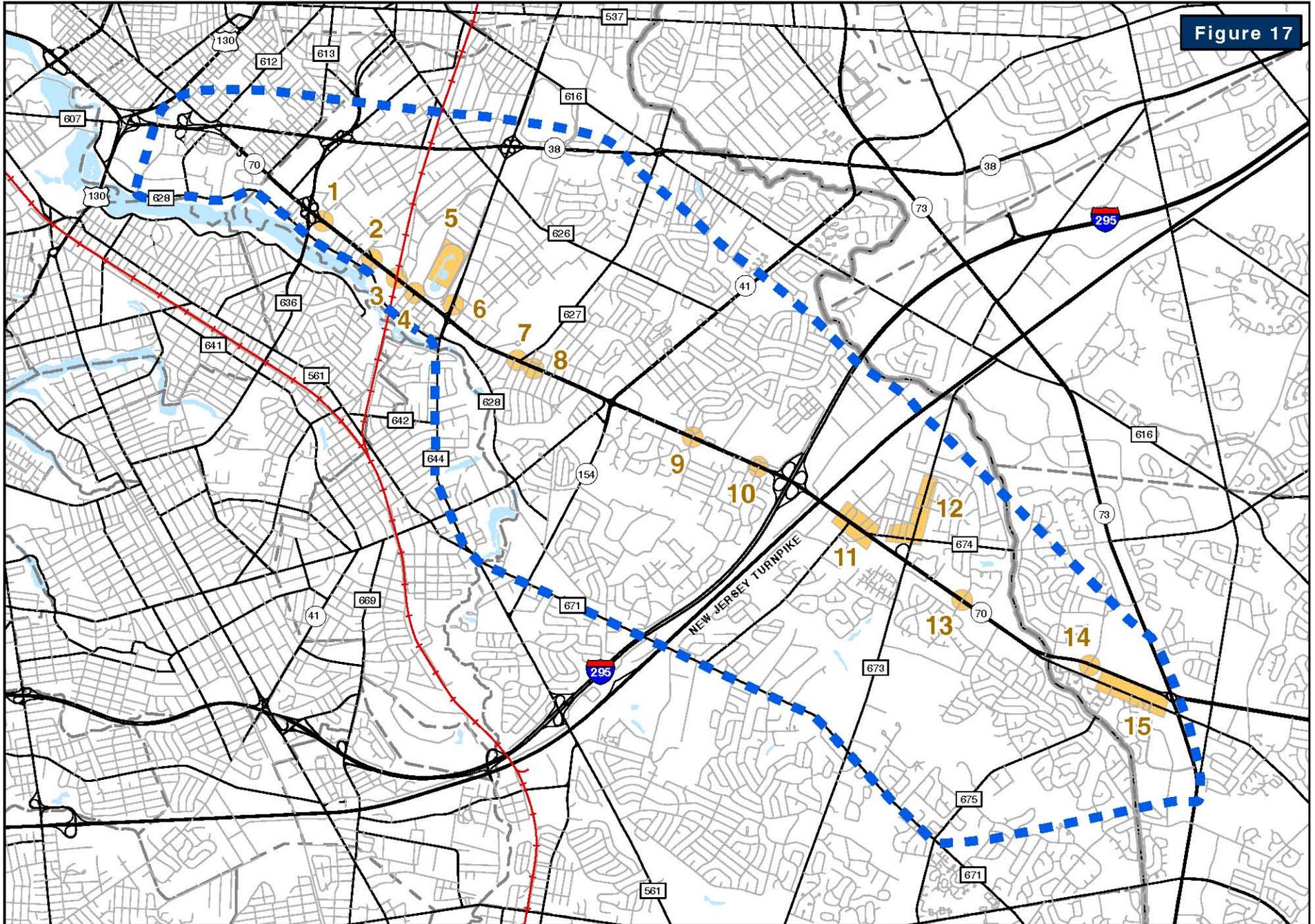
CORRIDOR-WIDE IMPROVEMENT STRATEGIES

- ▶ Conduct an origin and destination study and/or license plate survey to define the travel patterns of the NJ 70 commuter. Test suitability of express bus service between Philadelphia from Medford
- ▶ Identify opportunities to connect land uses. This will require a detailed review of aerial photographs by those who have an intimate knowledge of the local land uses, neighborhoods, and travel patterns between. This must be a working effort between the study team and municipal representatives.
- ▶ Install improved signage that is more visible, more clearly worded, and better placed.
- ▶ Develop long term, context sensitive improvements that maintain existing access points, create new access points, and normalize average speeds.
- ▶ Safety improvements

NJ 70 Corridor Study

Identified Problem Locations

Figure 17



● 10 Identified Problem Location

5.2 IDENTIFIED PROBLEM LOCATIONS AND POTENTIAL IMPROVEMENT SCENARIOS

Introduction

The following location specific problems were identified through meetings and field visits with representatives from each of the study area municipalities (see Figure 17). Follow up visits to the field were conducted by staff during off peak and peak periods to gather data and examine typical conditions. After the initial data gathering was complete and the problem areas defined, determinations were made concerning the regional significance of each location. As a result, those problems deemed to be of greater local significance than regional, were excluded. This exercise is an important step in keeping the study focused on the corridor.

Follow-up visits to the study area were conducted by staff during off-peak and peak periods to gather data and examine typical conditions.

MARLTON CIRCLE: CONFLUENCE OF NJ 70 AND NJ 73 > MILEPOST 8.33

The Marlton Circle was not analyzed in this report because the New Jersey Department of Transportation has a plan for reconstruction already underway. The plan is to eliminate the circle and replace it with a grade separated interchange. The transportation improvement program project number is **DB# 567** and titled **Routes 73 / 70 Marlton Circle Elimination (5)**

The Marlton Circle, at the intersection of Route 70 and Route 73, will be eliminated; a grade-separated interchange (Route 73 over Route 70) will be constructed. The primary objective is to improve traffic flow and thereby reduce congestion on Route 73 and Route 70 through the intersection. The circle was included in the crash analysis (section 4.0).

1. NJ 70 WESTBOUND / CURTHBERT BOULEVARD / EXECUTIVE CAMPUS > MILEPOST 1.12

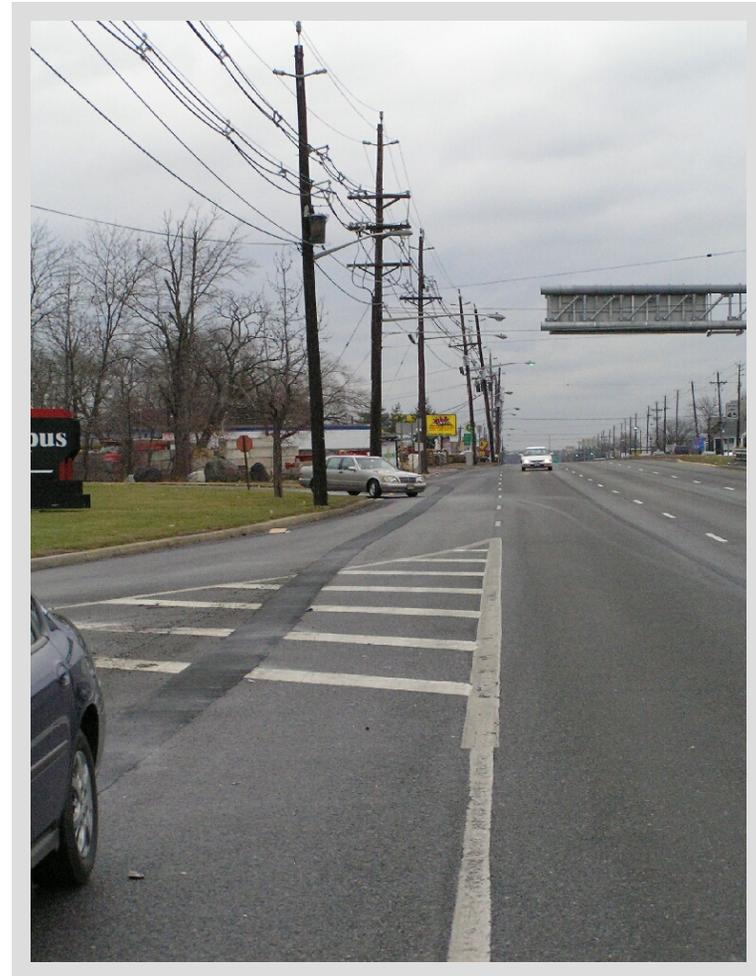
Identified Problem At this location conflicts were noted between traffic exiting the executive campus to NJ 70 westbound and traffic on 70 westbound en route to the Cuthbert Boulevard northbound off-ramp. Additionally, this weave length is relatively short thus increasing the probability for crashes. The executive campus access to NJ 70 westbound is controlled by a stop sign. The alignment of this approach makes this access function more like a driveway than a ramp. Field observations confirmed free flowing traffic

and seemingly higher speeds on NJ 70 westbound at this location. This is caused in part by the natural down grade of the facility westbound, three lanes of traffic, and few developments along this stretch. A crash cluster as defined in the safety analysis was not identified at this location.

Local officials identified this location of NJ 70 as site of regular pedestrian crossings. During one field visit a pedestrian was observed attempting to cross NJ 70 after disembarking from the eastbound NJTransit 406 bus.

Potential Improvement Scenario There is presently no other location for traffic from the executive campus to access NJ 70 westbound. Until an alternative is developed this access point must remain open. In the interim safety measures should be implemented to alert motorists on NJ 70 westbound of the traffic entering from the executive campus, i.e. signage, flashing beacon. Similar safety improvements are also appropriate for traffic exiting the executive campus into NJ70 westbound.

Vehicle exiting Executive Campus to NJ 70 westbound

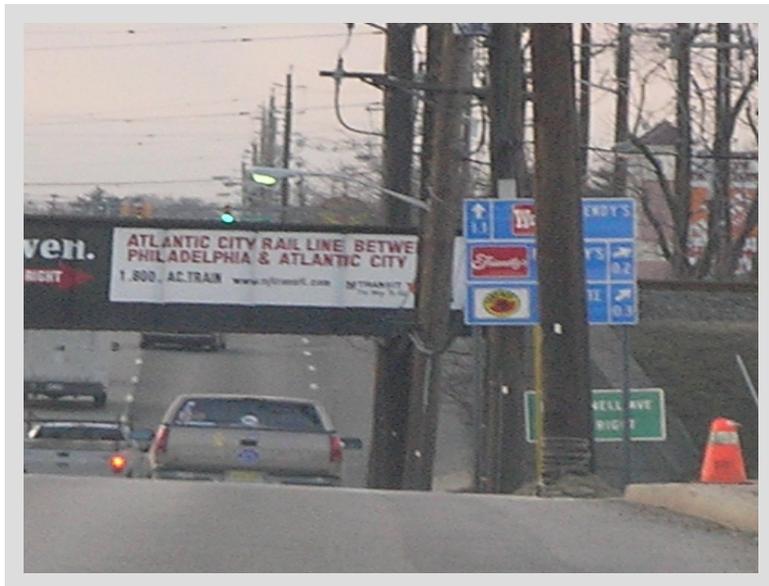


2. CORNELL AVENUE JUG HANDLE FROM NJ 70 WESTBOUND > MILEPOST 1.6

Identified Problem According to local officials NJ 70 westbound traffic frequently misses the right turn near-side jug handle access to The Pavilions shopping center. Traffic then attempts to turn right at the Cornell Avenue intersection where right turns are prohibited.

Currently a sign is located to the east of the NJTransit rail overpass, in advance of the near-side jug handle, that reads “SO. CORNELL AVE”, directing traffic for the U-Turn and jug handle. There are also smaller signs at this location

Visual clutter along NJ 70 westbound



advertising the fast food establishments located in the shopping center. On the west side of the rail overpass there are more signs displaying the same information at the jug handle ramp entrance.

Potential Improvement Scenario New and improved signs should be placed in advance of the jug handle and at the jug handle ramp. Signs should be very explicit and used in tandem with reflective roadway markings. These signs should make it very clear that to enter the shopping center, traffic must utilize the near side jug handle. Adding the signs that indicate the distance to the jug handle (i.e., “1/4 mile on right”) will better inform the motorist.

NJ 70 westbound at entrance to Cornell Ave. jug handle



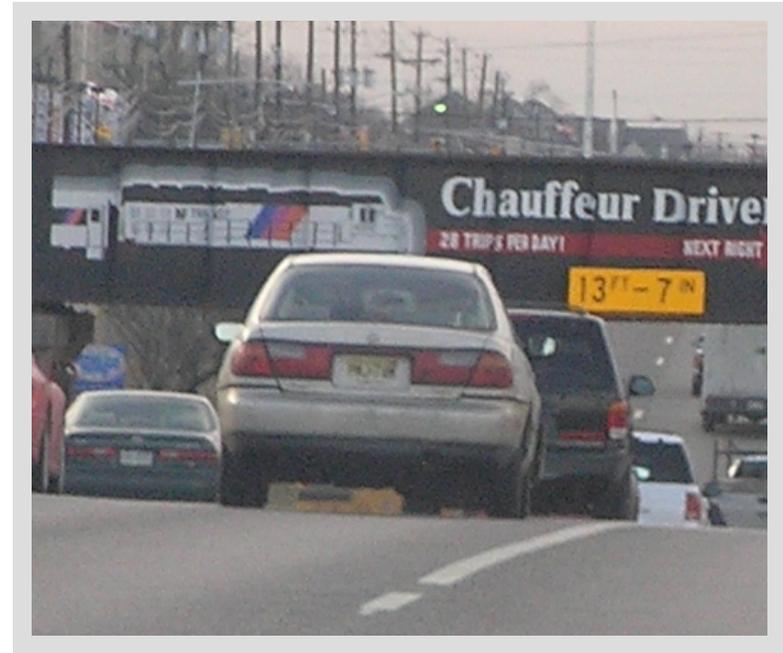
3. ATLANTIC CITY RAIL LINE BRIDGE OVER NJ 70 > MILEPOST 1.84

Identified Problem NJ 70 passes under the Atlantic City Rail Line bridge carrying three lanes per direction – a six lane cross section. According to local officials truck traffic is sometimes diverted through neighborhoods to avoid this underpass due to inadequate clearance. The vertical clearance under the bridge is posted at 13.7. The Geometric Design of Highways and Streets 2004 (American Association of State Highway and Transportation Officials) states: “Existing structures that provide clearance of 14 ft, if allowed by local statute, may be retained. In highly urbanized areas, a minimum clearance of 14 ft may be provided if there is an alternate route with 16 ft clearance.”

Potential Improvement Scenario Short Term - Develop a truck route to accommodate those trucks forced to use an alternate path due to the low clearance of the over pass. This effort should involve officials from state and local law enforcement, local businesses, trucking firms, and local government, i.e.: Cherry Hill Township. This type of cooperative approach is low cost, although it requires a high level of buy in by all parties involved.

Long Term - Raising the bridge is a high cost, large-scale improvement, albeit an effective one. If such an improvement is considered, it would be prudent to time the project to coincide with the proposed widening slated for the Garden State Park redevelopment project.

Atlantic City Rail Line overpass with posted height restriction



4. PENN AVENUE JUG HANDLE > MILEPOST 1.95

Identified Problem Although the number of signs for this near- side jug handle are sufficient, the information is somewhat unclear, and the sign placement can be confusing for the motoring public. Local representatives reported that NJ 70 westbound traffic often misses this jug handle for Haddonfield Road northbound causing them to make a U-turn from Haddonfield Road southbound—a move that can be very difficult.

Potential Improvement Scenario Existing signs should be replaced with new signs that make it very clear to motorists that to access Haddonfield Road northbound all traffic must utilize this jug handle.

Haddonfield Road northbound jug handle entrance



5. GARDEN STATE PARK REDEVELOPMENT > MILEPOST 2.07

Cherry Hill Township is currently undergoing one of the largest redevelopment projects the community has ever seen. When finished, the former Garden State Park horse racing complex will be the site of a mixed use development containing 1,652 residential units, 608 age restricted units, 285 affordable units with the balance as high-density. In addition to housing there will be one million square feet of office space, and two million square feet of retail.

Some of the planned transportation improvements include the widening of Haddonfield Road to accommodate access to the site and projected additional traffic, and a new road between the existing stable entrance on Haddonfield Road and NJ 70 that follows the western perimeter of the property. Also, a new right in right out access point will be added to the retail complex fronting NJ 70.

The impact of this project in terms of trip generation and level of service on surrounding facilities was considered in NJDOT's NJ 70 Concept Development Report. The total trip estimates are as follows: 2,662 a.m. peak hour trips; 4,490 p.m. peak hour trips; and 3,944 Saturday peak hour trips.

Garden State Park Redevelopment:

Identified Potential Problems

- ▶ Impact of additional trips to NJ 70, and to parallel and perpendicular roads resulting in neighborhood cut through routes and a possible reduction in safety
- ▶ Impact of increased traffic and wider roads on pedestrian and bicycle movements
- ▶ Expanding of current weekday and weekend peak period congestion

Potential Improvement Scenarios

- ▶ Identify transit opportunities that provide alternatives to automobile trips, i.e. neighborhood shuttle buses, connections between transit hubs and shopping destinations
- ▶ Identify important pedestrian crossings and develop improvements which promote safety and accessibility
- ▶ Implement traffic calming measures and traffic management techniques which facilitate safe and efficient flow of vehicles while maintaining quality of life

6. INTERSECTION OF CR 644 HADDONFIELD ROAD AND WYNWOOD AVENUE > MILEPOST 2.31 (NJ 70)

Identified Problem Haddonfield Road meets NJ 70 at a signalized intersection. Wynwood Avenue, which serves residential traffic and serves as a jug handle for traffic from NJ 70 westbound, meets Haddonfield Road at a signalized intersection approximately 500 feet north of the Haddonfield Road/NJ 70 intersection. The close proximity of these two signal sets sometimes creates confusion for motorists traveling southbound on Haddonfield Road. A safety problem occurs when southbound Haddonfield Road traffic fails to notice the Wynwood Avenue signal instead paying attention to the signal at NJ 70, sometimes running the red light signal at Wynwood Avenue.

Haddonfield Road southbound at Wynnewood Avenue



Potential Improvement Scenario Improvements at this location are needed to create greater awareness of the signal controlling the intersection at Wynwood Avenue and Haddonfield Road for motorists traveling southbound on Haddonfield Road. The following improvements are commonly used to achieve this goal and would be effective at this location: 1) Replace the signal head at Haddonfield Road and NJ 70 with an optical head which is only visible when approaching the signal from a relatively short distance away, 2) Improve signage in advance of the Wynwood intersection for motorists traveling southbound on Haddonfield Road, 3) Install a flashing strobe light to alert motorists of the signal ahead.

7. COOPER LANDING ROAD LEFT TURN MEDIAN OPENING > MILEPOST 2.92

Identified Problem From a corridor perspective there are few opportunities to cross NJ 70 directly. The median opening at Cooper Landing Road on NJ 70 eastbound provides access to the north side of the Erlton neighborhood, which is a significant population center, and other points north including Maple Shade Township. This left turn slot is the first opportunity to turn left east of Haddonfield Road. The opening has a left turn stacking lane on NJ 70 eastbound that can accommodate approximately 8 to 10 vehicles. Left turns from NJ 70 westbound are prohibited at this location. The crash analysis identified a crash cluster at this median opening. The need here is to address the safety problem while maintaining this critical access point.

Median opening at Cooper Landing Road



Potential Improvement Scenario Add a traffic signal to NJ 70 at the median opening for Cooper Landing Road (milepost 2.92) to operate in coordination with the signal at the intersection of NJ 70 and Edison/Georgia Avenues (milepost 3.00) located to the east. The purpose of this signal is to control left turns from NJ 70 eastbound to Cooper Landing Road northbound allowing the movement as protected only. Permissive left turns are inherently unsafe, with safety decreasing dramatically when motorists cross multiple lanes, in this case two lanes.

The turn arrow signal should be coordinated to permit left turns only when the minor streets at the NJ 70 and Edison/Georgia Avenues intersection have a green signal.

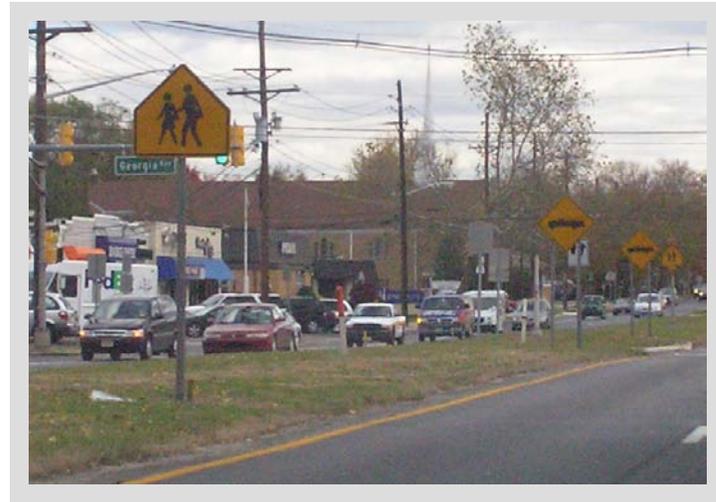
Traffic turning onto NJ 70 westbound from these minor streets would then queue at the Cooper Landing signal until the left turn phase ends. There is sufficient stacking capacity on NJ 70 westbound between Cooper Landing Road and Georgia Avenue (two lanes with a length of approximately 360 feet each). According to the NJ 70 Concept Development Study the combined number of vehicles turning from Edison/Georgia Avenues to NJ 70 westbound during the peak period is not great enough to exhaust the proposed queue. These two signals must be optimized and coordinated in order to lessen the probability of dilemma zone related crashes.

8. INTERSECTION OF GEORGIA AVENUE / EDISON AVENUES AND NJ 70 > MILEPOST 3.00

Identified Problem This intersection is located at the heart of Cherry Hill's densely developed Erlton neighborhood. According to local officials there is a problem with the left turn movements from the side streets. In particular, the opposing left turns from Georgia and Edison Avenues conflict causing hesitation by the motorists which results in inadequate clearing of the queue. The approaches of both Georgia Avenue and Edison Avenue are one lane accommodating all three movements: left turns, right turns, and through movements.

According to the NJDOT NJ 70 CD Report left turn movements from Georgia Avenue to NJ 70 eastbound in both the a.m. and p.m. peak periods were the highest volume movement of the day reaching 177 turns during the p.m. peak. Field visits identified recurring stacking on the minor street

NJ 70 eastbound at Georgia Avenue



approaches. The overall weekday level of service for the intersection in 2003 was: E (a.m.), F (p.m.) (*NJ 70 CD REPORT*).

Although left turn lanes are not present on NJ 70 at the intersection, left turns from NJ 70 are not prohibited. The demand for left turns from NJ 70 eastbound is accommodated at the Cooper Landing Road median opening located approximately 3/4 of mile to the west. There are several unsignalized median openings from which left turns can be made for NJ 70 westbound traffic.

Potential Improvement Scenarios Test the effects to level of service when adding a split phase signal configuration. This would allow each minor street approach to clear uninhibited by

the opposing minor street movements. Currently the minor street approaches are actuated to increase efficiency. Undoubtedly this improvement will compromise green time for through traffic on NJ 70 during high volume periods. Testing the alternatives using signal optimization software will allow for evaluation of benefits and disbenefits. Improvements at this location should be implemented in tandem with the recommended improvements for Cooper Landing Road.

9. INTERSECTION OF NJ 70 AND KINGSON ROAD / WEST GATE DRIVE > MILEPOST 4.30

Identified Problem Recurring peak period congestion frequent crashes, and a high demand for access to shopping and to homes plagues this area of the study corridor. The intersection of NJ 70 and Kingston Road/West Gate Drive is situated at the center of the Barclay and Kingston Estates neighborhoods of Cherry Hill Township. These neighborhoods, situated a short distance behind NJ 70, use NJ 70 as a primary access route. NJ 70 in this section of the corridor is two lanes per direction and serves a densely developed retail and commercial area. At roughly one mile in length, this four-lane section of the corridor contains two signalized intersections and seven median openings. The second intersection, Frontage Road/Covered Bridge Road at NJ 70, is located at the eastern end of the section.

Intersection Details

The Kingston Road/West Gate Drive intersection is unique to the study area because it is controlled by a four-phase signal

that includes a split phase movement for the minor streets.

The phases are:

- 1) NJ 70 through traffic
- 2) NJ 70 left turn only (actuated)
- 3) Kingston Drive only (actuated)
- 4) East Gate Drive only (actuated)

Each minor street approach is two lanes configured for a dedicated left turn lane and a shared left/through/right turn lane. NJ 70 has two through lanes plus a dedicated left turn lane with a protected signal phase. The left turn movement from NJ 70 and the side street movements are actuated, thus the amount of green time allotted to the movement correlates to the number of vehicles queuing at the approach. When all approach queues are full, maximum green time is allotted to each movement. Depending on the signal type, the extra green time needed may be taken from the non-actuated movement—NJ 70 main line. Less green time on NJ 70 could cause traffic to back up, leading to congestion that may continue until volumes decrease.

Turning Movements and Land Use

According to the NJDOT *NJ 70 CD Report*, demand for left turn movements from the minor street approaches is very high. Combined, there were 576 a.m. and p.m. peak hour left turns from Kingston Drive, and 427 from West Gate Drive. An examination of land use and the local street network indicates that this location bears a disproportionate burden of left turns due to a lack of left turn opportunities in the vicinity along NJ 70.

NJ 70 eastbound at Kingston Road intersection



This intersection (mile post 4.30) provides the first signalized opportunity to cross NJ 70 east of Kings Highway (mile post 3.66). The split phase nature of the side street approaches may also attract motorists seeking access to the other side of NJ 70 because it provides a protected movement, which is safer. This is the only four-phase intersection in the study area. Although it provides excellent access to the neighborhoods and for crossing NJ 70, the added signal phases may reduce the green time for through traffic on NJ 70.

Pedestrian Environment

An additional consideration is the pedestrian environment between Kingston Road and Covered Bridge Road. Sidewalks are intermittent in this location and only one marked crosswalk for access across NJ 70 is available, located on the east side of the intersection. The next crossing to the east is 1.3 miles away at Marlkrass Road, and to the west at Kings Highway, 0.6 miles away. Ironically, this location has a very high concentration of retail establishments that provide low wage employment. People who depend on public transportation often hold these jobs and pedestrian movements are an integral component of transit trips.

More crossing opportunities that are well marked and signal controlled will benefit the transit dependent. In addition they will provide a safer and more convenient option for pedestrian shoppers, and for shoppers who would wish to park their cars and circulate on foot.

Potential Improvement Scenarios

Short Term - The need at this location is three-fold: 1) reduce congestion on NJ 70, 2) increase capacity for left turn movements from the minor streets, and 3) improve pedestrian facilities.

1) Congestion reduction can take on several forms. The most practical and cost-effective short term measure is to optimize the signal, and to implement/optimize signal coordination. Signal optimization is an automated process by which the most efficient operation of a signal is identified through a series of tests. In this context it also refers to all maintenance, upgrades, timing adjustments, and miscellaneous efforts to improve efficiency of signal operation. Signal coordination is defined by the *Manual on Uniform Traffic Control Devices* as the establishment of timed relationships between adjacent traffic control signals. Signal coordination can greatly improve traffic flow and reduce congestion.

Increasing capacity by adding a through lane in both directions will also address congestion. This approach is a more costly option, and its long-term benefits are unclear. A major drawback of this approach is the need to close median openings to avoid safety problems associated with median

openings in a six-lane configuration. This will further restrict access to side streets and businesses. If this option is pursued the additional travel distance and time needed for using an adjacent signalized location to turn around should be considered.

2) Increasing the capacity of left turn movements from the side streets can be accomplished by creating dedicated dual left turn lanes. There is a grass median separating the approach and departure lanes on the minor streets that may be utilized to add a dedicated right turn lane. This will allow the original two lanes to become dual left turn lanes.

3) More crossing opportunities that are well marked and signal controlled will benefit the transit dependent and all pedestrians. In addition, it will provide a safer and more convenient option for pedestrian shoppers, and for shoppers who would wish to park their cars and circulate on foot.

Long Term - Provide more left turn opportunities along NJ 70 within this stretch of the corridor. This may become essential if medians are closed to accommodate a widening to three lanes per direction. Currently only the two intersections provide a signalized opportunity for left turns and u-turns. Between them lies the most densely developed retail section of the corridor, exemplifying the need for access.

Currently access is supplemented by the seven unsignalized median openings between Kings Highway and I-295 (1.4 miles). These openings, albeit needed for access, pose safety

concerns due to their design and proximity to one another. Six of the seven openings in this section are referred to as conventional midblock median. These openings which traffic from both directions. The unrestricted open area in this opening type presents safety issues. Another disadvantage is the absence of left turn lanes causing vehicles to queue in the through lane while waiting to enter the opening. A better and safer design type is the **directional midblock opening with left turn lanes**. The appendix contains diagrams of various median opening types and their associated advantages and disadvantages as described in the report *Safety of U-Turns at Unsignalized Median Openings* published by the National Cooperative Highway Research Program in 2004.

Another worthy consideration is the addition of a third signalized intersection. NJ 70 at Ranaldo Terrace and the entrance to Barclay Farms Shopping Center is a logical location. It is nearly equidistant from the adjacent two intersections (Kingston and Covered Bridge), and it would provide signalized left turn access to and from the shopping center. It would provide an additional signalized opportunity to turn left from the north side of NJ 70 easing the congestion at Kingston Drive by distributing the burden.

A circulation plan that incorporates access management and consolidation of median openings into fewer, better designed left-turn/u-turn opportunities, would be the best approach to meet the needs of the businesses, commuters, and residents in this section of Cherry Hill.

10. INTERSECTION OF COVERED BRIDGE ROAD / FRONTAGE ROAD AND NJ 70 > MILEPOST 4.81

Identified Problem This intersection suffers from poor operations and a high demand for turning movements. In particular, left turns from the minor streets compete during the all green phase that follows the leading left priority for Frontage Road. The reason for inadequate clearing of left turns is shadowing; i.e. head to head left turning vehicles block each other's view of oncoming right turn and through moving traffic. The result is inadequate clearing of the left turn queue and increased potential for conflicts between opposing vehicles.

At this location NJ 70 is two lanes per direction. Left turns and u-turns eastbound are accommodated by a near-side jug handle that utilizes neighborhood streets leading to Covered Bridge Road. Westbound left turns are made via far-side jug handle. Covered Bridge Road northbound and the Frontage Road southbound approaches each have a left turn only lane, and a shared-through/right turn lane. A leading left signal priority is provided for the Frontage Road approach only. This allows left turns to go unimpeded by opposing traffic at the beginning of the green cycle before turning to all green.

According to the *NJDOT NJ 70 CD Report*, left turn movements from Frontage Road in the a.m. was the heaviest volume movement of the day reaching 368 turns during the a.m. peak hour.

Covered Bridge Road jug handle entrance from 70 eastbound



Consequently, stacking is typical on the minor street approaches and is particularly problematic on the Frontage Road approach. Demand at this intersection is greatly influenced by the close proximity of the I-295 interchange located ¼ mile away. The *Route 70CD Report* determined the following overall level of service for this intersection: D+(a.m.), C+(p.m.) (weekday/2003).

The Frontage Road approach has geometric problems that exacerbate the overall intersection operations. The mix of Frontage Road southbound traffic with traffic from the apartment complexes, combined with the jug handle traffic from NJ 70 westbound compromises the efficiency of the

intersection. The hotel located on the west side of the jug handle has direct access to the jug handle that is duplicative and therefore unnecessary. The apartment complexes have duplicative access to Frontage Road also complicating the flow of traffic. The current design of this facility cannot adequately expedite the high volume of traffic entering Frontage Road simultaneously from these points. Greater capacity is needed although very little vacant land is available for expansion.

Potential Improvement Scenario Test the effects to level of service when adding a split-phase signal configuration. This would allow each minor street approach to clear uninhibited by the opposing minor street movements. To increase efficiency, the signals should be actuated so that the movement with the greatest number of queuing vehicles gets more time. Another possible signal configuration is the protected left turn phase allowing the unimpeded flow of the left turns from both approaches simultaneously. The appropriate geometry is necessary for this configuration.

Another consideration to better accommodate the high demand for left turns on Frontage Road southbound is the addition of a second left turn lane. Known as “dual left turns”, this improvement would move more left turning vehicles through the intersection in the same amount of time. This configuration requires a dedicated movement via split phasing—possibly exacerbating congestion on NJ 70. In addition, it involves more land area.

Frontage Road southbound will work more efficiently by closing the apartment complex access to the jug handle. This traffic can be accommodated via an alternate driveway to Frontage Road that already exists. Access from the hotel to the jug handle should also be eliminated since it too has an alternate access to Frontage Road. Access to the bank located on Frontage Road should also be moved away from the intersection. Presently the bank access enters Frontage Road near the intersection stop bar, which makes exiting the bank to Frontage Road southbound difficult. Redesigning the access point would benefit both the bank and the operations of the intersection.

Confluence of Frontage Road traffic and Covered Bridge Road jug handle traffic



11. NJ 70 / GREENTREE ROAD / SPRINGDALE ROAD INTERSECTION AND MARLKRESS ROAD JUG HANDLE > MILEPOSTS 5.60 – 5.75

Identified Problem According to local officials, traffic en route to Greentree Road or Springdale Road from NJ 70 eastbound often misses the nearside jug handle at Markkress Road, which provides access to these cross streets. This near side jug handle is especially confusing for motorists en route to Springdale Road northbound because it doesn't provide a direct connection. Instead, traffic must follow Greentree Road from Markkress Road, approximately 1/3 mile to the intersection with Springdale Road. There are two unsignalized median openings on NJ 70 east of Springdale Road where traffic is reportedly making u-turns to NJ 70 westbound to access these streets and/or other destinations on the north side of NJ 70, after having missed the jug handle at Markkress Road.

It was also reported that traffic frequently turns right on Springdale Road southbound from NJ 70 then redirects to Springdale Road northbound by making a U-turn. All three intersections with NJ 70 (Markkress, Greentree, and Springdale Roads) were identified as crash cluster locations.

Potential Improvement Scenario A field observation identified two signs for Markkress/Greentree/N. Springdale Roads. The first is located one-quarter mile in advance of the intersection, and the other is between the first and the intersection. Because this jug handle is somewhat confusing

to motorists unfamiliar with the territory, a re-wording that states more clearly that the Markkress Road jug handle is the only way to access these roads from NJ 70 eastbound, should be considered.

Also, only a single overhead street sign for Markkress Road is posted at the intersection with NJ 70 eastbound. Better signage at this location, which ties in to the previous signs, is necessary to direct traffic en route to Greentree Road or to Springdale Road northbound. In addition, a bigger, more prominent, directional sign should replace the existing sign on Markkress Road to facilitate smoother traffic flow. An overhead sign with arrows indicating the appropriate lane for the appropriate direction should be also explored.

NJ 70 eastbound approaching Markkress Road



12. HIGH VOLUME OF TRAFFIC ON SPRINGDALE AND GREENTREE ROADS FROM CHERRY HILL INDUSTRIAL COMPLEX

Identified Problem According to local officials, the Cherry Hill Industrial Complex generates a high volume of traffic en route to NJ 70 westbound via Springdale and Greentree Roads. This high volume of traffic adds to the problematic merge movement at Greentree Road and NJ 70 westbound and may be contributing to the high number of crashes at this location. This location would benefit from a redistribution of the traffic.

Potential Improvement Scenario There is a need to lessen the concentration of traffic from the industrial park emptying onto Greentree Road. The following approaches can be used separately or in combination:

- Create a connector road between Markkress Road and Springdale Road to provide a parallel facility for distributing the volume. Markkress Road is an ideal facility to connect to because it provides access to NJ 70 eastbound and westbound. Local officials have identified Garden Street as potential connector between Springdale Road and Markkress Road.
- Examine the work schedules of the larger employers in the industrial park. If this reveals that several businesses are letting out large numbers of employees at the same time, then staggering work hours slightly will lessen the burden on neighboring roads by distributing the traffic over time.

13. BIRCHWOOD PARK DRIVE > MILEPOST 6.61

Identified Problem There is a left turn lane and median break on NJ 70 eastbound at Birchwood Park for access into the development. This access is reportedly being used as a U-Turn for traffic that missed the Greentree/Springdale jug handle at Marlkers Road. Local representatives reported that this increase in traffic volume has created a nuisance for development residents, especially when it involves truck traffic. The crash analysis of median openings identified two crashes in the vicinity of this opening from 2001-2003.

Potential Improvement Scenario This additional traffic is inappropriate at this location and may be reduced through better directional signs to the Greentree and Springdale Roads jug handle at Malkress Road on NJ 70 eastbound. Field observations revealed road signs in advance of the jug handle and those at Marlkers Road are somewhat ambiguous and could benefit from clearer wording. The intersections of Marlkers Road and NJ 70, Greentree Road and NJ 70, and Springdale Road and NJ 70 were all identified as crash clusters in the crash analysis. This may be due in part to the lack of clarity regarding turning opportunities at each of these intersections.

14. INTERSECTION OF NJ 70 AND CROPWELL ROAD > MILEPOST 7.67

Identified Problem According to local officials this location experiences congestion during the afternoon and evening peak periods. The intersection connects NJ 70 with Old Marlton Pike (CR 600) via Cropwell Road. Southeastern Cherry Hill, the Woodstream neighborhood, and the Greentree Office Park of Evesham Township, are also accessible via Cropwell Road. This is a relatively busy intersection located at the heart of a heavily developed retail section of the corridor. At this intersection NJ 70 is two lanes per direction with left turn lanes and a protected signal phase, while Cropwell Road provides a two-lane approach with a dedicated left turn lanes and a shared through/right turn lane.

NJ 70 eastbound at Cropwell Road



Field visits to this location did reveal moderate congestion during the p.m. rush hours. According to the *NJDOT Route 70 CD Report*, this intersection did not meet the vehicle/capacity threshold used to identify a congestion management system deficiency. The intersection was identified in the crash cluster analysis as having 50 crashes during the three-year period (also identified in *Route 70 CD Report* for crashes). The predominant crash type, rear-end (54%), exceeded the state average. Rear-end crashes can be common at locations of traffic congestion. The high number of crashes may be related to the high activity level typical along this section of the corridor combined with p.m. peak period commuting traffic.

Potential Improvement Scenario Signal optimization and signal coordination should be explored in an effort to ensure the best possible efficiency and the best flow of traffic through the signal network. In addition, the higher number of side swipe crashes (24% of the total) may be an indication of a need for longer left turn stacking lanes.

15. INAPPROPRIATE USE OF THE SHOULDERS ON NJ 70 VICINITY OF SHOPPING AREAS > MILEPOSTS 7.67 – 8.3

Identified Problem Local officials reported that shoulders along NJ 70 in the eastern end of the study area are being used as right turn queues into businesses, particularly along the heavily developed, eastbound direction which has several access points. Inappropriate use of the shoulder presents a safety hazard when vehicles crossing the shoulder to access a business at the appropriate location, collide with those

vehicles already in the shoulder attempting to by-pass traffic queuing along NJ 70.

Potential Improvement Scenario Short Term - Implement chevron markings to delineate prohibited areas within the shoulder in order to keep vehicles out. These markings combined with rumble strips will prove even more effective by forcing motorists who violate the delineation to slow down, potentially reducing the number and severity of crashes.

Long Term - This location would benefit from a comprehensive access management plan. The purpose is to consolidate access points into fewer, more centralized locations. Creating a frontage road from which all business can be accessed is one technique. Benefits include: fewer conflict points between through traffic and entering traffic, shared parking, and encourages trip-chaining which reduces the number of trips.

Typical shoulder along NJ 70 eastbound



5.3 CUT-THROUGH TRAFFIC

Introduction

When motorists encounter traffic congestion on a higher level facility that they would typically prefer to use, they sometimes seek an alternate route on a lower level facility in an effort to bypass the congestion. This added volume is considered "cut-through" traffic. These problems tend to worsen during the a.m. and p.m. peak periods, while some cut-through routes are busy during the midday as well. In some cases the cut-through routes pass close to schools presenting safety hazards to pedestrians.

The cut through routes included in this section were identified by local representatives during the municipal field visits. Neighborhoods experiencing cut-through traffic reported either higher than average traffic volumes or higher speeds, sometimes both. In the case of this study area congestion along NJ 70 may prompt motorists to seek a path of least resistance. Also, the mobility constraints inherent in a divided highway may cause motorists to utilize more direct routes to and from their destination. Specific improvement scenarios are not identified. Instead, improvement strategies are offered in tool box fashion for consideration and are intended to be used as part of a comprehensive improvement plan.

At the beginning of the NJ 70 study municipal officials reported excessive volumes on select parallel routes to NJ 70. One suspected cause was congestion on NJ 70, exacerbated by

access issues resulting from the I-295 resurfacing project. This project has since been completed.

Recommendations

The NJ 70 corridor may benefit from a combination of signal improvements and traffic calming measures. This approach recognizes that congestion management is realistic, and congestion elimination is not. Signal modifications aimed at improving flow on the main facility, and traffic calming improvements aimed at reducing vehicle speeds through residential areas, are complimentary strategies.

The following techniques may be suitable for managing cut-through traffic in the affected neighborhoods of the NJ 70 corridor. It is important to remember that calming traffic on one street may negatively impact adjacent streets. Thus, it is recommended that a comprehensive approach be developed in order to best manage traffic while maintaining access and flow. For an effort to be successful it must incorporate a community-based approach that promotes understanding and raises awareness of both the problems and the improvement strategy.

1. Prohibit Turns Onto Selected Roads During Peak Hours

Signs prohibiting turns, with the exception of local traffic, onto a parallel route during the morning and/or afternoon peak period can be installed rather easily. The larger issue is the enforcement of such a ban.

2. Install Traffic Control Devices On Parallel Routes

Stop signs or traffic signals force traffic to stop frequently which may make the alternative route less desirable. However, traffic control devices should only be installed if warranted by careful traffic pattern analysis. Many times stop signs create a phenomenon called speed spiking where motorists accelerate excessively in the mid-block sections to try to make up for time lost at stop signs. This also occurs where speed bumps have been installed (see 3 below.)

3. Evaluate Traffic Calming

Traffic calming involves measures that rely on human psychology and physical constraints to slow or deter traffic. Traffic calming does not rely on regulatory measures (i.e.: speed limits) or traffic control devices, although these could be used in combination with traffic calming. These measures can be used to reduce speeds and volumes to acceptable levels, improve livability and safety, help prevent crime, and encourage redevelopment.

The three basic approaches of traffic calming are education, enforcement, and engineering. Education involves raising awareness of issues such as the safety hazards inherent in speeding or reckless driving. It can also focus on proactive approaches like advocating alternative mode use or a speed limit adherence campaign. Enforcement utilizes an increased or targeted police presence for the purpose of issuing citations to violators. The engineering approach examines the physical characteristics of a roadway and the average speed of its traffic, as well as safety issues related to walking and/or

bicycling, to develop design modifications which constrain the speed of traffic to a more desirable and context sensitive limit. This approach recognizes that the design speed of a facility dictates average speed, not the speed limit sign. Center medians, bulb-outs at intersections, speed tables, textured pavements, raised crosswalks, and intersection cushions are among applicable engineering measures used to calm traffic. Not all are appropriate for every situation. Before a particular measure is implemented, a comprehensive evaluation of the surrounding road network and the impacts on local circulation must be considered so as to not shift the problem to adjacent streets.

1. CR 628 PARK BOULEVARD WESTBOUND

Identified Problem According to local officials Park Boulevard is being used as a cut-through route to avoid westbound congestion on NJ 70 during the a.m. peak period. Park Boulevard, a two lane county route, parallels NJ 70 to the south and runs along the Cooper River following a southeasterly orientation. Westbound traffic reportedly enters NJ 70 from Park Boulevard via the Haddonfield Road/Grove Street intersection. Park Boulevard meets Haddonfield Road at an offset intersection. The Park Boulevard westbound approach has a shared left turn/thru lane and a channelized right turn lane, while eastbound has a left turn lane, a thru lane, and a channelized right turn.

From a regional perspective this facility is a logical parallel route to NJ 70 serving neighborhoods located to the south and

southeast for which NJ 70 is somewhat out of the way when traveling west. Although this facility is a county route intended to carry a more moderate volume of traffic, the speed and nature of the traffic is reportedly inappropriate. This is especially true where Park Boulevard traverses neighborhoods and pedestrian routes to schools.

2. CHAPEL AVENUE

Identified Problem Chapel Avenue is a county route (CR 626) from NJ 38 east to NJ 41 Kings Highway, after which it becomes a local street east to its terminus at Old Cuthbert Road. Chapel Avenue traverses residential neighborhoods and serves Cherry Hill East High School and Joyce Kilmer Elementary School.

Local officials reported that the current volume and speed of traffic on Chapel Avenue is excessive and inappropriate regarding existing land uses. This traffic is said to be using Chapel Avenue in an attempt to avoid NJ 70 eastbound backups in the p.m. peak period. Traffic reportedly reenters NJ 70 from Chapel Avenue via Old Cuthbert Road. This cut-through route is purportedly faster than following NJ 70 through the congestion.

From a regional perspective this facility is another logical parallel route to NJ 70 serving neighborhoods located to the north of NJ 70. Utilizing a parallel route to NJ 70 is more convenient for motorists living on the north side of NJ 70 due to the lack of left turn accommodations from NJ 70 eastbound.

This location would benefit from a comprehensive approach which retains access without compromising quality of life.

3. KRESSON ROAD, CROPWELL ROAD, RABBIT RUN ROAD, AND OLD ORCHARD ROAD

Identified Problem Traffic reportedly uses Rabbit Run Road and Old Orchard Road from Cropwell Road for access to NJ 70 because Cropwell Road does not intersect with NJ 70. Instead, Cropwell Road ends at Old Marlton Pike where traffic en route to NJ 70 must turn left and follow approximately one quarter mile west to connect with Cropwell Road northbound which meets NJ 70 at a signalized intersection. Cherry Hill East High is located on Cropwell Road which most likely contributes to increased traffic volumes on these roads, especially on Cropwell Road.

High volumes were reported on these routes due to cut-through traffic, resulting in vehicle stacking on the Old Orchard Road approach at NJ 70. Old Orchard Road is also reported to be used as a U-Turn from NJ 70 eastbound to NJ 70 westbound. Rabbit Run Road and Old Orchard Road are both wide, two lane residential streets, intended to carry neighborhood traffic. Old Orchard Road meets NJ 70 at a signalized intersection with a left turn lane and a shared left/right turn lane. Reported cut-through traffic volume is undesirable in the residential neighborhoods.

4. CUT THROUGH TRAFFIC IN ERLTON FROM NJ 70 EASTBOUND > MILEPOST 2.5

Identified Problem According to local officials traffic is attempting to by pass p.m. peak period backups along this two lane section of NJ 70 eastbound by turning right on Conwell Avenue, following to Park Boulevard and then re-entering NJ 70 eastbound via the signalized intersection at Edison Avenue. This cut-through route traverses residential streets in Cherry Hill's densely developed Erlton neighborhood.

5. NJ 70 EASTBOUND TO GROVE STREET TO 1-295 AND VOORHEES VIA CR 561/CR671

Identified Problem Representatives from Haddonfield Borough have identified CR 644 Grove Street as a cut through route between NJ 70 and I-295, as well as being the borough's number one high speed location. As a result Grove Street is the most heavily patrolled road in Haddonfield, also yielding the highest number of citations. A suspected cause of the high volume, described as being predominant during the p.m. peak period, is congestion on NJ 70 eastbound through the Erlton neighborhood. Grove Street meets NJ 70 approximately one half mile west of Erlton where NJ 70 necks down from a 6 lane cross section to a 4 lane cross section, a bottleneck and location of p.m. peak period congestion. It is purported that traffic wishing to avoid congestion on NJ 70 eastbound uses Grove Street as a path of least resistance.

The ultimate destination of the traffic utilizing this route is difficult to determine without a more detailed analysis. By examining a county street map it is apparent that following Grove Street, to either CR 561 Haddon Avenue or CR 671 Kresson Road, would provide the most direct route to the southeastern neighborhoods of Cherry Hill (Woodcrest) and northern Voorhees Township from NJ 70. Another possible destination is I-295 via CR 561 for travelers en route to points southwest. All three routes (Grove, Haddon, and Kresson) are county routes classified as urban principal arterials intended to carry inter-municipal traffic.

Although the volume of traffic maybe undesirable to the residents living in the vicinity of Grove Street, the high speed of the traffic creates a safety hazard compromising quality of life.

According to local officials, increased law enforcement has had only a marginal impact on speed reduction. In addition, the Haddonfield "Drive 25" campaign has not produced a lasting effect on Grove Street. Traffic calming engineering techniques have not been explored to date. Typically the engineer approach produces the most effective and lasting results. Education and enforcement work best as a compliment to engineering modifications.

6. NJ 70 / GROVE STREET / COLES MILL ROAD / WINDSOR AVENUE / MAPLE AVENUE

Identified Problem According to local officials motorists regularly use this route as a short cut between NJ 70 and CR 561 Haddon Avenue. Typically traffic volume is moderate and consistent on Grove Street and Maple Avenue from NJ 70, both of which are county routes. Haddonfield Borough has responded to complaints from residents along Maple Avenue concerning excessive traffic speeds on their street by installing a speed table on the east side of the Maple Avenue bridge, completed as part of the Maple Avenue bridge reconstruction project.

Since the completion of the bridge project, Maple Avenue has been included in the Haddonfield Traffic Calming Study (2004-2005). The study recommended that two additional speed tables be installed within 300' of the existing speed table. This more comprehensive approach will address speed along the length of Maple Avenue between Grove Street and Haddon Avenue. Speed and volume issues on Grove Street, Coles Mill Road, and Windsor Avenue need to be addressed in a comprehensive plan that balances traffic calming with access issues.

7. CUT – THROUGH TRAFFIC ON CR 561 HADDON AVENUE AND NJ 41 KINGS HIGHWAY

Identified Problem Traffic en route to Kings Highway northbound from CR 561 Haddon Avenue regularly backs up

on Potter Street which connects the two. In an attempt to avoid the Potter Street congestion traffic turns right onto Belmont Avenue then left onto Roberts Avenue which meets Kings Highway at a stop sign further north. This cut-through route gives motorists access to Kings Highway northbound without waiting in the stack of vehicles at Potter Street. Residents have complained about both the volume and speed of the cut-through traffic. Municipal officials believe that backs up on NJ 70 eastbound cause traffic to deflect to this cut-through route further exacerbating the problem.

Since the initiation of the NJ 70 study this location has been included as a priority in the Haddonfield Traffic Calming Study (2004-2005). In addition to long range improvement recommendations, temporary measures have been installed to address the volume and speed of the cut-through traffic.

5.4 SIGNS AND LANE MARKINGS

Introduction

Inconsistencies regarding road signs were identified through municipal meetings and field observations. Road signs are essential to the efficient flow of traffic. This is especially important on NJ 70 due to the variety of turning accommodations, i.e.: forward jug handles, reverse jug handles, and left turns at-intersection. Well-placed, well-worded signs used in combination with lane markings where appropriate, provide essential driver information that is especially useful to motorists unfamiliar to the NJ 70 corridor. In addition, better information for motorists can help reduce crashes due to driver error. The locations listed below were identified as having inadequate, confusing, or missing road signs.

Recommendations

Although there is inconsistency in the types of turning accommodations found along NJ 70 in the study area, there can still be consistency in the signing of each. In particular, signs should be consistent regarding placement (over head versus roadside, or both), wording, and use of arrows. In addition they should be combined with lane markings everywhere possible.

Identified Problem Locations: NJ 70 Eastbound

Penn Avenue/Park Boulevard/Haddonfield Road U-Turn

Signage is inadequate for motorists seeking to make a u-turn/left turn via this forward jug handle. Two signs are located in advance of Penn Avenue but none indicate that left turns at Haddonfield Road are accommodated via the jug handle. This is a very long and circuitous jug handle making this information necessary.

Marlkress Road/Greentree Road/Springdale Road Jug Handle

This is a very confusing movement, especially for motorists unfamiliar with the area. Although two signs, one located a quarter mile in advance and another stating exit only can be found before Marlkress Road (eastbound NJ 70), a sign with an arrow indicating where to turn for these three streets is needed at the intersection of Marlkress Road and NJ 70.

Delaware Avenue Jug Handle to Cornell Avenue U-Turn

More advance notice is necessary for motorists seeking to make a left or u-turn from NJ 70 eastbound at this jug handle. The current sign only displays the words "U-Turn" with an arrow located at the corner of NJ 70 and Delaware Avenue. Another sign placed in advance of the turn, in addition to a more informative sign at Delaware Avenue is needed.

Covered Bridge Road Jug Handle

More advance notice is necessary for motorists seeking to make a left or u-turn from NJ 70 eastbound at this jug handle.

Currently a sign is located at Pine Valley Road directing traffic for access to the forward jug handle.

Identified Problem Locations: NJ 70 Westbound

Rock Hill Road

No sign is provided on Rock Hill Road directing traffic where to turn for the Marlkress Road jug handle. One large sign combined with an arrow at the entrance to the jug handle will most likely be sufficient.

Frontage Road Reverse Jug Handle

Advance warning is adequate at this location. This jug handle should be included if improvements to signing on NJ 70 are implemented in order to achieve consistency.

Haddonfield Road Forward Jug Handle Via Fulton Street and Wynwood Avenue

This forward jug handle is within the six-lane section of NJ 70 between Erlton and the Haddonfield Road intersection, which typically experiences free flowing, higher speed traffic. There is also a horizontal curve in the roadway, that when combined with fast moving traffic, makes the jug handle easy to overlook. Only one sign is present located at Fulton Street. A second sign should be added in advance of Fulton Street.

Jug Handle to Cornell Avenue and The Pavilions Shopping Center

The signs at this location are a mix of Pavilions advertisements and directional signage to Cornell Avenue.

Further cluttering the view shed are the advertisements on the rail overpass and several telephone poles interspersed among the ground mounted signed. Although the number of signs is adequate, the placement of and type of sign should be reconsidered.

Identified Problem Locations: Corridor-wide

Lane Transition Warning Signs

Travel lanes on NJ 70 transition from three lanes to two lanes at the entry points to the Erlton and Barclay neighborhoods. These locations are prone to crashes due to the lane drops. Additional signs that warn motorists to slow down and be alert at the transition locations may help reduce crash frequency. These signs may be combined with traffic calming measures.

5.5 MOBILITY

Introduction

By design, a median divided highway presents access and mobility issues due to the limited number of crossing opportunities. In a location where development is sparse and curb cuts for driveways or side streets are few, the need for crossing points is less pressing. But where development is concentrated and retail is predominant, crossing opportunities are a vital concern. The fewer the crossing opportunities, the more travel time and additional distance required to turn around. This situation may be considered inconvenient to

business owners and residents that depend on the facility as their primary access route. Another consideration is the potential overburdening of turning opportunities due to demand.

Densely developed and predominantly built-out, The NJ 70 corridor study area is a prime example of the situation described above. NJ 70 serves as both regional highway and local street and is used for a variety purposes including commuter route, shopping route, and shore route.

The various sections of the study corridor have distinct characteristics, including differing lane configurations. In the six and eight lane sections, left turns and u-turns are predominantly made via jug handles. In the four lane sections these movements are accommodated by a mix of at-intersection turns, jug handles, and unsignalized median openings. As discussed elsewhere in this report, these openings supplement the protected turning movements along NJ 70, and provide access to local businesses.

The following graphics depict NJ 70's varying protected U-turn accommodations relative to select trip generators and residential areas within the study corridor. The pinkish shaded areas represent concentrations of commercial and/or retail establishments, and the un-shaded areas are predominantly residential. In this case, protected refers to left turns and U-turns that can be made during a signal phase or via interchange ramps. Movements made via unsignalized median openings can be characterized as unprotected. These

openings—depicted as black diamonds—are also shown on the graphics.

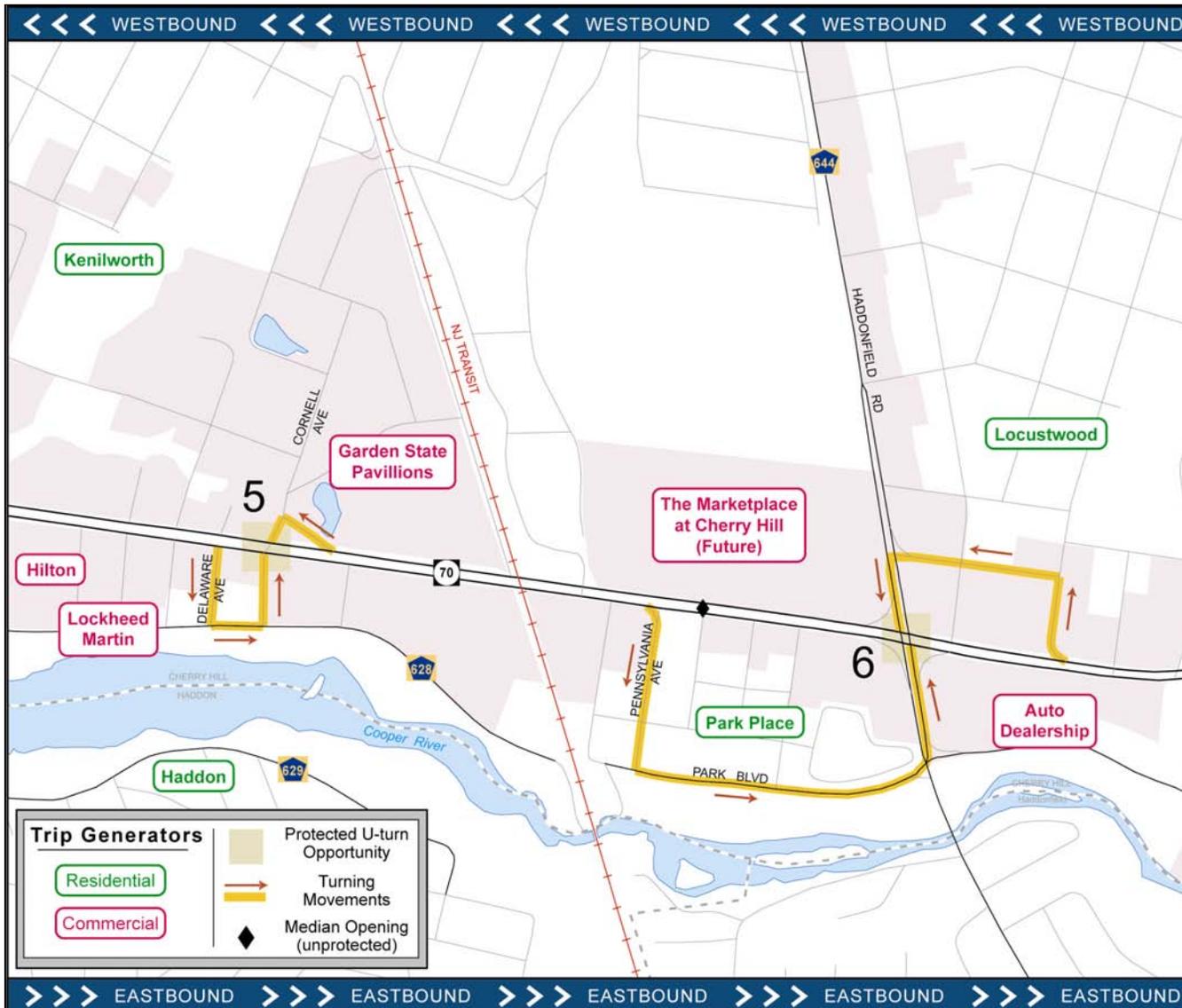
The purpose of these graphics is to present a corridor-wide perspective on local travel within the study area. The images allow the reader to visualize the location of each available U-turn opportunity, signalized and unsignalized, and the necessary routes between local origins and destinations. In addition, one can speculate on the changes to local travel routes and travel times in the absence of unsignalized median openings.

Protected U-turn Opportunities

1. McClelland Ave.:
signalized intersection
WB – nearside jug handle
EB – farside jug handle
2. Lexington Avenue:
signalized intersection
WB – farside jug handle
3. Donahue Avenue:
signalized intersection
EB – nearside jug handle
4. Cuthbert Blvd:
full interchange
WB / EB – all movements via ramps



Prepared by DVRPC



Protected U-turn Opportunities

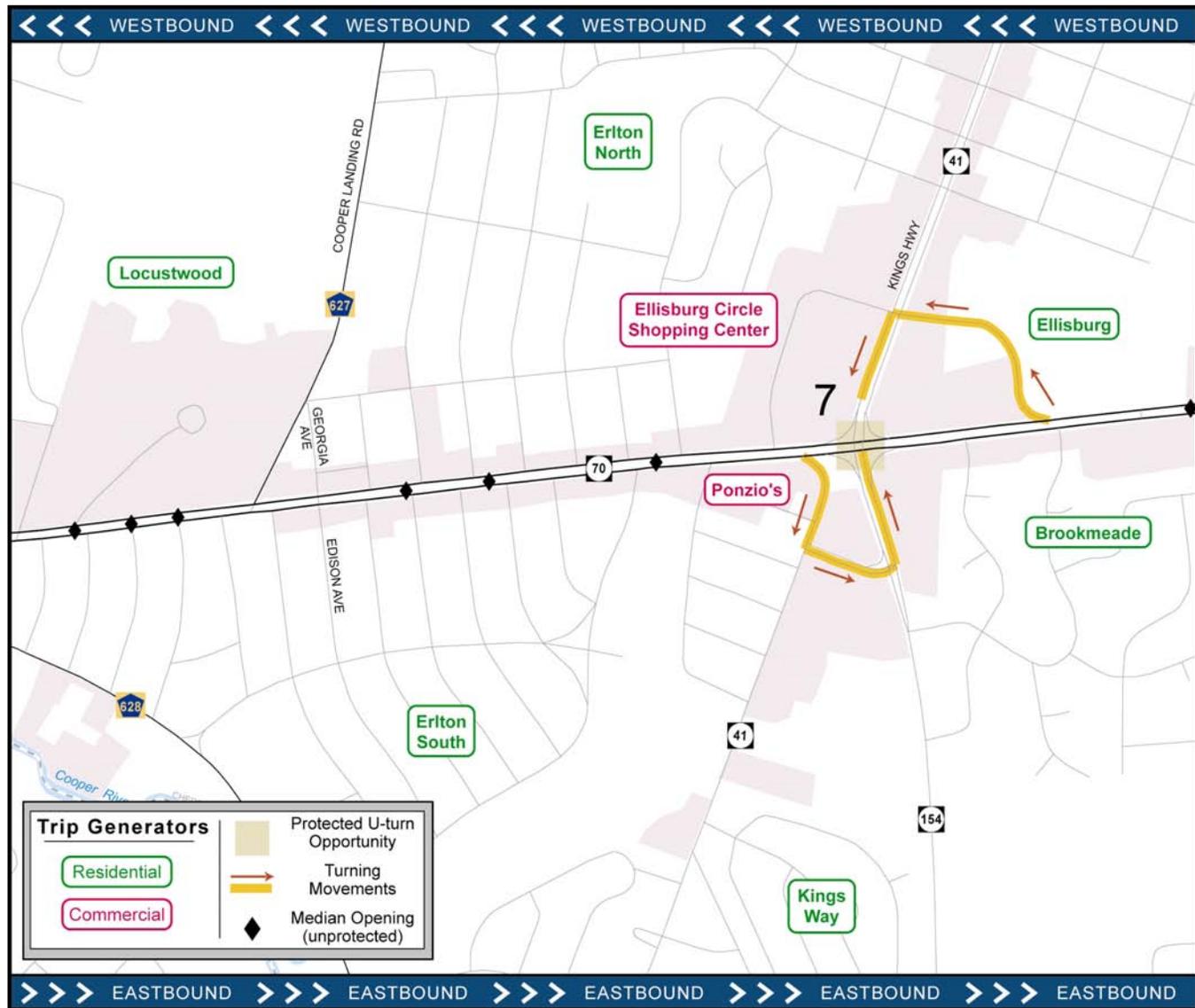
5. Cornell Avenue:
signalized intersection
 EB – nearside jughandle for U-turns, protected signal for dual left turns
 WB – nearside jughandle

6. Haddonfield Road:
signalized intersection
 EB – nearside jug handle via Penn Ave., Park Blvd., and Grove Street
 WB – nearside jug handle via Fulton Street, Wynnewood Ave., and Haddonfield Road

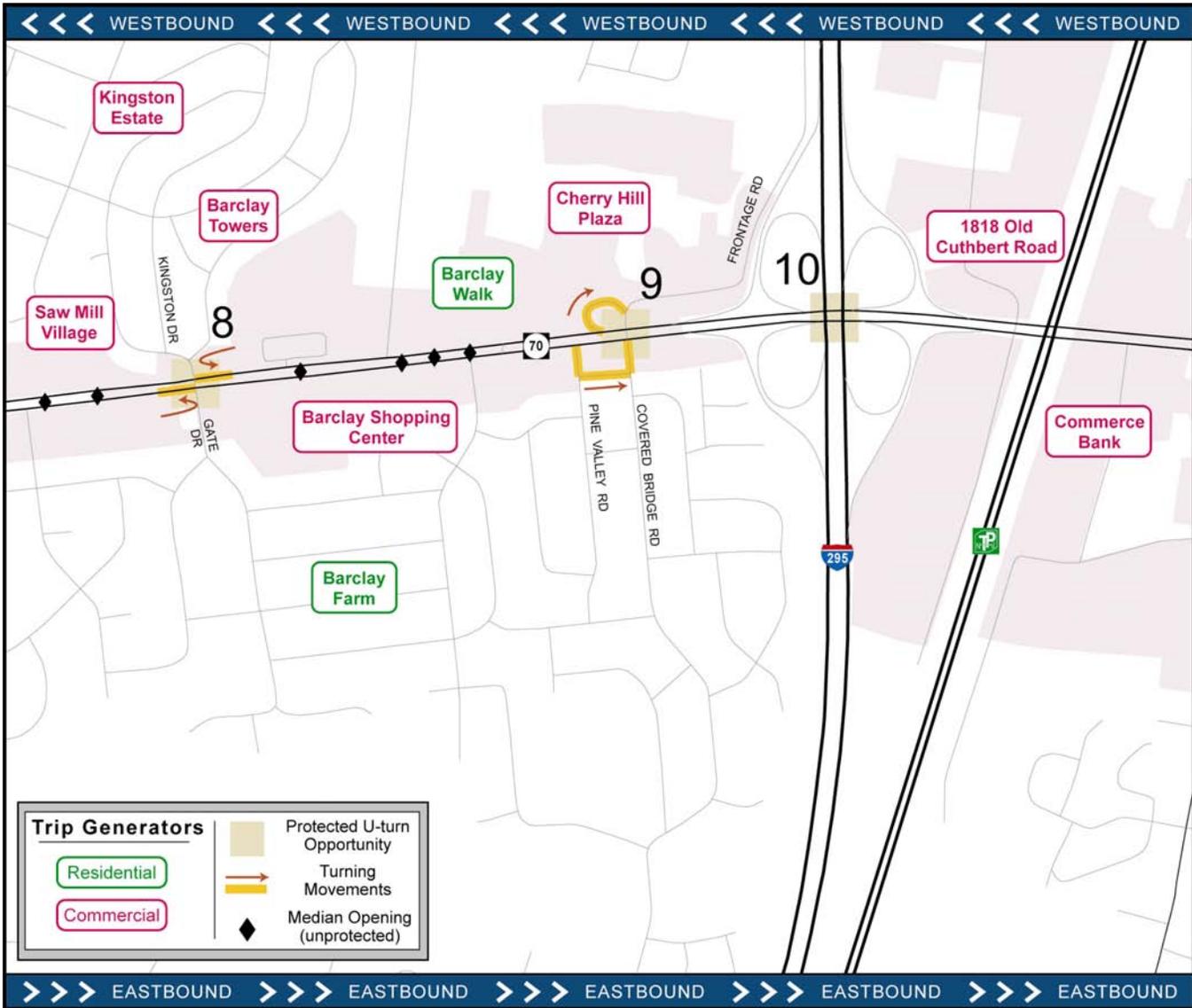
Prepared by DVRPC

Protected U-turn Opportunities

7. Kings Highway: *signalized intersection*
 EB – nearside jug handle via Kings Highway and Brace Road
 WB – nearside jug handle



Prepared by DVRPC



Protected U-turn Opportunities

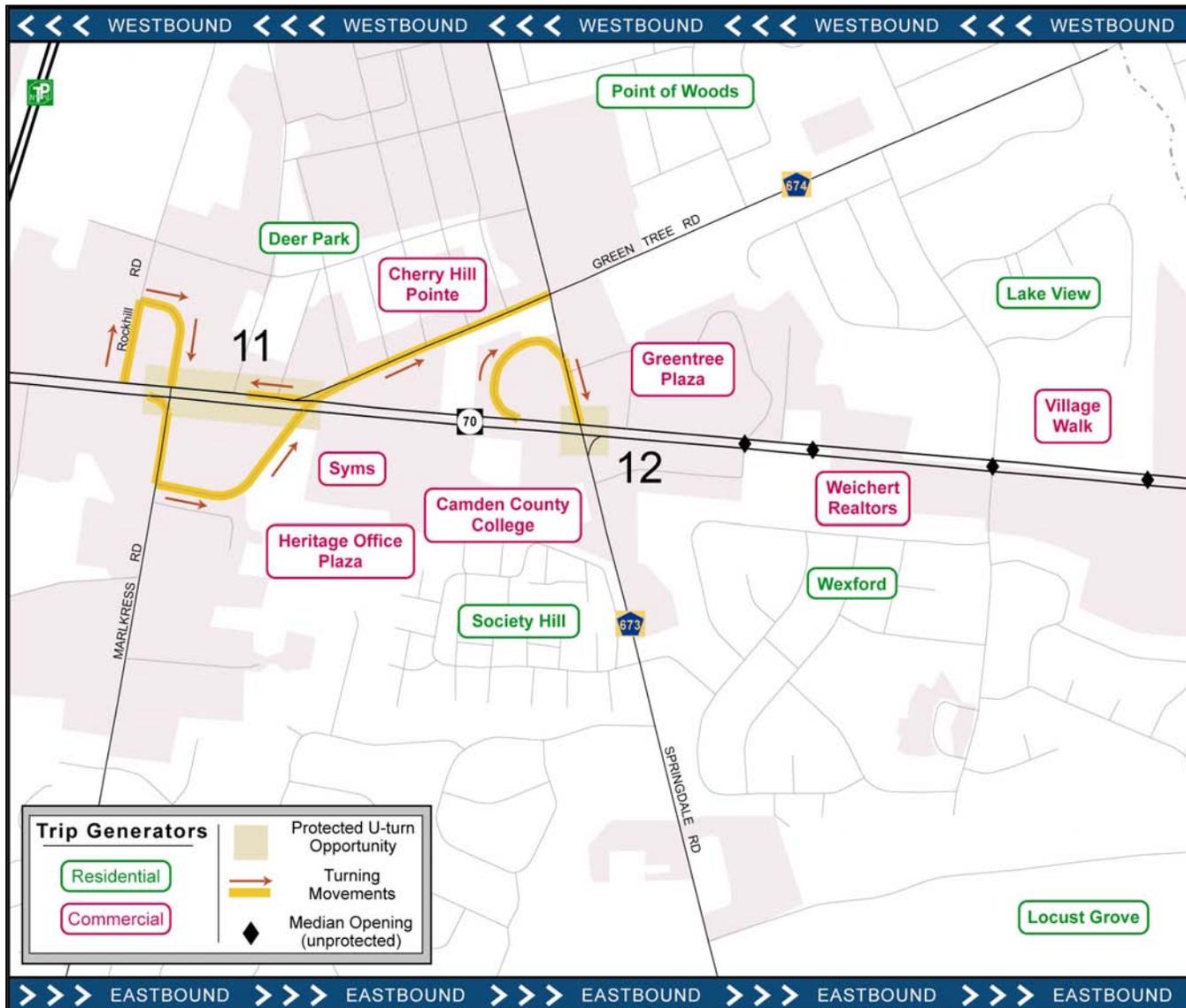
- 8. Kingston Drive, West Gate Drive: *signalized intersection*
EB / WB – U-turn/left turn at intersection via protected signal
- 9. Covered Bridge Road, Frontage Road: *signalized intersection*
EB – nearside jug handle via Pine Valley Road and Covered Bridge Road
WB – farside jug handle
- 10. I-295: *full interchange*
EB / WB – all movements via ramps

Prepared by DVRPC

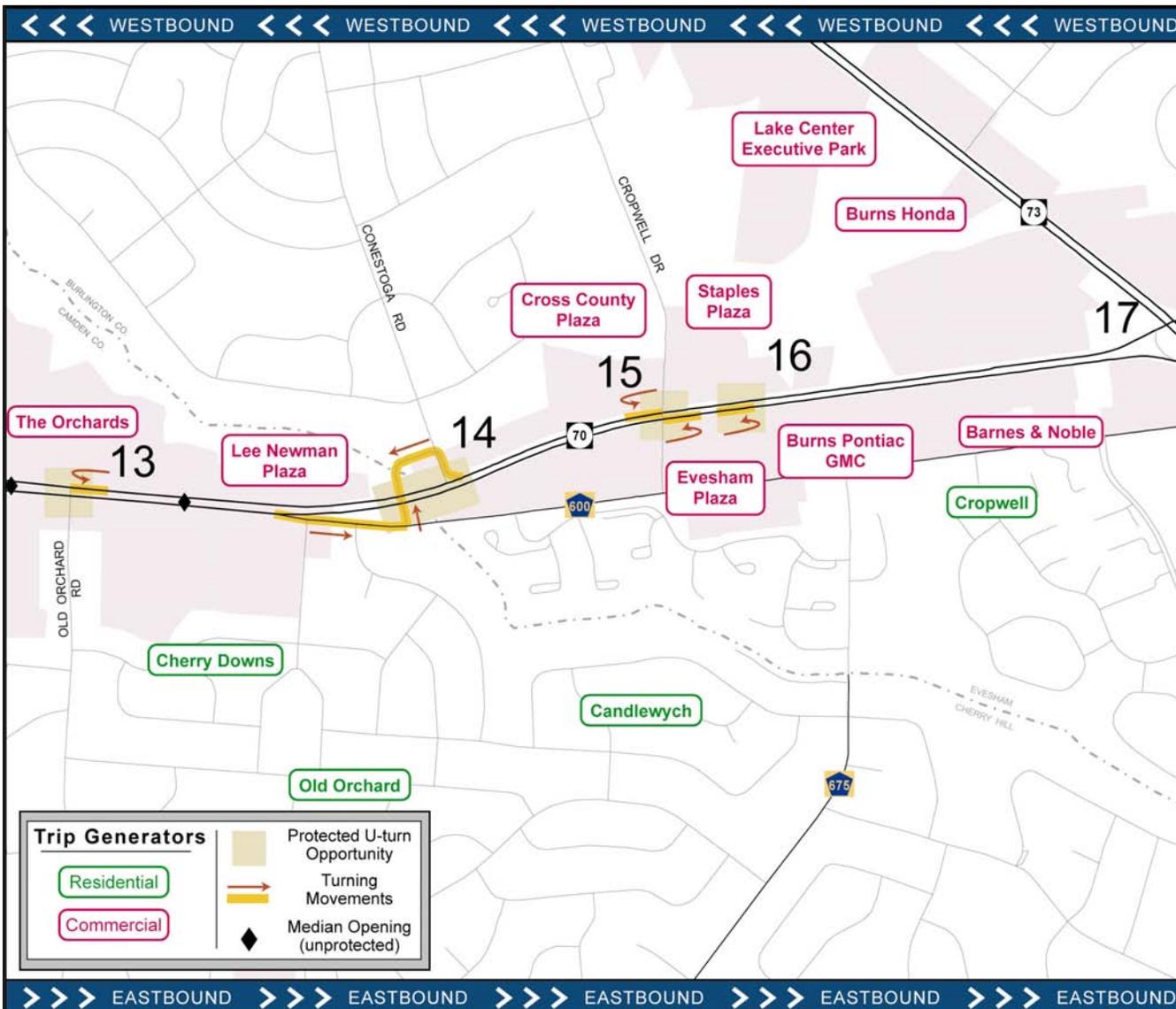
Protected U-turn Opportunities

11. Markkress Road, Greentree Road: *signalized intersection*
 EB – farside jug handle via Markkress Road and Greentree Road
 WB – farside jug handle via Rockhill Road

12. Springdale Road: *signalized intersection*
 EB – nearside jug handle via Markkress Road and Greentree Road
 WB – farside jug handle



Prepared by DVRPC



Protected U-turn Opportunities

13. Old Orchard Road:
signalized intersection
 WB – U-turn/left turn at intersection via protected signal

14. Conestoga Drive:
signalized intersection
 EB – nearside jug handle via Marlton Pike and Conestoga Drive
 WB – nearside jug handle via Conestoga Drive

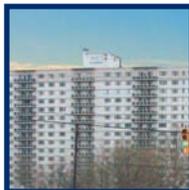
15. Cropwell Road:
signalized intersection
 EB / WB – U-turn/left turn at intersection via protected signal

16. Shopping Center:
signal for WB only
 EB – U-turn/left turn via protected signal

17. Marlton Circle:
signalized circle
 EB / WB – all turns via signalized circle

Prepared by DVRPC

6



INTELLIGENT TRANSPORTATION SYSTEMS (ITS)



NEIGHBORHOODS ► CONGESTION ► CRASHES ► ACCESS / MOBILITY ► IDENTIFIED PROBLEM LOCATIONS ► POTENTIAL IMPROVEMENT SCENERIOS



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6.0 INTELLIGENT TRANSPORTATION SYSTEM (ITS) COMPONENTS

New Jersey DOT has developed an ITS Strategic Deployment Plan to meet future transportation challenges facing the state through the deployment of ITS components. ITS is the application of advanced technologies (computers, communications, electronics, sensors) in an integrated manner for the operation of transportation systems at their optimal safety and efficiency. The intent of the plan is to use existing projects in the NJDOT pipeline to introduce ITS elements or initiate new projects that will best maximize the benefits of ITS and limited available funding.

New Jersey DOT has identified the South Jersey Urban Commuting Corridor as a priority corridor for ITS investment. This corridor addresses the needs of commuting within the counties of Gloucester, Camden and Burlington. These counties provide the commuter shed to the Philadelphia/Camden area, which experiences significant daily congestion. The corridor's commuting pattern is spread out in a radial pattern with demand centered toward the urban core. Limited access routes such as I-76, I-295, I-676, NJ 42, NJ 55, NJ 90 and the NJ Turnpike as well as urban arterials such as US 30, US 130, NJ 38, NJ 70 and NJ 73 provide both a daily incident management challenge and opportunity to manage demand. Given the nature of the transportation system demands and opportunities for management, this corridor can be well served by strategic investments in ITS projects.

A significant investment in ITS technologies has already taken place and is programmed to continue within the corridor, such as the installation of closed circuit TV (CCTV) cameras, variable message signs (VMS) and highway advisory radio (HAR). NJDOT staff, located at the Traffic Operation Control Center (TOC) in Cherry Hill, monitor traffic conditions and operate the ITS equipment. This center is staffed 24 x 7 and serves the 10 southernmost counties in New Jersey. Table 14 identifies the ITS components existing or programmed to be deployed within the NJ 70 Corridor Study area. 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 in disseminating information to the public.

A closed loop traffic signal system is being installed on US 30, NJ 38, NJ 70 and NJ 73, which will allow NJ DOT's staff to operate the traffic signals along the corridor remotely from the TOC. Every traffic signal along NJ 70 from NJ 38 to Radnor Boulevard will be interconnected through a fiber optic network within the closed loop system. These signalized intersections are part of an Advanced Traffic Management System, which includes the connection and integration of 97 signalized intersections, installation of 19 CCTV cameras, 4 HAR transmitters and 13 VMS. The system includes fiber optic installation to allow communication to NJ DOT's TOC.

The New Jersey Department of Transportation has expanded web-based commuter services by adding real-time traffic reports and traffic camera images on the department's web site. Commuters can now access a statewide map that features traffic delays, congestion and construction areas to better plan their daily trips to and from work. This information is available at www.state.nj.us/transportation/commuter/trafficinfo. NJDOT also has a partnership with SmartRoute Systems to provide free, real time, route-specific travel reports and construction /special event information available 24 X 7. This information is available at www.smartraveler.com.

Route	Milepost	Location	Municipality	Component
NJ 70	0.35	McClellan Avenue	Pennsauken	Closed Loop
NJ 70	0.63	Lexington Avenue	Pennsauken	Closed Loop
NJ 70	0.9	Donahue Avenue	Cherry Hill	Closed Loop
NJ 70	1.53	Cornell Avenue	Cherry Hill	Closed Loop
NJ 70	1.92	Garden State Park	Cherry Hill	Closed Loop
NJ 70	2.3	Haddonfield Road	Cherry Hill	Closed Loop
NJ 70	3	Georgia Avenue	Cherry Hill	Closed Loop
NJ 70	3.66	Kings Highway	Cherry Hill	Closed Loop

TABLE 14 (continued)
INTELLIGENT TRANSPORTATION SYSTEM COMPONENTS

Route	Milepost	Location	Municipality	Component
NJ 70	4.3	Kingston Road	Cherry Hill	Closed Loop
NJ 70	4.81	Covered Bridge Road	Cherry Hill	Closed Loop
NJ 70	5.6	Markkress Road	Cherry Hill	Closed Loop
NJ 70	5.75	Greentree Road	Cherry Hill	Closed Loop
NJ 70	6.1	Springdale Road	Cherry Hill	Closed Loop
NJ 70	6.94	Old Orchard Road	Cherry Hill	Closed Loop
NJ 70	7.34	Conestoga Drive	Cherry Hill	Closed Loop
NJ 70	7.67	Cropwell Road	Evesham	Closed Loop
NJ 70	8.01	Shopping Center	Evesham	Closed Loop
NJ 70	8.62	N. Maple Avenue	Evesham	Closed Loop
NJ 70	8.89	Locust Avenue	Evesham	Closed Loop
NJ 70	9.22	Plymouth Drive	Evesham	Closed Loop
NJ 70	9.73	Radnor Boulevard	Evesham	Closed Loop
NJ 70	9.59	Bonair Drive Boulevard	Evesham	Closed Loop
NJ 70	1.53	Cornell Avenue	Cherry Hill	CCTV
NJ 70	2.3	Haddonfield Road	Cherry Hill	CCTV
NJ 70	3.66	Kings Highway	Cherry Hill	CCTV
NJ 70	5.75	Greentree Road	Cherry Hill	CCTV
NJ 70	1.2 NB	Cuthbert Boulevard	Cherry Hill	VMS
NJ 70	6.58 WB	Birchwood Drive	Cherry Hill	VMS
NJ 70	9.05 WB	Kingsley Drive	Evesham	VMS
I-295	35.5 SB	North of NJ 70	Cherry Hill	VMS
I-295	34.7	NJ 70	Cherry Hill	CCTV
I-295	32.4	CR 561	Cherry Hill	CCTV
NJ 38	0.42 WB	Browning Rd	Pennsauken	VMS
NJ 38	0	US 130	Pennsauken	CCTV
NJ 38	0.6	NJ 70	Pennsauken	CCTV
NJ 38	1.56	Cuthbert Road	Cherry Hill	CCTV
NJ 38	2.8	Haddonfield Road	Cherry Hill	CCTV
NJ 38	3.86	Church Road	Cherry Hill	CCTV
NJ 38	1.14	Mansion Blvd	Pennsauken	Closed Loop
NJ 38	2.01	Longwood Ave	Cherry Hill	Closed Loop
NJ 38	2.54	Chapel Ave	Cherry Hill	Closed Loop
NJ 38	3.18	Cherry Hill Mall Entrance	Cherry Hill	Closed Loop
NJ 38	3.86	Cooper Landing / Church Road	Cherry Hill	Closed Loop
NJ 73	22.94 WB	Evesham Road	Evesham	VMS

7



CONGESTION MANAGEMENT SYSTEM (CMS)



NEIGHBORHOODS ► CONGESTION ► CRASHES ► ACCESS / MOBILITY ► IDENTIFIED PROBLEM LOCATIONS ► POTENTIAL IMPROVEMENT SCENERIOS



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7.0 CONGESTION MANAGEMENT SYSTEM

Introduction

The Congestion Management System (CMS) advances the goals of the DVRPC Long Range Plan and strengthens the connection between the Plan and the Transportation Improvement Program. It identifies congested corridors and strategies to mitigate the congestion. Where additions to capacity are appropriate, the CMS includes supplemental strategies to reduce travel demand and improve operations.

Summary of the Principles of the CMS

1. The CMS is region-wide.
2. The CMS will provide information on transportation system performance and identify strategies to minimize congestion and enhance the mobility of people and goods.
3. Building new road capacity may be appropriate when other strategies do not reasonably reduce congestion.
4. Regulations require that projects that add Single Occupancy Vehicles (SOV) capacity conform to the CMS to be eligible for federal funding.
5. The CMS will be updated on a regular basis.

CMS Subcorridor Types

Subcorridor types help with selecting strategies to reduce or manage congestion in congested corridors. Subcorridors are divided where similar strategies may be applicable. For example an older dense grid is a subcorridor type different from a suburban network. Each subcorridor is assigned one primary type, with notes providing more detail about its other characteristics.

For each type, a set of Very Appropriate strategies has been developed, as well as Secondary Appropriate Strategies. These strategies were chosen from a comprehensive list that is organized into nine categories.

NJ 70 CMS Corridor

There are two CMS subcorridor types identified within the limits of the NJ 70 Corridor Study area (Airport Circle to the west, Marlton Circle to the east). Figure 18, found at the end of this section, depicts the NJ 70 corridor and its CMS characteristics including identified subcorridors and their boundaries. The following text describes the subcorridor limits and general characteristics.

Subcorridor One: Airport Circle to Curtis Avenue (eastern edge, Erlton neighborhood)

Mile Post Limits 0.00 – 2.66

Type: *Developed Arterial*

CMS Description: Generally long-standing travel routes with development along them (mostly from before the 1970s), sometimes passing through community centers. It is fairly usual for them to have transit service. In some cases maintenance or reinvestment is an issue.

Land Use and Transportation Characteristics of Subcorridor

In this section of the corridor NJ 70 is a six lane cross section with a grass median. Left turns are accommodated through a mix of jug handles and protected turning phases at signalized intersections. Important connecting facilities include CR 636 Cuthbert Boulevard, and CR 644 Haddonfield Road.

The land use fronting NJ 70 is predominantly auto oriented retail and commercial businesses. A few small pockets of residential development are located several blocks removed from NJ 70, mostly concentrated in the western end of the corridor in Pennsauken Township. Moving into Cherry Hill Township, two small-scale residential neighborhoods are located between Park Boulevard and NJ 70. More substantial residential development can be found east of Haddonfield Road, although they too are several blocks removed from the commercial and retail uses found along NJ 70.

Important Issues for this Subcorridor

High crash rates, access problems, and lack of pedestrian amenities are the more important issues that need to be addressed in this section of NJ 70. Congestion, albeit to a lesser degree, is a secondary concern. Signage that is clearly worded, consistent, and legible is also lacking throughout the corridor.

Selected Strategies for Managing Congestion

Very Appropriate Strategies

- Computerized Traffic Signals
- Intersection Improvements
- County and Local Road Connectivity; Short Connections
- Safety Improvements and Programs
- Signage
- Access Management Policies
- Growth Management and Smart Growth
- Integrated Corridor Management
- Frontage/Service Roads

Secondary Appropriate Strategies

- Improvements for Pedestrians and Bicyclists
- Economic Development Oriented Transportation Policies
- “Transit First”/Transit Oriented Design policies
- Express Transit Services
- Bus Rapid Transit (BRT) and Exclusive Right-of-Way Bus Lanes

Subcorridor Two: Curtis Avenue (eastern edge, Erlton neighborhood) to I-295

Limits: 2.66 – 5.00

Type: Dense Suburban Network

CMS Description: Highly developed suburban centers where much of the movement is internal—these are areas where people live, shop, and work. They share some qualities with dense urban grid, but are generally more auto-oriented. While there is significant through traffic, local trips going in all directions are a large component of the mix. In some cases there is opportunity to enhance a sense of community character.

Transportation and Land Use Characteristics of the Subcorridor

This subcorridor is defined by the unique elements of its infrastructure and land use characteristics. Here, NJ 70 is a four lane cross section with a grass median. Left turns and U-turns are accommodated by a mix of jug handles and paved median openings. These median openings, known more commonly as “cut-throughs,” allow motorists direct access to side streets, businesses, and for making U-turns. On one hand they provide more access opportunities and relieve the jug handles from shouldering the entire burden of left turn/U-turn traffic. On the other hand, the allowed movement is uncontrolled, or permissive, and lets motorists enter into two lanes of oncoming traffic thus creating a safety concern. Important connecting facilities include CR 627 Cooper Landing Road, NJ 41 Kings Highway, Kingston Road, and Covered Bridge Road.

Land uses fronting NJ 70 in this section are a mix of homes converted to professional offices and stand-alone retail with sidewalk access. This pattern is predominant west of Kings Highway. Strip retail with building-front parking and stand-alone retail with parking is common east of Kings Highway. Professional office buildings are also present, but to a lesser degree. Throughout most of this subcorridor densely developed residential neighborhoods can be found immediately behind the businesses along NJ 70, making a significant majority of the retail accessible by foot.

Important Issues for this Subcorridor

Recurring peak period congestion, high crash rates, and access problems plague this section of NJ 70. The primary need is to address mobility and safety issues while retaining quality of life for the local residents.

Selected Strategies for Managing Congestion

Very Appropriate Strategies

- Computerized Traffic Signals
- Intersection Improvements
- County and Local Road Connectivity; Short Connections
- Improvements for Pedestrians and Bicyclists
- Signage
- Access Management Policies
- Integrated Corridor Management
- Frontage/Service Roads

Secondary Appropriate Strategies

- Safety Improvements and Programs
- Growth Management and Smart Growth
- Accessibility and Environmental Justice
- Community Friendly Transportation Policies
- Arterial and Collector Road

Subcorridor Three: I-295 to East of Radnor Boulevard (beginning of NJ 70's two lane cross section)

Limits: mile posts 5.00 – 10.00

Type: Developed Arterial

CMS Description: Generally long-standing travel routes with development along them (mostly from before the 1970s), sometimes passing through community centers. It is fairly usual for them to have transit service. In some cases maintenance or reinvestment is an issue.

Transportation and Land Use Characteristics of the Subcorridor

The lane configuration of NJ 70 varies slightly along the length of this subcorridor. The western-most ¼ mile is a six lane cross section where it passes through the I-295 interchange, after which it opens up to an eight lane cross section for a span of just under one mile. For the remainder of the subcorridor NJ 70 is a four-lane cross-section beginning at Springdale Road and moving east beyond the study area. In the six and eight lane sections all left turns from NJ 70 are made via jug handles. In the four lane section left turns are accommodated by a mix of paved median openings, some of

which are one way cut-throughs with stacking lanes, protected turning phases at signalized intersections, and one jug handle located at Conestoga Drive and Old Marlton Pike. Important connecting facilities include I-295, CR 672 Marlkress Road, CR 674 Greentree Road, CR 673 Springdale Road, CR 620 Old Marlton Pike, Cropwell Road, and NJ 73.

Land uses fronting NJ 70 vary somewhat according to lane configuration. From I-295 east to Springdale Road, the frontage is developed with a mix of retail and professional office buildings, many having large parking lots. The north side of NJ 70 in this section is primarily industrial and warehouse. Two very large residential tracts are situated south of NJ 70, well removed from the facility. These two combine single family and condominium style dwellings.

East of Springdale Road to Old Orchard Road the frontage of NJ 70 is a less dense mix of professional office buildings and high end retail. Located directly behind these businesses, in close proximity to NJ 70, are some of Cherry Hill Township's largest residential developments. Comprised of mainly single family homes, these developments stretch to the boundaries of the township and even into Evesham Township. The remainder of NJ 70's frontage is developed as stand alone retail, strip retail, and big box retail including a mall at the eastern end of the study area. The previously mentioned residential developments occupy the land behind these businesses as well.

Important Issues for this Subcorridor

High crash rates, access problems, and lack of pedestrian amenities are the more important issues that need to be addressed in this section of NJ 70. In the section between I-295 and Greentree Road, approximately 7/10 of a mile long, five significant crash clusters were identified. Recurring congestion is a problem in the vicinity of I-295. Signage that is clearly worded, consistent, and legible is also lacking throughout the corridor.

Selected Strategies for Managing Congestion

Very Appropriate Strategies

- Computerized Traffic Signals
- Intersection Improvements
- County and Local Road Connectivity; Short Connections
- Safety Improvements and Programs
- Signage
- Access Management Policies
- Growth Management and Smart Growth
- Integrated Corridor Management
- Frontage/Service Roads

Secondary Appropriate Strategies

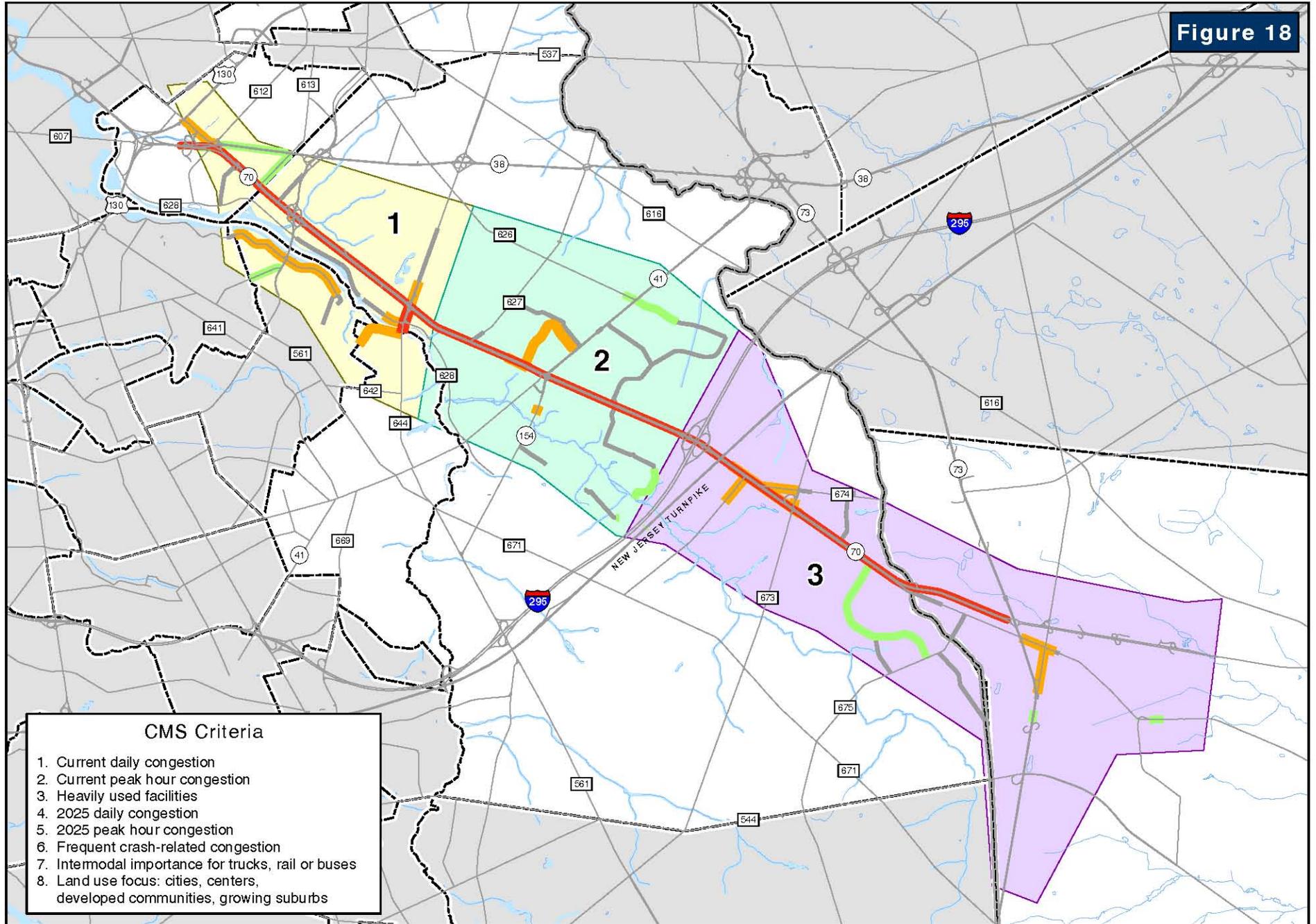
- Ramp Metering
- Economic Development Oriented Transportation Policies
- "Transit First"/Transit Oriented Design policies

- Express Transit Services
- Bus Rapid Transit (BRT) and Exclusive Right-of-Way Bus Lanes
- Improvements for Pedestrians and Bicyclists

NJ 70 Corridor Study

CMS Subcorridors

Figure 18



CMS Criteria

1. Current daily congestion
2. Current peak hour congestion
3. Heavily used facilities
4. 2025 daily congestion
5. 2025 peak hour congestion
6. Frequent crash-related congestion
7. Intermodal importance for trucks, rail or buses
8. Land use focus: cities, centers, developed communities, growing suburbs

0 0.25 0.5
Miles



Segments Meeting CMS Criteria

0.00 - 3.00

3.01 - 4.00

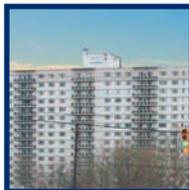
4.01 - 5.00

5.01 - 6.00



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November 2005

8



CONCLUSIONS AND RECOMMENDATIONS



NEIGHBORHOODS ► CONGESTION ► CRASHES ► ACCESS / MOBILITY ► IDENTIFIED PROBLEM LOCATIONS ► POTENTIAL IMPROVEMENT SCENERIOS



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8. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

NJ 70 is plagued by three major corridor-wide problems that became recurring themes during the study effort: congestion, access, and accidents. Recurring peak period congestion has reduced traffic flow to stop and go conditions in several sections of the study area. This is common knowledge to regular users of the facility and was quantified in the NJDOT Route 70 CD Report.

NJ 70 is divided by a grass median which limits access opportunities to signalized intersections and unsignalized median openings. Extra distance and time is added to almost every trip as drivers are forced to turn around via the nearest intersection in order to access the opposite direction of NJ 70. As a result, signalized intersections experience higher demand causing them to be overburdened. To supplement these access points, unsignalized median openings are provided, but only within the four lane cross sections of the facility. The openings are narrow and typically allow only two cars to queue before crossing into the stream of oncoming traffic either to make a u-turn, or enter a driveway.

Congestion, combined with limited access, results in cut through traffic—motorists by-pass traffic congestion from long waits at signals by using neighborhood streets as short cuts.

Accidents on NJ 70 are largely the byproduct of congestion and access related problems. Rear-end crashes are common on congested facilities, and are also common where travel lanes transition from 3 to 2, as motorists abruptly arrive on the heels of slower moving traffic. These three problems, congestion, access, and accidents, are most common in the parts of the corridor that have the highest retail concentrations and/or major roadway connections, i.e.: I-295.

Recommendations

The implementation chapter of this report includes two matrices: 1) a location specific improvements matrix, and 2) a crash cluster location matrix. These two tables provide an appropriate starting point for addressing the transportation, traffic, and safety problems of the NJ 70 corridor. Both matrices are prioritized according to need so that implementation plans can be tailored accordingly.

It is recommended that the problems identified in the Barclay Farm/Kingston Estates area be addressed first due to the breakdown of roadway operations on NJ 70, combined with the intense retail and residential landscape at this location. This location requires an innovative approach that balances the access needs of the local residential community with mobility and improved operations on NJ 70.

Problems identified that involve low cost improvements (signs, striping) can be included as quick fix items in a larger, longer term implementation plan. The NJDOT maintenance division may be able to address some of these improvements without further study.

The second highest crash cluster location* along the corridor is in the vicinity of NJ 70 and Old Cuthbert Boulevard. There were 83 westbound crashes (22 eastbound) and 71 rear end collision types. The data clearly shows the crash problem to be a westbound issue. NJ 70 westbound at this location experiences congestion due to the I-295 ramps.

*The highest crash cluster location is at the Marlton Circle (NJ 70 and NJ 73), which is currently being addressed by NJDOT.

9



IMPLEMENTATION



NEIGHBORHOODS ► CONGESTION ► CRASHES ► ACCESS / MOBILITY ► IDENTIFIED PROBLEM LOCATIONS ► POTENTIAL IMPROVEMENT SCENERIOS



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9. IMPLEMENTATION

The NJ 70 Corridor Study can be used as a tool for the systematic selection of transportation improvement projects. This section is intended to serve as a punch list for the government agencies having a stake in the implementation of improvements.

Also included is a matrix of crash cluster locations. These follow a priority ranking system different from that used in Table 15 that is described in the key of the table. Because a more detailed analysis is necessary for identifying appropriate improvements, *Center*, *Cost Range*, and *Benefits* categories are not included in this table.

Characteristics

In choosing which projects should advance, stakeholders can be guided by the information presented in the NJ 70 Corridor Transportation Improvements Implementation Matrix (see Tables 15 and 16). This easy to use matrix suggests the relative importance of each problem location. The potential improvement scenarios are evaluated against the following criteria: State Development and Redevelopment Plan (SDRP) center designation, project priority, relative cost range, and project benefits. In addition, the stakeholders necessary to carry out the plan are also identified.

State Development and Redevelopment Plan (SDRP) Centers

The concept of centers is the organizing planning principle for achieving a more effective and efficient pattern of development in New Jersey. Under the state plan, new growth and development should be organized into compact development in the form of centers surrounded by carefully controlled "environs" by way of municipal master plans and regulations, and through public investment policy.

Specifically, the SDRP defines center as "central places within planning areas where growth either should be attracted or not attracted, depending upon the unique characteristics and growth opportunities of each center". The Plan identifies five types of Centers: 1) Urban Centers; 2) Towns; 3) Regional Centers; 4) Villages; and 5) Hamlets and designates specific locales as centers. In the NJ 70 corridor there are no two designated centers.

Priority

There are three categories of priorities: high, moderate, and low. Priorities are assigned based on the type and severity of problem presented to motorists or other users of the system. Although safety issues usually receive the highest priority, other conditions such as congestion (time delay) and mobility are also considered. A higher degree of priority is assigned if there is an urgency to complete the improvement due to the

anticipated completion of a nearby major investment (development or transportation improvement). If there is concern that a section of right-of-way needed to complete an improvement is in danger of being developed or used for another use, the priority to act on that improvement is also heightened. If a project is relatively small scale and low cost, yet offers a projected high benefit, it may also receive a higher priority ranking.

Cost Range

Relative project costs are described as high, moderate, or low. High cost projects (\$5 to 35\$ million, or more) usually involve a major commitment from one or more funding source, lengthy public involvement, and require several years lead time in programming the required funds. They are typically large scale, complex, or multi-phased improvements usually involving new facilities. An improvement estimated to have a moderate cost (between \$2 and \$5 million) could involve reconstruction of an intersection, construction of a short connector road, or a widening of an existing road. Low cost projects (less than \$2 million) often involve operational type improvements at isolated locations can often be fast-tracked by maintenance departments. These cost ranges are general estimates and could be significantly changed due to design criteria or to environmental, right-of-way, or other issues.

Benefits

The assigned benefit of the project refers to the type of improvement expected, such as: safety enhancements, congestion mitigation, mobility improvements, or economic

development. The location and magnitude of the improvement determines the extent of the benefits received.

Roles of Agencies

In terms of a hierarchy of agencies, the New Jersey Department of Transportation (NJDOT) is primary, both in terms of maintaining NJ 70 and providing much of the design, right-of-way, and construction funding for major improvements. Municipalities make land use decisions in the corridor, which ultimately affects travel and traffic in the corridor.

New Jersey Department of Transportation

NJDOT has jurisdiction over the state highways in the corridor. In addition to NJ 70 these include: I-295, NJ 41, NJ 38, and NJ 73. Improvements to these highways are typically financed by state and/or federal funds. The state coordinates with the county and municipalities on what improvements are made to these facilities.

Camden and Burlington Counties

The county has jurisdiction over a network of roads throughout the study area. In New Jersey, county roads are given 500, 600 or 700 route designations. The 500 series of county roads are typically part of a statewide network of interconnected county routes; therefore 500 series routes are generally more significant than the other county roads. The primary function of the county network is to serve medium range trips or to serve as feeder routes to the state system.

Metropolitan Planning Organization (MPO)

DVRPC, serving as the MPO for this region, is required to coordinate a comprehensive and continuing transportation planning process. This process results in the development of a Transportation Improvement Program (TIP) which identifies all priority projects for which federal funds will be sought. The TIP represents a consensus among state and regional officials as to which regional improvements are to be made. In addition to the TIP, the MPO is required by federal legislation to develop a long range plan (LRP) to help direct region-wide transportation decision making over a period of at least 20 years. Long range plans do not specify the design of actual projects. Rather, they identify future needs to address transportation deficiencies.

Municipalities

Local governments have jurisdiction over their local road system and they control local land use decisions. Decisions made at the local level can influence the travel on roads at all levels. Therefore, local officials must understand the traffic impacts which could be generated from a particular development and understand the synergy that exists between land use decisions and transportation improvements. Local officials need to be involved in the transportation planning process to assist in the problem definition and to make improvement recommendations. Ideally, municipal officials utilize the circulation element of their municipal master plan to balance transportation priorities and quality of life issues.

NJDOT Pipeline Process

The New Jersey Department Of Transportation's Project Development Process consists of four levels for implementing projects. Known as pipelines, they are used to categorize projects according to the level of planning, engineering, regulation, and design necessary for implementation. Projects in pipeline one involve the most steps: concept development, feasibility assessment, preliminary design, final design, and construction. Large scale projects involving right-of-way acquisition fall into this category. Projects in pipeline four usually involve little planning or engineering and can be accomplished through a maintenance contract. Typical pipeline four projects include lane striping, short stretches of new pavement, or the addition of signs or lighting.

TABLE 15										
IMPROVEMENTS IMPLEMENTATION MATRIX - LOCATION SPECIFIC TRANSPORTATION PROBLEMS										
#	Location (west to east)	Mile Post	Municipality	Priority	Center	Cost Range	Benefits	Lead Role	Assisting Role	NJDOT Pipeline
1	NJ 70 Westbound @ Cuthbert Boulevard / Executive Campus	1.12	Cherry Hill	L	NA	L	SAFE, MOB	DOT	MCD	4
2	NJ 70 Westbound @ Cornell Avenue Jug Handle	1.60	Cherry Hill	L	NA	L	SAFE, MOB	DOT	MCD	4
3	Atlantic City Rail Line Bridge Over NJ 70	1.84	Cherry Hill	L	NA	L	MOB	CC	MCD	4
4	Sayre Avenue Jug Handle	1.95	Cherry Hill	M	NA	L	CON, MOB	DOT	MCD	4
5	Garden State Park Redevelopment	2.07	Cherry Hill	H	NA	M	CON, MOB	DOT	MCD	3
6	CR 644 Haddonfield Road @ Wynwood Avenue	2.31	Cherry Hill	M	NA	M	SAFE	CC	MCD	3
7	Cooper Landing Road Median Opening	2.92	Cherry Hill	H	NA	H	SAFE, MOB	DOT	MCD	2
8	NJ 70 @ Georgia / Edison Avenues	3.00	Cherry Hill	M	NA	M	SAFE, MOB	DOT	MCD	3
9	NJ 70 @ Kingson Road / West Gate Drive	4.30	Cherry Hill	H	NA	M / H	CON, MOB	DOT	MCD	1
10	NJ 70 @ Covered Bridge Road / Frontage Road	4.81	Cherry Hill	H	NA	M / H	CON, MOB	DOT	MCD	1
11	Greentree Road / Springdale Road / Marlkrass Road Jug Handle	5.6-5.75	Cherry Hill	H	NA	M	SAFE, MOB	DOT	MCD	4
12	Industrial Complex Traffic on Springdale / Greentree Roads	NA	Cherry Hill	M	NA	M / H	CON, MOB	MCD	MCD	1
13	Birchwood Park Drive	6.61	Cherry Hill	L	NA	M	SAFE, MOB	DOT	MCD	4
14	NJ 70 @ Cropwell Road	7.67	Evesham	L	NA	M	CON, MOB	DOT	MCD	3
15	Inappropriate Use of Shoulders On NJ 70	7.67-8.3	Evesham	L	NA	L	SAFE, MOB	DOT	MCD	4

KEY

Priority: H = High; M = Moderate; L = Low
Center: C = State Development and Redevelopment Plan designated center/corridor
Cost Range: H = High; M = Moderate; L = Low
Benefits: CON = Congestion; MOB = Mobility; SAFE = Safety
Role: MCD = Municipality; CC = Camden County; DOT = NJ Department of Transportation
NJDOT Pipeline 1 = Concept Development, Feasibility Assessment, Preliminary Design, Final Design, Construction
2 = Scope Development, Feasibility Assessment, Preliminary Design, Final Design, Construction
3 = Environmental Documentation, Final Design, Construction
4 = Maintenance Contract

TABLE 16

IMPROVEMENTS IMPLEMENTATION MATRIX - CRASH CLUSTER LOCATIONS

#	Nearest Cross Street or Driveway	Municipality	Mile Post Range	Total Crashes	Predominant Type (#)	Predominant Direction (#)	Priority	Lead Role	Assisting Role
1	CR 612 Browning Road (NJ 70 EB), NJ 70 WB at NJ 38.	Pennsauken	0.01 - 0.11	45	Rear End (27)	East (26)	L	NJDOT	CC
2	NJ 70 and McClellan Avenue (signalized)	Pennsauken	0.32 - 0.42	45	Rear End (24)	West (21)	L	NJDOT	MCD
3	CR 636 Cuthbert Boulevard at NJ 70 (interchange)	Cherry Hill	0.99 - 1.09	29	Rear End (13)	West (19)	L	NJDOT	CC
4	Cornell Avenue at NJ 70 (signalized)	Cherry Hill	1.50 - 1.60	56	Rear End (37)	West (32)	M	NJDOT	MCD
5	CR 644 Haddonfield Road at NJ 70 (signalized)	Cherry Hill	2.24 - 2.34	63	Rear End (41)	West (33)	M	NJDOT	CC
6	CR 627 Cooper Landing Road at NJ 70 (median opening)	Cherry Hill	2.88 - 2.98	68	Rear End (40)	West (34)	M	NJDOT	CC
7	Maine Avenue and Vermont Road at NJ 70 (median opening)	Cherry Hill	3.39 - 3.49	48	Rear End (25)	West (31)	M	NJDOT	MCD
8	NJ 41 Kings Highway at NJ 70 (signalized)	Cherry Hill	3.61 - 3.71	76	Rear End (48)	East (42)	H	NJDOT	CC
9	East of Sawmill Road and NJ 70 (two median openings)	Cherry Hill	4.11 - 4.21	44	Rear End (24)	East (29)	L	NJDOT	MCD
10	East of Kingston Road and NJ 70 (signalized, median openings)	Cherry Hill	4.30 - 4.40	57	Rear End (38)	West (31)	M	NJDOT	MCD
11	East Gate Drive at NJ 70 (unsignalized, median openings)	Cherry Hill	4.58 - 4.68	87	Rear End (58)	West (46)	H	NJDOT	MCD
12	Covered Bridge Road/Frontage Road at NJ 70 (signalized)	Cherry Hill	4.77 - 4.87	45	Rear End (27)	East (26)	L	NJDOT	MCD
13	I-295 at NJ 70 (interchange)	Cherry Hill	5.03 - 5.13	71	Rear End (38)	West (56)	M	NJDOT	MCD
14	Old Cuthbert Road at NJ 70 (unsignalized)	Cherry Hill	5.26 - 5.36	105	Rear End (71)	West (83)	H	NJDOT	MCD
15	East of Astoria Boulevard at NJ 70 (unsignalized)	Cherry Hill	5.42 - 5.52	26	Rear End (17)	East (13)	L	NJDOT	MCD
16	CR 672 Marlkness Road at NJ 70 (signalized)	Cherry Hill	5.57 - 5.64	61	Angle (22)	East (23)	M	NJDOT	CC
17	CR 674 Greentree Road at NJ 70 (signalized)	Cherry Hill	5.69 - 5.76	87	Rear End (48)	West (38)	H	NJDOT	CC
18	East of CR 673 Springdale Road at NJ 70 (signalized)	Cherry Hill	6.09 - 6.19	67	Rear End (37)	East (29)	M	NJDOT	CC
19	Vicinity of Old Orchard Road at NJ 70 (signalized T-intersection)	Cherry Hill	6.86 - 6.96	72	Rear End (54)	East (44)	H	NJDOT	MCD
20	Conestoga Drive at NJ 70 (unsignalized)	Evesham	7.40 - 7.50	27	Rear End (21)	East (13)	L	NJDOT	BC
21	Cropwell Road at NJ 70 (unsignalized)	Evesham	7.65 - 7.75	50	Rear End (27)	East (23)	M	NJDOT	BC
22	NJ 73 at NJ 70, Marlton Circle (signalized)	Evesham	8.29 - 8.33	250	Sideswipe (99)	West (101)	H	NJDOT	MCD

KEY

Priority: H (High) = 3 X THRESHOLD OF 24; M (Moderate) = 2 X 24; L (LOW) = 24 - 47

Role: MCD = Municipality; CC = Camden County; BC = Burlington County; DOT = NJ Department of Transportation



BIBLIOGRAPHY



NEIGHBORHOODS ► CONGESTION ► CRASHES ► ACCESS / MOBILITY ► IDENTIFIED PROBLEM LOCATIONS ► POTENTIAL IMPROVEMENT SCENERIOS



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2. National Cooperative Highway Research Program. *Report 524 Safety of U-Turns at Unsignalized Median Openings*. 2004
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4. Delaware Valley Regional Planning Commission. *2020 Long Range Transportation Plan*. 1995



APPENDIX

Appendix A: Municipal Representatives, Coordinating Agency Representatives

Appendix B: Needs Inventory

Appendix C: Crash Data Straight Line Diagrams

Appendix D: Median Opening Diagrams

Appendix E: Environmental Screening

Appendix F: Pedestrian Access Conditions to NJT Bus Stops on Route 70
(Route 38 - Route 73), NJDOT *NJ 70 CD Report*



NEIGHBORHOODS ► CONGESTION ► CRASHES ► ACCESS / MOBILITY ► IDENTIFIED PROBLEM LOCATIONS ► POTENTIAL IMPROVEMENT SCENARIOS



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APPENDIX A

Municipal Representatives, Coordinating Agency Representatives

Municipal Representatives

Sgt Dale Matchett, Traffic Officer, Police Department, Cherry Hill Township

Dave Benedetti, Director, Community Development, Cherry Hill Township

Nicole Hostettler, Senior Planner, Cherry Hill Township

Todd Okilchany, Zoning Board Administrator, Cherry Hill Township

Steve Musilli, Director of Engineering, Cherry Hill Township

Lt. Tim Gasparovich, Police Department, Haddonfield Borough

Sgt. Tew, Traffic Officer, Police Department, Evesham Township

Terri Bracchi, Department of Community Activities, Evesham Township

Coordinating Agency Representatives

Jody Barankin, Project Planning and Development, New Jersey Department Of Transportation

Patricia Feliciano, New Jersey Department Of Transportation, Office of Community Relations

Jim Yeager, Michael Baker & Associates

Amy Sokalski, Michael Baker & Associates

Alan Maiman, New Jersey Transit

APPENDIX B

Needs Inventory

NJ 70 Corridor Study, Transportation Needs Inventory

ID#		SOURCE:		
A - Congestion Mitigation		DB - Transportation Improvement Program / NJ Subregion FY 2003-2005		
B - Safety		S&D - NJ Study & Development Program FY 2003-2005		
C - Mobility		2025 - DVRPC Year 2025 Plan / Transportation Element,		
D - Operational Improvement		(P) - Project, (S) - Study		
E - Maintenance				
F - Transit / TDM				
G - ITS				
A. Congestion Mitigation				
ID#	Route	Description	Source	Map
A1	NJ 73	NJ 73 / NJ 70 Elimination of Marlton Circle The Marlton Circle, at the intersection of NJ 73 and NJ 70, will be eliminated; a grade-separated interchange will be constructed. The primary objective is to improve traffic flow and thereby reduce congestion on NJ 73 and NJ 70 through the intersection. Evesham Township	DB#567	yes
A2	US 30	US 30 / US 130 Elimination of Collingswood Circle This project will provide for the elimination of the Collingswood Circle at the intersection of US 30 and US 130. A new signalized intersection will be constructed, consisting of jughandles, ramps, and connector roadways. A pedestrian overpass is proposed in the vicinity of Richey Avenue. Detention basins will be located within the ramp infield areas. Additional improvements include roadway widening and resurfacing, sidewalk and curb construction, safety improvements, utility relocation, guiderail, traffic signals, landscaping and drainage improvements. Collingswood Borough, Woodlynne Borough	DB#155B	yes
A3	US 30	US 30 / US 130 Cooper River Bridge This project may provide for the construction of a proposed new bridge to accommodate traffic on US 30 and US 130 eastbound and westbound at the Cooper River, as well as proposed roadway, drainage, utility, landscape, and safety improvements. Various	DB#155C	yes
C. Mobility				
ID#	Route	Description	Source	Map
C1	NJ 38	Replacement of Pedestrian Bridge This project will provide for the Context Sensitive Design and ADA compatible replacement of the pedestrian bridge in the vicinity of Cherry Hill Mall which was demolished by a truck. The Department will be seeking restitution to cover the cost of replacing this structure. Cherry Hill Township	DB#00347	yes
C2	NJ 70	NJ 70 Needs Analysis, NJ 38 to NJ 73 A needs analysis with Context Sensitive Design will be undertaken for the development of a project to remediate identified safety and operational problems. Various	DB#252A	yes

D. Operational Improvements				
ID#	Route	Description	Source	Map
D1	NJ 38	NJ 38 Corridor Study, Airport Circle to US 206 A concept development study is ongoing for the development of a project for comprehensive corridor rehabilitation and operational improvements including, where appropriate, pavement rehabilitation, intersection improvements, drainage improvements, development of an access management plan, bicycle/pedestrian improvements, signing and lighting improvements, and roadside rehabilitation.	DB#191	yes
		Various		
D2	NJ 73	NJ 73, I-295 to Commerce Parkway This project will provide for proposed intersection improvements at the Fellowship Road, Church Road, and Atrium Way intersections with NJ 73. The Fellowship Road intersection will eliminate the ramp on the southwest corner and construct a ramp on the northwest corner. NJ 73 and Church Road will be slightly realigned at the intersection and a two-way ramp will be located on the northwest corner and two ramps will be located on the southeast corner. A forward jughandle will be located on the northbound side of NJ 73 at Atrium Way.	DB#9163	yes
		Mount Laurel		
F. Transit / TDM				
ID#	Route	Description	Source	Map
F1		Transportation Center, Cherry Hill Mall A conceptual project for Camden County scheduled for the 2002-2005 construction period and with the primary purpose of capacity.	2025(P)#C014	yes
		Various		

APPENDIX C

Crash Data Straight Line Diagrams

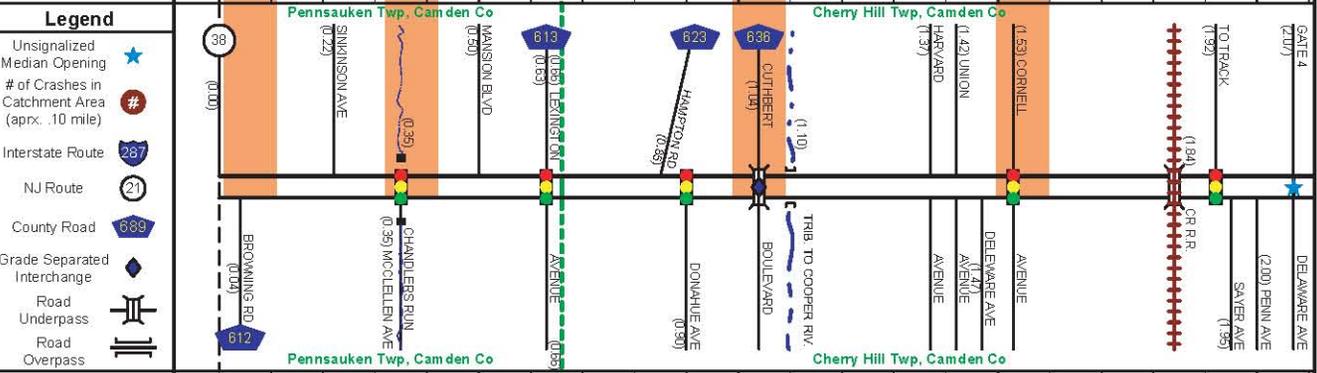
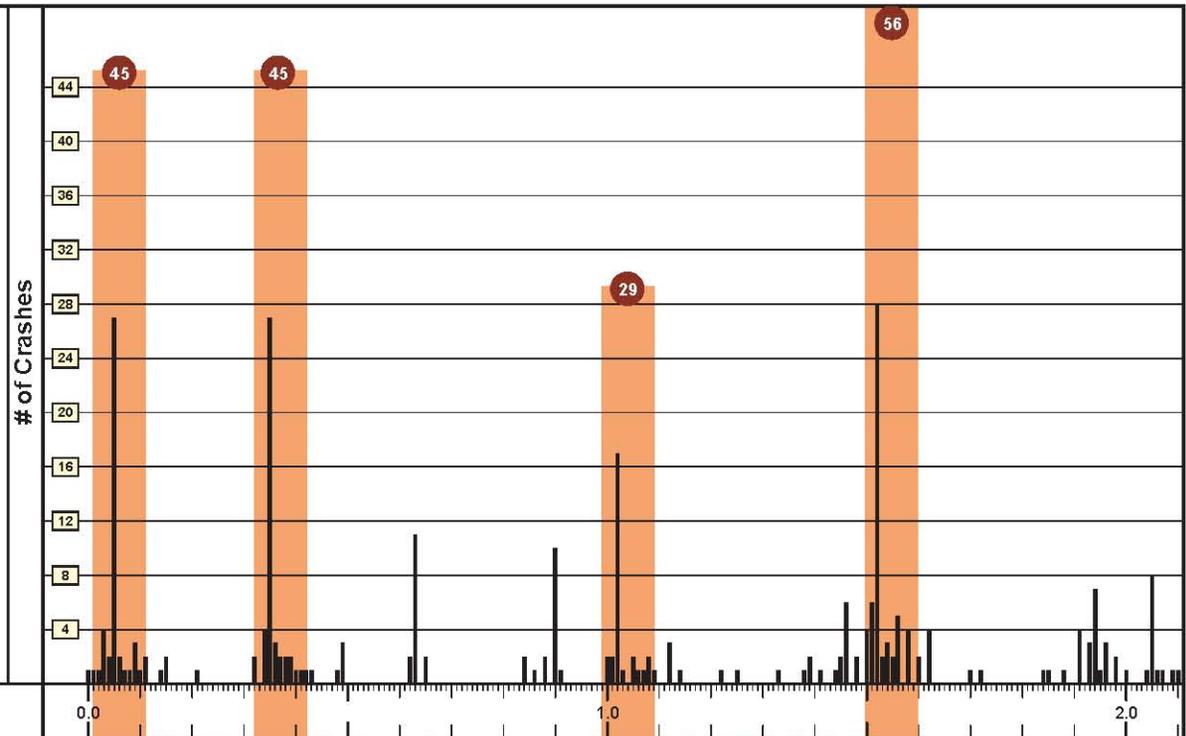
NJ 70

Crash Clusters by Mile Post

2001-2003

MP 0.00 - 2.10

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
OCTOBER 2005
Source Data: NJDOT



MILES		0.0	1.0	2.0
Divided	Street Name	John Davison Rockefeller Memorial Hwy		
	Jurisdiction	N.J.D.O.T.		
	Functional Class	Urban Principal Arterial		
	Speed Limit	45		
	Number of Lanes	6		
	SB/WB Shou.	0		
	SB/WB Pave.	36		
	Med. Type	Unprotected		
	Med. Width	24		
	Undiv.	NB/EB Pave.	36	
	NB/EB Shou.	0		
Traffic Volume		10,800 (94)	45,775 (03)	59,365 (03)

NJ 70

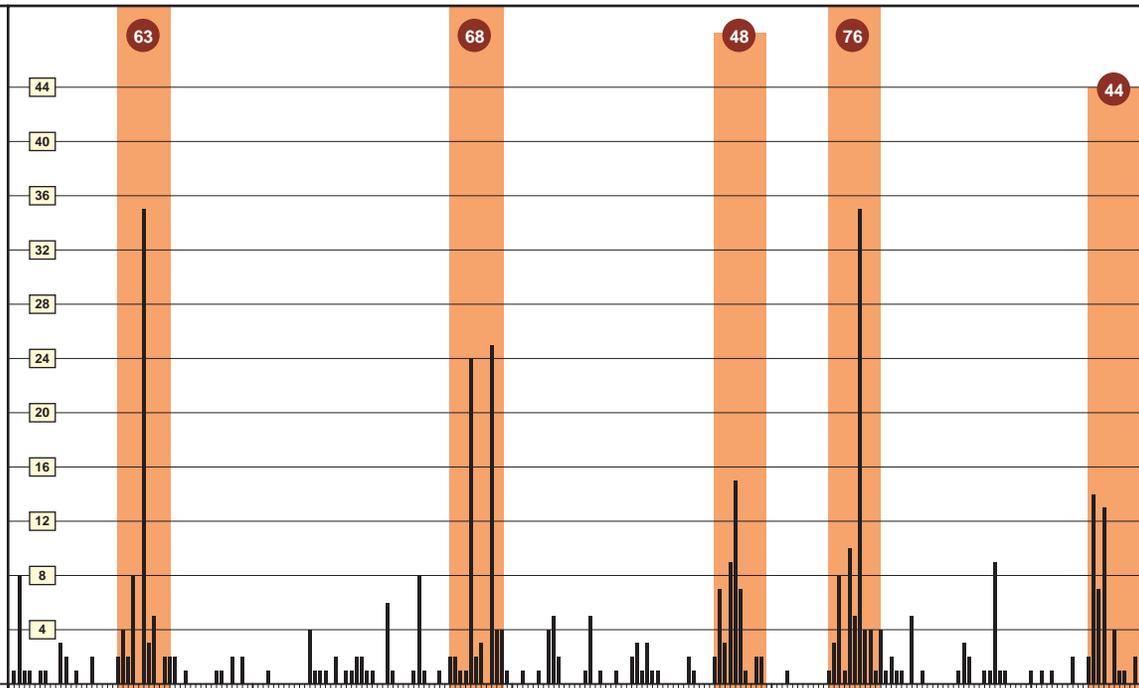
Crash Clusters by Mile Post

2001-2003

MP 2.04 - 4.21

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
OCTOBER 2009
Source Data: NJDOT

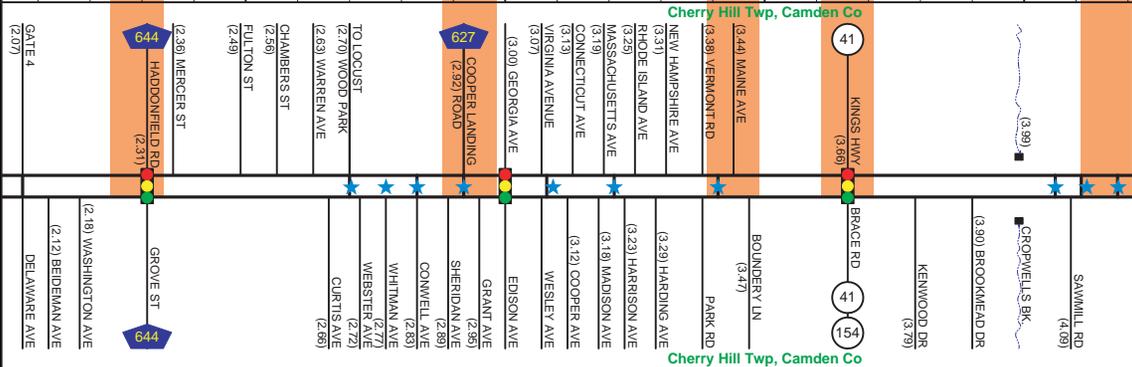
of Crashes



MILES

Legend

- Unsignalized Median Opening ★
- # of Crashes in Catchment Area (aprox. .10 mile) #
- Interstate Route 287
- NJ Route 21
- County Road 689
- Grade Separated Interchange ◆
- Road Underpass
- Road Overpass



MILES

Street Name		John Davison Rockefeller Memorial Hwy			
Jurisdiction		N.J.D.O.T.			
Functional Class		Urban Principal Arterial			
Speed Limit		45			
Divided	Number of Lanes	6	4	6	4
	SB/WB Shou.	0	10	12	10
	SB/WB Pave.	36	20	36	20
	Med. Type	Unprotected			
	Med. Width	24	VAR		
Undiv.	NB/EB Pave.	36	20	36	20
	NB/EB Shou.	0	10	12	10
Traffic Volume		51,339 (03) 52,220 (91) 48,830 (91)			

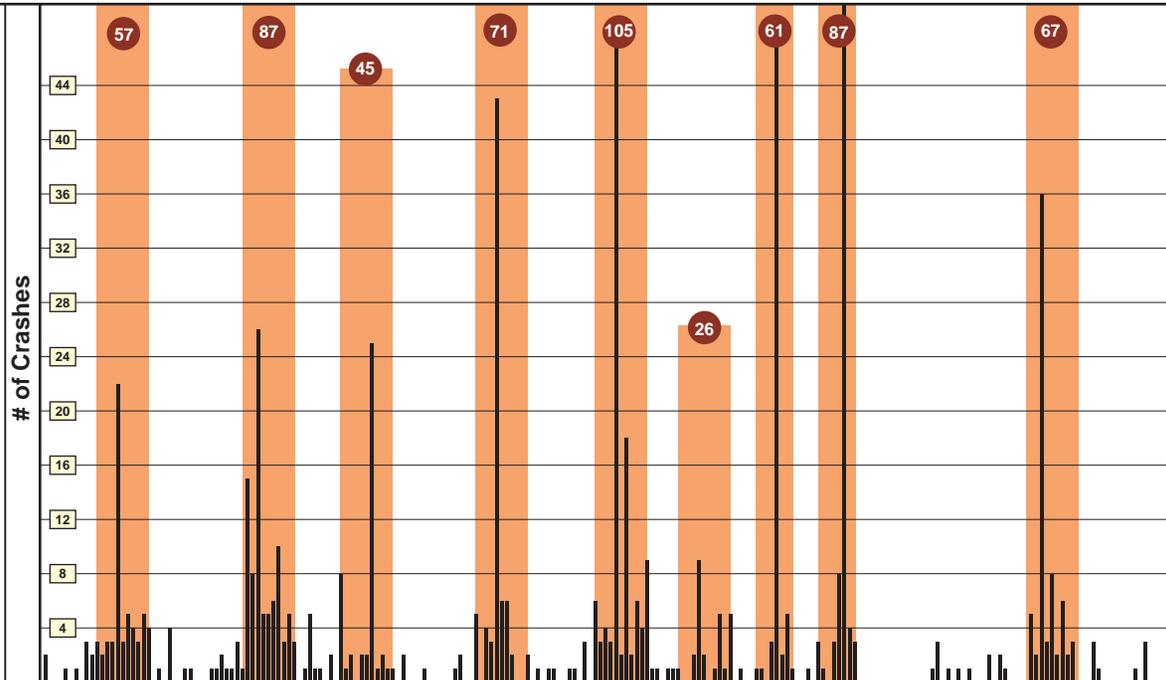
NJ 70

Crash Clusters by Mile Post

2001-2003

MP 4.20 - 6.38

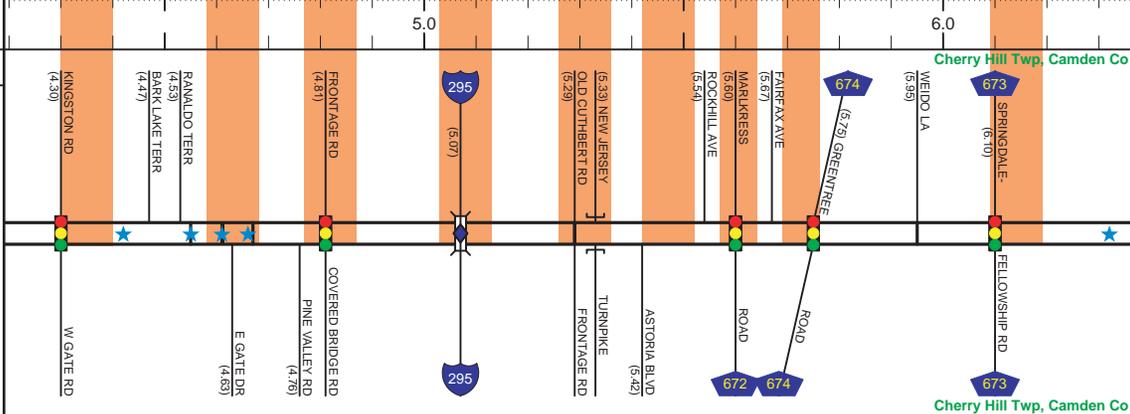
DELAWARE VALLEY REGIONAL PLANNING COMMISSION
OCTOBER 2005
Source Data: NJDOT



MILES

Legend

- Unsignalized Median Opening ★
- # of Crashes in Catchment Area (aprx. .10 miles) #
- Interstate Route 287
- NJ Route 21
- County Road 689
- Grade Separated Interchange ◆
- Road Underpass
- Road Overpass



MILES

Street Name		John Davison Rockefeller Memorial Hwy									
Jurisdiction		N.J.D.O.T.									
Functional Class		Urban Principal Arterial									
Speed Limit		45									
Number of Lanes		4		6		8		4			
Divided	SB/WB Shou.	10		6		0		10			
	SB/WB Pave.	20		24		36		48		20	
	Med. Type	Unprotected									
	Med. Width	VAR									
Undiv.	NB/EB Pave.	20		24		36		48		24	
	NB/EB Shou.	10		6		0		10			
Traffic Volume		55,398 (03)									

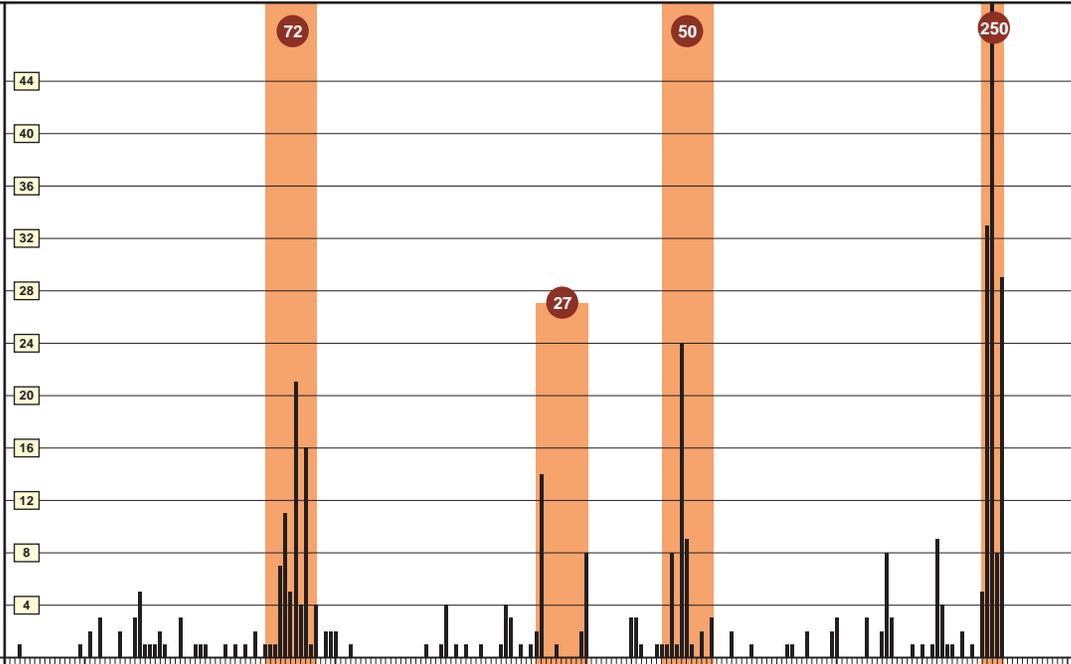
NJ 70

Crash Clusters by Mile Post

2001-2003
MP 6.35 - 8.33

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
OCTOBER 2005
Source Data: NJDOT

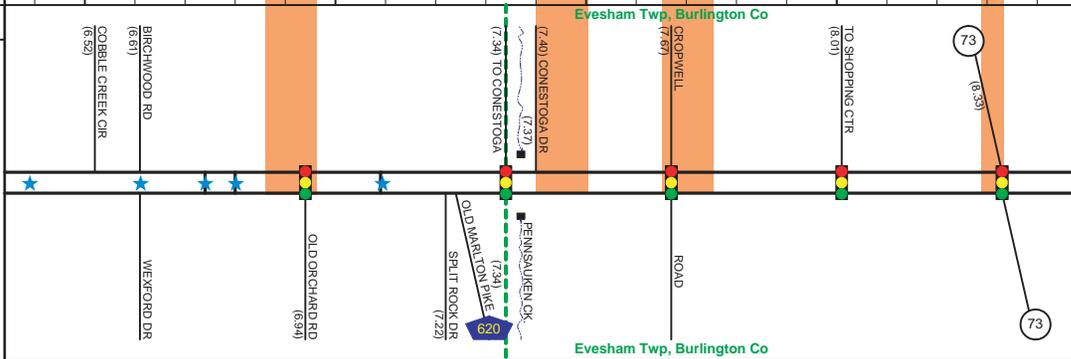
of Crashes



MILES

Legend

- Unsignalized Median Opening
- # of Crashes in Catchment Area (aprx. .10 miles)
- Interstate Route
- NJ Route
- County Road
- Grade Separated Interchange
- Road Underpass
- Road Overpass



MILES

Street Name	John Davison Rockefeller Memorial Hwy			
Jurisdiction	N.J.D.O.T.			
Functional Class	Urban Principal Arterial			
Speed Limit	45			50
Number of Lanes	4			
Divided	SB/WB Shou.	10		12
	SB/WB Pave.	20		24
	Med. Type	Unprotected		
	Med. Width	VAR		
Undiv.	NB/EB Pave.	24		
	NB/EB Shou.	10		12
Traffic Volume	41,260 (91)	43,380 (92)	40,640 (92)	37,747 (03)

NJ 70

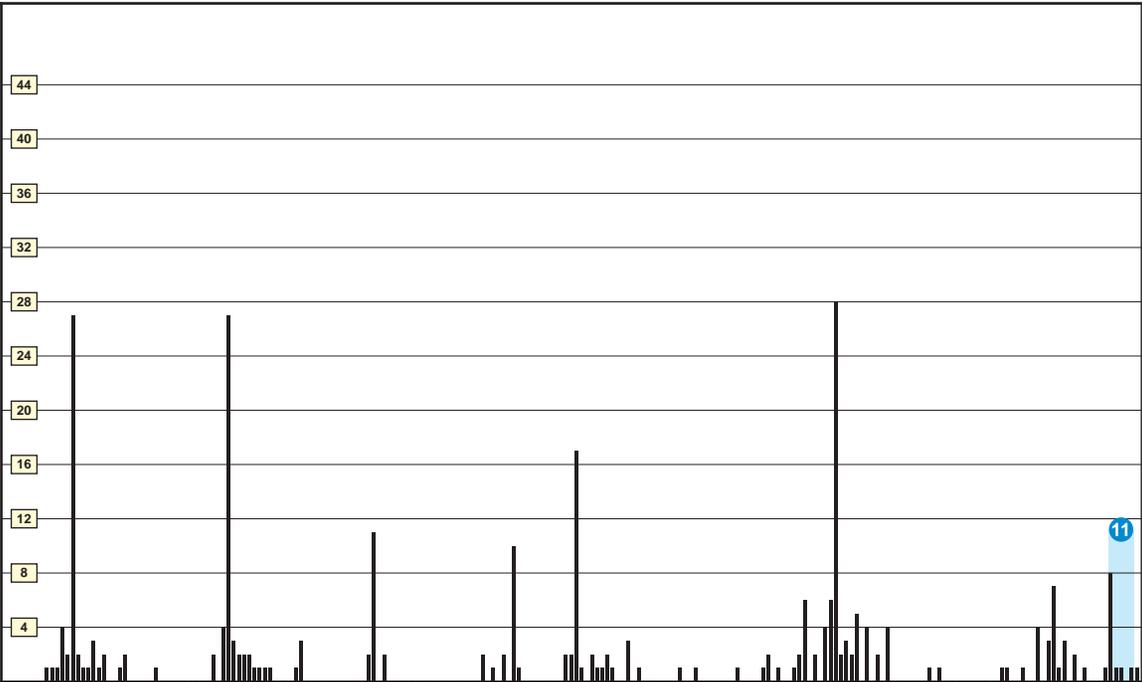
Median Opening Crash Frequency by Mile Post

2001-2003

MP 0.00 - 2.10



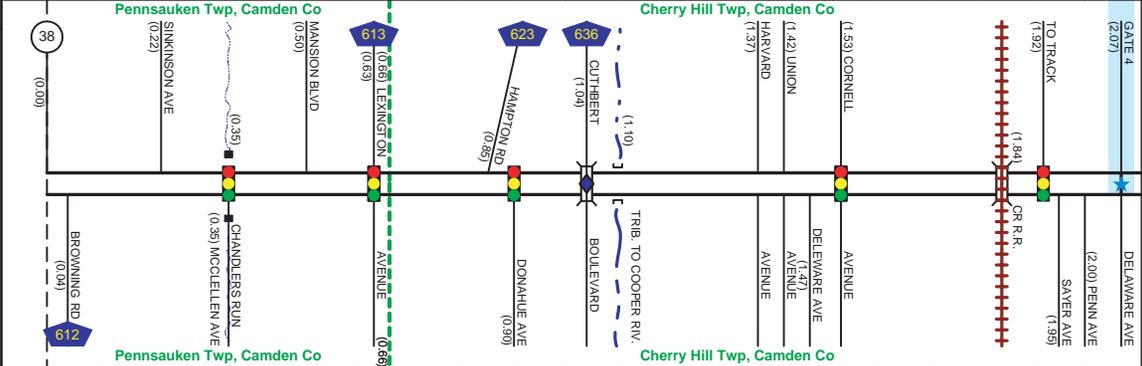
of Crashes



MILES

Legend

- Unsignalized Median Opening
- # of Crashes in Catchment Area (aprx. 210 feet)
- Interstate Route
- NJ Route
- County Road
- Grade Separated Interchange
- Road Underpass
- Road Overpass



MILES

Street Name	John Davison Rockefeller Memorial Hwy	
Jurisdiction	N.J.D.O.T.	
Functional Class	Urban Principal Arterial	
Speed Limit	45	
Number of Lanes	6	
Divided	SB/WB Shou.	0
	SB/WB Pave.	36
	Med. Type	Unprotected
	Med. Width	24
Undiv.	NB/EB Pave.	36
	NB/EB Shou.	0
Traffic Volume	10,800 (94) 45,775 (03) 59,365 (03)	

NJ 70

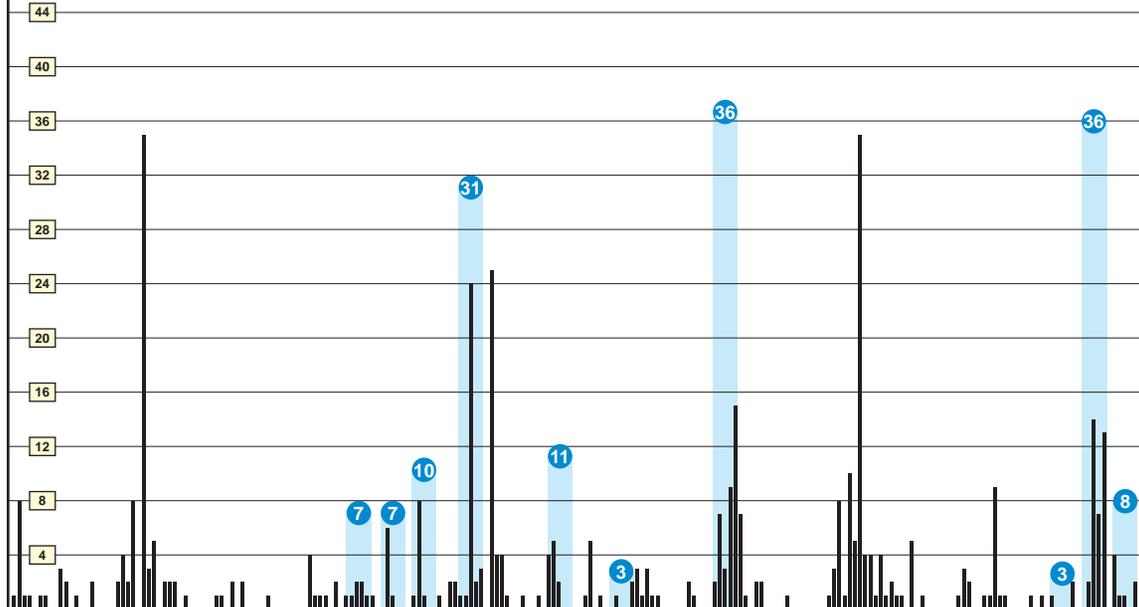
Median Opening Crash Frequency by Mile Post

2001-2003

MP 2.04 - 4.21



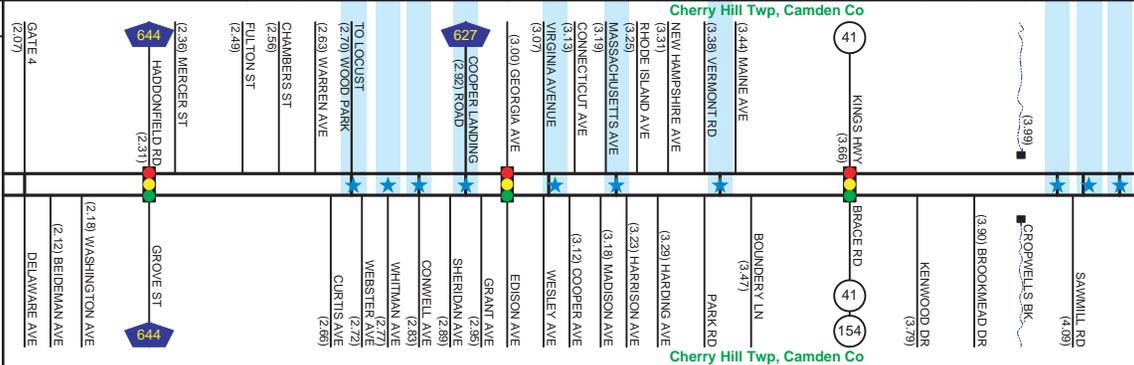
of Crashes



MILES

Legend

- ★ Unsignalized Median Opening
- # # of Crashes in Catchment Area (aprox. 210 feet)
- 287 Interstate Route
- 21 NJ Route
- 689 County Road
- ◆ Grade Separated Interchange
- ⊥ Road Underpass
- ⊥ Road Overpass



MILES

Street Name		John Davison Rockefeller Memorial Hwy			
Jurisdiction		N.J.D.O.T.			
Functional Class		Urban Principal Arterial			
Speed Limit		45			
Number of Lanes		6	4	6	4
Divided	SB/WB Shou.	0	10	12	10
	SB/WB Pave.	36	20	36	20
Med. Type		Unprotected			
Med. Width		24	VAR		
Undiv.	NB/EB Pave.	36	20	36	20
	NB/EB Shou.	0	10	12	10
Traffic Volume		51,339 (03) 52,220 (91) 48,830 (91)			

**NJ
70**

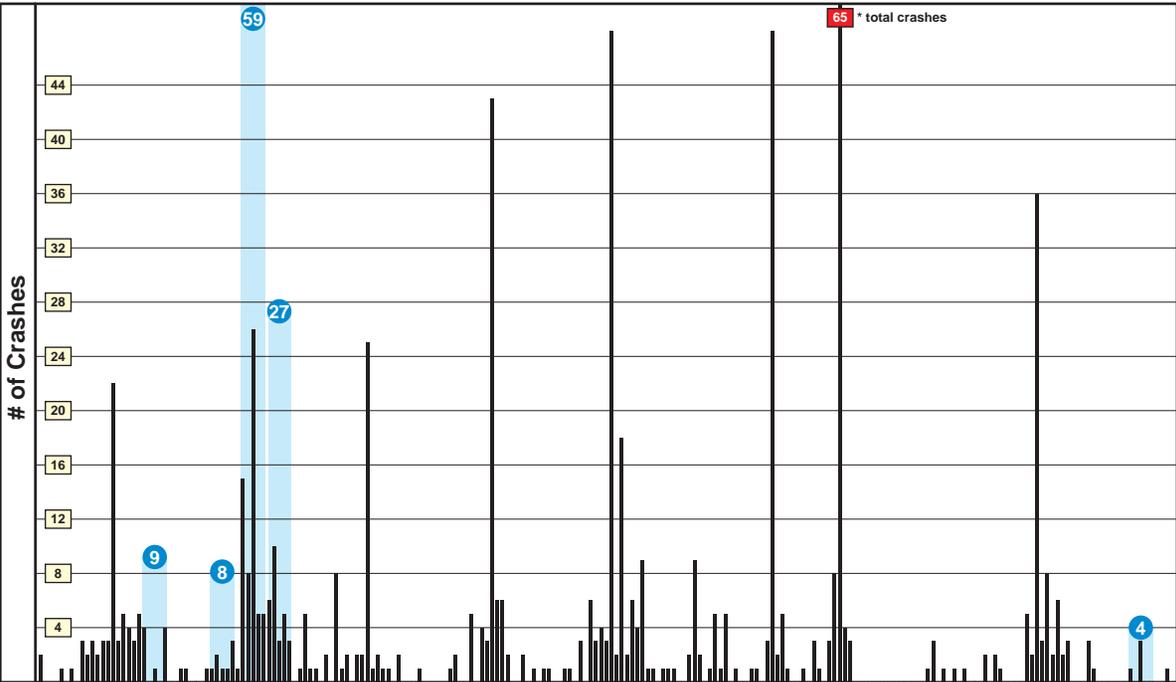
Median
Opening
Crash
Frequency
by
Mile Post

2001-2003

MP 4.20 - 6.38

DELAWARE VALLEY
REGIONAL PLANNING
COMMISSION
OCTOBER 2005

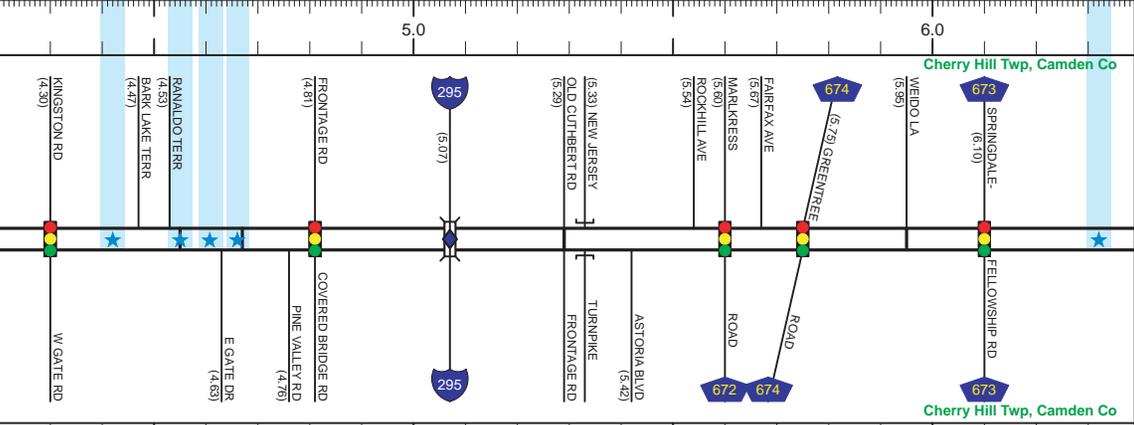
Source Data: NJDOT



MILES

Legend

- Unsignalized Median Opening ★
- # of Crashes in Catchment Area (aprx. 210 feet) #
- Interstate Route
- NJ Route
- County Road
- Grade Separated Interchange
- Road Underpass
- Road Overpass



MILES

Street Name		John Davison Rockefeller Memorial Hwy			
Jurisdiction		N.J.D.O.T.			
Functional Class		Urban Principal Arterial			
Speed Limit		45			
Number of Lanes		4	6	8	4
Divided	SB/WB Shou.		10	0	10
	SB/WB Pav.	20	24	48	20
Med. Type		Unprotected			
Med. Width		VAR			
Undiv.	NB/EB Pav.	20	24	48	24
	NB/EB Shou.		10	0	10
Traffic Volume		55,398 (03)			

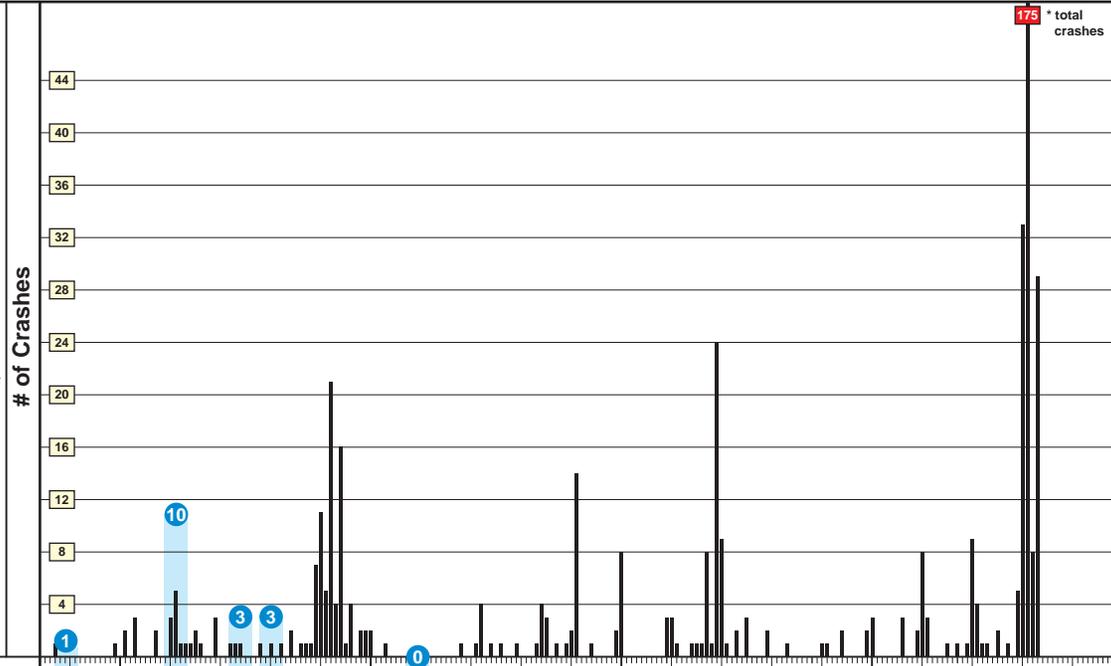
NJ 70

Median Opening Crash Frequency by Mile Post

2001-2003

MP 6.35 - 8.33

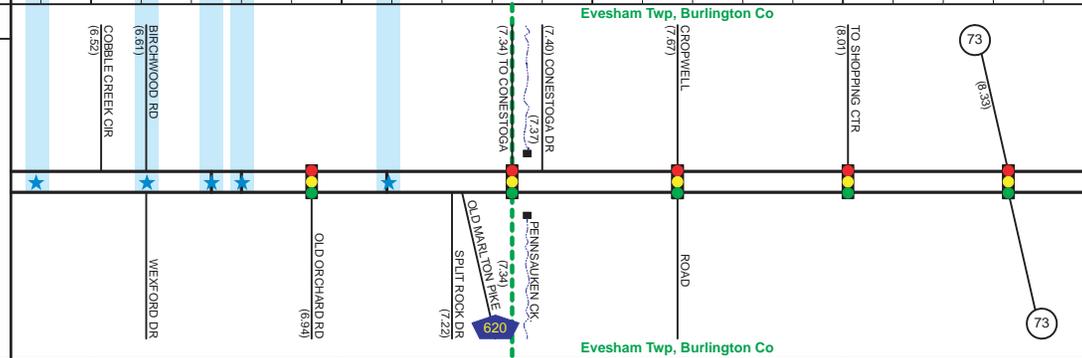
DELAWARE VALLEY
REGIONAL PLANNING
COMMISSION
OCTOBER 2005
Source Data: NJDOT



MILES

Legend

- Unsignalized Median Opening ★
- # of Crashes in Catchment Area (aprx. 210 feet) #
- Interstate Route
- NJ Route
- County Road
- Grade Separated Interchange
- Road Underpass
- Road Overpass



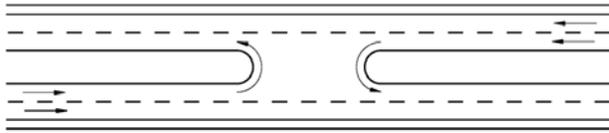
MILES

Street Name		John Davison Rockefeller Memorial Hwy	
Jurisdiction		N.J.D.O.T.	
Functional Class		Urban Principal Arterial	
Speed Limit		45 50	
Number of Lanes		4	
Divided	SB/WB Shou.	10	12
	SB/WB Pav.	20	24
	Med. Type	Unprotected	
	Med. Width	VAR	
Undiv.	NB/EB Pav.	24	
	NB/EB Shou.	10	12
Traffic Volume		41,260 (91)	43,380 (92) 40,640 (92) 30,240 (91) 37,747 (03)

APPENDIX D

Median Opening Diagrams

Type 1a—Conventional Midblock Median Opening Without Left-Turn Lanes



Advantages

Midblock access is provided for vehicles to (a) make a U-turn and (b) reach driveways on the opposite side of the street.

Since only major-road traffic is involved, delays to vehicles making U-turns will be less than where an intersection is present.

If U-turn traffic would otherwise proceed downstream to an intersection with a median opening, then this treatment should reduce VMT.

Since vehicles making a U-turn only need to enter, but not cross, the opposing roadway, a minimum gap of only 4 to 6 sec will be needed.

There are only four conflict points, which is less than at a three-leg or four-leg intersection.

Providing median openings for U-turns between intersections reduces the number of turning maneuvers at the intersections.

Accident rates at midblock median openings are lower than at three- or four-leg median openings.

Disadvantages

The absence of left-turn lanes increases potential for rear-end collisions between U-turn vehicles and following through vehicles.

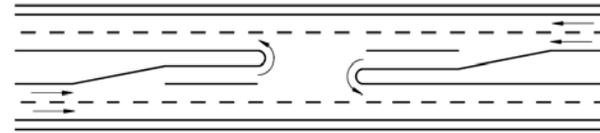
U-turn vehicles forced to stop in the median opening may encroach on adjacent lanes and interfere with through traffic.

U-turn vehicles entering the through lanes may delay full-speed through traffic.

Narrow medians may not provide enough space for larger vehicles to negotiate a U-turn.

With no directional island, opposing U-turn vehicles may have to overlap.

Type 1b—Conventional Midblock Median Opening With Left-Turn Lanes



Advantages

The presence of left-turn lanes reduces potential for rear-end collisions between U-turn vehicles and following through vehicles.

The presence of left-turn lanes mitigates the problem of U-turn vehicles encroaching on adjacent lanes and interfering with through traffic while waiting for a gap in the opposing traffic.

Midblock access is provided for vehicles to (a) make a U-turn and (b) reach driveways on the opposite side of the street.

Since only major-road traffic is involved, delays to vehicles making U-turns will be less than where an intersection is present.

If U-turn traffic would otherwise proceed downstream to an intersection with a median opening, then this treatment should reduce VMT.

Since vehicles making a U-turn only need to enter, but not cross, the opposing roadway, a minimum gap of only 4 to 6 sec will be needed.

There are only four conflict points, which is less than at a three-leg or four-leg intersection.

Providing median openings for U-turns between intersections reduces the number of turning maneuvers at the intersections.

Accident rates at midblock median openings are lower than at three- or four-leg median openings.

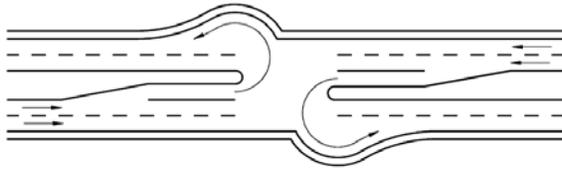
Disadvantages

U-turn vehicles entering the through lanes may delay full-speed through traffic.

Narrow medians may not provide enough space for larger vehicles to negotiate a U-turn.

With no directional island, opposing U-turn vehicles may have to overlap.

Type 1c—Conventional Midblock Median Opening With Left-Turn Lanes and Loons



Advantages

Widening on the far side of the turn makes it possible to make a U-turn without stopping or backing and reduces interference between U-turn and through traffic, particularly for large vehicles.

Without performing major reconstruction, additional space can be provided to facilitate the larger turning path of commercial vehicles along narrow medians.

The presence of left-turn lanes reduces potential for rear-end collisions between U-turn vehicles and following through vehicles.

The presence of left-turn lanes mitigates the problem of U-turn vehicles encroaching on adjacent lanes and interfering with through traffic while waiting for a gap in the opposing traffic.

Midblock access is provided for vehicles to (a) make a U-turn and (b) reach driveways on the opposite side of the street.

Since only major-road traffic is involved, delays to vehicles making U-turns will be less than where an intersection is present.

If U-turn traffic would otherwise proceed downstream to an intersection with a median opening, then this treatment should reduce VMT.

Providing median openings for U-turns between intersections reduces the number of turning maneuvers at the intersections.

Accident rates at midblock median openings are lower than at three- or four-leg median openings.

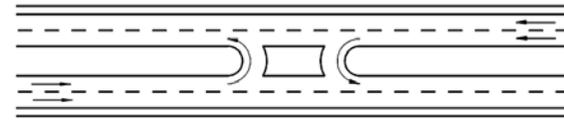
Disadvantages

U-turn vehicles entering the through lanes may delay full-speed through traffic.

With no directional island, opposing U-turn vehicles may have to overlap.

The presence of loons may make snow removal and other maintenance work more difficult.

Type 2a—Directional Midblock Median Opening Without Left-Turn Lanes



Advantages

This design prevents overlapping U-turns.

Midblock access is provided for vehicles to (a) make a U-turn and (b) reach driveways on the opposite side of the street.

Since only major-road traffic is involved, delays to vehicles making U-turns will be less than where an intersection is present.

If U-turn traffic would otherwise proceed downstream to an intersection with a median opening, then this treatment should reduce VMT.

Since vehicles making a U-turn only need to enter, but not cross, the opposing roadway, a minimum gap of only 4 to 6 sec will be needed.

There are only four conflict points, which is less than at a three-leg or four-leg intersection.

Providing median openings for U-turns between intersections reduces the number of turning maneuvers at the intersections.

Accident rates at midblock median openings are lower than at three- or four-leg median openings.

Disadvantages

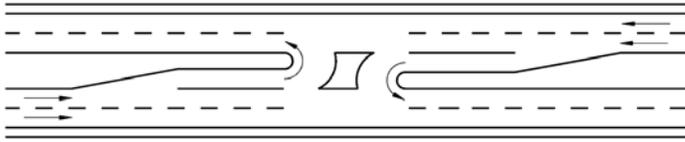
The absence of left-turn lanes increases potential for rear-end collisions between U-turn vehicles and following through vehicles.

U-turn vehicles forced to stop in the median opening may encroach on adjacent lanes and interfere with through traffic.

U-turn vehicles entering the through lanes may delay full-speed through traffic.

Narrow medians may not provide enough space for larger vehicles to negotiate a U-turn.

Type 2b—Directional Midblock Median Opening With Left-Turn Lanes



Advantages

The presence of left-turn lanes reduces potential for rear-end collisions between U-turn vehicles and following through vehicles.

The presence of left-turn lanes mitigates the problem of U-turn vehicles encroaching on adjacent lanes and interfering with through traffic while waiting for a gap in the opposing traffic.

This design prevents overlapping U-turns.

Midblock access is provided for vehicles to (a) make a U-turn and (b) reach driveways on the opposite side of the street.

Since only major-road traffic is involved, delays to vehicles making U-turns will be less than where an intersection is present.

If U-turn traffic would otherwise proceed downstream to an intersection with a median opening, then this treatment should reduce VMT.

Since vehicles making a U-turn only need to enter, but not cross, the opposing roadway, a minimum gap of only 4 to 6 sec will be needed.

There are only four conflict points, which is less than at a three-leg or four-leg intersection.

Providing median openings for U-turns between intersections reduces the number of turning maneuvers at the intersections.

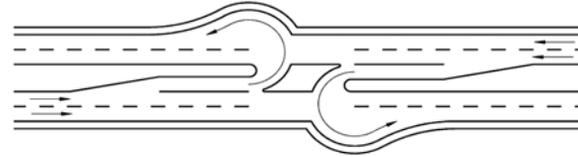
Accident rates at midblock median openings are lower than at three- or four-leg median openings.

Disadvantages

U-turn vehicles entering the through lanes may delay full-speed through traffic.

Narrow medians may not provide enough space for larger vehicles to negotiate a U-turn.

Type 2c—Directional Midblock Median Opening With Left-Turn Lanes and Loops



Advantages

Widening on the far side of the turn makes it possible to make a U-turn without stopping or backing and reduces interference between U-turn and through traffic, particularly for large vehicles.

Without performing major reconstruction, additional space can be provided to facilitate the larger turning path of commercial vehicles along narrow medians.

The presence of left-turn lanes reduces potential for rear-end collisions between U-turn vehicles and following through vehicles.

The presence of left-turn lanes mitigates the problem of U-turn vehicles encroaching on adjacent lanes and interfering with through traffic while waiting for a gap in the opposing traffic.

This design prevents overlapping U-turns.

Midblock access is provided for vehicles to (a) make a U-turn and (b) reach driveways on the opposite side of the street.

Since only major-road traffic is involved, delays to vehicles making U-turns will be less than where an intersection is present.

If U-turn traffic would otherwise proceed downstream to an intersection with a median opening, then this treatment should reduce VMT.

Providing median openings for U-turns between intersections reduces the number of turning maneuvers at the intersections.

Accident rates at midblock median openings are lower than at three- or four-leg median openings.

Disadvantages

The presence of loops may make snow removal and other maintenance work more difficult.

APPENDIX E

Environmental Screening

ENVIRONMENTAL SCREENING

Introduction

A top level screening has been conducted to determine the occurrence of potentially environmentally sensitive sites along the NJ 70 Corridor. The areas of interest are Wetlands/ Open Space, Potential Hazardous Waste Sites, Threatened and/or Endangered Species, and Historic Sites /Community Facilities.

Wetlands/ Open Space

The Map: Wetlands, & Open Space was compiled using data from the US Fish and Wildlife Service, New Jersey Office of State Planning and the Delaware Valley Regional Planning Commission's Open Space Inventory. Wetlands, flood prone areas, county and municipal open space data were examined and mapped to identify any areas of concern. In the study area, the wetland and flood prone areas are mainly associated with three main bodies of water in the study area: Cooper River; North Branch Cooper River and the Pennsauken Creek. While there are no wetland areas that are immediately adjacent to NJ 70, there are four locations that fall within the flood prone areas. The areas are located at the nexus of NJ 70 and NJ 38, in the vicinity of Cuthbert Boulevard, near Park Drive, near St. Andrew's Church, and between Mimosa Road and Conestoga Road at the border of Cherry Hill Township and Evesham Township.

Potential Hazardous Waste Sites

New Jersey Department of Environmental Protection's (NJ DEP) database of known contaminated sites was queried to determine if any of these sites were present in the study area. The Known Contaminated Sites List for New Jersey - 2001 are those sites and properties where contamination of soil or ground water has been identified or where there has been, or there is suspected to have been, a discharge of contamination. Table X lists the known sites which fall within the study area and rated high based on a level of site complexity. These sites are graphically represented on the Map: Known Contaminated Sites. This list may include sites where remediation either is currently under way, required but not yet initiated or has been completed. Additionally new contaminated sites have been identified since the creation of this list and are not included here. For a complete list of all Known Contaminates Sites, regardless of severity, please refer to the Appendix. For further information contact NJDEP's Site Remediation Programs (SRP) lead program, which are identified with each site listed in the table.

Additional environmental sources were also examined to determine the existence of other potentially hazardous or contaminated sites. Sites from the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database were examined. These sites are the US Environmental Protection Agency's

(US EPA) Superfund Sites and the program is administered in cooperation with the individual states. The National Priorities List (NPL) of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories was also reviewed. Although there are a few occurrences within the municipalities associated with the study, the sites are located outside of the NJ 70 study area boundaries.

Threatened and/or Endangered Species

The New Jersey Department of Environmental Protection (NJDEP) Natural Heritage Program performed a database search of their Natural Heritage Database and the Landscape Project habitat mapping for occurrences of any rare wildlife species, habitat, rare plants or natural communities that are in the NJ 70 study area. The databases show no record of any rare plant, animals, or habitat located within a 1/4 mile of the study area. The Natural Heritage Program has provided a list of rare species and natural communities that have been documented from Camden and Burlington Counties. If there is a suitable habitat at a particular project site, then these species may have the potential to be present. This list is located in the Appendix.

Historic Sites /Community Facilities

A top level screening has been conducted to determine the occurrence of potentially environmentally sensitive sites. Cultural features such as historic sites, schools, and churches have been identified within the NJ 70 Corridor. These features

must be considered when identifying any potential roadway improvements in the area. These features are graphically represented on the Map: Community Facilities. A detailed list of the community facilities is located in the appendix. Table XX provides a listing of all sites that are listed in the New Jersey and National Registers of Historic Places, NJDEP - Historic Preservation Office. None of the ten historic sites are located on or adjacent to NJ 70.

NJ 70 Corridor Study					
Environmental Screening - Community Facilities					
Type	NAME	ADDRESS	CITY	COUNTY	STATE
School	A. Russell Knight Elementary School	Old Carriage Rd	Cherry Hill	Camden	NJ
School	Barclay School	1200 Winston Way	Cherry Hill	Camden	NJ
School	Cherry Hill High-East High School	Kresson Rd	Cherry Hill	Camden	NJ
School	Henry C. Beck Middle School	Cropwell Rd	Cherry Hill	Camden	NJ
School	James Johnson Elementary School	Kresson Rd	Cherry Hill	Camden	NJ
School	Kingston Elementary School	Kingston Rd	Cherry Hill	Camden	NJ
School	Richard Stockton Elementary School	Wexford Drive	Cherry Hill	Camden	NJ
School	Rosa International Middle School	485 Browning Lane	Cherry Hill	Camden	NJ
School	J. Fithian Tatem Elementary School	One Glover Avenue	Haddonfield	Camden	NJ
Place of Worship	Saint Stephens Church	6306 Browning Road	Pennsauken	Camden	NJ
Place of Worship	Bethel Church	1704 Springdale Road	Cherry Hill	Camden	NJ
Place of Worship	Hillman Church		Cherry Hill	Camden	NJ
Place of Worship	Immaculate Conception Novitiate		Cherry Hill	Camden	NJ
Place of Worship	Queen of Heaven Church	700 Marlton Pike West	Cherry Hill	Camden	NJ
Place of Worship	Saint Andrews Church	327 Marlton Pike West	Cherry Hill	Camden	NJ
Place of Worship	Catholic Church of Saint Mary's	2001 Springdale Road	Cherry Hill	Camden	NJ
Place of Worship	Saint Marys Church		Cherry Hill	Camden	NJ
Place of Worship	Saint Michaels Church	601 Kings Highway North	Cherry Hill	Camden	NJ
Place of Worship	Saint Pius X Church	344 Kresson Road	Cherry Hill	Camden	NJ
Place of Worship	Temple Emanuel	1101 Springdale Road	Cherry Hill	Camden	NJ
Place of Worship	Trinity Church	499 Route 70 East	Cherry Hill	Camden	NJ
Place of Worship	Woodland Church		Cherry Hill	Camden	NJ
Place of Worship	Mount Olivet Church	206 Douglass Avenue	Haddonfield	Camden	NJ
Cemetery	Calvary Cemetery	2398 Marlton Pike West	Cherry Hill	Camden	NJ
Cemetery	Locustwood Cemetery	Route 70	Cherry Hill	Camden	NJ
Historic	Barclay Farmstead	209 Barclay Lane	Cherry Hill	Camden	NJ
Historic	Bonnie's	Waylond Road over Sawmill Creek	Cherry Hill	Camden	NJ
Historic	Samuel Coles House	1743 Old Cuthbert Road	Cherry Hill	Camden	NJ
Historic	Cooper River Park Historic District	Cooper River (between Kaighn Ave and Walworth Lake)	Pennsauken, Cherry Hill, Haddonfield	Camden	NJ
Historic	Kay-Evans Farmstead	100 Borton Mill Road	Cherry Hill	Camden	NJ
Historic	Haddon Fortnightly Clubhouse	301 East King's Highway	Haddonfield	Camden	NJ
Historic	Greenfield Hall (Third Methodist Church)	343 East King's Highway	Haddonfield	Camden	NJ
Historic	Samuel Mickle House	345 East King's Highway	Haddonfield	Camden	NJ
Historic	Lullworth Hall	435 East King's Highway	Haddonfield	Camden	NJ
Historic	Cropwell Friends Meeting House	801 Cropwell Road	Evesham	Burlington	NJ

Table X
NJ Department of Environmental Protection
Site Remediation Program
Known Contaminated Sites (2001)

DVRPC MAP ID	SITE ID	NAME	ADDRESS	CITY	COUNTY	STATUS	LEAD	REMEDIAL L	STATUS_DT	XYORIGIN	X COORD	Y COORD
x	NJL500001623	KSM FASTENING SYSTEMS INCORPORATED	301 NEW ALBANY RD	Moorestown Township	Burlington	Active	BEECRA	D	1988-10-27 00:00:00	MAP1	358921	411857
x	NJD982796211	SUBURBAN PAVING	100 CUTHBERT BLVD	Audubon Borough	Camden	Active	BCM	C3	1998-04-09 00:00:00	MAP1	331798.781	388654.625
x	NJL500048541	CONCORD CHEMICAL COMPANY INCORPORATED	17TH & MICKLE STS	Camden City	Camden	Active	BEECRA	C3	1999-06-08 00:00:00	MAP1	323592.36	404640.53
x	NJD980529028	CHERRY HILL ERLTON LANDFILL	920 MCGILL AVE	Cherry Hill Township	Camden	Pending	BFO-CA	C3	1993-04-16 00:00:00	MAP1	348139.813	396658.219
x	NJL900000589	HADDON HEIGHTS BOROUGH SANITARY LANDFILL	DEVON AVE & I 295	Haddon Heights Borough	Camden	Pending	BFO-CA	C3	1993-04-21 00:00:00	MAP1	331575.813	378513.813
x	NJL900001751	HADDONFIELD BOROUGH SANITARY LANDFILL	ATLANTIC AVE	Haddonfield Borough	Camden	Pending	BFO-CA	C3	1993-04-09 00:00:00	MAP1	332496	394899
x	NJD980769137	MAPLE SHADE TOWNSHIP LANDFILL	501 RTE 73	Maple Shade Township	Burlington	Pending	BFO-CA	C3	1992-09-23 00:00:00	MAP1	356313	406073
x	NJL000057232	BEL AIR MOTOR LODGE	RTE 73 & WILLOW RD	Maple Shade Township	Burlington	Pending	BFO-CA	C3	1996-04-11 00:00:00	MAP1	360462.594	402615.438
1	NJD981565252	ROCHESTER INCORPORATED	7027 KAIGHN AVE	Pennsauken Township	Camden	Pending	BUST	C2	1994-12-29 00:00:00	MAP1	334163.4905	400448.2434
2	NJD048590087	DISMAR CORPORATION	4415 MARLTON PK	Pennsauken Township	Camden	Active	BUST	C2	1990-03-12 00:00:00	MAP1	348197.844	380336.313
3	NJL600155782	LIFE SUPPORT AMBULANCE	5050 CENTRAL HWY	Pennsauken Township	Camden	Active	BFO-S	C2	1995-09-26 00:00:00	MAP1	371384.25	387950.125
4	NJP000875708	HESS SERVICE STATION	RTE 38 W	Pennsauken Township	Camden	Active	BUST	C2	1988-10-27 00:00:00	MAP1	369586.563	386911.094
5	NJL600145999	GOODWILL INDUSTRY INCORPORATED	5421 RTE 70 (MARLTON PK)	Pennsauken Township	Camden	NFA	BUST	C2	1994-12-06 00:00:00	ADDMATCH	383179.8941	387020.3793
6	NJD070285408	MCDONNELL DOUGLAS TRUCK SERVICES	2374 MARLTON PK W	Cherry Hill Township	Camden	Active	BUST	C2	1991-09-27 00:00:00	MAP1	342658.8394	392409.2232
7	NJL500014451	HARMONSON BROTHERS INCORPORATED	908 NORTHWOOD AVE	Cherry Hill Township	Camden	NFA-A	BFO-S	C2	1999-01-07 00:00:00	MAP1	381114.9132	388862.4981
8	NJL600157135	DELCREST MEDICAL PRODUCTS & SERVICE CO	800 RTE 38	Cherry Hill Township	Camden	Active	BUST	C2	1994-11-02 00:00:00	MAP1	341057.656	395398.938
9	NJL500052048	SW ELECTRONICS & MANUFACTURING CORP	619 HOLLYWOOD AVE	Cherry Hill Township	Camden	Active	BEECRA	C2	2000-07-11 00:00:00	ADDMATCH	327372.406	402231.563
10	NJD986604189	MOBIL SERVICE STATION	RTE 38 & CHAPEL AVE	Cherry Hill Township	Camden	Active	BUST	C2	1990-10-25 00:00:00	MAP1	324418.969	414247.406
11	NJD982280257	ATOMIC TIRE & AUTO SERVICE COMPANY	408 HADDONFIELD RD	Cherry Hill Township	Camden	Active	BUST	C2	1995-06-02 00:00:00	MAP1	358828.625	390810.688
12	NJL600004758	CITGO SERVICE STATION	RTE 38 & MALL DR	Cherry Hill Township	Camden	Active	BUST	C2	1993-02-22 00:00:00	MAP1	344493.969	408066.375
13	NJD986609956	MOBIL SERVICE STATION	500 HADDONFIELD RD	Cherry Hill Township	Camden	Active	BUST	C2	1988-08-02 00:00:00	MAP1	340016	390881.094
14	NJL600038848	SERVICE STATION	2025 RTE 70 & WASHINGTON AVE	Cherry Hill Township	Camden	Active	BUST	C2	1994-04-04 00:00:00	MAP1	342217.531	407922.406
15	NJD982793689	EXXON SERVICE STATION	RTE 70 & MARLKRESS RD	Cherry Hill Township	Camden	Active	BUST	C2	1988-08-24 00:00:00	MAP1	353213.625	379669.219
16	NJL600130645	LOCUSTWOOD CEMETERY ASSOCIATION	RTE 70 W	Cherry Hill Township	Camden	Active	BUST	C2	1991-05-31 00:00:00	MAP1	373605.5	383816.594
17	NJP000887398	MOBIL SERVICE STATION	RTE 70 & GEORGIA AVE	Cherry Hill Township	Camden	Active	BUST	C2	1989-03-22 00:00:00	MAP1	335775.844	415852.25
18	NJL800538639	330 BEECHWOOD AVE	330 BEECHWOOD AVE	Haddonfield Borough	Camden	Active	BFO-S	C2	2000-02-18 00:00:00	ADDMATCH	357937.375	389920.344
19	NJL800305153	427 WELLINGTON AVENUE	427 WELLINGTON AVE	Haddonfield Borough	Camden	Active	BFO-S	C2	1997-09-24 00:00:00	ADDMATCH	352019	393312
20	NJL000053397	ELLISBURG SHOPPING CENTER	1590 KINGS HWY & RTE 70	Cherry Hill Township	Camden	Pending	BUST	C2	1997-08-26 00:00:00	MAP1	347162.719	386467.438
21	NJD986608263	EXXON SERVICE STATION	RTE 70 & ELLISBURG CIR	Cherry Hill Township	Camden	Active	BUST	C2	1994-10-31 00:00:00	MAP1	346992.25	384820.313
22	NJL600105050	GREEN NURSERY	ELLISBURG CIR & BRACE RD	Cherry Hill Township	Camden	Active	BUST	C2	1991-10-16 00:00:00	DIFF	380967.2525	388620.9283
23	NJL600188932	CITGO SERVICE STATION	RTE 70 & KINGSTON RD	Cherry Hill Township	Camden	Active	BUST	C2	1989-09-07 00:00:00	MAP1	350064.344	380899.688
24	NJL800603607	36 RANOLDO TERRACE	36 RANOLDO TERR	Cherry Hill Township	Camden	Active	BFO-S	C2	2001-01-08 00:00:00	ADDMATCH	358533.406	396158.344
25	NJL800053365	CASINO LIMOUSINE SERVICE	615 CHAPEL AVE E	Cherry Hill Township	Camden	Pending	BUST	C2	1994-11-18 00:00:00	MAP1	338288.0441	400728.5426
26	NJD980664114	INFOTRON SYSTEMS CORPORATION	9 OLNEY AVE NORTH	Cherry Hill Township	Camden	Active	BEECRA	C2	1993-04-27 00:00:00	MAP1	367326.656	387095.25
27	NJD000555052	CHERRY HILL INDUSTRIAL CENTER	20 OLNEY AVE	Cherry Hill Township	Camden	Active	BEECRA	C2	2000-09-11 00:00:00	MAP1	360639.281	393388.688
28	NJL800045536	EXXON SERVICE STATION	1701 MARLTON PK	Cherry Hill Township	Camden	NFA-A	BUST	C2	1997-04-22 00:00:00	MAP1	340844.7052	401842.236
29	NJL600102776	SUNOCO SERVICE STATION	RTE 70 & GRAYDON AVE	Cherry Hill Township	Camden	Active	BUST	C2	1994-05-09 00:00:00	MAP1	330561.688	401492.469
30	NJD011153103	ARAMARK SERVICES INCORPORATED	1178 MARLKRESS RD	Cherry Hill Township	Camden	Active	BUST	C2	1989-12-12 00:00:00	MAP1	348977.5	394154.031

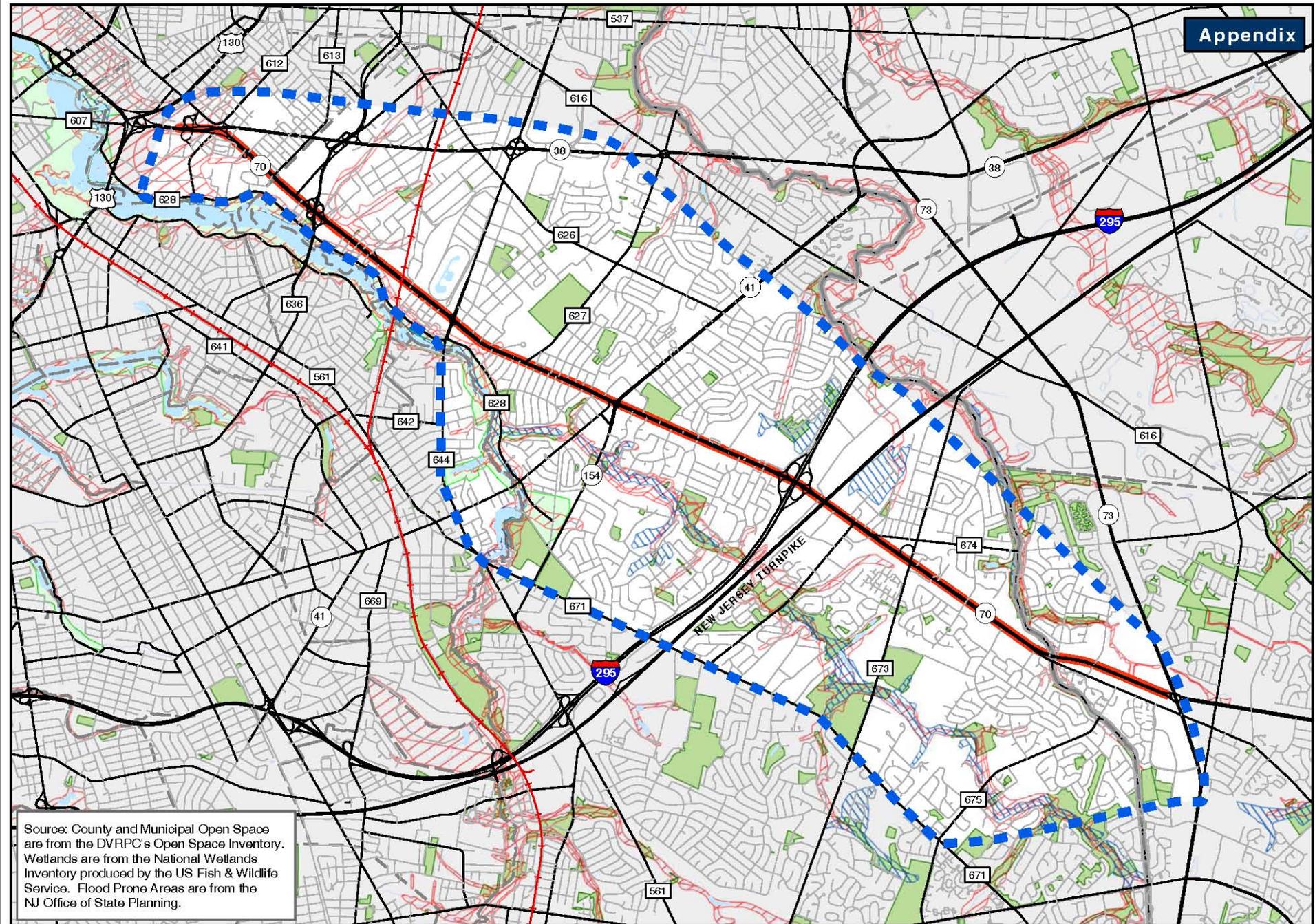
Table X
NJ Department of Environmental Protection
Site Remediation Program
Known Contaminated Sites (2001)

DVRPC MAP ID	SITE ID	NAME	ADDRESS	CITY	COUNTY	STATUS	LEAD	REMEDIAL L	STATUS_DT	XYORIGIN	X COORD	Y COORD
31	NJD981182512	EXXON SERVICE STATION	RTE 70 & SPRINGDALE RD	Cherry Hill Township	Camden	Active	BUST	C2	1988-01-14 00:00:00	MAP1	380618.2767	387771.6586
32	NJD986599512	EXXON SERVICE STATION	RTE 70 & MARLTON PK	Evesham Township	Burlington	Active	BUST	C2	1985-11-18 00:00:00	MAP1	387364.5	347985.0313
33	NJD000693978	SUNOCO SERVICE STATION	930 RTE 70 & MARLTON PK	Evesham Township	Burlington	Active	BUST	C2	1989-09-29 00:00:00	MAP1	344248.406	418960.125
34	NJL800593808	FORMER MOBIL FACILITY #LX6	RTE 70 & CROPWELL RD	Evesham Township	Burlington	Active	BUST	C2	2000-08-23 00:00:00	ADDMATCH	380672.9817	389838.8786
35	NJD981485808	BURNS HONDA	500 RTE 70 W	Evesham Township	Burlington	NFA	BUST	C2	1994-06-29 00:00:00	MAP1	361146.656	390022.313
36	NJD000693960	SUNOCO SERVICE STATION	RTE 73 & BAKER BLVD	Evesham Township	Burlington	Active	BUST	C2	1993-11-22 00:00:00	MAP1	344296	418129
37	NJL800606311	16 DOWNING STREET	16 DOWNING ST	Cherry Hill Township	Camden	Active	BFO-S	C2	2001-01-04 00:00:00	ADDMATCH	370017.6918	383965.9919
38	NJD986581023	TEXACO SERVICE STATION	RTE 73 & MAPLE AVE	Evesham Township	Burlington	Active	BUST	C2	1995-05-08 00:00:00	MAP1	339523.594	408683
	NJD136903267	GOODYEAR AUTO SERVICE CENTER	1108 RTE 70 (MARLTON PK)	Cherry Hill Township	Camden	Pending	BFO-S	C1	1993-03-21 00:00:00	MAP1	365839	387857
	NJD982180275	NJ DEPARTMENT OF TRANSPORTATION	RTE 70 & OLD CUTHBERT RD	Cherry Hill Township	Camden	Active	BFO-S	C1	1993-06-18 00:00:00	MAP1	335697.344	399689.5
	NJL600074652	GARDEN STATE RACE TRACK	RTE 70 & HADDONFIELD RD	Cherry Hill Township	Camden	Active	BFO-S	C1	2000-10-05 00:00:00	MAP1	361146.656	390022.313
	NJL800034563	BRIND LILY TRUCK LEASING	2374 RTE 70	Cherry Hill Township	Camden	Active	BFO-IN	C1	1994-01-25 00:00:00	MAP1	349175	393706
	NJL800503401	34 COOPER RUN DR	34 COOPER RUN DR	Cherry Hill Township	Camden	Active	CEHA	C1	1999-07-12 00:00:00	ADDMATCH	344866	387740
	NJL800516452	10 LAUREL TERRACE	10 LAUREL TERR	Cherry Hill Township	Camden	Active	CEHA	C1	1999-09-10 00:00:00	ADDMATCH	334163	400448
	NJL800516676	405 WOODLAND AVE	405 WOODLAND AVE	Cherry Hill Township	Camden	Active	CEHA	C1	1999-08-31 00:00:00	ADDMATCH	360325	391976
	NJL800575052	7 SNOWDEN PLACE	7 SNOWDEN PL	Cherry Hill Township	Camden	Active	CEHA	C1	2000-05-30 00:00:00	ADDMATCH	358122	389534
	NJL800584823	15 COOPER RUN	15 COOPER RUN	Cherry Hill Township	Camden	Active	CEHA	C1	2000-06-30 00:00:00	ADDMATCH	351954	388903
	NJL800585630	66 SHERIDAN AVE	66 SHERIDAN AVE	Cherry Hill Township	Camden	Active	BFO-S	C1	2000-11-06 00:00:00	ADDMATCH	342797	403724
	NJL800609323	407 SHERRY WAY	407 SHERRY WAY	Cherry Hill Township	Camden	Active	BFO-S	C1	2001-01-08 00:00:00	ADDMATCH	352019	393312
	NJL800620312	629 LONGWOOD AVE	629 LONGWOOD AVE	Cherry Hill Township	Camden	Active	CEHA	C1	2000-12-27 00:00:00	ADDMATCH	348578	400497
	NJL800487753	HOLTZ PROPERTY	125 N CROPWELL RD	Evesham Township	Burlington	Active	BFO-S	C1	1999-05-26 00:00:00	ADDMATCH	363071	381341
	NJL800100927	412 GROVE STREET	412 GROVE ST	Haddonfield Borough	Camden	Active	BFO-S	C1	1995-03-09 00:00:00	ADDMATCH	340844.7052	401842.236
	NJD982531782	MOBIL SERVICE STATION	RTES 70 & 295	Cherry Hill Township	Camden	Active	BUST	B	2000-10-18 00:00:00	MAP1	344845	393867
	NJL000049957	MARLTON PIKE PRECISION COMPANY	BEECHWOOD AVE & OLIVE ST	Cherry Hill Township	Camden	Pending	BFO-S	B	1993-04-01 00:00:00	MAP1	342659	392409
	NJL500000542	ACCU PRINTS INCORPORATED	2076 E MARLTON PK	Cherry Hill Township	Camden	Active	BFO-IN	B	1993-05-13 00:00:00	MAP1	354312	394616
	NJL500012794	GANDALF SYSTEMS CORPORATION	9N OLNEY AVE	Cherry Hill Township	Camden	Active	BEECRA	B	1992-04-13 00:00:00	MAP1	346229	394372
	NJL800091159	OLD SHARP SCHOOL	MARLKRESS RD	Cherry Hill Township	Camden	Active	BFO-IN	B	1994-09-27 00:00:00	MAP1	370852	383187
	NJL800397622	ARETT SALES CORPORATION	1152 MARLKRESS RD	Cherry Hill Township	Camden	Active	BFO-IN	B	1998-04-09 00:00:00	ADDMATCH	370018	383966
	NJD982533432	SHELL SERVICE STATION	RTES 70 & 73 (MARLTON CIRCLE)	Evesham Township	Burlington	Active	BFO-S	B	1994-10-18 00:00:00	MAP1	368899	387123
	NJL600007967	AMOCO SERVICE STATION	RTE 70 & CONESTOGA DR	Evesham Township	Burlington	Active	BUST	B	1991-08-26 00:00:00	MAP1	368944	387517
	NJL600191621	GULF SERVICE STATION	RTES 70 & 73	Evesham Township	Burlington	Active	BUST	B	1993-11-30 00:00:00	GPS	339829	402584
	NJL800349383	4 OLNEY AVENUE NORTH	4 OLNEY AVE N	Cherry Hill Township	Camden	Active	BUST		1997-12-08 00:00:00	MAP2	360902	393953
	NJL800434748	MOBIL SERVICE STATION	1501 RTE 38	Cherry Hill Township	Camden	Active	BUST		2000-08-23 00:00:00	MAP2	342103	402569
	NJL800511263	TEXACO SERVICE STATION	1390 RTE 70 E	Cherry Hill Township	Camden	Active	BUST		1999-08-24 00:00:00	DIFF	353524	393022
	NJL800566838	CHERRY HILL REPAIR	1516 RTE 38	Cherry Hill Township	Camden	Active	BUST		2000-05-12 00:00:00	MAP2	342602	402705
	NJL800567448	9 WEIDO LA	9 WEIDO LA	Cherry Hill Township	Camden	Active	BFO-S		2000-07-11 00:00:00	MAP2	360699	390064
	NJL800347247	MARLTON SQUARE SHOPPING CENTER	701 TO 735 RTE 70 W	Evesham Township	Burlington	Active	BFO-S		1997-11-06 00:00:00	MAP1	330673	402588
	NJL800405128	EXXON SERVICE STATION	RTE 73 & 70 CIR	Evesham Township	Burlington	NFA-A	BUST		1998-07-20 00:00:00	MAP1	369455	386995
	NJL800504417	MARLTON SPECIALITY SHOPS	300 RTE 73 S	Evesham Township	Burlington	Active	BUST		1999-07-16 00:00:00	MAP1	372123	386597
	NJL600237572	J & J SNACK FOODS	6000 CENTRAL HWY	Pennsauken Township	Camden	Active	BFO-IN		1994-09-13 00:00:00	MAP2	373147	384468

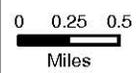
This table was developed using New Jersey Department of Environmental Protection Site Remediation Program's data but this secondary product has not been verified by NJ DEP and is not state authorized.

NJ 70 Corridor Study

Appendix



Source: County and Municipal Open Space are from the DVRPC's Open Space Inventory. Wetlands are from the National Wetlands Inventory produced by the US Fish & Wildlife Service. Flood Prone Areas are from the NJ Office of State Planning.



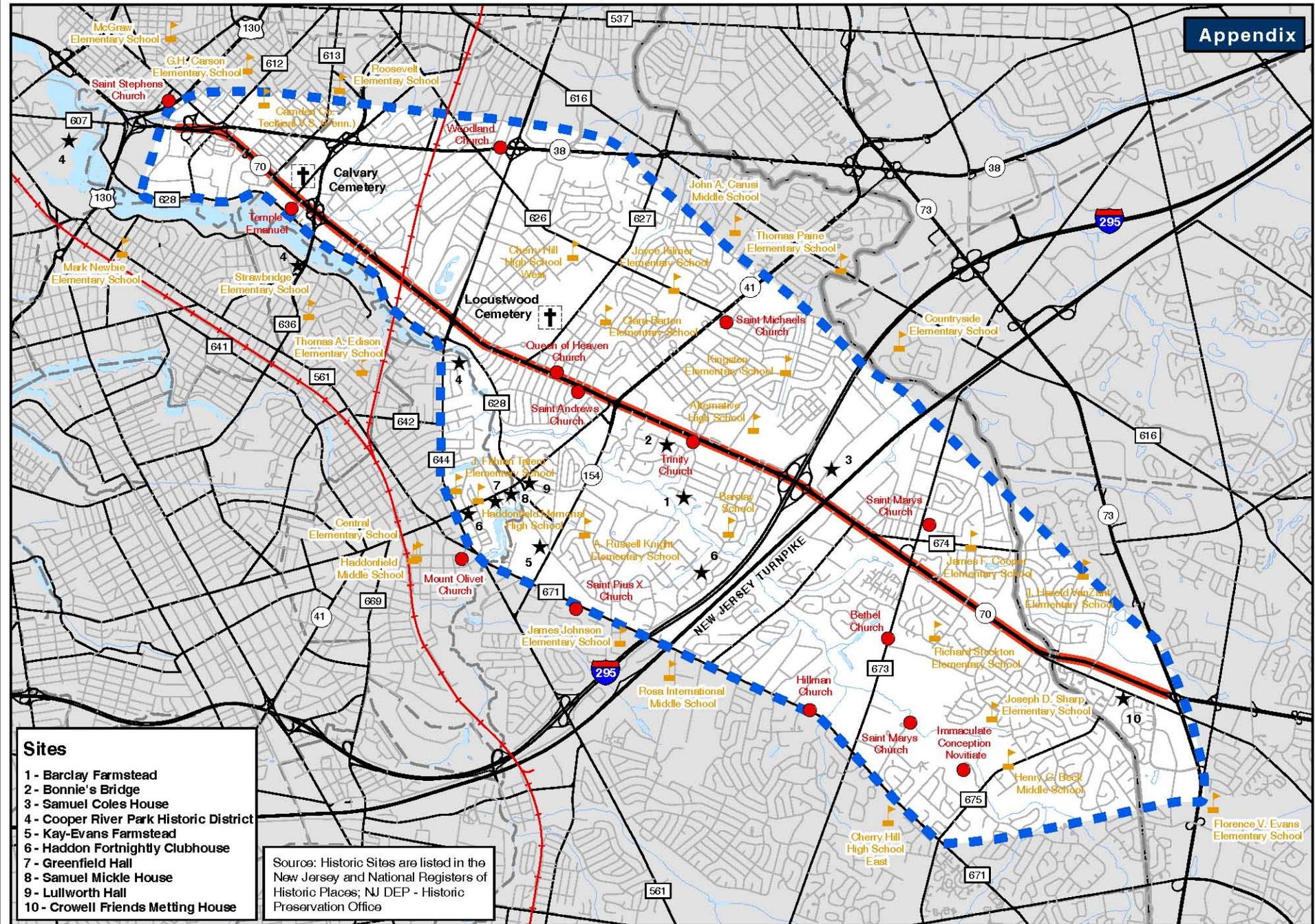
 Study Area
 NJ 70

 County Open Space
 Municipal Open Space

 Wetlands
 Flood Prone Area

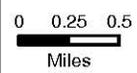
NJ 70 Corridor Study

Appendix



- Sites**
- 1 - Barclay Farmstead
 - 2 - Bonnie's Bridge
 - 3 - Samuel Coles House
 - 4 - Cooper River Park Historic District
 - 5 - Kay-Evans Farmstead
 - 6 - Haddon Fortnightly Clubhouse
 - 7 - Greenfield Hall
 - 8 - Samuel Mickie House
 - 9 - Lullworth Hall
 - 10 - Crowell Friends Meeting House

Source: Historic Sites are listed in the New Jersey and National Registers of Historic Places; NJ DEP - Historic Preservation Office



Study Area
 NJ 70

Place of Worship
 Cemetery

School
 Historic Site

APPENDIX F

**Pedestrian Access Conditions to NJT Bus Stops on Route 70 (Route 38 –
Route 70), NJDOT *NJ 70 CD Report***

Pedestrian Access Conditions to NJT Bus Stops on Route 70 (Route 38 - Route 73)										
Direction	Accommodations	Approximate Location	NJT Bus Route	Ped Access-Facility	Facility Condition	Adjacent Pedestrian Accessible Destinations	Signalized Intersection (within 5 min. walk)	Crosswalk-Type*	Ped Head	Push Button
EB	Shelter	E. of Sayer Avenue	406 to Medford Lakes	None	N/A	None	Garden State Park Entrance Road	Zebra striping across Rte 70 (ES only) and GSP Entrance Rd	Yes	Yes
EB	None	E. of S. Washington Ave.	406 to Medford Lakes	Sidewalk	Substandard - Narrow	Residential	Haddonfield Road (Rte 644)	Striping across all four legs	Yes**	Yes
EB	None	E. of Haddonfield Road	406 to Medford Lakes	Sidewalk	Substandard - Narrow	Residential, Retail	Haddonfield Road (Rte 644)	Striping across all four legs	Yes**	Yes
EB	None	E. of Curtis Ave.	406 to Medford Lakes	Sidewalk	Deficient - In disrepair	Residential	None	N/A	N/A	N/A
EB	None	W. of Conwell Ave.	406 to Medford Lakes	Sidewalk	Good	Residential	Edison Ave.	Striping across Rte 70 (ES only) + Edison Ave.	Yes	Yes
EB	Shelter	W. of Edison Ave.	406 to Medford Lakes	Sidewalk	Good	Residential	Edison Ave.	Striping across Rte 70 (ES only) + Edison Ave.	Yes	Yes
EB	None	W. of Boundary Lane	406 to Medford Lakes	Sidewalk	Good	Residential, Retail, Commercial	Kings Hwy (Rte. 573/41)	Striping across all four legs	Yes	Yes
EB	Shelter	E. of Kings Highway	406 to Medford Lakes	Sidewalk	Good	Residential	Kings Hwy (Rte. 573/41)	Striping across all four legs	Yes	Yes
EB	Shelter	E. of Sawmill Rd.	406 to Medford Lakes	Sidewalk	Good	Residential, Retail, Commercial	Kingston Dr.	Striping across Rte 70 (ES only)	Yes	Yes
EB	Shelter	E. of Kingston Drive	406 to Medford Lakes	Sidewalk	Good	Residential, Retail, Commercial	Kingston Dr.	Striping across Rte 70 (ES only)	Yes	Yes
EB	None	W. of East Gate Dr.	406 to Medford Lakes	None	N/A	None	None	N/A	N/A	N/A
EB	Shelter	E. of Pine Valley Rd.	406 to Medford Lakes	None	N/A	None	I-295 Interchange	None	None	None
EB	Shelter	E. of Springdale Rd.	406 to Medford Lakes	Sidewalk	N/A	Commercial	Springdale Rd. (Rte. 673)	Striping across Rte 70 (ES only)	Yes	Yes
EB	None	B/t Springdale & Wexford Rds.	406 to Medford Lakes	Sidewalk	N/A	None	None	N/A	N/A	N/A
EB	None	W. of Wexford Rd.	406 to Medford Lakes	Sidewalk	Substandard	None	None	N/A	N/A	N/A
EB	None	W. of Rte 73	406 to Medford Lakes	Sidewalk	N/A	None	Route 73	None	None	None
WB	Shelter	E. of Rte. 38 Junction	406 to Camden/Phila.	None	N/A	None	McClellan Ave.	Striping across Rte 70 (WS only)	Yes	Yes
WB	None	W. of Mansion Ave.	406 to Camden/Phila.	Sidewalk	Deficient - In disrepair	Retail	McClellan Ave.	Striping across Rte 70 only	Yes	Yes
WB	None	W. of Lexington Ave.	406 to Camden/Phila.	Sidewalk	Deficient - In disrepair	None	Lexington Ave.	Striping across Rte 70 only	Yes	Yes
WB	Shelter	E. of Lexington Ave Ext.	406 to Camden/Phila.	None	N/A	None	None	N/A	N/A	N/A
WB	None	W. of Cornell Ave.	406 to Camden/Phila.	None	N/A	None	Cornell Ave.	Striping across Rte 70 (ES only) and Cornell Ave	Yes	Yes
WB	Shelter	E. of Garden State Park Entrance Road	406 to Camden/Phila.	Sidewalk		None	Garden State Park Entrance Road	Zebra striping across Rte 70 (ES only) and GSP Entrance Rd	Yes	Yes
WB	Shelter	E. of Chambers Ave.	406 to Camden/Phila.	Sidewalk	Good	Retail	None	N/A	N/A	N/A
WB	Shelter	E. of Cooper Landing Rd.	406 to Camden/Phila.	Sidewalk	Good	Residential, Retail	Edison Ave.	Striping across Rte 70 (ES only) + Edison Ave.	Yes	Yes
WB	None	E. of Connecticut Ave.	406 to Camden/Phila.	Sidewalk	Good	Residential, Retail	Edison Ave.	Striping across Rte 70 (ES only) + Edison Ave.	Yes	Yes
WB	None	E. of New Hampshire Ave.	406 to Camden/Phila.	Sidewalk	Good	Residential, Retail, Commercial	None	N/A	N/A	N/A
WB	Shelter	W. of Kings Highway (Rt3. 41)	406 to Camden/Phila.	Sidewalk	Good	Retail	Kings Hwy (Rte. 573/41)	Striping across all four legs	Yes	Yes
WB	None	Between Kings Hwy. & Kingston Dr.	406 to Camden/Phila.	Sidewalk	Good	None	None	N/A	N/A	N/A
WB	Shelter	E. of Kingston Drive	406 to Camden/Phila.	Sidewalk	Good	Residential, Retail	Kingston Dr.	Striping across Rte 70 (ES only)	Yes	Yes
WB	Shelter	E. of Railroad Terrace	406 to Camden/Phila.	Sidewalk	Good	Residential	None	N/A	N/A	N/A
WB	Shelter	W. of Covered Bridge Rd.	406 to Camden/Phila.	None	N/A	None	Covered Bridge Rd.	None	None	None
WB	Shelter	E. of Greentree Rd.	406 to Camden/Phila.	Sidewalk	Good	Residential, Retail	Greentree Road	Striping across Rte 70 only	None	Yes
WB	Shelter	E. of Springdale Rd. (Rte. 673)	406 to Camden/Phila.	Sidewalk	Good	Retail	Springdale Rd.	Striping across Rte 70 (ES only)	Yes	Yes
WB	Shelter	E. of Wexford Dr.	406 to Camden/Phila.	None	N/A	None	None	N/A	N/A	N/A
WB	Shelter	W. of Old Orchard Rd.	406 to Camden/Phila.	None	N/A	None	Old Orchard Rd.	None	None	Yes
WB	None	Between Old Orchard Rd. & Split Rock Dr.	406 to Camden/Phila.	Sidewalk	Substandard - intermittent	None	Old Orchard Rd.	None	None	Yes
WB	None	W. of Rte 73	406 to Camden/Phila.	None	N/A	None	Route 73	None	None	None

*ES=East Side, WS=West Side

**Pedestrian intersection control consists of a countdown signal.

NJ 70 CORRIDOR STUDY

Publication No.: 06003

Date Published: November 2005

Geographic Area Covered: Cherry Hill Township, Haddonfield Borough, Evesham Township, Pennsauken Borough

Key Words: corridor study, transportation problem locations, improvement scenarios, project priorities, project benefits, implementation plan

ABSTRACT: This document presents a transportation improvement plan for the NJ 70 Corridor in Camden and Burlington Counties. The corridor planning effort undertakes the traditional examinations of an existing transportation/circulation system, in this case NJ 70 and surrounding facilities, identifying safety and functional or operational problems, and recommending potential solutions, as appropriate. This plan takes a comprehensive look at the transportation needs of the corridor and identifies which project locations are in need of immediate attention, and identifies who is responsible for advancing these projects to the next step.

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**Delaware Valley
Regional Planning
Commission**

NEIGHBORHOODS ► CONGESTION ► CRASHES ► ACCESS / MOBILITY ► IDENTIFIED PROBLEM LOCATIONS ► POTENTIAL IMPROVEMENT SCENERIOS

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