



Route 45 Corridor Study

Gloucester County, New Jersey



Delaware Valley Regional Planning Commission

March 2005



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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.



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.

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.

TABLE OF CONTENTS

1. Executive Summary.....	1
2. Introduction.....	3
3. Transportation and Economic Development Supporting Goals	7
3.1 Land Use	7
3.2 Transportation.....	8
3.3 Future Development and Infrastructure	9
4. Background	11
4.1 Corridor Land Use and Transportation Planning Linkage	11
4.2 Study Area	12
4.3 Corridor Existing Land Uses	17
4.4 Planning Trends of Existing Zoning and Land Use	21
4.5 Population, Employment and Housing Data	24
4.5.1 Population.....	24
4.5.2 Employment.....	29
4.5.3 Housing	30
4.6 Housing Affordability	31
4.6.1 Fair Share Housing	34
4.7 Planning Trends of Population, Employment, and Housing Conditions.....	35
4.7.1 Caldor Site: Woodbury Heights.....	35
4.7.2 Telford Inn Intersection: Mantua Township.....	37
4.8 Traffic Volumes.....	39
4.9 Highway Facilities	40
4.10 Crash Data.....	40
4.11 Public Transportation	50
5. Transportation Problems & Potential Improvement Scenarios	53
5.1 Identified Problem Locations and Potential Improvement Scenarios	53
5.2 Corridor-Wide Issues & Potential Improvement Scenarios	87

6. Corridor Wide Economic Development Strategies.....	91
6.1 Descriptions of Recommended Strategies.....	92
7. Plan Implementation.....	99

Maps

1. Study Area	5
2. Land Use 1995	19
3. Zoning.....	25
4. Traffic Counts	41
5. Intersection Accident Locations	47
6. Aerial Map	55
7. Aerial Map	57
8. Aerial Map	59
9. Aerial Map	61
10. Aerial Map	53
11. Aerial Map	65
12. Aerial Map	67

Tables

1. Corridor Existing Land Use	17
2. Zoning Districts and Uses	22
3. Municipal Population Forecast and Change 2000-2025	27
4. 2000 Municipal Population by Age.....	28
5. Employment Forecast and Change 2000-2025	30
6. Total Number of Housing Units in 2000	31
7. Housing Affordability – 1998	33
8. House Sale Prices – 1999	34
9. Characteristics of NJ 45 Signalized Intersections	43
10. Corridor Accident Summary (2001-2003)	45
11. Intersection Crash Locations (> 10) in 2001-2003	49
12. Bus Route 410 Average Weekday Bus Ridership.....	51
13. Route 45 Corridor Transportation Improvement Implementation Matrix	103

1. EXECUTIVE SUMMARY

This document represents an opportunity to link transportation and land use planning for a portion of the New Jersey Route 45 (Route 45) corridor in Gloucester County. This study focuses on a transitional area at a stage of growth between first generation suburbs and a new regionalism community type, promoting economic development and transportation improvement strategies. This can be accomplished by managing growth appropriate to infrastructure capacity and consistent with county, state, and regional plans to foster economic development.

The study area is located in southern New Jersey along Route 45 and encompasses the following six municipalities in Gloucester County: Deptford, West Deptford, City of Woodbury, Woodbury Heights, Mantua and Harrison. The downtown, main street areas of the City of Woodbury and Harrison (Mullica Hill) were excluded from the study. This corridor has become a commercial destination for both local and regional shoppers and continues to be a major north-south arterial through the county.

The study corridor shows typical development patterns that have become characteristic of the Delaware Valley over the past decade. Suburbanization is the trend along Route 45 in Mantua and Harrison Township where land for development is available. At the same time, there are disinvestments in core cities and first-generation suburbs such as Woodbury City and Woodbury Heights that show signs of declining population. Route 45 through the City of Woodbury is an area that was established as a commercial district prior to the dominance of the automobile. Here, land use density is higher than surrounding areas. Stores are smaller in square footage, closer together, and on street parking is provided. Through Woodbury Heights, Deptford, and West Deptford along the corridor, the density of commercial development is less intense, the footprints of buildings become larger and strip malls are more prevalent. Confronting this corridor, along with increased development and congestion are the associated problems of transportation safety and poor access.

Transportation and Economic Development Supporting Goals are formulated and conforms with the policy goals and objectives of the New Jersey State Plan, Delaware Valley Regional Planning Commission (DVRPC) Year 2025 Land Use

and Transportation Plan, and local municipal plans; and serves as a guide for implementation of the recommendations and strategies in this study.

Multi-agency field views to review transportation problem locations were undertaken and consequently technical analysis to quantify the identified transportation problem areas and document practical solutions. Most transportation problems in the study area occur during recurring peak period congestion. There is a major problem with access to/from the many businesses along the study corridor. The report recommends access management by New Jersey Department of Transportation (NJDOT), as Route 45 is a state route and they have jurisdiction. Intersections along the corridor showed the most problems – capacity issues, safety (large number of accidents) and lack of pedestrian amenities. Recommended improvement strategies are adding/converting turning lanes, signal timing, signal coordination, pavement markings, and pedestrian enhancements at these intersection. Improvement scenarios have been recommended based on their ability to correct existing or potential problems or deficiencies.

Corridor Wide Economic Development Strategies are presented according to priority. An immediate course is corridor access management; if access to businesses along the corridor is seamless the corridor becomes more attractive for investors. In the short term examples of strategies presented comprise of suburban center zoning, economic development planning and greenway corridors. Long-term strategies are presented in the form of traffic impact fees ordinances and growth boundaries. These give local municipalities potential land use and economic development strategies for implementation with resulting initiation of revitalization or growth management in the corridor, where appropriate.

A strategic implementation plan for the corridor was formulated and gives the priority, benefit, cost and responsible agency for identified strategies. While no single strategy will have the desired impact on congestion within the study area, the combination of strategies will have an impact on the economic vitality of the local area as well as the quality of life and mobility of the corridor as a whole.

2. INTRODUCTION

This study was initiated by the Gloucester County Planning Department to conduct a planning effort that addresses economic development and transportation issues along New Jersey Route 45 (Route 45). This corridor has become a commercial destination for both local and regional shoppers and continues to be a major north-south arterial through the county.

Route 45 is an arterial highway that serves both regional and local traffic in southern New Jersey. The study area is approximately 8 miles long. The limits of the corridor extend from Salem Avenue (CR 551) in Woodbury to Swedesboro Road (US 322) in Harrison Township. The study area is shown in **Map 1**. The study area encompasses the following six municipalities in Gloucester County: Deptford, West Deptford, Woodbury, Woodbury Heights, Mantua and Harrison.

The Route 45 corridor varies considerably regarding land use, as well as lane configuration and functionality of the facility, over its length. As a result, with a few exceptions the problems identified in the corridor study area tend to be isolated. Problems related to congestion, mobility, access, and safety were examined.

The report is organized into seven sections. The body of the document begins with some Transportation and Economic Development Supporting Goals for the corridor about land use, transportation and future development and infrastructure. This section (Section 3) provides a vision of the corridor, in terms of land use, transportation, and future development and serves as a guide for implementation of the recommendations and strategies in this study.

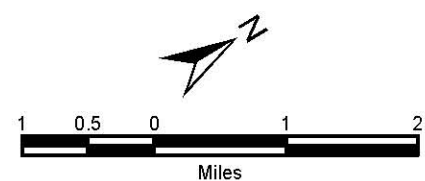
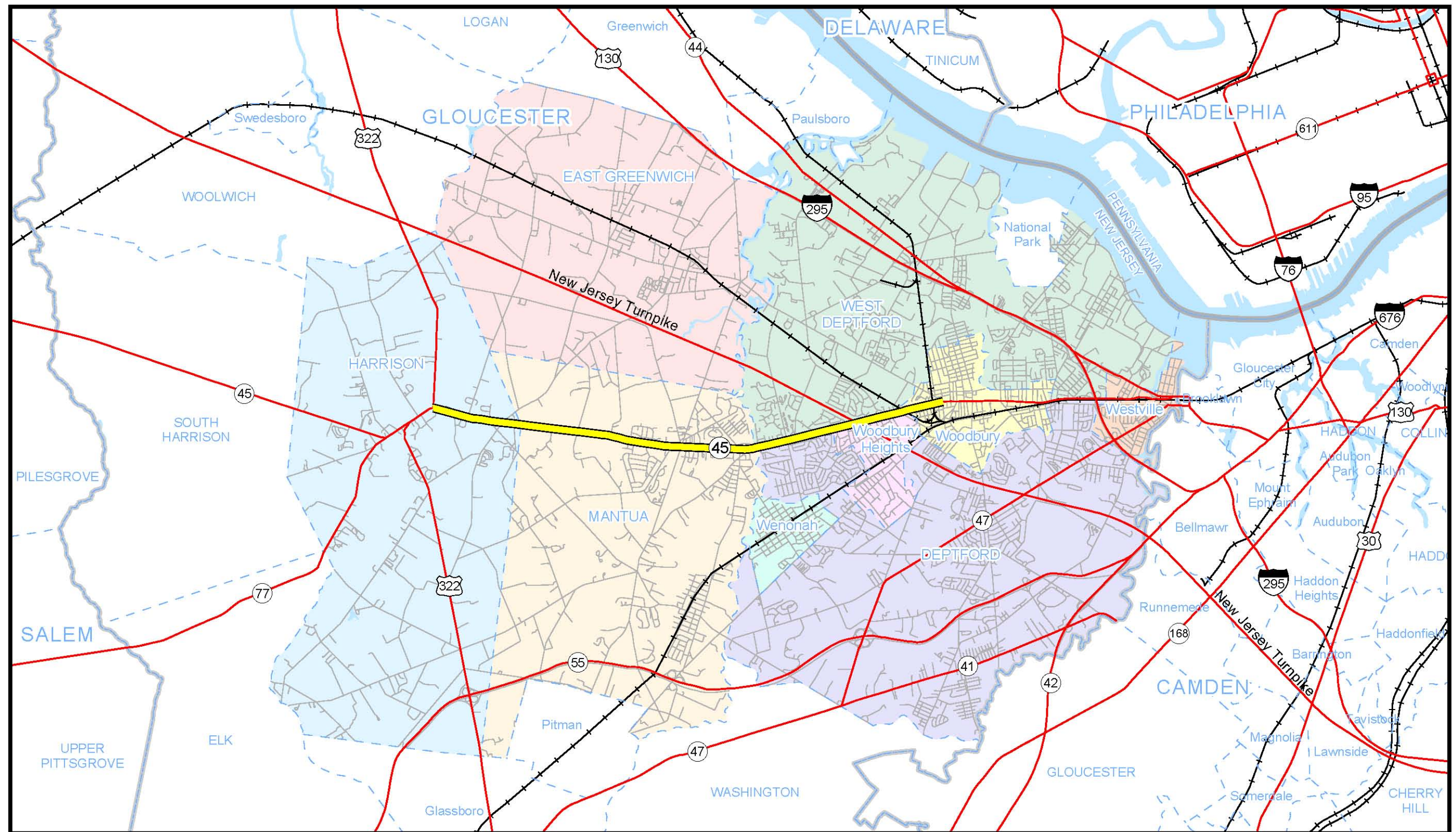
Section 4 looks at the background information of the corridor and examines the study area in terms of regional setting. It looks at existing land uses, population, employment, and housing and examines the trends of this data. The background data is concluded by looking at the traffic volumes, highway facilities, crash data and public transportation.

Section 5 is the transportation issues section examines both isolated problem locations and issues spanning multiple municipalities. The problem locations presented by representatives of the municipalities within the study area are examined. Staff conducted field visits during a.m. and p.m. peak periods to

examine problems under typical conditions and gather additional data. Potential improvement scenarios are presented for each problem location.

Section 6 and 7 presents plan implementation. Section 6 looks at Corridor Wide Economic Development Strategies. Descriptions of various strategies that local officials may use along the corridor to initiate revitalization or growth management are provided. Each strategy is assigned a priority depending on the importance and the ability to move the strategy toward implementation.

Section 7 discusses a transportation implementation plan. A matrix is provided that is intended for use as a quick reference for identifying improvement projects. Each problem is numbered and described according to the following criteria: priority ranking (high, medium, low), cost range (high, medium, low), and benefits (safety, mobility, congestion). Also identified on the matrix is the government organization responsible for assuming the lead and assisting roles in the project implementation, i.e.: New Jersey Department of Transportation (NJDOT), County, or Municipality).



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CORRIDOR AND STUDY AREA

 Route 45 Corridor

MAP 1
ROUTE 45
CORRIDOR STUDY:
STUDY AREA

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3. TRANSPORTATION & ECONOMIC DEVELOPMENT SUPPORTING GOALS

The goals summarize the vision of the corridor, in terms of land use, transportation, and future development and serve as a guide for implementation of the recommendations and strategies in this study.

3.1 Land Use

Goal 1. Ensure the protection of natural resources, particularly water resources and agriculture.

Goal 2. Establish a variety of approaches, mechanisms and tools that are appropriate for dealing with challenges faced by corridor communities.



Objectives

- Amend zoning bulk requirements to protect natural resources on new development sites.
 - Maintain the character of floodplain and wetland areas within the corridor with extra buffering and strict development regulations.
 - Create design guidelines for berms, natural landscaping, and increased building setbacks for visual aesthetics.
 - Require subdivisions and site plans to have an open space set aside to create and enhance greenways and quality of life.
 - Minimize alterations to existing topography with particular attention given to protecting steep slopes (those in excess of 10 percent) from disturbance.
 - Continue to review, evaluate and update local comprehensive plans in relation to the county and regional plans.
 - Prepare and implement new and improved development regulations to ensure consistency with local or county master plans.
 - Promote and explore joint municipal agreements and other tools that will promote Smart Growth within the corridor.
-

3.2 Transportation

Goal 1. Maintain a safe and efficient multimodal circulation system throughout the corridor while protecting the current function of the transportation network, preserving capacity and establishing a beneficial relationship between land use and both regional and local circulation patterns.



Goal 2. Provide safe and efficient access to multiple commercial establishments without environmental impacts.

Goal 3. Enforce speed limits in order to reduce accidents and provide a safer environment for pedestrians and bicyclists.

Goal 4. Work with New Jersey Transit (NJ Transit), NJDOT and the county to identify new bus routes and shelters along the Route 45 Corridor.

Objectives

- Encourage traffic flow improvements and the implementation of design standards that are based on a functional classification system for local roadways.
- Identify and set priorities, working with county officials, for projects that are appropriate for inclusion of DVRPC's Transportation Improvement Program and NJDOT's Transportation Program.
- Encourage ridesharing among local residents and identify areas that might be used for long distance and commuter parking areas.
- Establish criteria upon which the need to establish future mass transit opportunities might be established.
- Promote the development of a network of pedestrian and bicycle facilities linking residential, employment, shopping, schools, and open space.
- Preserve the character of existing neighborhoods by directing growth through arterial highways and efficient access management, rather than redirecting to local roads.

3.3 Future Development And Infrastructure

Goal 1. Achieve a future overall development pattern that is responsive to the economic needs of the corridor in light of regional trends and containing congestion on Route 45.

Goal 2. Preserve and enhance the physical environment such as open space and agriculture, to preserve the rural character of Gloucester County as an amenity to the quality of life and an economic development attractor.

Goal 3. Ensure development will occur in an efficient manner where the short and long- term costs to the public sector will be minimized.



Goal 4. Expand and diversify the corridor's economic base and offer a broad range of job opportunities for corridor residents.

Goal 5. Provide and maintain additional municipal services and county facilities to support new economic development and county revitalization.

Objectives:

- Direct commercial and high-density residential uses to places where sewer, water, and transportation infrastructure systems already exist.
 - Encourage mixed-use development near interchanges of arterial roadways and transit stops as well as large open spaces key for redevelopment.
 - Relate land use to the natural resources and accessibility of the road network, especially in terms of access to certain establishments and residential neighborhoods.
 - Amend zoning ordinances to establish performance measures to reduce incompatibility between land uses and the use of buffering.
-

- Create coordination mechanisms between bordering municipalities, county and state officials to maintain levels of service and to encourage shared access onto specific sites and arterial roads.
 - Locate future employment centers close to major transportation corridors, interchanges, and transit routes in order to maximize accessibility for potential employees and clients.
 - Promote new business and industries that will tap the skill set of the corridor residents who currently commute to jobs outside the corridor.
 - Work with county and state officials to provide new or improved transportation facilities within areas of economic development.
 - Encourage investment in existing business districts, compatible with the architectural character of the community and discourage scattered commercial and industrial developments, such as strip developments.
-

4. BACKGROUND

The Route 45 corridor study area extends approximately eight miles from Salem Road (CR 511) in Woodbury City to Swedesboro Road (US 322) in Harrison Township. It begins just south of the designated Main Street in Woodbury passing through the highway commercial zones of Deptford, West Deptford, and Mantua and terminates at the edge of historic Mullica Hill in Harrison Township.



Route 45 is an arterial highway that is utilized as both a shopping destination and a shortcut to the more southern communities of Gloucester County from major highways such as I-295 and the NJ Turnpike. Route 45 is a four-lane highway that is divided with a grass median through Woodbury Heights, West Deptford, and Deptford

requiring the use of jug handles to access commercial sites on the opposite side of the highway with U-turns. Through Mantua and Harrison, Route 45 is an undivided two-lane highway with two distinct characteristics: more passive uses such as housing and open space and until recently, big-box retail development.

While Woodbury Heights and Woodbury are declining in population, the remaining municipalities within the study corridor are booming with population and economic growth. Many of the older commercial lots are now vacant due to three factors: (1) disinvestments; (2) larger lot requirements for big-box building footprints; and (3) accessibility.

4.1 Corridor Land Use and Transportation Planning Linkage

Corridor planning recognizes the linkages between land use and transportation and permits the creation of an integrated comprehensive plan that looks at issues across municipal boundaries. The Route 45 corridor runs through a substantial portion of Gloucester County and provides important connections between

different local and regional networks of transportation services and facilities. Corridor planning involves a multimodal approach: all elements must be considered for the future viability of Route 45.

Analysis of Route 45 corridor will result in:

- A comprehensive approach for transportation and land use enhancements.
- Alternatives that focus on the impacts of transit options, access management, and Intelligent Transportation Systems (ITS).
- Improvements in a regional context that guides the implementation of the county economic development plan as well as local master plans.

4.2 Study Area

In order to develop an economic development strategy for the Route 45 Corridor, an accurate inventory of the existing highway and land use conditions is essential. This section will look at the physical conditions of the corridor as well as the existing land use and zoning regulations. This analysis will help identify potential problems, determine future needs, and develop the necessary policies and strategies to implement plans that respond to (re) development pressures.

Woodbury City Milepost 24.9 to 25.5



Woodbury City is located at the northern end of the study area. The uses include several car dealerships, an ACME grocery store, and smaller retail establishments. Woodbury City's Main Street is located just north of the study area. Recent efforts to address the traffic and promote downtown shopping have been a priority for the Main Street Program. In Woodbury, Route 45 has two lanes of

travel in each direction. At the intersection of Salem Avenue (CR 551), the speed limit changes from 25 mph to 40 mph as you head south. The entire portion of the corridor is commercial establishments, however the character of

the size and type of commercial changes from small retail stores to car dealerships and other uses with large parking lots in the front of each lot. Sidewalks are provided with pedestrian signals at the intersections for movements across NJ 45.

Woodbury Heights
Milepost 23.9 to 24.9



Woodbury Heights is located between Woodbury and Deptford Township and is the smallest of the municipalities involved in the study. This section of Route 45 acts as the boundary between Woodbury Heights and West Deptford Township. Population decline and economic disinvestment is evident along the Route 45 corridor as many

of the lots are empty, abandoned or open for development. Woodbury Heights is home to one of the largest vacant strip mall commercial developments in the region, which use to house a Caldor. This site has seen many large retailers in the past two decades. Empty storefronts have also been torn down to make way for larger service-oriented businesses such as a Super WaWa. Commercial uses on Route 45 must compete with other comparable businesses.

As Route 45 continues as a four-lane highway the speed limit increases to 45 mph at Evergreen Avenue (CR 650) and then to 50 mph at Elm Avenue (CR 652). As the speed increases, ten-foot shoulders are also added to the highway. This section of Route 45 also contains a six-foot curbed median that prevents crossovers. Jug handles provide turning movements at each of the signalized intersections. Due to the divided barrier, it is difficult to access certain stores when traveling in the opposite direction and shoppers may often choose to go to comparable stores out of the area. Sidewalk access may be provided at some commercial properties, although this is not consistent throughout the corridor. Pedestrian crosswalks and push buttons are provided at each signalized intersection, although there are no pedestrian signals.

West Deptford
Milepost 22.8 to 24.9

West Deptford Township is located between Mantua Township and the City of Woodbury. Route 45 continues to act as a boundary between the townships. Located in West Deptford Township are two major shopping centers that have remained fully occupied: Southwood and Greenwood. The vacant Bradlees site is next to the Shop



Rite; however, the parking lot remains in use. It is currently being utilized as an informal park-and-ride lot. A hairdresser adjacent to Bradlees also uses the lot for overflow parking. In addition, West Deptford has residential development that backs up to Route 45.

This section of Route 45 is a four-lane divided highway, two lanes by direction, with a speed limit of 50 mph. A six-foot curbed median and ten-foot shoulder are provided. Again, jug-handles provide turning movements at each of the signalized intersections. The presence of sidewalks is again not consistent on this section of Route 45. Pedestrian crosswalks and push buttons are available at each signalized intersection.

Deptford Township
Milepost 22.8 to 23.9



Deptford Township is located between Woodbury Heights and Mantua Township. The majority of this section of the corridor is zoned for commercial, however, there is a small portion zoned for single-family dwellings. While there is an access street from the neighborhood that enables these residents to avoid Route 45 traffic, the noise and traffic impacts can

be seen and heard. Development in Deptford Township has been concentrated in other portions of the township, specifically the mall area, at the convergence of Route 42 and Route 47. This section of the township has seen the development of small retail such as Taco Bell and other fast food restaurants. The entire township has recently been rezoned and the township's policy is to allow for residential and commercial uses along the Route 45 Corridor.

The characteristics of the highway are similar to that of West Deptford with two lanes of northbound travel, 50 mph speed limit, curbed median, jughandles and inconsistent sidewalk access.

Mantua Township
Milepost 19.4 to 22.8



Mantua Township is located between Deptford Township, West Deptford Township and Harrison Township. Vehicles enter Mantua Township through the intersection at Main Street. A majority of the vehicles will utilize the jug handle to enter the downtown area of Mantua while some vehicles continue on Route 45. At this point, the lanes reduce from a four-lane road into two lanes with one

travel lane in each direction. The curbed median is also removed at this point, the speed limit reduces to 35 mph, and sidewalks are provided.

This is a commercial area of Mantua and a destination for local residents and regional shoppers passing through. There are commercial establishments such as K-Mart, two banks, an ACME grocery store, the Telford Inn Restaurant, and the post office. In addition, a Walgreens has been constructed at the corner of Berkley Road. A Taco Bell /Long John Silver restaurant has also just opened across from the K-Mart shopping center and is located between Brittany Street and Chestnut Street.

In the lot adjacent to the K-Mart shopping plaza, a new Home Depot and Kohl's have been built. In order to accommodate the traffic that is now generated, the

road has been widened to four lanes with a traffic light at Washington Avenue. The increased width only runs the length of the Home Depot / Kohl's property and then funnels back into two-lanes. Plans have been discussed to build a bridge to link the two shopping centers. This will help to reduce traffic along Route 45 between the two centers.



*Harrison Township
Milepost 18.2 to 19.4*



While only a small portion of Harrison Township is included in the study area, it is an important area. Known as the center of town, the study area affects the Historic Mullica Hill area as well as the intersection at Route 322. This area along Route 45 has smaller scale commercial uses - a drug store, day care facility, diner, two banks, the police station, and an

elementary school. Along Route 45, the elementary school is a large traffic generator and school buses often have difficulty accessing the site. Just to the east of Route 45 is the Clearview Regional High School. This is located within a one-half mile of both Cedar and Breakneck Road intersections. The Township of Harrison has focused on pedestrian access to the center of town with sidewalks and banners. Off-street parking is an issue for commercial businesses. This portion of Route 45 is one-travel lane in each direction with no on street parking within the study area (on-street parking is permitted in historic Mullica Hill). The speed limit is 40 mph and reduces to 30 mph as you approach US 322. New

commercial is proposed at the intersection of Cedar Road, a new Women's Health Center between Colson Lane and Red Oak Lane, and a Goddard Nursery School has been constructed at the corner of Wingate Road.

4.3 Corridor Existing Land Uses

While the majority of the land has been zoned for commercial uses, an assessment (using existing maps and aerial photographs) concluded that a majority of the land use (any land that was touching Route 45) was used as residential single-family detached units. This analysis measured the lots directly adjacent to the Route 45 corridor and went back 50 feet in each direction of the right-of-way line. **Table 1** shows the existing land use characteristics along the corridor. **Map 2** illustrates the land uses within the corridor.

Table 1. Corridor Existing Land Use

Land Use Category	Total Acres	Percent Coverage
Residential – Single-Family (detached)	33.3	37
Residential – Single –Family (attached)	4.9	5
Commercial	13.8	16
Transportation	1.4	2
Agricultural	10.1	12
Vacant	3.7	4
Wooded	10	10
Parking	10.1	14
Total	87.3	100

Residential Uses

Single-family units, both attached and detached, make up approximately 43 percent of the corridor's land use coverage. While a majority of the land is shown as zoned for commercial uses, these dwellings were constructed well before the development patterns of the past decade. Route 45 has become a commercial destination for both local and regional shoppers, causing residential units to be displaced. In some instances, some residential houses have special access roads so traffic from the main arterial will not directly affect their access to

their homes. In other cases, the topography of the land keeps the single-family units separate from the road. Shoulders are provided without curbs in many areas.

Commercial Uses

Approximately 75 percent of the highway frontage is zoned for commercial use, ranging from retail and services to office and research, however, while a majority of the corridor is zoned for commercial, only 16 percent of the existing corridor uses are traditional commercial uses. This number takes into account those lots within a 50-foot buffer from the right-of-way. A majority of the strip mall commercial developments along Route 45 are occupied, however, the larger zoned lots, such as Caldor and Bradlees, account for a large portion of commercially zoned area.

Transportation and Parking

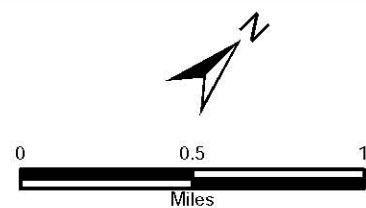
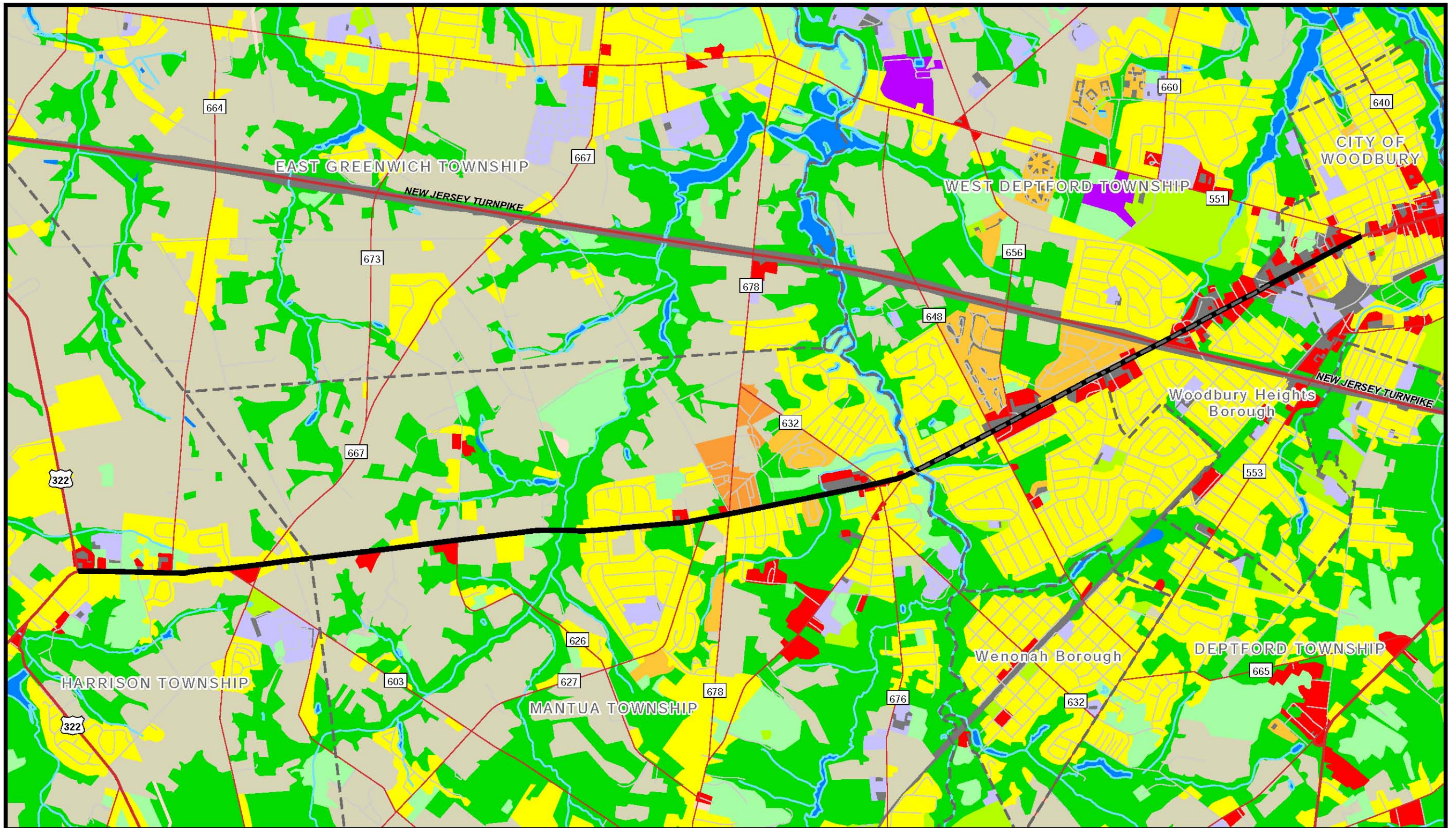
Transportation and parking land uses include all streets, alleys, access points, sidewalks, parking lots and loading docks. Approximately 14 percent of the Route 45 Corridor study area is covered by asphalt that serves these needs. On certain commercial sites, the parking lots are hundreds of feet wide with little or no landscaping.

Vacant and Wooded

















The Route 45 Corridor study area has two distinct characters. On the northern side through the City of Woodbury, the Borough of Woodbury Heights, and West Deptford, it is virtually built out. The corridor in Mantua and Harrison is open space or wooded. There are many lots that remain open or wooded. These make up 15 percent of the corridor.

Agricultural

Agricultural uses are prevalent throughout the townships of Mantua and Harrison where the corridor changes back into a two-lane highway with wide shoulders and no curbing. These agricultural uses provide a scenic landscape and amenity to residents as well as travelers. Agricultural uses make up 12 percent of the corridors land uses.



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 Residential - Single Family (Detached)	 Manufacturing - Light	 Commercial	 Agriculture
 Residential - Multi-Family	 Manufacturing - Heavy	 Community Services	 Mining
 Residential - Row Homes	 Transportation and Parking	 Military	 Wooded
 Residential - Mobile Homes	 Utility	 Recreation	 Water

MAP 2
ROUTE 45
CORRIDOR STUDY:
LAND USE
1995

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4.4 Planning Trends of Existing Zoning and Land Use

- Preexisting nonconforming buildings with large setbacks create a design problem in terms of aesthetics and pedestrian access.
- High travel speeds and barriers create accessibility problems for certain retail establishments along the Route 45 corridor.
- Route 45 will continue to be a major north-to-south arterial through the county with increasing congestion.
- Transit accessibility will continue to be an issue that must be improved if residents are to shop in their own downtown and not at the regional malls.

Current Zoning Regulations

Municipal zoning regulations have a direct bearing on the future economic impact and traffic flow. Zoning provisions establish controls for land use, density, lot dimensions, and building placement. These regulations dictate the extent and location of new redevelopment that directly affect the amount of traffic that will be generated.

To obtain a thorough understanding of current regulations, the zoning ordinances of study area municipalities were reviewed. Uses, densities, and setback requirements in each zoning district have shaped the character of land-development-influenced traffic patterns.

Map 3 illustrates the numerous existing zones for each of the study area municipalities. Each zone has been taken from the respective zoning ordinances of each municipality. As illustrated in both **Table 2** and **Map 3**, more intensive, mixed-use zoning is located near the City of Woodbury while the less intensive uses are located in Mantua and Harrison townships. This corridor is a good example of development patterns over the past decade. The downtown of the City of Woodbury is an area that was established as the commercial district prior to the dominance of the automobile. Stores are smaller in square footage, closer together, and parking is only provided on the street.

Uses such as professional offices, personal services shops, and smaller retail stores are located here. Moving further south along Route 45, through Woodbury Heights, Deptford, and West Deptford, the intensity of commercial lessens. The footprints of buildings become larger and strip malls dominate the landscape. Entering Mantua, large big-box retail uses are located on Route 45. The

Table 2. Zoning Districts and Uses

Municipality	Zoning District	Allowed Uses	Accessory Uses
City of Woodbury	C-1 (Commercial)	Retail, commercial, business	Dwelling units, Motor vehicle Storage.
	C-2 (Commercial)	Services, churches, public/quasi public offices, and financial.	
Borough of Woodbury Heights	HC (Highway Commercial)	Commercial, retail, offices, banks, restaurants, shopping centers, gas stations, hotels and car sales.	Parking lots, Garages, signs, outside storage.
West Deptford Township	C (General Commercial)	Any use permitted in R-3, dwelling units, hotels, retail, gas station, hotel, business school, laundry establishment, printers, bakery.	Identical to the permitted uses.
	SC (Shopping Center)	Uses permitted in C zone, residential, outdoor storage, printers and public garage.	
	R-2 (Suburban Residential)	Single-family detached units	
Deptford Township	R-6 (High Density Residential)	Townhouses/apartments	Parking lots, signs, fences.
	R-10 (Medium Density Residential)	Single-family detached units (10,000 sq. ft lots)	
	C-2 (Commercial)	Eating/drinking establishment, banks, offices, personal services, day care.	
Mantua Township	R-11 (High Density Residential)	Single-family detached dwellings at .25 acre	Ancillary uses
	CC (Community Commercial)	Retail, eating/drinking establishment, banks, offices, personal services, garden centers, gas stations, day care, public utilities.	
	PC (Planned Commercial)	Retail, business, offices, movie theaters, hotels, shopping centers, recreation, park and rides, and garden	

Table 2. Zoning Districts and Uses

Municipality	Zoning District	Allowed Uses	Accessory Uses
Mantua Township (cont.)	TP (Trailer Park)	centers. Detached dwelling units (mobile homes) for the purpose of affordable housing.	Churches, cemetery, public utility, community shelters.
	AR (Agricultural Residential)	Farms, playgrounds, golf courses, dwelling units (3 acre lots)	
	NC (Neighborhood Commercial)	Retail, eating/drinking, banking, professional offices, personal services and garden centers	
Harrison Township	PO (Professional Office)	Offices for doctors, dentists, opticians, insurance, real estate, attorneys, engineers, accountants, architects and management firms.	
	C-1 (Village Commercial)	Food markets, bakery, clothing, jewelry, florist, books, appliances, dry goods, hardware, barbers, dry cleaning, and self - service laundry, paper sales, restaurants, offices, post office and library. (10,000 sf lots)	
	C-2 (General Commercial)	Same as C-1, (43,560 sf lots) hotels, studios, recreational facilities, furniture stores.	
	INS (Institutional)	Government buildings, churches, schools, college, cemetery and private recreational.	
	R-2 (Village Residential)	Single-family detached (1 acre, without sewers), farms, public buildings, and recreation.	

southern end of the study area through Mantua and Harrison is used for more passive uses such as farmland, recreation, and administrative buildings. The zoning in each of the municipalities supports the most recent master plans in terms of development and growth management. Each community has incorporated different types of commercial into their towns, using Route 45 as an area for larger-building-footprint uses that will require larger parking facilities.

4.5 Population, Employment, And Housing Data

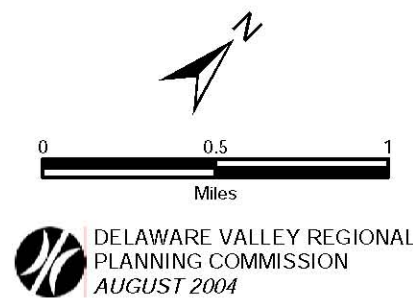
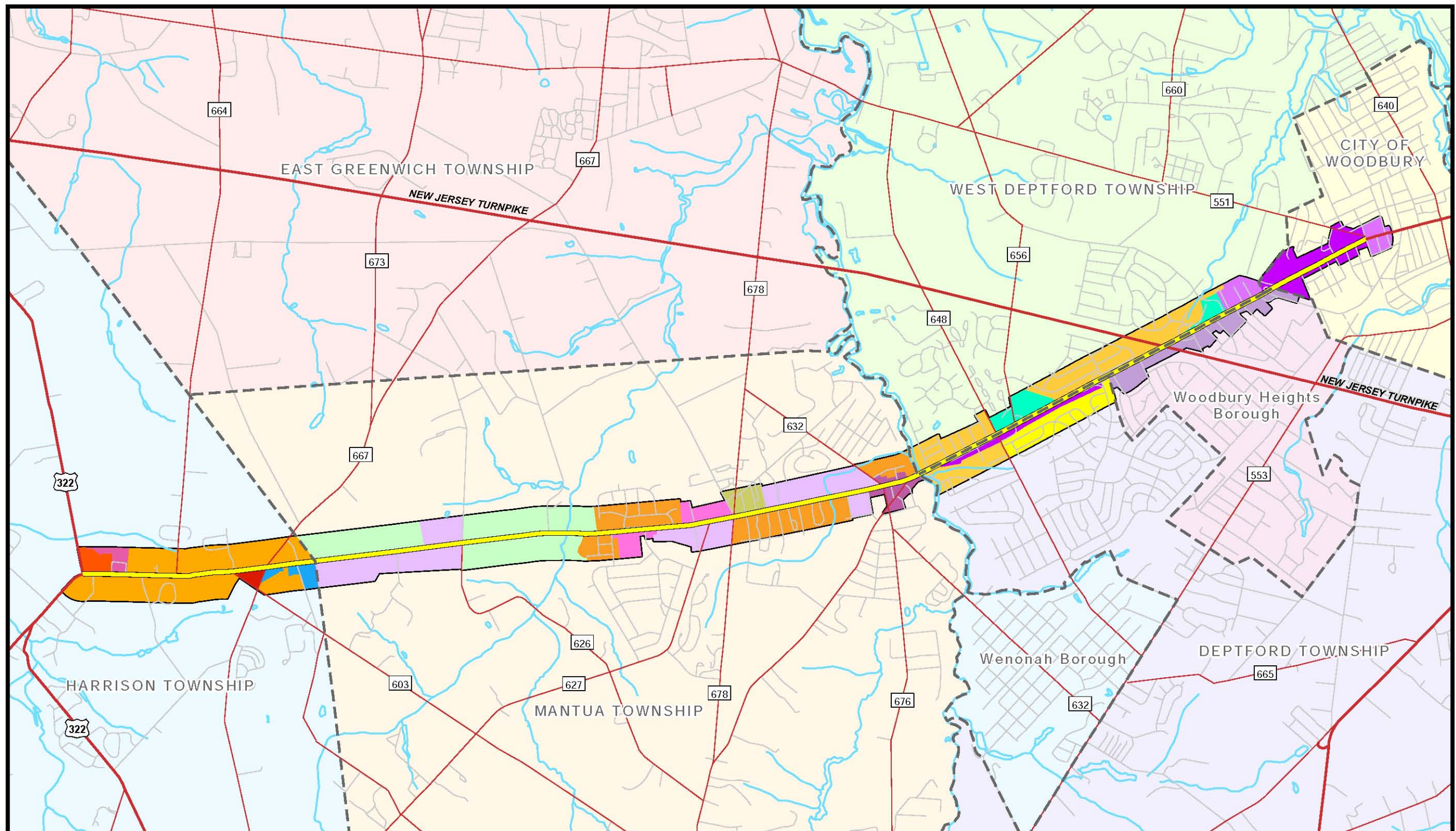
Demographic and population trends within the corridor affect land use, community facilities, and transportation. This data can also help to explain current development patterns in the Route 45 corridor, as more people require more schools, homes, and ultimately, more trips. What the corridor is currently comprised of, how it has recently changed, and how it is forecast to change in the next 25 years is discussed in this section.

4.5.1 Population

Over the past 50 years, the Delaware Valley has experienced a rapid decentralization of population. Prior to World War II, transportation constraints, together with socioeconomic factors, fostered a clustering of population in the region's cities and towns. The rapid increase in automobile ownership during the postwar years greatly reduced the time and costs associated with commuting to the region's core employment centers and enabled people to move further into the suburbs.

The Delaware Valley region is forecast to add more than 529,000 people in the next two- and-a-half decades. New Jersey as a four-county wide region will continue to grow more rapidly than Pennsylvania with Gloucester County having the highest growth rate in the region. The following charts and maps give a broad overview of the population and employment changes for each of the six municipalities located along the Route 45 Study corridor: Deptford Township, West Deptford Township, City of Woodbury, Borough of Woodbury Heights, Mantua Township, and Harrison Township.

To produce its forecasts, DVRPC uses a multi-step, multi-source methodology by applying standard demographic methods along with current demographic and economic information available at the regional, county, and municipal levels.



ZONING CODE BY MUNICIPALITY

Woodbury Heights
Highway Commercial (HC)

DEPTFORD

Commercial (C-2)
Single Family Residential (R-10)
1 and 2 Family Residential (R-6)

HARRISON

Village Commercial (C-1)
General Commercial (C-2)
Institutional, Public-Semi Public (INS)
Professional Office (PO)
Village Residential (R-2)

MANTUA

Community Commercial (CC)
Neighborhood Commercial (NC)
Planned Commercial (PC)
High Density Residential (R-11)
Trailer Park (TP)

Woodbury

Commercial (C-1)
Commercial (C-2)

WEST DEPTFORD

General Commercial (C)
Suburban Residential (R-2)
Shopping Center (SC)

MAP 3

ROUTE 45 CORRIDOR STUDY: ZONING

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Population change has six major components: births, deaths, domestic in-migration, domestic out-migration, international immigration, and changes to group quarters' population.

The demographic analysis provides a basis for predicting future growth and estimating both residential and nonresidential land area requirements. **Table 3** presents a summary of the DVRPC population forecasts for the study area. DVRPC's forecasts show that within the corridor, only Woodbury City and Woodbury Heights are projected to lose population.

Table 3. Municipal Population Forecast and Change 2000-2025

Municipality	2000 Census Population	2010 Forecast	2025 Forecast	2000-2025 Change	2000-2025 % Change
Deptford Township	26,763	28,040	29,640	2,877	11
Harrison Township	8,788	11,060	16,290	7,502	85
Mantua Township	14,217	16,200	18,920	4,703	33
West Deptford Township	19,368	20,410	23,350	3,982	21
Woodbury City	10,307	10,140	9,730	577	-6
Woodbury Heights	2,988	2,920	2,870	118	-4
Corridor Total	82,431	88,770	100,800	18,369	18
County Total	254,673	278,960	322,520	67,847	27

Source: Population and Employment Forecasts, 2000-2025, 9-County Region, DVRPC, No. 73, March 2002.

Population breakdown by age is also shifting in the study area. By reviewing the 2000 U.S. Census data age distributions in the corridor, useful insight into future needs of the corridor can be obtained. The age breakdowns are given in

Table 4. Two important sub- trends will take shape over the next 25 years, primarily due to the aging of the “baby boom” generation. The first trend is the loss of prime working age persons, ages 25 to 50 and the second trend is the rapidly growing elderly population. This is an extremely important element, as human capital is a vital economic component to the study area and the region. Gloucester County as a whole is expected to double its elderly population over the next 25 years. Since most of the region’s forecasted elderly will likely live in the suburbs at densities that may not support a viable transit system, or in areas that currently do not provide transit, the region’s elderly will increasingly rely on the automobile. It is forecasted that by 2030, almost 20 percent of driver mileage will be attributable to elderly drivers.

Table 4. 2000 Municipal Population by Age

Municipality	Under 5	5 to 19	20 to 44	45 to 64	65 to 74	75 to 84	85+
Deptford Township	1,668	5,291	10,019	5,773	2,164	1,427	421
Harrison Township	757	2,346	3,279	1,824	294	227	61
Mantua Township	1,131	2,972	5,357	3,175	962	519	101
West Deptford Township	1,137	3,874	7,309	4,691	1,379	810	168
Woodbury City	669	2,133	3,700	2,103	774	664	264
Woodbury Heights	179	671	1,004	738	239	128	29
Corridor Total	5,541	17,281	30,668	18,304	5,812	3,775	1,044
County Total	16,689	57,640	92,990	57,676	16,083	10,533	3,062

Source: DVRPC, 2000 Census Profile by Minor Civil Division, 28-County Service Area: Age and Sex, No. 68, February 2002.

Table 4 clearly indicates that a large proportion is of school age (21 percent; ages 5 to 19), while a still larger portion is of childbearing age (37.4 percent; ages 20 to 44), indicating a potential need for additional facilities such as school and recreational areas. It is also apparent from the table that significant portions of the population are approaching retirement age. This may also indicate the beginning of additional requirements for special facilities and services, such as assisted living facilities and public transportation that will be needed in the future to support this population. Both new development and redevelopment proposals should be aware of these growing population trends.

4.5.2 Employment

As the character of the area has shifted from agricultural to a more suburban development pattern, the amount of employment opportunities has also increased. With numerous office and commercial developments, the corridor has seen a substantial increase in the amount of professional employment opportunities, as well as an increase in the retail and service sector. According to DVRPC forecasts, most of the municipalities in the study area are expected to have a relatively strong employment growth, however, City of Woodbury and Woodbury Heights employment is expected to decline. This is shown in **Table 5**.

Table 5 shows that employment in these six municipalities are forecasted to increase substantially, and exceed the county average of 23 percent. The employment growth potential for this corridor is high over the next 25 years. The proximity of the corridor to I-295 and major regional shopping areas will contribute to the amount of employment growth. In addition, the amount of open space still available within these communities is an additional attraction.

Table 5. Employment Forecast and Change 2000-2025

Municipality	1990 Census Employment	2000 Employment Forecast	2025 Employment Forecast	2000- 2025 Change	2000-2025 % Change
Deptford Township	10,740	13,000	14,350	1,350	10.4
Harrison Township	1,247	1,350	1,750	400	29.6
Mantua Township	6,181	7,350	11,200	3,850	52.4
West Deptford Township	6,333	8,650	13,050	4,400	50.9
Woodbury City	10,103	10,400	10,250	150	-1.4
Woodbury Heights	2,115	1,850	1,550	300	-16.2
Corridor Total	36,719	42,600	52,150	9,550	18
County Total	86,079	99,700	122,650	22,950	23

Source: Population and Employment Forecasts, 2000-2025, 9-County Region, DVRPC, No. 73, March 2002.

4.5.3 Housing

Trends in housing can illustrate whether a municipality is providing a suitable mix of housing types and what types of housing may be constructed in the future. Ideally, a municipality can support a number of housing types at different price ranges in order to accommodate the needs of various-income-level residents. Affordability, quality, and the age of the housing stock in a community should be considered when planning for future residential development.

The rate of new residential development in the study area has been increasing for the past decade. **Table 6** illustrates total housing units for renter and owner units as well as the average household size.

Table 6. Total Number of Housing Units in 2000

Municipality	2000 Total Units	Vacant Units	Owner Occupied	Renter Occupied	Average Household Size*
Deptford Township	10,647	634	7,752	2,261	2.76
Harrison Township	2,939	91	2,455	393	3.22
Mantua Township	5,411	146	4,835	430	2.72
West Deptford Township	7,999	280	5,396	2,323	2.72
Woodbury City	4,310	259	2,432	1,619	2.68
Woodbury Heights	1,045	18	951	796	2.95
Corridor Total	32,351	1,428	23,821	7,822	2.84
County Total	95,054	4,337	72,516	18,201	2.88

Source: 2000 Census Profile by Minor Civil Division, Housing Occupancy and Tenure, DVRPC, No. 71, February 2002.

* Household size for owner occupied units.

Table 6 indicates a larger amount of housing units are family owned, which presents additional support for increased schools, special facilities, and recreational amenities that are needed to maintain these booming communities. Looking at the study area corridor, the average household size is virtually equal to that of the county average.

4.6 Housing Affordability

As has been the trend across much of the Delaware Valley, limited availability of affordable housing is becoming a problem within the newly developed

communities of Gloucester County. Difficulty in obtaining affordable housing is no longer a problem associated with only the lowest income segment of the population, but rather has become a problem for many moderate-income households.

Nearly all indicators of growth along the corridor relating to population, employment and housing indicate large gains. However, some corridor growth may be threatened by a lack of affordable housing, thus not bringing in a diversified population to sustain all types of employment. Young first time homebuyers may not be able to afford newer developments that have dominated these municipalities.

DVRPC has developed a housing affordability index that was calculated by dividing the region's median family income in 1998 (estimated at \$55,330, based on 1990 data adjusted by changes in the Consumer Price Index) by the minimum income required to purchase a median priced housing unit in each corridor municipality. Therefore, if a median-income family earned exactly enough to buy the median priced housing unit in a municipality, the result would be a value of one. Thus, an index of less than one indicates that a median-income family could not afford to purchase the median priced housing unit in that municipality (the lower the index, the less affordable the unit is). The minimum income necessary to purchase the unit was determined based on the following assumptions:

- The average buyer would provide a 16.8 percent down payment (average figure obtained from the National Association of Realtors) and mortgage the remainder;
 - The buyer would obtain a 30-year fixed rate mortgage at an interest rate of 6.9 percent (the 1998 average interest rate in the Northeast, as obtained from Freddie Mac);
 - The buyer would be required to pay private mortgage insurance (PMI), which would add .25 percent to the interest rate;
 - Additional costs would include yearly hazard insurance (.324 percent of the home's value), closing costs (2 percent of the value) and property taxes (based on each individual municipality's tax rate); and
 - The housing-expense ratio requirement (the ratio of the buyer's annual housing payment to annual income) equals 25 percent, meaning that each household's yearly housing payment (including the mortgage payment, property taxes, hazard insurance, and private mortgage insurance) cannot
-

exceed 25 percent of their total annual income (as per the National Association of Realtors). The minimum income required to purchase a unit was calculated such that the buyer earned enough each year to meet this 25 percent housing-expense ratio requirement.

Within the corridor, all the municipalities have an index of more than one, indicating that each municipality has available affordable housing. **Table 7** illustrates housing and affordability from 1998.

Table 7. Housing Affordability - 1998

Municipalities	1998 Median Sales Price	Affordability Index First-Time Buyers	Affordability Index Repeat Buyers	Affordable (Yes/No)
Deptford Township	\$111,225	1.06	1.72	Yes / Yes
Harrison Township	\$100,000	0.64	1.04	No / Yes
Mantua Township	\$118,990	0.96	1.55	No / Yes
West Deptford Township	\$98,250	1.18	1.91	Yes / Yes
Woodbury City	\$85,000	1.24	1.98	Yes / Yes
Woodbury Heights	\$107,950	0.98	1.57	No / Yes
County Total	\$103,569	1.01	1.63	Yes / Yes

Source: DVRPC, Homeownership, A Dream Still Vanishing? April 2001, Report #01013.

The data collected for this index was from 1998. The first-time buyers index for each of these municipalities is substantially lower, with Harrison Township, Mantua Township and Woodbury Heights having first-time buyer indexes below one, thus indicating that housing is only affordable to repeat homebuyers. In

April 2000, New Jersey Monthly magazine printed a chart of sale prices from 1999. In only one-year, the housing prices in the study area communities drastically changed. This is shown in **Table 8**.

Table 8. House Sale Prices - 1999

Municipality	Number of Sales	1999 Average Sale Price
Deptford Township	133	\$ 93,493
Harrison Township	80	\$162,934
Mantua Township	186	\$117,059
West Deptford Township	198	\$112,613
Woodbury City	100	\$104,981
Woodbury Heights Borough	16	\$120,338

New Jersey Monthly Magazine, August 2001.

4.6.1 Fair Share Housing

A review of housing characteristics and trends must also consider legal obligations for providing housing opportunities. A fair share analysis determines whether a municipality is providing its “fair share” of multifamily dwellings and to what degree existing regulations support multifamily development. In New Jersey, local governments are required to plan for and prepare land use regulations to meet the legitimate needs of various housing types and income levels within their boundaries.

Beginning in 1975, the New Jersey courts have mandated that all municipalities in the state provide affordable housing opportunities to their fair share of the region’s low and moderate-income population. The first New Jersey State Supreme Court ruling was in 1975, Southern Burlington County NAACP v. the Township of Mt. Laurel, 67, N.J. 151. (Mt. Laurel I) At the time, this mandated that no municipality could enforce regulations that would exclude certain income level households within their municipality. In 1983, the Supreme Court of New

Jersey ruled in this same case, otherwise known as Mt. Laurel II, that each municipality would now have an assigned numerical allocation of low and moderate income housing units that they would need to provide. This ruling also created the Council of Affordable Housing (COAH) where these numbers are calculated every six years. Municipalities are required to specify within their local housing plans how their fair share housing need will be met.

4.7 Planning Trends of Population, Employment, and Housing Conditions

- Woodbury City and West Deptford are the primary commercial and employment centers for this portion of the county.
- A majority of the population relies on employment and shopping opportunities within the corridor.
- With an increase in the elderly population, infrastructure and municipal services will become more important.
- Although there is affordable housing in these municipalities, they are less affordable for the first-time homebuyer.

4.7.1 Caldor Site: Woodbury Heights

The largest vacant commercial site in the region is known as the Caldor Site in Woodbury Heights. This site is situated on the northbound side of Route 45 between Maple Avenue and Cherry Avenue. Due to the grass barrier that runs through the middle of the highway, vehicles cannot access the property via a left hand turn from the southbound lanes of traffic. Those wishing to visit this site must go up to the light at Griscolm Lane and use the U-turn to access the northbound lanes traffic. Several reasons have been used to explain the closing of this store on this site: (1) not accessible (2) Bradlees (a similar chain store) was located across the street for those not wanting to make the U-turn and, (3) corporate financial problems. Nonetheless, the Caldor Site is one of Woodbury Height's largest retail sites. This small residential community relies on its few commercial sites for tax ratable to offset property taxes. Recent disinvestments in this small community have caused a rise in property taxes, and several sites along Route 45 are now vacant.



This site once housed a Caldor and Rickel home center. Both companies have since gone out of business

The site currently holds a vacant Caldor building with an attached pizza shop. There is a pad site at the corner of Cherry Avenue where a bank has recently reopened. The Caldor building is located to the rear of the lot abutting the residential neighborhood and leaving extensive paved areas of parking along the Route 45 frontage. Recent development applications in surrounding municipalities indicate that this reusable site may be too small for the “Big-Box” building trend that is occurring in other suburban areas of the region. Recently, major retailers such as Target, Walgreen’s, Home Depot, Kohl’s, Blockbuster, and Taco Bell Restaurants have shown interest in larger developable lots in Mantua and Harrison. However, the smaller commercial strip malls in West Deptford and Deptford are fully occupied with smaller retail establishments such as service and personal shops, paint stores, office uses, and grocery stores. Except for this site, the economic health of this corridor appears sound. The vacant Bradlees parking lot is currently being used as a park-and-ride.

Although discussions have taken place to bring a Super G or a Stop and Shop supermarket into the existing building that once housed Caldor, the concept of older vacant shopping centers along the corridor should be addressed. Below is a concept drawing of the Caldor Site from the perspective of the opposite side of Route 45. This concept shows three office-type buildings closer to the highway with parking relocated to the rear of the buildings. Notice that the architecture

and scale are mimicking that of the adjacent bank and residential community. Due to the size of the lot, a considerable amount of space was available for additional higher density residential uses (town houses). This is a good transition between the office use along Route 45 and the residential neighborhood while, promoting smart growth initiatives with infill cluster housing. The plan shows pedestrian access in the front of the buildings as well as a bus shelter that protects riders from the weather and passing vehicles. The existing bus transit service along Route 45 helps to promote this lot as a prime office-retail-residential occupation site for the region. Should a supermarket occupy the existing building in the near future, the concepts and landscaping elements illustrated in this drawing could still be incorporated into the site.



Concept Drawing for Caldor Site

4.7.2 Telford Inn Intersection: Mantua Township

Route 45 and Main Street in Mantua is also known as the Telford Inn intersection. Route 45 southbound channels into one lane from two lanes of traffic at this intersection and as a result, bottlenecks and congestion occur. In addition to the lack of traffic capacity, a majority of Mantua Township's commercial base is located from Main Street to Harrison Avenue. Entering Mantua Township on Route 45, there are vacant single-family residential units that have converted to a business use. There is also a Walgreens pharmacy that has recently been constructed at the corner of Berkley Road and Route 45. Across from Walgreens is the post office. Traffic to the post office is heavy and because the space is leased, local officials should consider relocating the post office to a less busy commercial area, such as Main Street when the lease expires. This will help to add identity to this small downtown and create



Route 45 and Main Street intersection at the Telford Inn

pedestrian activity in the area, away from the heavy car and truck traffic using Route 45. However, just past this intersection, on the western side, are the K-Mart shopping center and the Home Depot / Kohl's shopping center. Route 45 has been widened along the entire frontage of Home Depot and a traffic light has been installed. This will help with the additional traffic generated from Home Depot, Kohl's, and a Taco Bell on the eastern side of Route 45 across from the K-Mart shopping center. This area is entirely zoned for commercial uses, except for a portion set aside for trailer park uses. Currently, there are no sidewalks and transit shelters are unprotected in this busy area. The township should consider having developers install sidewalks along this busy commercial corridor to encourage walking between stores.

In Mantua Township the corridor has residential developments and single-family units mixed in with smaller strip mall commercial. At the intersection of Harrison Avenue, motorists come to another bottleneck where there is a WaWa and bank at the corner. While this intersection moves smoothly now, additional traffic will be generated from the new housing units (41) to be constructed off Harrison Avenue and the Target that is proposed for the eastern corner lot.

Mantua Township has targeted its commercial uses here because the sewer and water infrastructure is already in place. In contrast to this commercial

development that is occurring along Route 45, Mantua Township also has large areas of farmland and open space that is zoned for agricultural-residential uses and passive recreational uses. The minimum acreage for residential development is three acres and this has worked to deter many of the developers from building large lot homes. In an effort to further preserve the farmland areas, Mantua Township has recently proposed to change the minimum acreage for residential lots to five acres. Not wanting to change the zoning to agricultural completely, local officials feel this serves as a growth management tool for the township without being accused of spot zoning by some developers. Commercial development should be targeted to areas where the infrastructure (water and sewer) is already in place rather than the rural locations.

4.8 Traffic Volumes

The average annual daily traffic (AADT) volumes are displayed on **Map 4**. These counts collected by DVRPC are for a three-year period from 2001 to 2003. Along Route 45, the traffic volumes are higher in the northern section; drop only slightly through its mid-section, and level off to a much lower volume in southern sections of the study area. Volumes increase slightly as you approach the southern end of the corridor in Harrison Township.

This pattern correlates closely with both the corridors development pattern and the lane configuration of Route 45. The northern section of Route 45 (Woodbury City, Woodbury Heights, West Deptford, and Deptford) is more densely populated and typically has two travel lanes in each direction with a curbed median. Traffic Volumes in this section range between 20,000 and 25,000. In Woodbury City, an AADT of 24,803, the highest traffic volume in the corridor, was recorded just north of the intersection between Salem Avenue (CR 551) and Cooper Street (CR 534).

As you travel south, the roadway narrows to one lane by direction and the development pattern is more rural in nature. In Mantua Township, AADT volumes are 17,367 near Berkley Road (CR 632), dropping to a volume of 10,418 at Breakneck Road (CR 626) on the southern end of the township. Traffic volumes begin to increase again in Harrison Township. One factor for this increase is that Clearview Regional High School is located within a half-mile of both Cedar and Breakneck Road intersections. This school serves both Mantua and Harrison townships. Another factor for the increase is that Route 45

intersects with US 322 at the southern end of the study area. Along, US 322, motorists can gain access to other major highway facilities such as the NJ Turnpike and NJ 55.

4.9 Highway Facilities

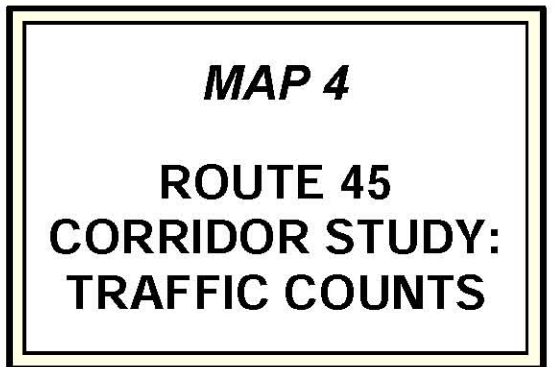
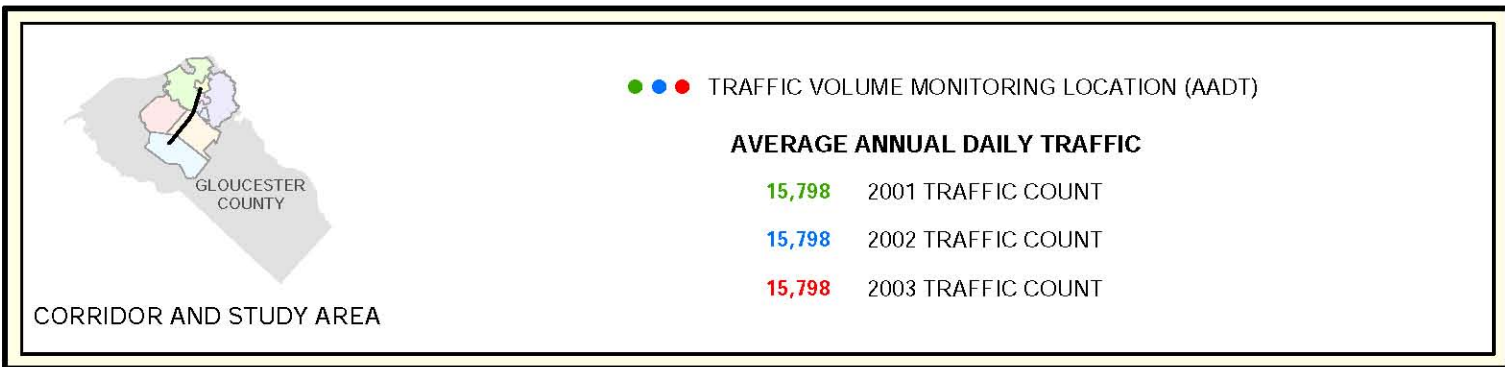
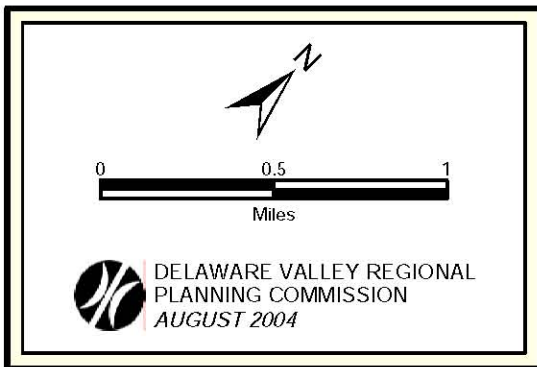
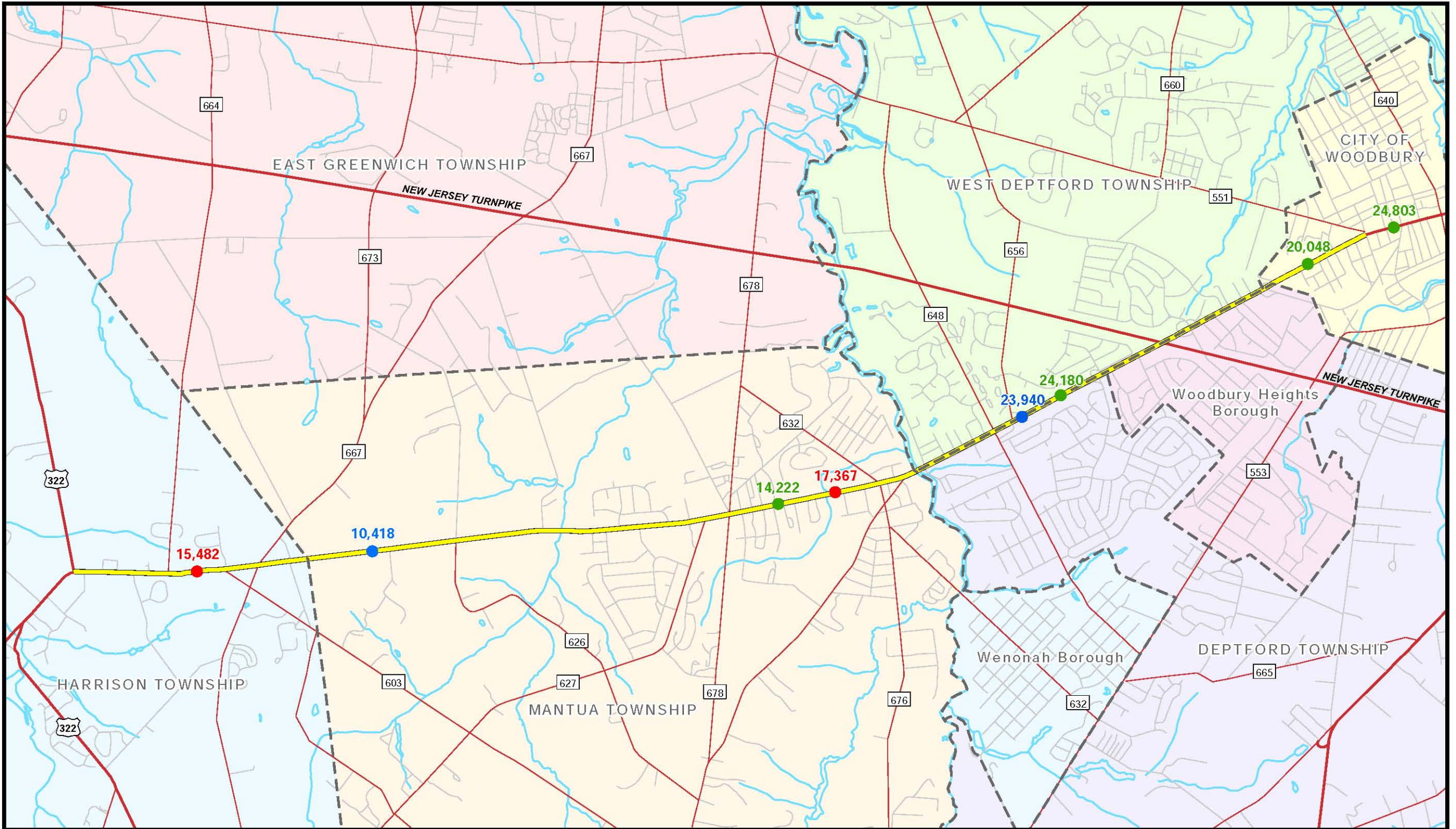
Route 45 is a north-south facility that runs from Westville in Gloucester County south to Salem City in Salem County. The portion of Route 45 within the study area connects the City of Woodbury to Mullica Hill. The focus of this study does not include either of the main streets of these locales. This planning effort focuses on Route 45 from milepost 18.16 in Harrison Township to milepost 25.49 in Woodbury.

Route 45 is an arterial highway facility that provides north-south access to this portion of Gloucester County. Within the study corridor, there are really no major highway facilities that intersect with Route 45. Just north of the corridor there is access to I-295 and Route 47 in Woodbury, and to the south there is access to US 322 in Harrison Township. Route 45 acts as a connector between these facilities. It allows county residents to access these facilities via the many east-west County Roads that bisect Route 45. These intersections are generally signalized. **Table 9** provides a description of the characteristics of each of the signalized intersections on Route 45. The New Jersey Turnpike also bisects the corridor, however there is no interchange with Route 45. There is an interchange along US 322 on the southern end of the corridor.

4.10 Crash Data

Crash data for the Route 45 corridor was collected from the New Jersey Department of Transportation Bureau of Safety Program's Accident Records Database. The data used for this report focuses on Route 45 within the study limits for a three-year period from 2001-2003. Within this database, there was limited data pertaining to Harrison Township along Route 45. For the Swedesboro Road (US 322) intersection, accident data for 2001 was incomplete. Therefore, the accident data for Harrison Township only accounts for 2002-2003.

During this three-year period, there were 598 accidents throughout the corridor. There were no fatalities recorded. However, there were 286-recorded injuries



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Table 9: Characteristics of NJ 45 Signalized Intersections

Intersecting Streets	Mile Post / Municipality	Intersection Approach Configurations	Signal Type	Pedestrian Amenities
Salem Ave. (CR 551) / Carpenter St. / Penn St.	Milepost: 25.49 Woodbury	NJ 45 SB: 2 through lanes 1unmarked right turn lane NJ 45 NB: 2 lanes-by-direction Salem Ave.: 1 lane-by-direction Carpenter St: One way street exiting the intersection Penn St.: One way street exiting the intersection	No protected phasing	NJ 45 NB: signals, crosswalk Carpenter St.: crosswalk Salem Ave: signals, crosswalk Penn St.: crosswalk
Twells Ave. / Bellevue Ave.	Milepost: 25.30 Woodbury	NJ 45: 2 lanes-by-direction Twells Ave.: 1 lane-by-direction Bellevue Ave.: 1 lane-by-direction	No protected phasing	NJ 45 SB: signals, crosswalks Twells Ave.: signals, crosswalks Bellevue Ave.: signals, crosswalks
Evergreen Ave. (CR 650)	Milepost: 24.90 Woodbury / Woodbury Heights	NJ 45 SB: 2 through lanes, right lane for far side jug handle NJ 45 NB: 2 through lanes Evergreen: left turn, shared left/right turn Jug handle: left turn, shared through/left turn	NJ 45 SB: Left turns made via far side jug handle NJ 45 NB: Left turns made via near side jug handle and a controlled left on to Evergreen Evergreen: protected phasing cycle Jug handle: protected phasing cycle	None
Griscolm La. / Elm Ave. (CR 652)	Milepost: 24.40 West Deptford / Woodbury Heights	NJ 45: 2 lanes-by-direction Griscolm La.: left turn, shared through/right turn Elm Ave.: left turn, shared through/right turn	NJ 45 SB: Left turns made via far side jug handle NJ 45 NB: Left turns made via near side jug handle and a controlled left on to Elm Ave.	NJ 45 SB: signal push buttons, crosswalk NJ 45 NB: signal push buttons, crosswalk
Riviera Dr. / College Blvd.	Milepost: 23.88 West Deptford / Woodbury Heights	NJ 45: 2 lanes-by-direction Riviera Dr.: left turn, shared through/right turn College Blvd.: right turn, shared through/left turn	NJ 45 SB: Left turns made via far side jug handle NJ 45 NB: Left turns made via near side jug handle and a controlled left on to College Blvd.	NJ 45 SB: signal push buttons, crosswalk
Parkville Rd. (CR 656)	Milepost: 23.34 West Deptford / Deptford	NJ 45 SB: Left turns made via near side jug handle and a controlled left on to Parkville Rd. NJ 45 NB: Left turns made via near side jug handle Parkville Rd.: left turn, through, right turn Jug handle: 1 left turn, 1 shared through/right turn	NJ 45 SB: Left turns made via near side jug handle and a controlled left on to Parkville Rd. NJ 45 NB: Left turns made via near side jug handle Parkville Rd.: protected left turn phasing Jug handle: protected left turn phasing	NJ 45 NB: signal push buttons, crosswalk Parkville Rd.: signal push buttons, crosswalk
Main St. (CR 533A)	Milepost: 22.69 Mantua	NJ 45 SB: 1 through lane, 1 shared through/right lane NJ 45 NB: 2 through lanes that merge to 1after intersection Main St.: 1 lane-by-direction Jug handle: 1 lane with channelized U-turn lane	NJ 45 NB: Left / U-turns made via near side jug handle Jug handle: delayed green	NJ 45 NB: signal, striped crosswalk
Berkley Rd. (CR 632) / Mantua Blvd. (CR 676)	Milepost: 22.56 Mantua	NJ 45 SB: 1 lane-by-direction NJ 45 NB: 1 lane-by-direction Berkley Rd.: 1 lane-by-direction, channelized right turn Mantua Blvd.: 1 lane-by-direction	Berkley Rd.: delayed green	NJ 45 SB: signal push buttons crosswalk NJ 45 NB: signal push buttons crosswalk Berkley Rd.: signal push buttons, crosswalk
Washington Ave.	Milepost: 22.09 Mantua	NJ 45 SB: left turn, through, shared through/right turn NJ 45 NB: left turn, through Washington Ave.: 1 lane-by-direction Home Depot Access: right turn lane, shared through/left turn (2 entrance lanes)	NJ 45 SB: protected left turn phasing NJ 45 NB: protected left turn phasing	NJ 45 SB: signals, crosswalk Washington Ave.: signals Home Depot Access: signals, crosswalk
Harrison Ave. (CR 678) / Mt. Royal Rd. (CR 678)	Milepost: 21.73 Mantua	NJ 45: 1 lane-by-direction Harrison Ave.: 1 lane-by-direction Mt. Royal Rd.: 1 lane-by-direction	No protected phasing	Harrison Ave.: signal push buttons
Cowhawkin Rd. (CR 667)/ Cedar Rd. (CR 667)	Milepost: 19.17 Harrison	NJ 45: 1 lane-by-direction Cowawkin Rd.: 1 lane-by-direction Cedar Rd.: 1 lane-by-direction	NJ 45 NB: protected left turn phasing	NJ 45 NB: signal push buttons
Wilford Station Rd. (CR 664)	Milepost: 18.69 Harrison	NJ 45: 1 lane-by-direction Wilford Station: 1 left turn, 1 right turn	No protected phasing	None
Swedesboro Rd. (US 322)	Milepost: 18.16 Harrison	NJ 45 SB / US 322 WB: left turn, through NJ 45 NB: 1 lane-by-direction US 322 EB: 1 lane	NJ 45 SB: protected left turn phasing NJ 45 NB: delayed green	NJ 45 SB: signals, crosswalk US 322 EB: signals, crosswalk

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because of these crashes. **Map 5** graphically displays all of the accident locations at intersections with five or more occurrences.

Accidents are classified into five categories. These are rear end collision, sideswipes, angle, left turn, and other. Rear-end and sideswipe accidents typically comprised of vehicles traveling in the same direction, while angle and left turn crashes involved opposing traffic movements. Accidents included in the “other” category relate to incidents involving among other things, animals, fixed objects, and pedestrians.

Table 10 provides a breakdown by year for the number of accidents, the injuries, and the type of accident that occurred. The most common accidents in the corridor are rear end collisions that accounted for 40percent of the total accidents in the corridor. This accident type tends to be more common on roads where dedicated left turn lanes are not provided. This situation may also contribute to sideswipe accidents (10.4 percent of total accidents) due to weaving between lanes and an attempt to avoid vehicles queuing to turn left.

Table 10. Corridor Accident Summary (2001-2003)

Year	Accidents	Injuries	Fatalities	Angle	Rear End	Side-swipe	Left - Turn	Other
2001	159	73	0	23.3%	34.0%	13.2%	7.5%	22.0%
2002	234	127	0	23.9%	42.3%	11.1%	6.4%	16.2%
2003	205	86	0	22.9%	42.0%	7.3%	11.7%	16.1%
Total	598	286	0	23.4%	40.0%	10.4%	8.5%	17.7%

Source: NJDOT, Crash Data 2001-2003

Angle accidents were the next most common accident type along Route 45 resulting in 23.4 percent of the accidents. Many of these accidents occurred in a section of Route 45 that contains commercial properties with numerous uncontrolled curb cuts. This type of condition also factors into left turn accidents. These account for 8.5 percent of the accidents. Both left turn and angle accidents also occur at several nonsignalized intersections where one turning movement crosses the on-coming flow of traffic. “Other” accidents accounted for 17.7 percent of the total accidents for this three-year period. Throughout the

corridor, most accidents occurred during daylight hours (82.3 percent), with dry surface road conditions (70.6 percent), which suggests that other contributing factors may be more significant, such as road geometry, sight distance, or driver behavior.

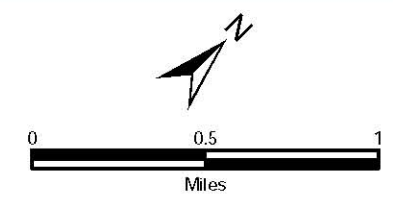
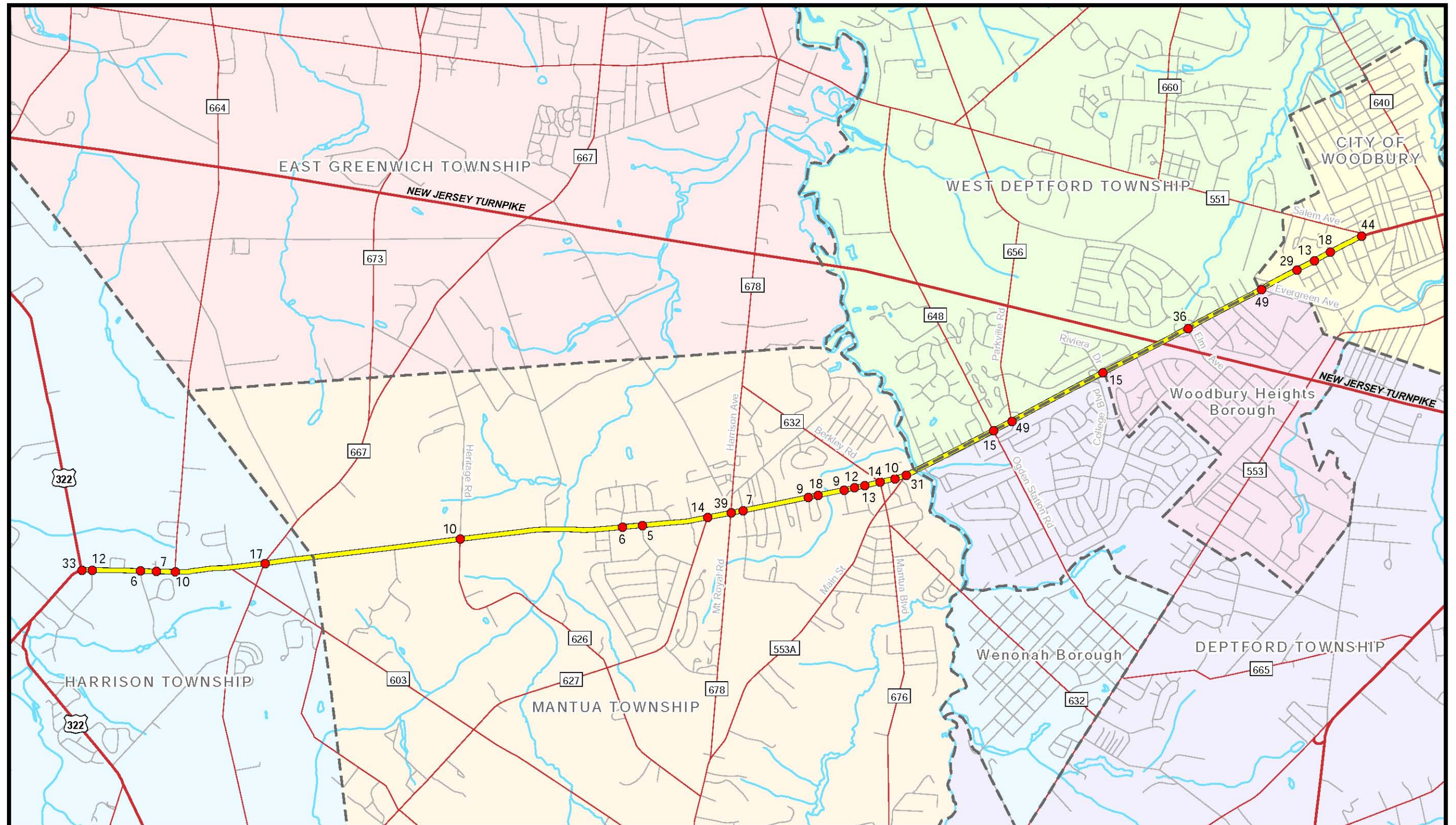
Route 45 crash statistics were compared with the NJDOT At/Between Intersections Accident Summaries for State System Roads, excluding toll roads and interstates, using 2003 data. Considering the corridor as a whole, Route 45 exceeds the statewide threshold for angle accidents with 22.9 percent compared to 12.78 percent for the state system roads. Left turn collisions also surpass the statewide threshold at 8.5percent compared to 3.72 percent statewide. Route 45 falls below the statewide threshold for both same direction rear end and sideswipes of 44.26 percent and 16.63 percent respectively.

According to the New Jersey Department of Transportation, rear end and sideswipe collisions involve traffic moving in the same direction. Angle crashes involve angular traffic (e.g. north and west), and left turn and head-on events involve opposing traffic.

Table 11 lists 21 locations where there have been at least 10 accidents during 2001-2003 in the study area. In total, these 21 different locations make up 85 percent of the total accidents in the corridor. Many of these locations are major intersections along Route 45. Traffic volumes are generally higher in these areas. Salem Avenue, Evergreen Avenue, Parkville Road, and Swedesboro Road are good illustrations of this.

Two other high accident locations are areas with high commercial activity. Many of the accidents listed for Reid Street in Woodbury City actually correspond to accidents entering or leaving the Acme shopping plaza. This section of Route 45 does not have a curbed median and no turn lanes are provided. Access in and out of the shopping plaza is curb cuts.

The other area of commercial activity is location in Mantua Township on Route 45 between Chestnut and Brittany streets. At this location, there is a shopping plaza that includes a K-Mart and Acme grocery store and includes four access points. Opposite of this plaza is newly constructed Taco Bell/Long John Silver and an ice cream parlor that also has separate entrances to Route 45. The Taco Bell property does provide additional access roads to both Chestnut and Brittany streets. As is the case with Reid Street, this area of Route 45 currently contains



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CORRIDOR AND STUDY AREA

- ACCIDENT LOCATION
- 6 TOTAL NUMBER OF ACCIDENTS

MAP 5
ROUTE 45
CORRIDOR STUDY:
INTERSECTION ACCIDENT
LOCATIONS (5 or more)

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Table 11. Intersection Crash Locations (> 10) in 2001-2003

Intersection	Total Accidents	Collision Type				
		Angle	Rear End	Side- swipe	Left Turn	Other
SALEM AVENUE (CR 551) / CARPENTER STREET	44	31.8%	22.7%	18.2%	11.4%	15.9%
TWELLS AVE / BELLEVUE AVENUE	18	16.7%	38.9%	5.6%	27.8%	11.1%
STUART AVENUE	13	30.8%	46.2%	15.4%	0.0%	7.7%
REID STREET	29	13.8%	37.9%	10.3%	31.0%	6.9%
EVERGREEN AVENUE (CR 650)	49	32.7%	22.4%	22.4%	12.2%	10.2%
ELM AVENUE (CR 652) / GRISCOLM LANE (CR 652)	36	19.4%	52.8%	16.7%	0.0%	11.1%
RIVIERA DRIVE / COLLEGE BOULEVARD	15	6.7%	40.0%	20.0%	6.7%	26.7%
PARKVILLE ROAD (CR 656)	49	24.5%	42.9%	8.2%	4.1%	20.4%
ODGEN STATION ROAD (CR 648)	15	13.3%	40.0%	6.7%	0.0%	40.0%
MAIN STREET (CR 553 A)	31	16.1%	61.3%	9.7%	0.0%	12.9%
TOMKIN STREET	10	20.0%	60.0%	0.0%	0.0%	20.0%
BERKLEY AVE (CR 632) / MANTUA BLVD (CR 676)	14	21.4%	57.1%	14.3%	0.0%	7.1%
CHESTNUT STREET / BRITTANY STREET (KMART / ACME ENTRANCE)	34	41.2%	29.4%	5.9%	0.0%	23.5%
BARRY DRIVE	18	11.1%	16.7%	66.7%	5.6%	0.0%
HARRISON AVE / MT ROYAL RD (CR 678)	39	17.9%	38.5%	2.6%	30.8%	10.3%
JACKSON RD (CR 627)	14	0.0%	71.4%	7.1%	0.0%	21.4%
HERITAGE RD (CR 626)	10	30.0%	10.0%	0.0%	0.0%	60.0%
COHAWKIN RD (CR 667) / CEDAR RD (CR 667)	17	23.5%	23.5%	11.8%	17.6%	23.5%
WOLFERT STATION ROAD (CR 664)	10	30.0%	50.0%	0.0%	0.0%	20.0%
EARLINGTON AVENUE	12	25.0%	50.0%	0.0%	16.7%	8.3%
SWEDESBORO RD (US 322)	33	39.4%	51.5%	0.0%	0.0%	9.1%

Source: NJDOT, Crash Data 2001-2003

no median or center turn lanes. The multitude of access points to Chestnut Street, Brittany Street, and the commercial properties provide many points for possible conflict.



Route 45 at Chestnut Street, Mantua Township near K-Mart / Acme shopping plaza

4.11 Public Transportation

New Jersey Transit buses are the sole mode of public transportation in this corridor. Eight bus routes pass through the municipalities in the study area. Philadelphia and Camden are the primary origins for these bus services, with their destinations outside the study area in suburban south New Jersey. Six of these routes (401, 402, 410, 412, 455, 463) converge in Woodbury, which acts as the transit hub of the region. The other two routes (400, 408) provide service to the Deptford Mall region. The only bus route that directly serves Route 45 is the Route 410 Bus.

The Route 410 runs from Bridgeton to Philadelphia passing through the entire length of the study area along Route 45. During weekday peak hours, the bus takes approximately 21 minutes to traverse from downtown Mullica Hill to downtown Woodbury. From Woodbury, it takes another 30 minutes to Philadelphia. The first bus comes out of Bridgeton at 4:53 a.m. with the last bus arriving back at 12:39 a.m., for a span of service of approximately 18 hours. There are 18 inbound trips daily, with the morning peak period between 6 a.m. and 9 a.m. Peak-hour headways are approximately 20 to 30 minutes and off-

peak headways are 50 to 70 minutes. During the 4 p.m. and 7 p.m. afternoon peak period there are outbound headways of about 30 minutes. Limited Saturday and Sunday service is provided with headways of about one hour.

Table 12 provides New Jersey Transit numbers for weekday bus ridership in comparable months of October for the years 2000 to 2002. These numbers show total weekday ridership for the route, not just the ridership within the study area. Overall, ridership has remained constant over this period.

Table 12 Bus Route 410 Average Weekday Bus Ridership

Year	Weekday Ridership	Trips per Day	Avg. Ridership Per Trip
2000	1,118	34	33
2001	1,183	34	35
2002	1,141	34	34

Source: New Jersey Transit, Median Ridership Report, October 2000, 2001 & 2002

5. TRANSPORTATION PROBLEMS AND POTENTIAL IMPROVEMENT SCENARIOS

This section of the report presents both corridor-wide transportation issues and location specific areas identified as currently experiencing transportation problems. At the onset of this effort, field views were conducted to review potential locations for inclusion into the study. Participants included representatives from NJDOT, Gloucester, local municipalities, and staff DVRPC. During these preliminary field views, a base set of locations is identified for further review. DVRPC staff conducted subsequent follow-up field views to better define the existing conditions, observe the operating conditions, refine the problem identification, and begin to formulate potential improvement scenarios.

Thirteen problem locations identified within the six municipalities that make up the corridor. The locations depicted are on **Maps 6-12**. The following are descriptions of the existing conditions, identified problems and Potential Improvement Scenarios for both corridor-wide issues and the identified specific locations. The location descriptions presented are from a general north to south direction through the corridor and the numbering is unrelated to project priority.

The nature of this planning document does not provide specific detailed improvement recommendations. However, potential improvement scenarios, which in some cases represent a range of alternatives, are presented. Transportation improvements at these locations could have important implications for the economic vitality of the local areas as well as the mobility of the corridor as a whole.

5.1 Identified Problem Locations and Potential Improvement Scenarios

- 1) NJ 45 & Salem Avenue (CR 551) / Carpenter Street / Penn Street
Mile Post: 25.49
Woodbury City (refer to **Map 6**)

Identified Problems:

This section of Route 45 experiences the heaviest traffic volume in the corridor.

The intersection geometry at this location is a problem. This location has four lanes, two in each direction with an unmarked right turn lane on the southbound approach. Salem Avenue (CR 551) carries one lane by direction and intersects at an acute angle. CR 551 is more commonly known as Kings Highway in other parts of Gloucester County.

To further complicate the intersection, a pair of streets serves as one-way exits out of the intersection.



Route 45 & Salem Road (CR 551) looking south

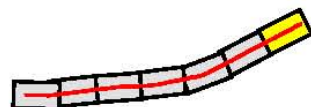
The angle of intersect of Salem Avenue creates very difficult turn radii for vehicles. Due to this angle, vehicles entering the intersection from Salem Avenue must use a stop bar approximately 40 feet from the intersection. These vehicles need additional time to get through the intersection. Vehicles exiting Salem and turning left onto Route 45 have to make a double move to turn, and often cross over the stop bar and center line for southbound Route 45 traffic. The turning radius of the intersection is also the reason that left turns from Route 45 northbound are restricted.



Salem Avenue Approach



Date Of Photography: Spring 2000



Signalized Intersection



Transportation Problem Locations



0 0.1 0.2
Miles

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**ROUTE 45
CORRIDOR STUDY:
MAP 6**

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Mile Markers (not to scale)

23.4

23.5

23.6

23.7

23.8

23.9

24.0

24.1

24.2

24.3

24.4

WEST DEPTFORD TOWNSHIP

PARKVILLE ROAD

NEW JERSEY TURNPIKE

BISCAYNE BLVD.

RIVIERA DR.

GRISCORN LA.

7

6

5

45

DEPTFORD TOWNSHIP

COLLEGE BLVD.

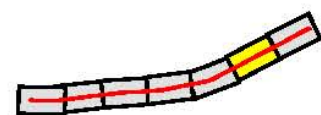
ALLIANCE ST.

NEW JERSEY TURNPIKE

ELM AVE.

Woodbury Heights
Borough

Date Of Photography: Spring 2000



Signalized Intersection



Transportation Problem Locations

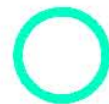
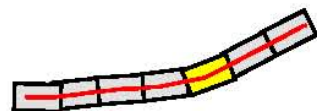


**ROUTE 45
CORRIDOR STUDY:
MAP 7**

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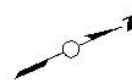
Date Of Photography: Spring 2000



Signalized Intersection



Transportation Problem Locations

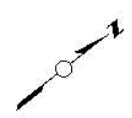
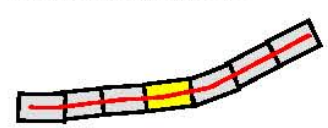



**ROUTE 45
CORRIDOR STUDY:
MAP 8**

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Date Of Photography: Spring 2000





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0

0.1

0.2

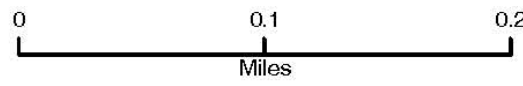
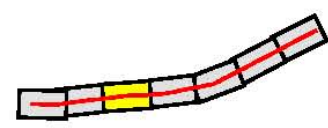
Miles

ROUTE 45
CORRIDOR STUDY:
MAP 9

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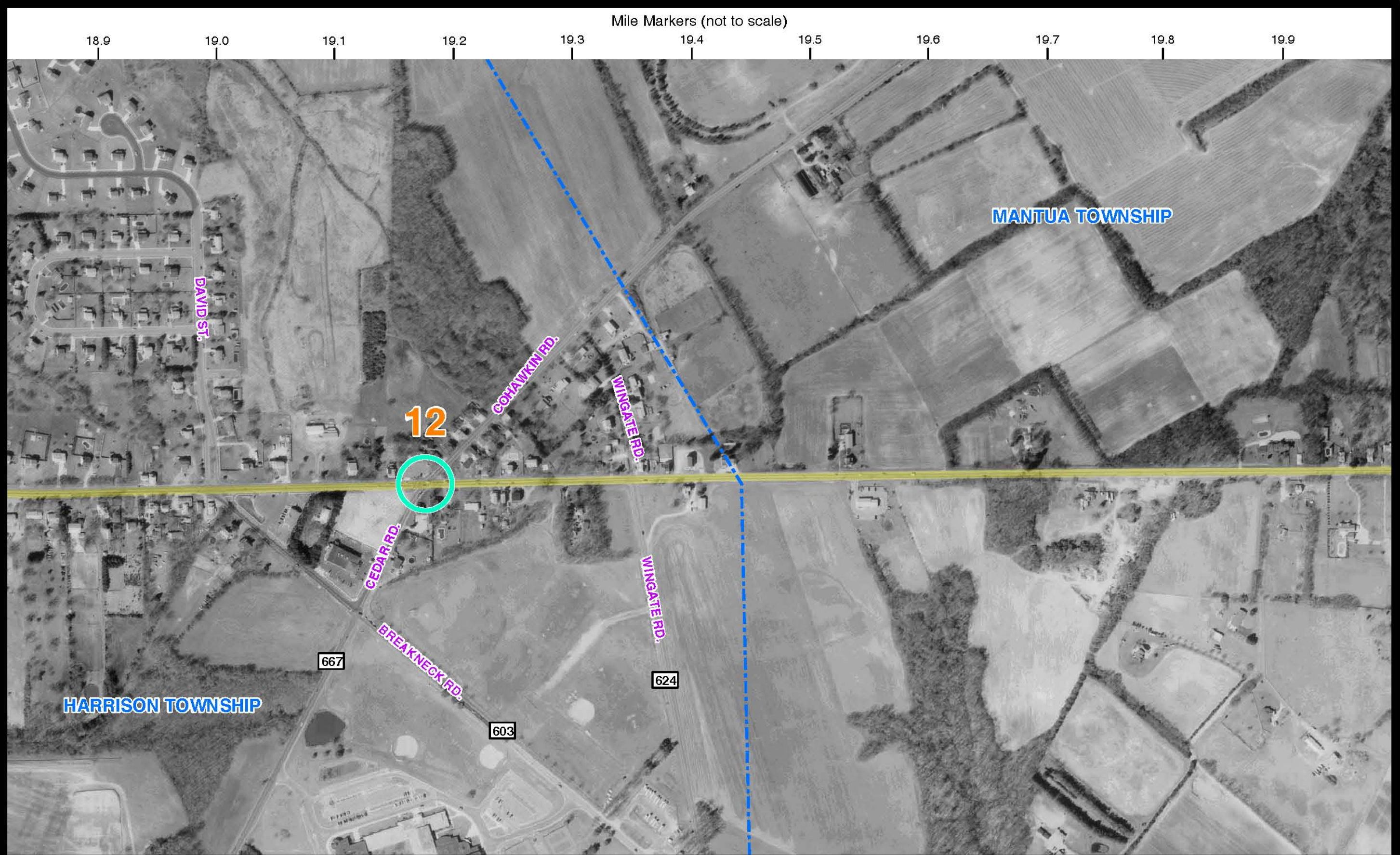


Date Of Photography: Spring 2000

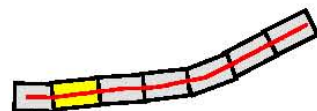


ROUTE 45 CORRIDOR STUDY: MAP 10

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Date Of Photography: Spring 2000



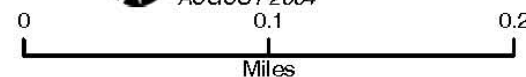
Signalized Intersection



Transportation Problem Locations

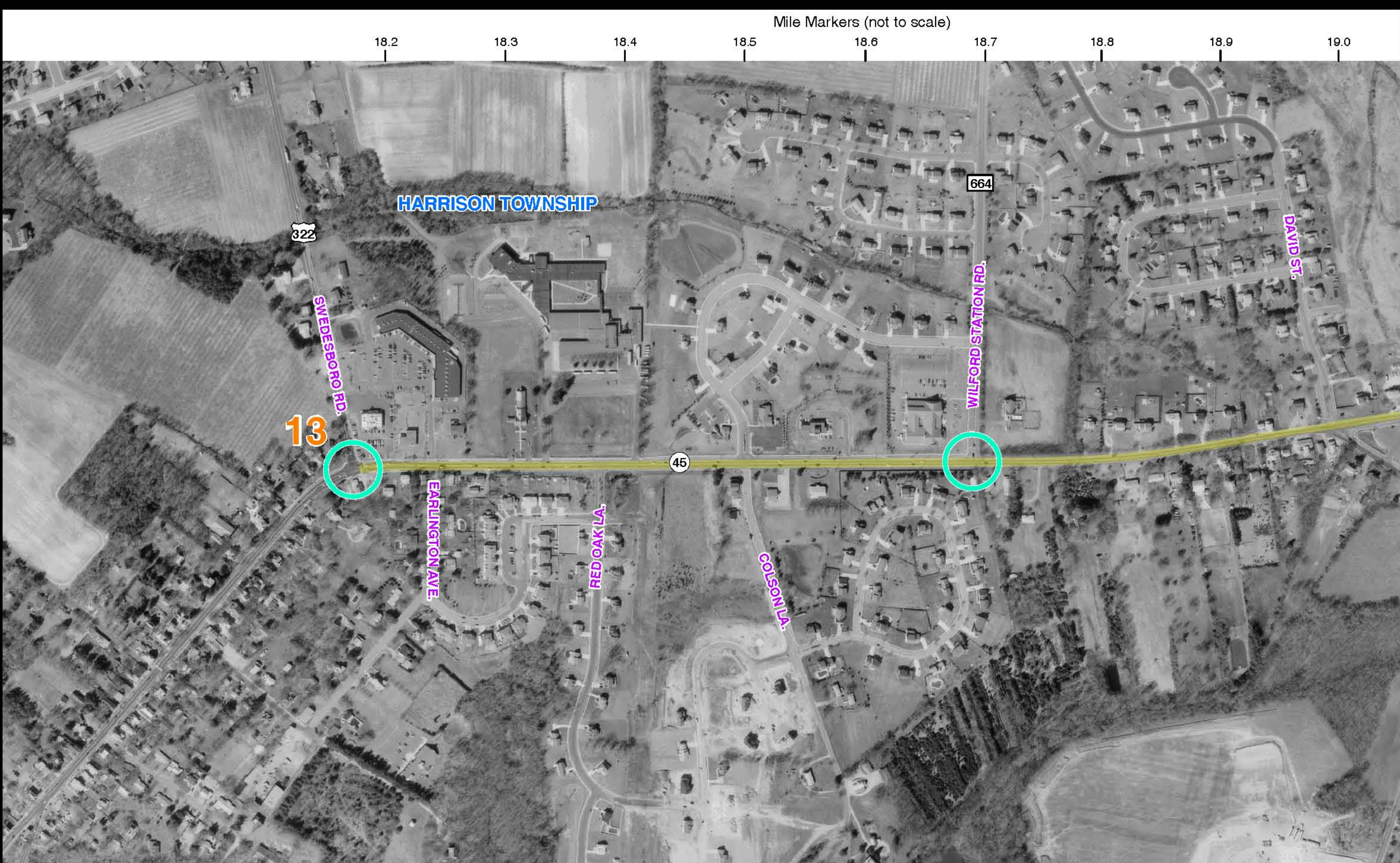


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AUGUST 2004

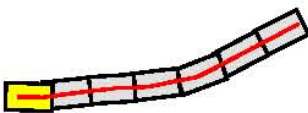


ROUTE 45 CORRIDOR STUDY: MAP 11

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Date Of Photography: Spring 2000



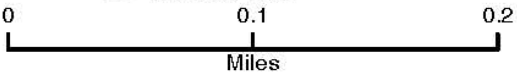
Signalized Intersection



Transportation Problem Locations



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AUGUST 2004



**ROUTE 45
CORRIDOR STUDY:
MAP 12**

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Municipal representatives also identified the differences in speeds from Woodbury Heights into Woodbury as a safety problem. Approaching this intersection from the south, the speed limit is 45 mph, and it reduces to 40 and then to 25 mph north of Salem Avenue in the downtown Woodbury area. The roadway is perceived as being wide open when driving through the car dealership area, so the vehicles are not slowing down and this creates a high-speed traffic chute into the city. The signal heads mounted on the mast arms are somewhat obscured by utility lines.

The crash analysis at this location indicated that there were 44 accidents over the three-year period from 2001-2003. The highest rate was angle accidents at 31.8 percent and is attributed to the double move traffic makes because of the geometry of the intersection. Sideswipe accidents account for 18.2 percent of the accidents and may be a result of the unmarked right turn lane.

Potential Improvement Scenarios:

- Move the stop bar farther away from the intersection for Route 45 southbound to avoid conflicts with left-turn movements off Salem Avenue.
- Install lane designation signing and striping to allow for a right turn lane from Route 45 southbound to Salem Avenue (CR 551).
- Install warning signage with supporting hazard identification beacon with a flashing yellow signal on Route 45 northbound to warn motorists to reduce speed approaching the intersection.
- Optimize signal timing of the intersection. Determine if an all-red phase of the signal-timing plan will allow vehicles making left turns from Salem Avenue to proceed through the intersection safely.

2) NJ 45 & Twells Avenue / Bellevue Avenue

Mile Post: 25.30

Woodbury City (refer to **Map 6**)

Identified Problems:

This intersection is a four-way signalized intersection. This section of Route 45 is two lanes by approach with two local streets: Twells Avenue and Bellevue Avenue carrying one lane by direction. Left turns are permitted; however, there are no turning lanes or protected phasing. Twells Boulevard tends to acts as a

cut through from Route 45 to Kings Highway (CR 551). Congestion problems are augmented by the lack of protected turn signal phasing. With no exclusive left turning lane, vehicles that are queuing to turn left obstruct through movements.

Field observations noted that average vehicle speeds appear to exceed the posted speed limit, making the probability for an accident even greater. The most common crashes at this location are rear end collisions at 38.9 percent and left turn with 27.8 percent of the total crashes. Both the high speeds and queuing left turn vehicles may attribute to these types of collisions.

Potential Improvement Scenarios:

- Redesignate the left lanes in each direction as a left turn lane shared through turn. Place overhead signing on mast arms to promote the left turn / through lane.
- Optimize signal timing of the intersection. Further evaluate the turning movements of the intersection and verify the need for a protected left turn phase. With traffic using Twells Boulevard as a cut through, a northbound phase may be all that is needed.

3) NJ 45 & Reid Street / Acme Parking Lot

Mile Post: 25 – 25.5

Woodbury City (refer to **Map 6**)

Identified Problems:

This section of Route 45 is dominated by access in and out of the Acme grocery store. There is also new commercial growth with fast food restaurants, like Dominos and Dunkin Donuts. Route 45 carries two lanes in each direction with a speed limit of 40 mph.



Acme Shopping Plaza in Woodbury City

Again, observations noted that vehicle speeds might exceed the posted speed limit, making access in or out of the Acme difficult. These movements into and out of the parking lot are one of the problems of this stretch of roadway. No northbound left turn lanes are provided and there are no traffic signals at any of the various curb cuts. Vehicles just have to wait for the nearby traffic light creates a gap for entering or exiting. The numerous curb cuts also provide additional conflict points for vehicular traffic.

Some vehicles also may use the parking lot as a cut-through between Route 45 and Kings Highway (CR 551) by accessing the parking lot to get to Acme Boulevard on the north end.

Potential Improvement Scenarios:

- Evaluate the feasibility of incorporating a center turn lane on Route 45. This would reduce delay for the through traffic and create a safer environment for left turning vehicles.
- Develop a specific access management plan for this section of Route 45, which seeks to eliminate unnecessary curb cuts to and from the highway.
- Evaluate the feasibility to restrict left turns from businesses.
- Conduct a signal warrant analysis to determine the appropriateness of a traffic light at an entrance to the Acme. An additional light at this location might help to reduce speeds. This effort should be initiated at the local level and coordinated with the New Jersey Department of Transportation.

4) NJ 45 & Evergreen Avenue (CR 650)

Mile Post: 24.90

Woodbury City / Woodbury Heights Township (refer to **Map 6**)

Identified Problems:

At this signalized intersection, Route 45 carries two travel lanes in each direction, and functions as a T-intersection for traffic on Evergreen Avenue. The raised curbed median that extends for two mile to Mantua Township begins south of this intersection. A pair of jug handles accommodates U-turns and left turns from Route 45. Evergreen Avenue includes a left turn lane and a shared left/right turn lane. There is a lack of pavement marking to guide traffic and the dual lefts

contribute to the numerous sideswipe crashes.

The other leg of the intersection is the far side jug handle for Route 45 southbound traffic making U-turns or left turns. The jug handle has both a left turn lane and a shared through/left turn lane. Northbound traffic uses a jug handle located one-tenth of a mile south of the intersection. The NB jug handle traverses behind an auto part store & Wendy's Restaurant where it intersects with Evergreen Avenue and traffic must make a left turn to get back to Route 45.

Adding to the complexity of the intersection is a set of railroad tracks located just north of the intersection. During congested periods, vehicles straddle the tracks. In addition, there is a large curb cut off the southbound jug handle that allows direct access into a fast food restaurant.



Looking west on Evergreen Avenue towards Route 45

This location provides a pedestrian environment that is unfriendly due to the lack of sidewalks, crosswalks, and wide lanes.

Potential Improvement Scenarios:

- Re-stripe jug handle pavement markings to identify lanes and turning movements and reduce driver confusion.
- Install pavement-marking extensions through intersection to help guide vehicles through the intersection.
- Delineate and sign any access from jug handle into commercial property
- Better pedestrian amenities should be implemented, including sidewalks, striping, signing, and protected signal phasing.
- Further evaluate the intersection to optimize signal-timing plan.

5) NJ 45 & Griscolm Lane / Elm Avenue (CR 652)

Mile Post: 24.40

West Deptford Township / Woodbury Heights Township (refer to **Map 7**)*Identified Problems:*

Route 45 at this signalized intersection carries two lanes of traffic in each direction. A far-side jug handle accommodates left turns and U-turns from Route 45 southbound. A nearside jug handle is used to accommodate northbound traffic on Route 45. Both Griscolm Lane and Elm Avenue each carry one lane of traffic that expands at the intersection. The entire intersection is set at a low elevation that helps to obscure the traffic signals.



Looking south to intersection toward Griscolm Lane / Elm Avenue

A field observation revealed deficient pavement surface, and faded or absent lane markings. On both the Griscolm Lane and Elm Avenue approaches, two lanes designated with pavement markings, but lanes are not marked with directional arrows. Each of the left lanes is not aligned for through traffic. In addition, there is no protected left-turn phasing. The approach from Elm Avenue is complicated with a bridge over the turnpike and excessive foliage blocking the sight lines of the intersection. Only, a static sign is present that informs motorists of an upcoming intersection.

Pedestrian amenities are deficient. Crosswalks and signal pushbuttons are available but no sidewalks or pedestrian signal heads.

Potential Improvement Scenarios:

- Re-stripe pavement markings at all points of the intersection to identify turning movements and reduce driver confusion. One lane should be marked as left turn and the other as through / right turn.
- Resurface the asphalt pavement and install more prominent, reflective lane markings.
- Increase the size of the signal heads to improve visibility.
- Install a hazard identification beacon with a flashing yellow signal on Elm Avenue approaching Route 45 northbound to warn motorists of the impending intersection.
- Cutback trees, shrubs, and foliage to allow for better visibility of intersection.

6) NJ 45 & Riviera Drive / College Boulevard

Mile Post: 23.88

West Deptford Township / Woodbury Heights Township (refer to **Map 7**)*Identified Problems:*

The configuration of this intersection is almost identical to Griscolm Lane / Elm Avenue. The curbed grass median is present at this location. At this juncture, Route 45 carries two lanes of traffic in each direction with left-turns and U-turns from a far-side jug handle for southbound traffic; a nearside jug handle is used to accommodate northbound traffic on Route 45. This intersection is set at a higher elevation on top of a hill. Both Riviera Drive and College Boulevard each carry one lane of traffic that expands to two lanes at the intersection.

Field observation revealed, faded or absent lane markings, and a lack of pedestrian amenities. On both the Riviera Drive and College Boulevard legs of the intersection, two lanes are designated with pavement markings, but these lanes are not marked with directional arrows. Each of the left lanes is not aligned for through traffic. In addition, there is no protected left-turn phasing.

This location is very critical for potential commercial development located in the vacant Caldor shopping center. Any southbound traffic must utilize the jug handle to make a U-turn to get to the development. Municipal officials stated that



Elevation variation south of Riviera Drive / College Boulevard adjacent to Caldor shopping center

development has been held up because of a lack of access through the grass median. Due to the elevation changes of Route 45 at this location, NJDOT has been unwilling to grant access through the median due to safety reasons and limited sight lines.

Potential Improvement Scenarios:

- Re-stripe pavement markings to identify turning movements and reduce driver confusion. One lane should be marked as left turn and the other as through / right turn.
- Install more prominent, reflective lane markings.
- Increase the size of the signal heads to help improve visibility.
- Further analysis of the intersection should take place with the addition of new commercial development. New traffic signal coordination plan with protected phasing may be required.

7) NJ 45 & Parkville Road (CR 656)

Mile Post: 23.34

Deptford Township / West Deptford Township (refer to **Map 7**)

Identified Problems:

At this location, Route 45 continues to carry two lanes of through traffic. Traffic operations at this location are controlled by a signalized intersection. Nearside jug handles are provided for vehicles making left and U-turns. The southbound jug handle cuts through the Shop-Rite parking lot and surrounds a Taco Bell restaurant where it then links with Parkville Road. There are entrances to Taco

Bell between the intersection and the jug handle on both Route 45 and Parkville Road. Commercial access directly across from jug handle increases the complexity of this location. Traffic backs up to the jug handle, preventing traffic from



making turns off the jug handle. Northbound traffic uses a jug handle located two-tenths of a mile south of the intersection. The northbound jug handle traverses behind several retail stores and joins backup as a separate leg of the intersection.



Looking east on Parkville Road towards Route 45 intersection

Potential Improvement Scenarios:

- Re-stripe pavement markings to identify turning movements and reduce driver confusion.
- Resurface the asphalt pavement and install more prominent, reflective lane markings.
- Optimize signal timing of the intersection.
- Increase the size of the signal heads to help improve visibility.
- Cutback trees, shrubs, and foliage to allow for better visibility of intersection.
- Formulate an access management plan to address unnecessary curb cuts.

8) NJ 45 & Main Street (CR 533A)

Mile Post: 22.69

Mantua Township / West Deptford Township (refer to **Map 8**)*Identified Problems:*

The signalized intersection of Route 45 and Main Street (CR 533A) marks the southern end of a four-lane section of Route 45 before it narrows to two lanes. The curbed median dividing Route 45 also ends at this location. Approaching southbound on Route 45, the posted speed limit is 50 mph reduces to 35 mph at the intersection. A southbound nearside jug handle provides left turn and U-turn movements.



Traffic merging from two lanes to one at Main Street

The major identified problem at this location is the lane drop. During the PM peak hour, southbound traffic backs up several blocks, blocking access to the jug handle. There is no dedicated right turn lane into the jug handle, and drivers use the shoulder to gain access to the jug handle. This jug handle has a curb cut that provides access to a Mobil gas station. This gas station also has two other access points onto Route 45.

Adding to the congestion in the local area is the close proximity of two other signalized intersections. The intersections of Main Street and Route 45; Mantua Boulevard / Berkley Road and Route 45; and Mantua Boulevard and Main Street are signalized intersections less than a quarter mile from each other and form a triangle. This configuration is like a traffic circle and when a problem occurs at one leg of the triangle, traffic backs up at all intersections.



Looking southbound at traffic delays approaching Berkley Street

This delay contributes to the high number of accidents in the area. Crash analysis indicates that there were 31 crashes at this location from 2001-2003. Rear end crashes are the leading type of crash with 61.3 percent.

Townships officials recommends continuing the four lanes of traffic on Route 45 and keep this lane configuration until Harrison Avenue (CR 678) / Mt. Royal Road (CR 678). The problem is that there are many constraints that make this very difficult to justify, and extremely expensive. First, there is very limited right-of-way between Main Street and Berkley Avenue and there are no shoulders provided. This makes adding even one lane difficult. Another constraint is a bridge on Route 45 over a stream just south of the K-Mart shopping plaza. Improvements to the bridge would have to include widening to accommodate any additional lanes.

Potential Improvement Scenarios:

- Install additional signing on Route 45 southbound to warn motorists of a lane drop approaching the intersection.
- Provide a separate southbound right-turn lane for vehicles entering the jug handle through minor widening and restriping.
- Re-stripe pavement markings to identify turning movements and reduce driver confusion.
- Due to the close proximity of the two intersections, evaluate all three traffic signals and optimize signal timings. This would improve the progression of traffic through this area of town.
- Provide a lead green for the jug handle in an effort to help keep the queue from spilling back onto the highway.

9) NJ 45 & Berkley Road (CR 632) / Mantua Boulevard (CR 676)

Mile Post: 22.56

Mantua Township (refer to **Map 8**)

Identified Problems:

This location is a four-way intersection where Route 45 carries one lane of traffic by directions. Berkley Road is offset from Mantua Boulevard, which requires a three cycle signal phasing. A channelized right turn lane is present on Berkley Road. Pedestrian amenities like crosswalks are provided, however the crosswalk on Berkley Road connects to a channelized curbed median where there are no additional sidewalks or crosswalks.



Route 45 & Berkley Road / Mantua Boulevard



Berkley Road (CR 632) at Route 45

On one corner of this intersection, there a Walgreens has been constructed. Access to the property is permitted from Route 45 and Berkley Road. The

developer has made improvements to the intersection to allow for three separate lanes (left, channelized right, through). Opposite to Walgreens is a post office that creates a number of small trips and helps to create congestion in this vicinity.

As previously mentioned, this intersection is one of three that are related to the proximity of Main St. & Route 45, and Mantua Boulevard and Main Street. Problems on one location influence the entire area.



Mantua Boulevard (CR 676) at Route 45

Potential Improvement Scenarios:

- Due to the close proximity of the two intersections, evaluate all three traffic signals and optimize signal timings. This would improve the progression of traffic through the area of town.
- The improvements should also consider pedestrian needs by upgrading the crosswalks, sidewalks, and pedestrian signals.
- Further analysis of the intersection should take place to evaluate the new level of service and evaluate the performance of the signal-timing plan since the Walgreens has been built and traffic patterns may have changed.

10) NJ 45 & Chestnut Street / Brittany Street (Kmart / Acme Entrance)

Mile Post: 22.36 to 22.47

Mantua Township (refer to **Map 8**)

Identified Problems:

Currently, Route 45 carries one lane of traffic by direction. It contains wide shoulders that act as deceleration and turning lanes.

This section of Mantua Township contains many commercial developments that abut Route 45. For example, the K-Mart & Acme shopping plaza includes many curb points. Plans have been discussed to build a new bridge between the new Home Depot / Kohl's property and the K-Mart / Acme property. This will help to relieve congestion on Route 45 by allowing circulation between adjacent commercial properties.

A new commercial development has been constructed across from K-Mart. This development includes a Taco Bell and a Long John Silvers. The main access is along Route 45, with side entrances along both Brittany Street and Chestnut Street. Left turns are allowed into this development, but this will require some widening on the opposite side of the access to provide a minimum allowance for a bypass area on the shoulder.



Looking south on Route 45 at access points into commercial properties

Within this one-third mile of roadway, there are four access points into the shopping plaza on the west side and there are seven curb cuts on the east side. The crash analysis revealed that 41.2 percent of the total crashes were angled crashes. The multitude of curb cuts is a direct factor in the extremely high rate of

angled crashes.

Potential Improvement Scenarios:

- Access management strategies are suggested for these commercial areas in NJ due to the large number of driveways and development along these roads.
- Evaluate the feasibility of incorporating a center turn lane on Route 45. This would reduce delay for the through traffic and create a safer environment for left turning vehicles.

11) NJ 45 & Harrison Avenue (CR 678) / Mt. Royal Road (CR 678)

Mile Post: 21.73

Mantua Township (refer to **Map 9**)

Identified Problems:

This four-way signalized intersection carries one lane of traffic by direction. There is no protected phasing for left turns and although there are push buttons for pedestrians, there are no crosswalks or sidewalks provided. Route 45 provides wide shoulders that act as a bypass lane for vehicles trying to get around queued traffic waiting to make a left turn.



Looking northbound at Route 45 & Harrison/Mt. Royal Road

The western approach of Harrison has been identified as a problem because Harrison Avenue converges with Jessup Mill Road just prior to Route 45. Vehicles exiting Wawa may use Jessup Mill Road to return to the Route 45 intersection and must merge with traffic on Harrison. Field observations discovered that some vehicles use dirt cut-through between Jessup Mill and Harrison to gain access to or from the Wawa.



Jessup Mill Road joining Harrison Avenue

Future development has been proposed along Route 45 at this intersection. Discussions are taking place about a proposed Target being developed across from the Wawa.

Potential Improvement Scenarios:

- Resurface the asphalt pavement and install more prominent, reflective lane markings.
- Increase the size of the signal heads to help improve visibility.
- Optimize signal timing of the intersection. Further evaluate the turning movements of the intersection and verify the need for a protected left turn phase or need for separate left-turn lanes. These may be provided on Route 45 through minor widening and restriping.
- Further analysis of the intersection should take place with the addition of new commercial development. New traffic signal coordination plan with protected phasing may be required.
- Intersection improvements to the geometry of Harrison Avenue and Jessup Mill Road may help to improve the efficiency of the intersection. Investigate joining Jessup Mill Road at a right angle farther west of the Route 45 intersection. Access to the Wawa would need to be provided.

12) NJ 45 & Cohawkin Road (CR 667) / Cedar Road (CR 667)

Mile Post: 19.71

Harrison Township (refer to **Map 11**)

Identified Problems:

This location is a four-way intersection where Route 45 carries one lane of traffic by direction. There is a protected left-turn phase for northbound Route 45 turning onto Cohawkin Road (CR 667).

Cohawkin Road approach is uphill into the intersection. Elevation difference between Cohawkin Road and



Route 45 can compromise sight distance problems.

Northbound at Route 45 & Cohawkin Road / Cedar Road

Turning Radius from NB Route 45 onto Cedar is limited. Large vehicles have a difficult time making this move and run up onto the curb. This southeast corner of this intersection is vacant and zoned for commercial.

At this intersection, there is a park-and-ride lot located on the southwest corner of the intersection. In the AM peak, the bus stop is located on the opposite side of the street. However, there are limited pedestrian amenities. Although there are signal push buttons, there are no crosswalks or pedestrian signal heads.

Potential Improvement Scenarios:

- Increase the turning radius for right turns from Route 45 South onto Cedar Road by cutting back the corner to provide better sight distance and turning lane.
- Improved signal heads to improve visibility.
- Better pedestrian amenities should be implemented, including striping, signing and protected signal phasing.

- Future development of southwest corner should provide adequate spacing between intersection and entrances.

13) NJ 45 & US 322 (Swedesboro Rd)

Mile Post: 18.16

Harrison Township (refer to **Map 12**)

Identified Problems:

This location is the terminus of our study area. At this location, Route 45 intersects with US 322 at a three-way intersection. US 322 is a major route in South Jersey with access to other major highway facilities such as the NJ Turnpike and NJ 55. This is also a highly traveled corridor for shore traffic in the summer months. US 322 carries only one lane in each direction at this location with a shoulder that allows thru/right-turning traffic to squeeze by left-turning traffic. Route 45 northbound intersection approach carries one lane for all movements, while Route 45 southbound has a through lane and a left turn lane with protected phasing.



Route 45 & US 322 looking southbound

During the PM peak hours the majority of the traffic is traveling south on Route 45 toward Mullica Hill. During a PM peak-hour field view, approximately 30 cars were queued up in this direction while waiting for the light. Only about half of them made it through during the next signal phase. The traffic backs up to the Harrison Township Elementary School and blocks entrances to the Mullica Hill Shopping Village. Traffic queues also occurred on the other two legs of the intersection. With this heavy volume of traffic moving southbound, vehicles making a left turn from Route 45 northbound have a difficult time with no protected green arrow.

The crash analysis indicated problems at this intersection with 33 crashes occurring during 2002 to 2003. Approximately 40 percent of these accidents are angle accidents; such as vehicles making unprotected left turns onto US 322. Rear end crashes comprise of 50 percent of the accidents. These are generally vehicles traveling in the same direction waiting in queues.



Route 45 southbound traffic queued up during PM Peak

Pedestrian amenities are deficient at this location. Although signals and crosswalks are present on Route 45 southbound and US 322 eastbound legs of the intersection, the Route 45 crosswalk leads directly into a vacant commercial driveway on the east section of the road.

Potential Improvement Scenarios:

NJDOT had a consultant analyze this location in detail, which is documented in

the *Route 322 Concept Development Study, October 2002*. The study evaluated the intersection and determined that intersection runs at a Level of Service (LOS) F. A LOS F intersection is characterized by traffic flow at extremely low speeds, with high delays, high volumes, and extensive queuing.

- The proposed improvements detailed in the Route 322 Concept Development Study include providing separate left and right-turn lanes on Route 322 through minor widening and re-striping. A Route 45 southbound right-turn lane will be provided via minor widening and re-striping. Installing closed loop detectors to the intersection operation, as a fully actuated signal will optimize the traffic signal.
- The proposed improvements should also consider pedestrian needs by upgrading the crosswalks and pedestrian signals.
- Trees and shrubs should be cut back to provide better visibility of street and directional signing on US 322.

5.2 Corridor-Wide Issues And Potential Improvement Scenarios

The following general issues have been identified throughout the corridor.

5.2.1 Access Management

Route 45 is the major route for traffic in the region, it naturally lends it self to commercial land uses. Several sections of Route 45 have commercial activity close together. Most of these commercial properties have access locations that conflict with vehicular traffic on Route 45. Access Management Provisions improve safety and efficiency on roadways by limited and controlled access points. The purpose of access management is to provide vehicular access to land development in a manner that preserves the safety and efficiency of the transportation system. The key is to limit and consolidate access along major roadways, while promoting a supporting street system and commercial activity. Ideally, access management should be an asset to the community's comprehensive plan. Access management guidelines are best implemented after a municipality has determined where development should occur and where it should be limited.

In general, an Access Management plan should:

Separate conflict areas. Intersections created by public streets and driveways are places in the roadway that have the potential for trouble, where crashes can almost be predicted. Adequate spacing between intersections allows drivers to react to one intersection at a time, while simultaneously reducing crash potential. Provisions should seek to close off unnecessary curb cuts and enhance access and mobility through shared driveways and internal circulation between adjacent properties.

Throughout the corridor there are several sections of Route 45 where this should be implemented. One example would be Transportation problem location # 10 in Mantua, where the K-Mart, Acme and new commercial developments across the street have multiple access points on the both sides of Route 45. The more access points, the more conflict points, and the crash data provides evidence of this problem showing a high number of angle and rear end crashes.

Separate turning volumes from through movements. Through traffic often needs to slow down for vehicles exiting, entering, or turning across a roadway. Providing turning lanes, designing driveways with large turning areas, and restricting turning movements in and out of driveways allows turning traffic to get out of the way of through traffic.

As mentioned in transportation problem location # 3, this section of Route 45 in Woodbury City would be a prime candidate for this improvement. This is a two-lane section of roadway with no turning lanes and no protected turns into or out of the Acme plaza. A high number of left turn and rear end crashes verify that there are many conflicts. These may be avoided by removing the turning movements from the through traffic.

Provide sufficient spacing for placement of traffic signals. Good spacing of signalized intersections reduces conflict areas and increases the potential for smooth traffic progression.

Provide for adequate on-site circulation and parking. Design easily accessible on- and off-street parking that can accommodate cars and other vehicles. This helps to minimize any traffic disturbance, and reduces the number of driveways that businesses need for access to

major roadways. A great example of this is in Mantua Township. There is a proposed bridge to connect the Kohl's / Home Depot property and the K-Mart / Acme shopping retail centers. This would allow traffic to go from one retail center to the other without using Route 45.

Persons seeking new access to modifying existing access to Route 45 must submit applications for access to NJDOT. The rules governing access to state roadways can be found in the New Jersey State Highway Access Management Code (New Jersey Administrative Code, Title 16, Chapter 47).

5.2.2 Public Transportation

The Route 410 NJ Transit Bus represents the only public transportation option in the corridor. Increasing the use of transit has the potential to reduce single occupancy vehicle trips that could reduce congestion in the Route 45 study area. Increasing the frequency of bus service should be examined. Unfortunately, the suburban and rural characteristics, and land use densities of the Route 45 corridor do not necessarily support increasing the frequency of service. The future of transit depends on land use, demographic patterns, and willingness to ride, all of which are beyond the scope of this study. There are also budgetary and financial constraints that may limit increasing service.

There may be some possibilities to help improve the system. A 2002 DVRPC study, I-295 / US 130 Riverfront Transportation Corridor Study, identified the City of Woodbury as an appropriate location as a transfer center for buses serving the South Jersey area. Six NJ Transit routes (401, 402, 410, 412, 455, and 463) converge in Woodbury and continue on to serve the southern portion of South Jersey. A need was identified for a transit center that would ease bus transfers to other portions of the region. The study recommended a Hunter Street Site in Woodbury as a Transfer Center. This type of facility would benefit the Route 45 Corridor by increasing both the accessibility and efficiency of the transit network.

Another amenity to enhance the attractiveness of transit would be to erect shelters at existing bus stops, where appropriate, along Route 45. These shelters should be made accessible by having paved walkways on their approach and having appropriate seating and glass windscreens to enhance customer comfort. If possible, provide appropriate lighting to discourage excessive evening hour loitering. A current bus schedule should be posted at

each bus stop for each route as well as transfer points for intersecting buses. This has the potential to increase the attractiveness of transit, increase transit trips, and result in a possible corresponding decrease in auto travel.

5.2.3 Pedestrian and Bicycle Facilities and Amenities

Several municipal officials expressed concerns over pedestrian safety along the corridor.

The high speeds, wide lanes, curbed median, and the multitude of ingresses and egresses out of commercial properties do not provide a favorable environment for pedestrians. Field observations revealed that in most areas pedestrian traffic was present, but not very concentrated. Although some of the signalized intersections have crosswalks and/or push buttons, these amenities are not available throughout the region.

Many areas are lacking in both pedestrian and bicycle facilities. Although these trips represent a small percent of work trips, they can be an effective method of reducing vehicular travel. In order to make bicycling and walking a viable alternative to driving, there must be safe facilities, including sidewalks and bike lanes. Safe crossing areas at intersections, including marked crosswalks, signals, and if necessary, pedestrian islands throughout the corridor are necessary to encourage pedestrian traffic. Employers should provide bicycle racks where employees can store their bikes securely.

A regional pedestrian/bicycle program could be developed to build a system of interconnected routes, lanes, paths, and greenways that provides recreational as well as alternative transportation opportunities.

5.2.4 Trailblazing Signs

At strategic locations throughout the corridor, trailblazer signs would be beneficial to increase the visibility of local amenities. They help to highlight and promote historical sites, parks, waterways, shopping districts, etc. Gateway signs as you enter or exit a municipality may be very beneficial in this corridor. Route 45 acts as a boundary between several communities, and depending on direction of travel (north/south) you may be traveling in one municipality, while on-coming traffic is in another municipality. Gateway signage helps nonresidents gain a better understanding of their location and helps to promote each municipality.

6. CORRIDOR-WIDE ECONOMIC DEVELOPMENT STRATEGIES

The following are descriptions of various strategies that local officials may use along the corridor to initiate revitalization or growth management, where appropriate. Each strategy is assigned a priority depending on the importance and the ability to move the strategy toward implementation. Immediate priorities are those that are an issue and do not require further study. Short-term priorities should be implemented within three to five years and may require a higher degree of preliminary examination prior to implementation. A long-term priority should be implemented within five to ten years and will usually require significant study and cooperation. A description of each of the priorities is also provided.

Immediate

- Access Management Provisions
- Capital Improvement Plans and Programs
- Conservations Easements and Local
- Land Trusts
- Corridor Access Management Overlay District
- Multi-Municipal Comprehensive Plans
- Official Maps
- Streetscape Design
- Transit Oriented Development
- Vegetation and Open Space Management

Short-Term

- Economic Development Incentives
- Economic Development Planning
- Greenway Corridors
- Open Space/Cluster Development
- Park-and-Ride Programs
- Fee-in-Lieu Provisions
- Pedestrian and Bikeway Facilities
- Right-of-Way Preservation
- Suburban Center Zoning
- Traffic Signal Systems

Long-Term

- Growth Boundaries

- Parking Management Programs
- Traffic Impact Fee Ordinances

Each of the strategies requires action from the local government as well as county and state officials in order to be implemented. As each municipality is ultimately responsible for adopting or implementing the strategies that are appropriate to their municipality, the creation of a Corridor-Wide Task Force should also be explored. This task force could be used to further investigate these strategies and determine the benefits that each municipality will gain from its implementation.

Many of the strategies can be implemented by amending municipal planning documents. Each description notes which planning document ordinance is primarily affected by the strategy. Commonly cited documents include the Municipality Master Plan, Zoning Ordinances, and the Subdivision and Land Development Ordinance. In some instances, more than one document may need to be amended in order to maintain consistency among all the regulatory documents for the municipality.

6.1 Descriptions of Recommended Strategies

Access Management Provisions improve safety and efficiency on roadways by limiting and controlling access points. The purpose of access management is to provide vehicular access to land development in a manner that preserves the safety and efficiency of the transportation system. Access management principles work best when they are included with transportation and land use planning.

Access management tools are especially useful along Route 45, which experiences both regional and local traffic. With all this commercial activity, such as several strip mall developments along the route, there are many points of conflicts with vehicular traffic. A corridor-wide access management plan is one specific tool that the municipalities may choose to implement. This strategy can be adopted as part of the municipality's zoning ordinance or subdivision and land use ordinance.

Capital Improvement Programs are documents that set out a municipality's plans for future capital improvements, such as roads and other public facilities as

well as the method of financing. The range and scope of these programs can vary considerably from one to twenty years, however, they are required to cover at least a six-year cycle and should be updated on the cycle as well. The capital improvement program is consistent with the municipal master plan and zoning ordinance and allows for implementation of facilities that will foster the community's growth. The Governing Body is responsible for adopting the capital improvement program, and amendments to the master plan and zoning ordinance may be required to ensure consistency of all regulatory documents.

Conservation Easements and Local Land Trusts assist local governments in conserving natural areas and agricultural land. Conservation easements are legal documents that restrict certain activity on land and conserve natural features. Local land trusts are often involved in the purchase of these easements. Conservation easements are effective measures to limit development and are less expensive than purchasing the land outright. Municipalities in the study area, specifically Mantua and Harrison, have several acres of open space and prime agricultural land. In order to focus development back into the suburban core of these municipalities, the preservation and protection of these natural lands should be a priority and conservation easements can be an immediate measure to ensure protection. The responsibility for conservation easements lies with the governing body; however, identification of conservation easements should be identified through the open space or recreation element of the master map, the official town map and the zoning ordinance.

Economic Development Incentives include a wide range of actions designed to promote local business and often take the form of grants or loans from county or state level government agencies. Certain incentives are offered through the county economic development office, and municipalities interested in offering certain incentives such as tax incentives should work with county economic development staff.

Economic Development Planning is the process of analyzing local business development and retention goals and defining strategies to meet those goals. Many communities already perform economic development planning within their Master Plan Elements and should continue to do so. The next step in the process should be to coordinate efforts with neighboring communities to ensure consistency and negate competition for tax ratable commercial establishments. Appropriate tools for economic development planning include the master plan and the capital improvement program.

Fees-in-Lieu Provisions require developers to provide public open space within their development or to contribute a fee-in-lieu of the land to be used to improve parkland elsewhere. These should be given high priority, especially in the communities that have agricultural space left along Route 45. The responsibility for implementing parkland dedications or fee-in-lieu provisions lies with the governing body, planning and zoning boards and the park and recreation commission. Changes to the master plan, zoning ordinance and subdivision ordinance will be required.

Greenways are linear networks of open space that protect the natural environment and provide low impact recreational opportunities. Greenways are important tools to improving the quality of life and work as a community asset. In addition to the Governing Body, Planning Commission and Zoning Board, many environmental groups are active in providing support for greenways. Linear areas of land available for greenway planning should be identified in the Master Plan, Zoning Ordinance, and Official Map.

Growth Boundaries are geographic boundaries that separate land into two categories: that in which growth is appropriate, such as in urban or suburban areas with appropriate infrastructure, and that in which growth is not appropriate such as agricultural and natural lands. Growth boundaries are most effective on a regional level. The municipalities should work together to establish and concentrate where they would like growth without compromising the open space that has made these communities so desirable. Coordination with Gloucester County will also be helpful to ensure plan consistency. Growth boundaries should be identified through the master plan, zoning ordinance, and official map.

Multi-Municipal Comprehensive Plans allow for formalized cooperation between municipalities to coordinate on various issues. Participating in multi-municipal plans can help acquire grant money and force state agencies to consider local plans in decision-making processes. Multi-municipal plans are developed with all or some of the municipalities within the study area. Establishing a corridor-wide task force to begin looking at the possibility of multi-municipal plans is the first step. Implementation of multi-municipal plans is the responsibility of the planning boards and governing body. In order to ensure consistency with the regulatory documents, the zoning ordinance and master plan will need to be amended.

Official Maps legally establish the location of existing and proposed streets, parks and other public lands and facilities. Creating an official map is not only required through the MLUL but also notifies landowners of the location of future public improvements. Official maps must show public roads and drainage facilities as well as dedicated right-of-way and any future areas of public improvements. Official maps are powerful planning tools and municipalities should ensure that all recommendations and improvements mentioned in the master plan are graphically shown on the official map. The official map is adopted by ordinance by the governing body.

Park-and-Ride Programs encourage the use of transit and ultimately lower the amount of congestion on the roadways by providing parking areas near transit stops. Park-and-rides facilities can provide a number of benefits in terms of air quality and improving commuting. Commuting time can be reduced, especially with express transit services from park and ride lots. They serve as points where individuals can transfer to high occupancy vehicles, reducing the number of single occupancy vehicles on the road. Facilities may be stand-alone lots or may be located in the parking lots of businesses, schools, or other public institutions. This should be further studied as the corridor already has one park-and-ride lot and will aid in relieving congestion during peak workday hours. Park-and-ride lots will require modifications to the master plan and zoning ordinance and coordination with NJ Transit.

Parking Management Programs manage parking within a municipality ensuring that parking supply meets the demand. Inadequate or under-designed parking areas near commercial buildings can cause a decline in business while an oversupply of parking results in an inefficient use of land, unnecessary financial responsibilities and an increase in the amount of impervious coverage. Parking management programs are long-range goals and municipalities should work with the business community to establish where this type of program will have the largest benefit.

Performance Zoning provides a means of regulating development based on the specific impacts of the development on site, rather than the specific types of uses. For example, performance zoning for an industrial site might consider impacts such as vehicle traffic, air pollution, and lot coverage, but not regulate what types of industry could locate in that specific development. Performance zoning standards provide municipalities with more control over the impacts of development, while giving developers more flexibility in the types of permitted

uses. This technique is relatively high priority and municipalities should consider adopting performance zoning standards to minimize development impacts such as congestion, pollution and tax bases. Performance Zoning is implemented through the zoning ordinance but modifications to the master plan and official map will need to be completed.

Planned Unit Developments allow for large acres of land, usually 10 or more, to be developed as a single entity within an overall plan and include both residential and quasi-public, commercial, or industrial areas. Although similar to residential cluster developments, this type of development is considered in whole instead of piece-meal by the planning board. Planned unit developments are a good tool to provide set aside land for low-and moderate-income housing and must be shown on the official map. There are smaller unit developments, such as planned unit residential development that requires a minimum of five acres and may or may not include nonresidential uses.

Residential Cluster Development allows residential units to be concentrated on a small portion of a parcel rather than spread throughout. There is no minimum area necessary. They are developed in accordance with a plan and are limited to residential uses and an ancillary common or public space. This type of development can preserve natural areas, farmland, and scenic views; have an environmental impact; and reduce infrastructure needs. Cluster development should be given a high priority and can also be encouraged for commercial development and mixed-use development. Residential cluster developments are a good tool for open space preservation as well as providing low- and moderate-income housing. Cluster development should be incorporated to all municipal documents: the master plan, subdivision ordinance, zoning ordinance and official map.

Suburban Center Zoning directs growth into identified centers, which contain a mix of retail, office, residential, public, and recreation uses. Suburban center zoning should be a high priority and can be implemented fairly quickly. This is particularly important for those municipalities with secondary areas for small commercial activity. Implementing suburban center zoning requires changes to be made to the master plan and the zoning ordinance.

Traditional Neighborhood Development applies historic development patterns to new development projects and is characterized by compactness and a mix of uses in a pedestrian-friendly village type setting. This type of development may

be built near transit stops or close to highway entrances or exits. This development strategy is a high priority and entails changing the master plan, zoning ordinance, and subdivision ordinance.

Traffic Impact Fee Ordinances allow local governments to levy fees on developers to pay for improvements to the transportation system made necessary by their new developments. There must be a “rational nexus” or clear linkage between the new development and the need for transportation improvements for traffic impact fees to be legally defensible. These are useful planning strategies that municipalities may want to consider giving the design of Route 45 as a two-lane highway where a majority of the open space for development is located. Modifications to the zoning ordinance and subdivision ordinance will need to be made in order to implement the fee.

Traffic Signal Optimization Systems use timing and signal coordination to manage the flow of traffic volumes along a corridor. In municipalities where congestion is a serious concern, the possibility of implementing closed loop traffic signal systems may be a relatively high priority and should be considered. Traffic signal timing can be optimized and coordinated to allow for progression of traffic flow. Municipalities should work with both the county and New Jersey Department of Transportation in order to explore implementation of such a system.

Transfer of Development Rights (TDR) embrace the concept that some sites are more suited for development than others due to environmental constraints, infrastructure limitations, or consideration of public policy. For these reasons, certain “sending zones” are established where the property owner may develop at a very low density or sell a “transferable” development entitlement to another property owner in a “receiving zone.” A good example is farmland that is used for agricultural purposes but zoned for residential development. In this type of situation, a farmer could sell the “right” to build that housing to another owner and continue to farm the land while receiving tax reductions. The process of implementing TDRs involves several steps and will require a commitment from municipal, county and state officials. Successful implementation will require modifications to the master plan and zoning ordinance.

Trip Reduction Ordinances are used to manage transportation demand and are designed to reduce traffic at peak hours by changing the driving habits of commuters. Trip reduction ordinances require businesses to reduce trips-to-work

among their employees. This can be done by engaging in tactics such as employee subsidies for the use of transit, parking fees for employees who drive alone, or flextime. Although these ordinances are a low priority, it is a measure that can be implemented in a short period of time and promotes smart growth. Modifications to the zoning ordinance and subdivision ordinance will need to be made in order to implement these measures.

Village Protection Programs can serve to protect historic villages by ensuring that future development within them, as well as modifications to existing buildings, is consistent with the historic context of the village. These programs may also be incorporated within the historic preservation commission of the town, but will also serve to reiterate the municipalities' need for preservation and consistency. Modifications to the zoning ordinance, subdivision ordinance, and master plan will need to be done in order to implement these programs. The historic preservation commission has the responsibility of adopting such an ordinance with recommendations made to the planning board and governing body.

7. PLAN IMPLEMENTATION

Development of a strategic implementation plan for the corridor is based upon the land use scenarios, the transportation needs, and the economic development strategy, in conformance with the policy goals and objectives of the New Jersey State Plan, DVRPC's Year 2025 Land Use and Transportation Plan, and local municipal plans. This implementation plan will include a definition of the roles and responsibilities of all affected agencies for each improvement project.

The Route 45 Corridor Study can be used as a dynamic long-range tool for the systematic selection of projects to create a significantly improved transportation system within the study area. This document can serve as a punch list for the government agencies with a stake in the implementation of improvements. Municipal governments are key players in this process. Even though the state or county may maintain a highway, it is the welfare of the local residents that is affected the most. Those who use the highway frequently benefit from safety and mobility the most. Therefore, the local municipality should assure that the improvements are advanced by involvement in the process no matter which agency has a lead role.

Characteristics

In choosing which projects should advance first, stakeholders can be guided by the information presented in **Table 13** Route 45 Corridor Transportation Improvements Implementation Matrix. This easy to use matrix suggests the relative importance to stakeholders of the various attributes of each problem location. Each improvement scenario identified is evaluated in terms of project priority, cost range, and project benefits. The stakeholders necessary to carry out the project are identified.

Priority

Priorities are estimated in terms of three categories: high, moderate, and low. Priorities are assigned based on the perception of the extent of the problems they present drivers, with safety being the highest priority, but congestion (or time delay) and mobility also considered important. A higher degree of priority is also assigned if there is an urgency to complete the improvement due to the imminent 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 also receives a higher priority ranking.

Cost Range

Costs are also assigned to categories of high, moderate, and low. High cost projects usually involve a major commitment from one or more funding sources; lengthy public involvement, and several years lead-time in programming the required funds. They are typically large scale, complex, or multi-phased improvements and can entail the construction of new facilities. In general, a project in this category is estimated to cost between \$5 and \$35 million, however some major projects have been known to cost in the hundreds of millions of dollars. An improvement estimated to have a moderate cost could involve a major reconstruction of an intersection, construction of a short connector road or a widening of an existing road. In general, a project in this category is estimated to cost between \$2 and \$5 million. Low cost projects can often be fast-tracked with maintenance, or pool funding. They are often operational type improvements at isolated locations and typically cost less than \$2 million. These cost ranges are generalized estimates and could be significantly changed for a specific location due to environmental, right-of-way, or other factors uncovered during detailed design of the improvement.

Benefits

Benefits describe the kind of impact the improvement will yield, such as enhancing safety, lessening congestion, improving mobility, or encouraging economic development. Economic development benefits are derived from a transportation improvement generally through an increase in the accessibility of affected individual properties or areas. The strategic location and magnitude of the improvement determines the extent of the benefits received by the affected properties. The increased level of access to a property may make it attractive enough to induce new commercial or residential development, or entice existing land uses to expand. Increased accessibility can also have a positive effect on property values.

Roles of Agencies

In terms of a hierarchy of agencies, the New Jersey Department of Transportation (NJDOT) is primary, in terms of both maintaining Route 45 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 affect traffic levels on Route 45. In addition, many of the cross streets

are designed, built, and maintained by local and county government and these impact how well Route 45 functions. Developers (usually a private entity) actually build the housing, commercial, and industrial projects that generate the trips that must be accommodated by a publicly owned transportation infrastructure. In addition, some of the transportation improvements themselves are designed and financed by developers.

New Jersey Department of Transportation

NJDOT has jurisdiction over the state highways in the corridor. In addition to Route 45 the only state highway in the corridor is US 322 located at the terminus of this project in Harrison Township. Improvements to these highways are typically financed by state and/or federal funds. Occasionally, developer contributions are also a source of funding if the project has special impact on the facility by a development. The State ultimately makes the decision on what improvements are done to their facilities but often coordinates with the county or local municipalities when the improvements include facilities under their jurisdiction.

Gloucester County

The counties have 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. There are two 500 series routes within the corridor: CR 551 and CR 553A, which serve as access roads into or across Route 45. The primary function of the county network is to serve medium range trips or to serve as feeders to the state system. Improvements to county roads are financed by county dollars or, where eligible, they can receive federal or state funding. The county has the ultimate decision concerning improvements on county roads, but typically coordinates with the municipality in which the improvement is located.

Municipalities

Local governments not only have jurisdiction over their local road system they also control local land use decisions. The decisions made at the local level can affect the traffic on roads at all levels. Therefore, local officials must understand the traffic impacts that 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 for all levels of transportation improvements to make sure that the concerns of their residents are addressed and to assist in the problem identification and improvement recommendations. Municipal officials need to make use of the circulation element of their master plan to identify important missing links in their highway network and begin to preserve space for these links to be built. The master plan is an important tool for municipalities to use in addressing their circulation needs.

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 what 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.

Developers

As properties are developed or redeveloped, the transportation needs of the properties can change, sometimes drastically. Providing proper transportation access to a new development is often critical to the success of that development. Therefore, developers must work with the transportation providers to assure that the necessary changes are beneficial to both the development and the existing transportation infrastructure. Developers frequently design and construct improvements for traffic attributable to their developments or to provide enhanced access to their site.

TABLE 13. Route 45 Corridor Transportation Improvement Implementation Matrix

Location		Municipality	Priority	Cost Range	Benefits	Lead Role	Assisting Role
1	Salem Avenue (CR 551)	Woodbury City	H	M	Cong Safe	DOT	GC, MCD
2	Twells Avenue / Bellevue Avenue	Woodbury City	M	M	Cong Safe	DOT	MCD
3	Reid Street	Woodbury City	M	H	Safe Mobl	DOT	MCD
4	Evergreen Avenue (CR 650)	Woodbury City / Woodbury Heights Twp.	H	L	Cong Safe Mobl	DOT	GC, MCD
5	Elm Avenue / Griscolm Lane (CR 652)	West Deptford Twp. / Woodbury Heights Twp.	H	M	Safe Mobl	DOT	GC, MCD
6	Riviera Drive / College Boulevard	West Deptford Twp. / Woodbury Heights Twp.	M	M	Safe, Mobl	DOT	GC, MCD
7	Parkville Road (CR 656)	Deptford Twp./ West Deptford Twp.	H	M	Safe Mobl	DOT	GC, MCD
8	Main Street (CR 553 A)	Mantua Twp.	H	H	Cong Safe Mobl	DOT	GC, MCD
9	Berkley Avenue / Mantua Boulevard (CR 632 / CR 676)	Mantua Twp.	M	H	Cong Safe Mobl	DOT	GC, MCD
10	Chestnut Street / Brittany Street (Kmart / Acme Entrance)	Mantua Twp.	H	H	Cong Safe Mobl	DOT	GC, MCD
11	Harrison Avenue / Mt Royal Road (CR 678)	Mantua Twp.	H	M	Cong Safe Mobl	GC, MCD	DOT
12	Cohawkin Road (CR 667) / Cedar Road (CR 667)	Harrison Twp.	M	M	Cong	DOT	GC, MCD
13	Swedesboro Rd (US 322)	Harrison Twp.	H	H	Cong Safe Mobl	DOT	MCD

Key:

Priority:

H = High, M = Moderate, L = Low

Cost Range:

H = High, M = Moderate, L = Low

Benefits:

Cong = Congestion, Mobl = Mobility, Safe = Safety

Role:

MCD = municipality, GC = Gloucester County, DOT = NJ Dept. of Transportation

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Geographic Area Covered: The Route 45 Corridor study area in southern New Jersey extends approximately eight miles from Salem Road (CR511) in Woodbury City to US 322 (Swedesboro Road) in Harrison Township. The study area is located in Gloucester County and includes the following municipalities: City of Woodbury, Borough of Woodbury Heights, Deptford Township, West Deptford Township, Mantua Township and Harrison Township.

Key Words: corridor study, transportation planning land use planning economic development, growth management, potential transportation improvement scenarios, traffic congestion, implementation plan

Abstract: This document presents a planning effort that links transportation and land use planning by managing growth appropriate to infrastructure capacity and consistent with county, state, and regional plans to foster economic development. This study provides a set of suitable transportation improvements, land use and economic development strategies that address the needs of corridor residents and employers for Route 45 in Gloucester County.

This study focuses on a transitional area at a stage of growth between first generation suburbs and a new regionalism community type, promoting economic development and transportation improvement strategies. The goal of the study is to enhance this region as a major transportation artery and economic center in the county, thereby encouraging urban redevelopment and infill development, and discouraging the continuing trend of sprawl.

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