bike route (Delaware Bike Route 1) which passes through portions of west and south Kent County, linking Newark and Rehoboth Beach.

Sidewalks

Sidewalks are the primary type of pedestrian facility in the region, although pedestrians may use bike paths, bike trails, greenways, and paved shoulders when no sidewalk is present. Sidewalks should be constructed at a minimum width of five feet, with curb ramps for wheelchair access. A 48-inch width is permitted at pinch points. Bicyclists are legally permitted on sidewalks unless specifically prohibited such as in certain downtowns or other locations where potential conflicts with pedestrians are high. However, sidewalks are not designed to safely accommodate most adult bicyclists, who can reach speeds of 15-20 miles per hour. Sidewalks are designed to accommodate travel at about 3 miles per hour, a typical walking speed.

Sidewalks are common within urbanized areas, but are less common in outlying unincorporated areas. DelDOT maintains an inventory of roadways with sidewalks in municipalities and in suburban developments. Statewide, Delaware has 784.19 miles of roadway with sidewalks on both sides, and 206.4 miles of roadways with sidewalks on only one side.

Table 3.15 illustrates miles of roadways with sidewalks in Kent County. There are slight increases since 1994 in Kent County; approximately 1 mile more of one-sided sidewalks and 3 more miles of double-sided sidewalks. Kent County accounts for 10.9 percent of statewide total for miles of roadways with sidewalks on both sides and 14.8 percent of miles of roadways on one side only.

Table 3.15
Roadways with Sidewalks, Kent County, 2000

	Roadways in Miles – 1994		Roadways in Miles – 2000	
	One-sided Sidewalk	Double-sided Sidewalk	One-sided Sidewalk	Double-sided Sidewalk
Kent County	29.55	82.45	30.57	85.26
Statewide	NA	NA	206.4	784.19

Source: Delaware Department of Transportation (DelDOT)

According to 2004 DelDOT Pedestrian Facility data as presented in Table 3.16 Type of Pedestrian Facility, within Kent County there are 25.3 miles of footpaths, over 400 miles of sidewalk, and nearly 7 miles of crosswalks. The majority of facilities are sidewalks, with less than 10 percent of the facilities as footpaths and crosswalks.

Table 3.16
Type of Pedestrian Facility

Type of Facility	Distance (Miles)	Percent of Total
Crosswalk	6.7	1.5%
Footpath	25.3	5.7%
Sidewalk	409.8	92.8%
Total	**441.8**	**100.0%**

Source: 2004 DelDOT Statewide Sidewalk Database

Design of Facilities

The careful design of crosswalks, traffic signals, medians, overpasses, underpasses, bicycle parking, and pedestrian plazas further support bicycling and walking. These facilities may be particularly critical for children, senior citizens, and disabled pedestrians. Bicycle parking is a critical factor for commercial destinations, employment sites, and public transit connections. DelDOT has installed high-security clamp-type bike racks at many park & ride lots across the state and employers are encouraged to do the same.

Also, various types of traffic calming devices may facilitate pedestrian travel by slowing motor vehicle travel, increasing visibility, and providing pedestrian crossing refuge islands. Two suburban developments in Kent County have utilized traffic calming features, primarily speed humps, on their streets. Downtown Dover uses sidewalk bulb-outs, textured pavements, on-street parking, and a traffic-diverter to calm traffic and create a more pedestrian-friendly environment.

DelDOT and Kent County have both adopted measures to improve bicycle and pedestrian facilities as a standard course of business. Most new roadway projects consider the need for and include improvements for multi-modal facilities. The most significant pedestrian improvement project underway is to provide sidewalk connections throughout the US 13 corridor in Dover. In addition, through the land development process, more stringent requirements have been imposed on developers to include sidewalks and/or shared use paths in conjunction with their projects.

Safety

Bicyclists and pedestrians are at risk of injury from motor vehicles or other hazards along their travel path. Pedestrian and bicycle accident figures suggest that since 2000, decreases in accidents and accidents involving fatalities have been due in part to better marked intersections. Bike lanes and other improvements including sidewalks also have contributed to increasing safety for walkers and bicyclists. Overall, there has been a decline in pedestrians involved in accidents as well as a decline in pedestrian fatalities. There has been an increase in bicyclist fatalities though the number of accidents involving bicyclists has decreased, refer to Table 3.17.

Table 3.17
Kent County Pedestrian and Bicycle Traffic Fatalities, 2002

YEAR	TOTAL CRASHES		INJURY CRASHES		FATAL CRASHES	
	Pedestrian	Bike	Pedestrian	Bike	Pedestrian	Bike
1990	32	26	30	25	2	1
1991	33	21	30	20	3	0
1992	39	17	32	17	7	0
1993	20	20	19	20	1	0
1994	26	21	25	19	1	0
1995	22	28	19	27	1	0
1996	26	27	25	27	1	0
1997	32	22	30	21	2	1
1998	22	19	20	19	2	0
1999	21	20	20	17	0	0
2000	22	16	22	14	1	0
2001	24	22	20	22	4	0
2002	17	17	17	14	1	2

Note: Total crashes include those with injury, fatality, or property damage of $500 or more. Some crashes may not meet these criteria and not be reported in the state reporting system. *Source: DelDOT.*

During 2000 ~ 2002, bicycle and pedestrian crashes accounted for 1.7 percent of all traffic crashes, 4.4 percent of all injury involved crashes and 17 percent of all fatality involved crashes in the County. During the same three-year period, 8.9 percent of all bicycle/pedestrian injury crashes and 11.4 percent of all bicycle/pedestrian fatal crashes in Delaware occurred in Kent County. The total number of crashes has decreased since 1997, except for year 2001.

Bicycle and Pedestrian Planning

DelDOT is actively updating the state's Long Range Bicycle plan that will address the bicycle facilities at both the route and policy levels. The plan, Delaware Bicycle Facility Master Plan, was initiated by DelDOT to determine a statewide network for bicycle routes to fulfill their mission to provide infrastructure for bicycle travel as a transportation option. It is DelDOT's goal to designate and maintain these routes for riders seeking both long touring and utilitarian trips. The effort will build on the success of Delaware Bicycle Route 1. DelDOT is planning to update the state's Pedestrian Plan and Policy. The City of Dover has a bicycle and pedestrian plan, adopted in 1997. Most other municipalities include bicycle and pedestrian planning within their comprehensive plans.

Railroads

According to the Delaware Statewide Long-Range Transportation Plan of 2002, the existing railroad corridors and rights-of-way in Delaware include Wilmington & Northern Industrial Track freight lines; the West Yard owned by Norfolk Southern; the New Castle Secondary and Delmarva Secondary owned and operated by Norfolk Southern (NS); the Northeast Corridor (NEC) passenger rail line owned and operated by the National Railroad Passenger Corporation (Amtrak); the Wilmington and Western Railroad owned by Historic Red Clay Valley Inc.; the state-owned New Castle Industrial right-of-way, which is not in operation; and the state-owned Wilmington & Northern right-of-way, which is also not used. Delaware has five freight railroads and 218 freight rail-miles.

DelDOT has reported that the three major commodities make up approximately 75 percent of local rail traffic: automobiles, coal and chemicals. DelDOT has concluded that rail freight represents an under-utilized resource in Delaware, with the volume of service consistently below the capacity of the rail lines.

Rail Lines

Kent County has fifty-six miles of active freight railroad lines, which are primarily operated by Norfolk Southern, a company that took over from Conrail. These lines include the *Delmarva Secondary Line* and *Indian River Secondary Line.* Both of these lines are rated as "Class 3" railroads by the Federal Railroad Administration (FRA), with standard allowable operating speeds of 40 miles per hour. Amtrak passenger rail service is available in Kent County to bring visitors from Philadelphia and other parts of the state to the Delaware State Fair Grounds in Harrington for one Saturday of the State Fair, and occasionally to NASCAR races at Dover Downs. Figure 3.8 illustrates the following rail lines.

- *Delmarva Secondary Line.* This primary north-south connection along Delmarva is operated by Norfolk Southern and roughly parallels the US 13 roadway corridor. This line continues south into Maryland, making a connection to the Eastern Shore Railroad (ESHR) in Pocomoke, Maryland, and continuing to a barge that floats rail cars across the Chesapeake Bay at Cape Charles, Virginia. To the north, this line connects to the Northeast Corridor, serving many destinations in the northeastern United States. This is the longest rail line in Kent County, spanning 34.5 miles within the county.

- *Indian River Secondary Line.* Another Norfolk Southern line in Kent County, the *Indian River Secondary Line,* connects Harrington with Milford and continues in a southerly direction near the Atlantic coast of Delmarva covering 7.8 miles in Kent County. Primary commodities on these lines include coal, chemicals, agricultural products, forest products, and construction aggregates.

The future of rail in Delaware remains uncertain, but there are positive signs. In recent years, railroads have played a small and diminishing role in Delaware's transportation

system, though they continue to be best suited for hauling bulky, low-value goods. Except for large-volume deliveries to major customers, railroads typically require connections with trucks to start or complete shipments. Nationwide, the railroad industry is seeking to disinvest in low-volume, non-profitable rail lines. This has been true of Norfolk Southern, which is the leading rail freight hauler in Kent County and throughout Delaware. However, with the reopening of the Shellpot Bridge in Wilmington, NS can serve Delaware and the Delmarva more efficiently. NS is therefore stepping up its marketing efforts and considering new intermodal facilities. This will provide new opportunities for shippers and industries to use rail as an alternative to highway and truck transportation.

Rail Yards and Transfer Facilities

Additional intermodal transfer centers, switching yards, and similar facilities greatly increase the feasibility of rail transport. Kent County has two such facilities in operation, offering limited services for rail transport.

- *Corrado America.* A rail-to-truck commodity transfer facility, owned by Corrado America, exists in Felton for the transfer of aggregates but is not in operation.

- *Proctor and Gamble.* This yard services the General Foods and Proctor and Gamble plants on the West Side of Dover. Here, many cars of raw materials arrive from various points in North America for the manufacture of paper and food products.

- *Harrington Yard.* Harrington Yard is a location where train crews report to duty. Here, scheduled freights begin and end their journeys for destinations throughout the northeastern United States. Also, local trains from the *Indian River Secondary* and destinations on the lower Delmarva Peninsula begin and end their journey at Harrington.

Passenger Rail

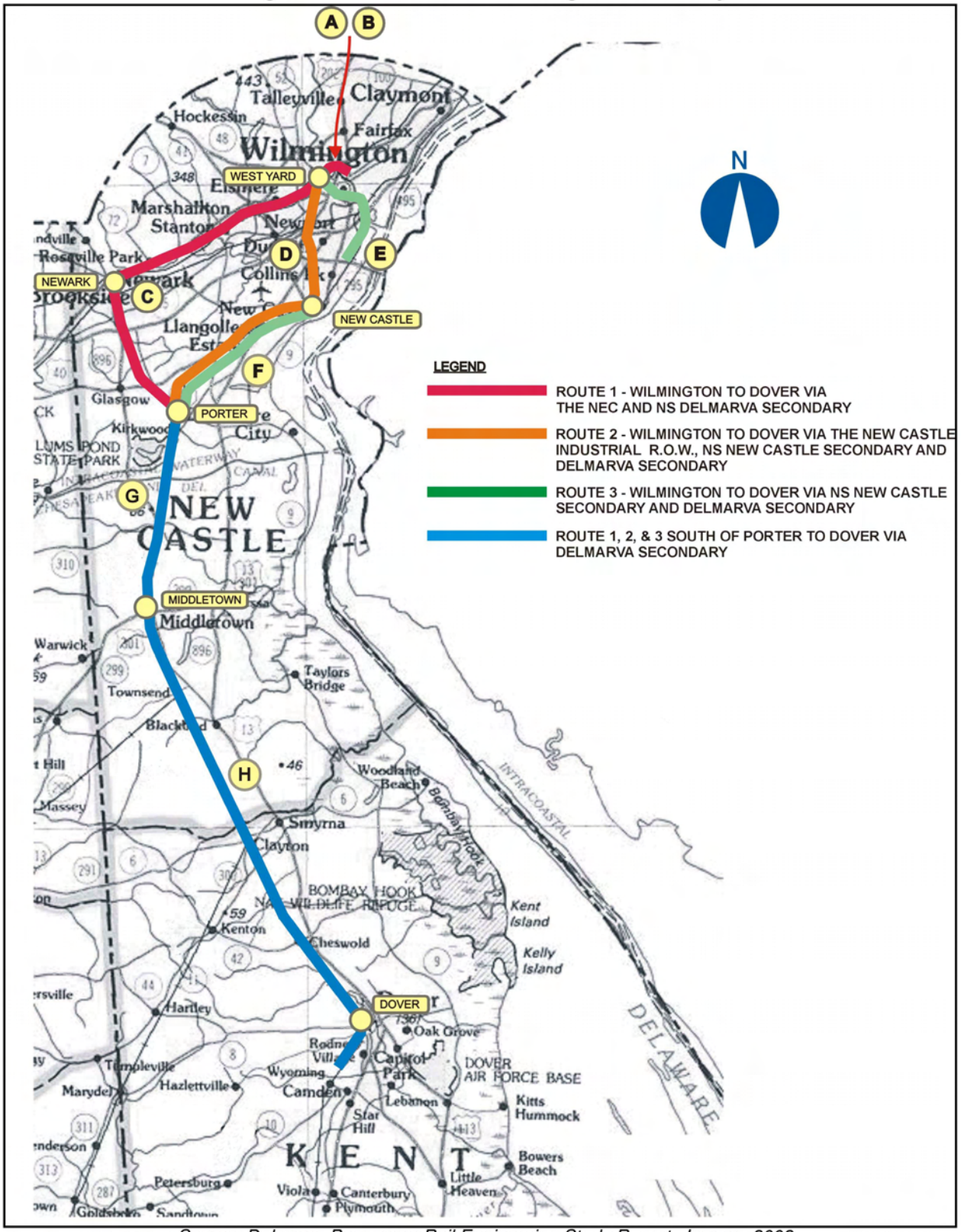
Options for future passenger rail service between Wilmington and Dover are currently under study. Three alternative routes each with an optional alignment into Wilmington were investigated for potential. The proposed routes are shown in the Figure 3.10. Low-end and high-end costs were developed for each of the options providing a range of values. The high-end costs provide an almost fully double-tracked railroad system to operate Wilmington-Dover passenger rail service. Low-end costs provide a suitable single-track operation with passing sidings that is anticipated to be sufficient for initial service. Both low-end and high-end scenarios are compatible with NEC operations, where necessary, and transparent to NS freight operations.

The study considered service between Wilmington and Dover as well as a shorter initial minimum-operating segment that would provide rail service between Wilmington and Middletown. Eight push-pull commuter trains daily were assumed in each direction with seven stations between Wilmington and Middletown and three stations South of Middletown. The study anticipated the earliest rail service between Wilmington and Dover could be operational in 2010.

The range of capital costs for passenger rail service between Wilmington and Dover range between $303 and $477 million including rolling stock and stations. Delaware Passenger Rail Service has a great capacity for growth and will relieve traffic congestion on the highway system. This is particularly important as Delaware continues its rapid growth, particularly in the Middletown area and northern Kent County.

The operating and maintenance (O&M) costs for service between Wilmington and Dover range from $12,333,000 to $13,786,000. This translates to a range of $13.90 to $15.54 per trip for the initial service assumed to begin in year 2010. The O&M costs for service between Wilmington and Middletown range from $5,987,000 to $7,090,000 yielding costs per trip of $11.44 to $12.41. These figures are comparable with the cost of $12.36 per trip for the existing DART bus service. There are also many non-commensurate items such as air quality, energy conservation, traffic systems management, land use, etc. that favor passenger rail.

Figure 3.8 Delaware Passenger Rail Study



Source: Delaware Passenger Rail Engineering Study Report, January 2002

Aviation

Kent County has seven aviation facilities available for public use. The primary aviation facility in Kent County is Dover Air Force Base (DAFB), which permits limited public service at the Civil Air Terminal. A joint use agreement between the Air Force and DelDOT authorizes DelDOT to permit scheduled commuter or commercial charters, that have been approved by DelDOT and the installation commander, as well as general aviation aircraft with two-way radios for communicating with the DAFB Air Traffic Control, to use the flying facilities at DAFB. These flights are subject to certain conditions set forth in the "Joint Use Agreement."

Charter aircraft operations are limited and authorized on a case-by-case basis. Additionally, organizations desiring to conduct operations at DAFB must obtain approval in advance from DelDOT, and DelDOT works with the Federal Aviation Administration (FAA). Aircraft using DAFB are entitled to use the flying facilities for landings, take-offs, and movement of passengers, but can only park at the Civil Air Terminal ramp. Except on NASCAR race days, the total number of aircraft cannot exceed 37 per day and no more than 13,500 per calendar year. The facility has been averaging between 402 and 450 flights each year. Fifty operations per day are allowed on NASCAR race days. DAFB is the largest aerial port facility on the East Coast and is an important part of the economy of Kent County.

In addition to the facilities at the Dover Air Force Base, five of Kent County's other public use aviation facilities provide general aviation services. Another facility, the *DelDOT Helistop* is a publicly owned helicopter-landing pad, located at the DelDOT complex in Dover, and available for public use. An ancillary facility, the *Kent County AeroPark* is a 115-acre county-owned Industrial/business Park located next to the Air Force Base. Several of the 23 lots in the Park are reserved for aircraft related industries. A summary of Kent County's aviation facilities appears in Table 3.18 and Figure 3.9 identifies the locations of aviation facilities.

Figure 3.9
Airport Location

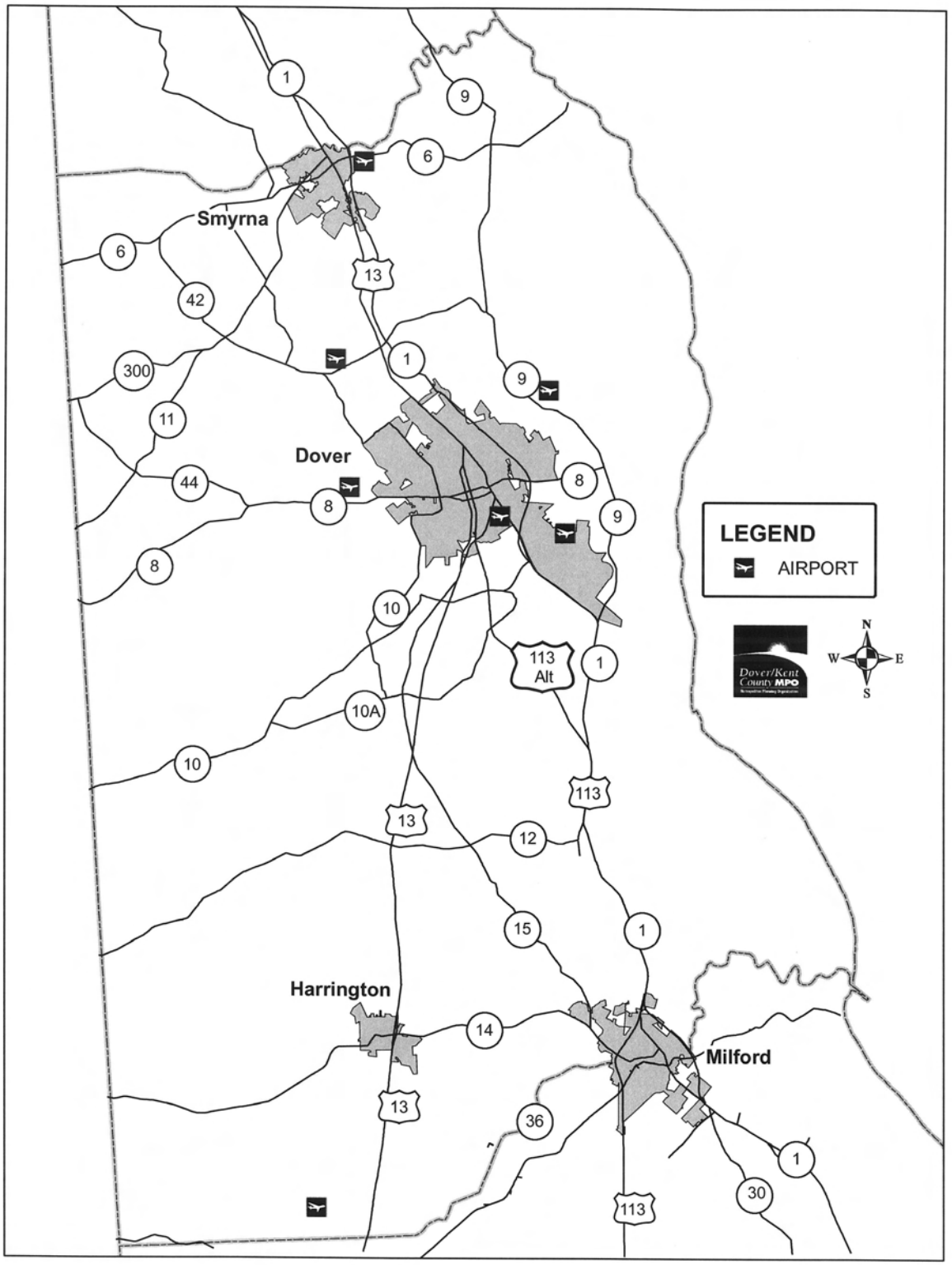


Table 3.18
Summary of Public Use Airports

Name	Location	Longest Runway	Runway Surface	Services	1999 Operations	2000 Operations
Smyrna Airport	Smyrna	2,600 ft	Turf	Hangars, Tiedowns, Avgas	4,500	2,500
Chandelle Estates Airport	Dover	2,550 ft	Paved	Hangars, Tiedowns, Repairs, Avgas	3,500	6,800
Delaware Airpark	Cheswold	3,582ft	Paved	Hangars, Tiedowns, Repairs, Avgas, Jet	8,000	18,000
Jenkins Airport	Wyoming	2,875 ft	Turf	Hangars, Tiedowns, Repairs, Avgas	2,500	2,500
Civil Air Terminal	Dover	13,000 ft	Paved	Fuel By Request	400	400
Chorman Airport	Farmington	3,588 ft	Asphalt	Tiedowns, Repairs, Avgas	NA	2,550
DelDOT Helistop	Dover	60 x 60 Sq ft	Asphalt	None	NA	NA

Source: Delaware Department of Transportation (DelDOT), Office of Aeronautics

The annual number of operations at each public use facility is well within the facility's capacity for annual service volume. However, most of the privately owned airfields are anticipated to provide inadequate capacity over the next fifteen to twenty years. To meet this need, DelDOT acquired the Delaware Airpark in Cheswold in 2000. Activity at this facility has increased considerably since 1999, when there were approximately 800 flights. In 2002, the volume rose to approximately 18,000 trips. Increased activity is due in part to the Airway Science program offered at Delaware State University. The acquisition of this facility by the state is particularly important because it will serve as the only publicly owned airport in the county. Delaware Airpark is operated by the Delaware River and Bay Authority. The Delaware Airpark is actively under study for expansion.

Delaware Airpark is the only publicly owned Kent County airport that has been identified as having potential negative noise impacts, although the degree of these impacts is relatively minor. Another area of concern involving airports is potential safety hazards due to aircraft operations. The FAA has guidelines for designating runway protection zones, and the Air Force maps a potential crash zone around DAFB. Kent County, the City of Dover and DAFB are working on zoning regulations to limit development in potentially hazardous areas.

According to DelDOT statistics, air freight has the smallest market share of goods movement in Delaware, but its potential is great, since air freight is well suited for carrying high-value, low-volume goods. With exception to Dover Air Force Base, more airports service corporate and pleasure-related activity. DelDOT has indicated that the Civil Air Terminal at DAFB was at 3.3 percent of capacity in 2002 and is expected to reach 26.7 percent of capacity in 2015.

Delaware has made good progress on implementing several important recommendations from the 1998 Delaware Aviation System Plan. A high priority issue for Kent County was the provision of general aviation facilities. To this end, DelDOT purchased the Delaware

Air Park (Cheswold) in 1999 and has been working since then to follow-through with Plan-recommended runway expansion project for that airport which will allow expanded use. Property acquisitions have been identified and are currently being pursued as a prelude to actual construction.

Another major goal of the State Aviation System Plan is to foster economic growth by increasing private use of airports (tourism, recreational flying) as well as seeking commercial air carriers to provide passenger and airfreight services. One important development in this direction is the hand-off of management of the Delaware Airpark and the Dover Air Force Base Civil Air Terminal (CAT) to the Delaware River & Bay Authority. DRBA's leadership will allow their considerable resources to be used to develop these services and other business activity at the airports.

DelDOT has just finished an Air Cargo study for the Civil Air Terminal. The study recommends expanding the facility to accommodate commercial (privately owned) air cargo that serves the military base. This activity could lay the groundwork for additional non-military-oriented commercial airfreight in the future as demand grows in the region. At the request of the local advisory committee, the study also looked at the concept of expanding the CAT facilities to accommodate aircraft traffic related to the bi-annual NASCAR events at Dover Downs. This expansion would help Dover remain competitive as a venue for NASCAR by allowing more and larger aircraft to directly access the city.

Along with the development of these airport projects, which will require the greatest amounts of capital spending, additional land purchases, and extensive planning, the Aviation System Plan lays out the role of smaller airports in Kent County. Chandelle Estates and Chorman airports are two small airports that are recommended for improvements to their existing facilities by virtue of their having asphalt (all weather) landing strips. Chorman's runway is long enough to accommodate business jets. Each is recommended to be widened to for additional safety and to receive additional navigation aids to increase their hours and conditions of operation.

Other small airports - Henderson, Jenkins, and Smyrna - have turf landing strips and primarily serve recreational fliers and may offer specialized services; For example, Jenkins has an aircraft parts salvage business. They fill an important niche that must exist or that business will either shift to larger airports (taking up needed capacity) or simply be lost. The Plan envisions continued support for these airports (for example: elimination of obstructions), but there are no plans for physical expansion.

Marine

Rivers, ports, bays, and estuaries are all used for movement of people, goods and services and can also serve as recreational destinations and recreational uses. In Kent County, the Delaware Bay, Leipsic River, St. Jones River, Murderkill River, and other waterways provide avenues for recreation as well as the movement of people and goods.

The estuary formed by the Delaware River and the Delaware Bay meets the Atlantic Ocean at Cape Henlopen, south of Kent County. Part of the Intercoastal Waterway, which runs along the entire eastern seaboard, this estuary is also a major shipping channel serving the ports of Wilmington and Philadelphia.

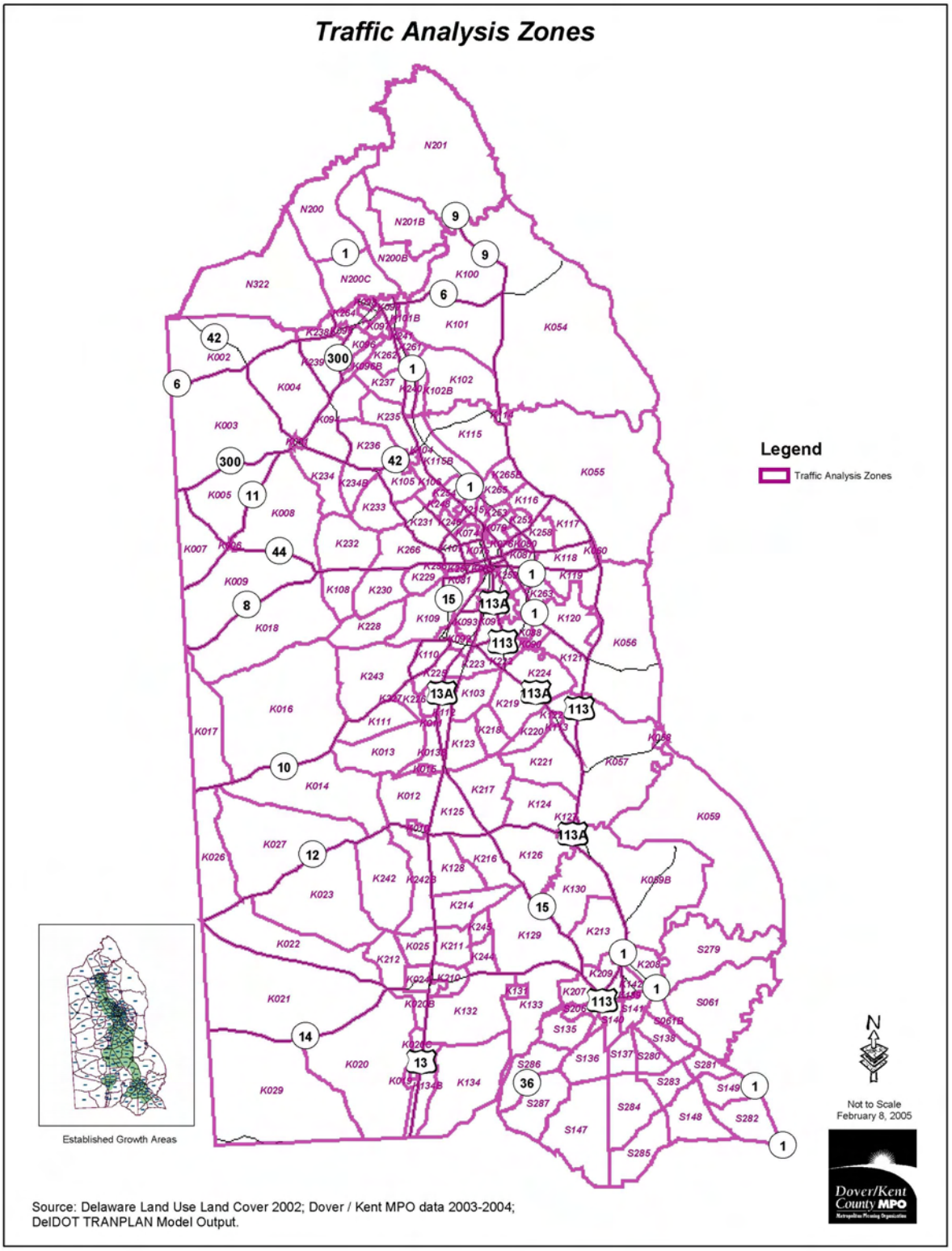
With the onset of World War II, the United States Army Corps of Engineers began to deepen the Delaware's shipping channel to a depth of 40 feet. Today, the Corps dredges an average five million cubic yards of material annually to maintain the channel at this depth. Without continuous dredging, the channel would be only eighteen feet deep, and unable to accommodate the largest ships bound for the ports upstream. Considered as a whole, the bay/river is the world's largest freshwater port and the combined activities of the various shippers using it rank the waterway second in the United States in total waterborne commerce. The Delaware River carries approximately 2,700 ships per year to and from several public port facilities and private industry facilities along its banks in Delaware, Pennsylvania, and New Jersey.

Most of the bay coastline in Kent County is marsh, and forms the Bombay Hook National Wildlife Refuge and other important wildlife areas. Therefore, most of the water access in the county is in small-scale recreational use. The commercial and recreational fishing facilities in Bowers Beach are the most significant docking facilities in the county; however smaller operations can also be found in Leipsic.

Demand for Transportation Facilities and Services

The demand for transportation facilities and services is typically identified through a transportation planning process that conducts trip generation and travel demand analysis that supports the identification of areas in need of various types of transportation improvements. Land use analysis of existing conditions and forecasted conditions provides the basis for transportation forecasting. In order to conduct both the land use and transportation analysis for both current conditions and future conditions, the study area is divided into traffic analysis zones. A traffic analysis zone (TAZ) is a unit of geography used in transportation planning models. The spatial extent of the zones typically varies from very large areas in rural areas to smaller areas in more urbanized areas. The areas are defined based upon population and housing units and are based upon Census data. Due to recent growth, documented by the 2000 Census, the TAZs used to support both land use and transportation forecasting are depicted in Figure 3.10.

Figure 3.10
Traffic Analysis Zones



According to the Statewide Long Range Transportation Plan of September 2002, there are three major transportation trends and challenges facing Delaware that impact the demand for transportation facilities and services. Those trends continue to be predominant issues with respect to transportation. The trends and challenges include rapid growth, a "graying" population, and an "aging" infrastructure.

Rapid growth refers mainly to unchecked or unmanaged growth that can lead to capacity, congestion, and access issues among others. A "graying" population refers to the fact that fastest growing population sector of Delaware is the elderly sector (age 65 years or older) which is anticipated to grow by 74.7% over the next 25 years. An elderly traveler's demands and needs include safer roads, clearer signage, out-reach programs, para transit, and in some cases, public transportation.

Aging infrastructure impacts travel safety and these issues include maintenance, care, attention, and costs. Also in Delaware, as the population continues to increase people start to place greater demands for more modes of transportation and alternatives means of travel from the automobile. The following variables are used to describe the demands and needs of the traveling population, and provide a basis for comparison of needs and demands over time.

Relationship of Transportation and Land Use

There is a direct relationship between transportation and land use; therefore, land use affects the level of demand for transportation services. Land use patterns and densities support various levels and types of transportation services. For example, where land is used in a low-density pattern, frequent transit service is in low demand and not cost-effective.

This relationship between transportation and land use affects decisions about the needs for transportation facilities, services and programs. Land use patterns are determined by population and economic growth within various regions. Projected employment and population growth translate to growth in traffic volumes in specific geographic areas. Therefore, transportation planning should provide for a transportation network and system that reflects existing and proposed land use patterns. Investments in the transportation system are expected to support existing development and future growth and/or redevelopment.

Land use policies must account for growth and development in the context of transportation issues such as congestion and concurrency. This means that the transportation facilities must be adequate, based on adopted service standards, to serve proposed development. If existing transportation facilities are not adequate for the proposed development, either the development must be denied or adequate transportation facilities or demand-management strategies must be provided concurrently with development. This long range transportation plan takes this relationship between land use and transportation into account.

Existing Land Use

The predominant source of existing land use data was the 2002 statewide land use / land cover data. Municipal data and other land based data were also used to augment the state's data, as well as Purchase of Development Rights (PDR) data provided by the Delaware Department of Agriculture, and floodplain data from the Delaware Department of Natural Resources and Environmental Control (DNREC) which originated with the Federal Emergency Management Agency (FEMA).

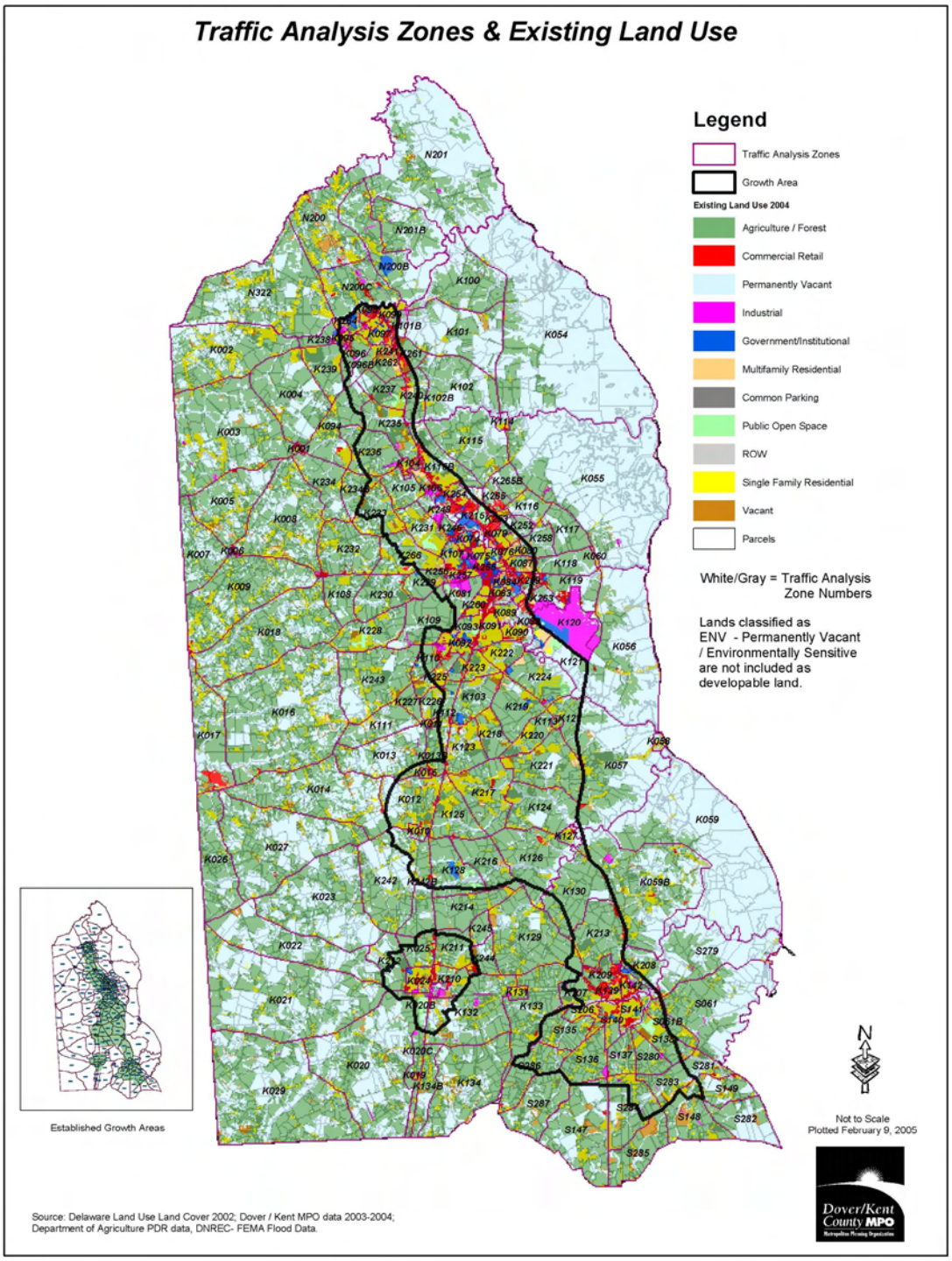
As Table 3.19 and Map 3.11 illustrate, the predominant land uses in the Dover / Kent County MPO region includes agriculture / forest and permanently vacant – environmentally sensitive land uses. Residential land uses comprise 9.3 percent of the total land in the study area.

Table 3.19
Land Use - Existing Conditions

Existing Conditions Land Use*	Acres	Percent of Total
Agriculture	222,433	48.0%
Commercial	6,723	1.5%
Public Open Space	2,000	0.4%
Government/Institutional	2,413	0.5%
Industrial	3,749	0.8%
Common Parking	21	0.005%
Multifamily Residential	2,148	0.5%
Single Family Residential	40,722	8.8%
Streets/Right of Way	2,508	0.5%
Vacant	6,314	1.4%
Permanently Vacant – Environmentally Sensitive	174,614	37.7%
Total	**463,645**	**100.0%**

Includes PDR and 100 Year Floodplain Adjustments

Figure 3.11


Traffic Analysis Zones & Existing Land Use
Legend
Traffic Analysis Zones
Growth Area
Existing Land Use 2004
Agriculture / Forest
Commercial Retail
Permanently Vacant
Industrial
Government/Institutional
Multifamily Residential
Common Parking
Public Open Space
ROW
Single Family Residential
Vacant
Parcels
White/Gray = Traffic Analysis Zone Numbers
Lands classified as ENV - Permanently Vacant / Environmentally Sensitive are not included as developable land.
Established Growth Areas
N
Not to Scale
Plotted February 9, 2005
Source: Delaware Land Use Land Cover 2002; Dover / Kent MPO data 2003-2004; Department of Agriculture PDR data, DNREC- FEMA Flood Data.
Dover/Kent County MPO

Goods Movement

The US Department of Transportation measured Delaware goods shipments in a 1997 Commodity Flow Survey. The survey indicated that Delaware goods shipments valued nearly $17 Billion and weighed 24 million tons. A majority of shipments were moved by truck (73.3% by value and 64.4% by weight). The main commodities shipped from Delaware were chemicals, plastic and wood, food, electronic and office equipment, pulp, paper and textiles.

As previously indicated, the dominant means of goods movement in Kent County, as in all of Delaware and the United States, is trucks. Trucks move about 80 percent of the total volume of manufactured goods to and from Delaware each year. The use of trucks has been increasing, due in large part to past expansion of the highway network, federal deregulation of the trucking industry, changes in business and manufacturing industries, and the lack of viable, effective alternatives across Delaware.

In Kent County, US 13, US 113, and SR 1 are major truck routes. US 13 is the principal freight transportation route for private and for-hire motor carriers in Delaware. Seventy-three percent of Kent County's motor carriers use US 13. On average, it is used 13 hours per day and close to six days per week. In 1994, roadways with the highest estimated percentage (>15 percent) of truck traffic included portions of:

- US 13 - Sussex County to Harrington
- DE 9 - Leipsic
- DE 42 - Kenton
- DE 6 at RD 95
- RD 275 and 279 west of Harrington
- RD 316 south of Harrington
- RD 384 from Sussex County Line to US 13

High truck traffic volumes have also been recorded through Farmington, Felton, Woodside, Camden, Wyoming, Cheswold, and Smyrna. The only Kent County location identified as having low clearance for trucks is DE 14 in Milford at the Mispillion River that forms the Kent County boundary.

The high degree of dependence on trucks has given rise to several concerns, including road capacity, safety, accelerated damage to the highway system, air quality, noise and the overall impact of truck traffic on community and neighborhood integrity, character and quality. In several areas throughout the state, shippers, carriers, and the community have made special efforts to direct trucks to designated routes. According to DelDOT statistics, from 1999 to 2002, the number of trucks in crashes, personal injury crashes and property damage crashes has fallen significantly. Other communities have expressed interest in route designation, but the nature of the authority and the basis for undertaking a comprehensive program of this type are not firmly established. Another approach to easing the impacts of trucking and roadway congestion is to encourage the multimodal movement of people, through transit, non-motorized modes, carpools, and other means, in order to lessen the overall burden on congested roadways used by trucks.

Table 3.21
Mode Choices

Mode / Year	1990	2000
Drove Alone	77.7	79.7
Carpooled	14.4	12.9
Public Transportation	0.6	0.8
Bicycle or Walked	3.4	2.5
Motorcycle or Other	1.1	1.0
Worked at Home	2.8	3.1

Source: 2000 CTPP Data for Dover / Kent MPO

Through, Regional, and Local Trips

An understanding of the type of trip demand is important in assessing and planning for future transportation needs. Trips can be classified into three types based upon the origin and destination of the trip. These types are Through, Regional, and Local.

- *Through.* Through trips neither originate nor terminate in Delaware. The key roadways in Kent County that carry through traffic are US 13, and SR 1.

- *Regional.* Regional trips include trips that originate in one county of the state and terminate in another county or out-of-state, or vice versa. Key roadways in Kent County that carry regional traffic are DE 8 and DE 300.

- *Local.* Local trips originate and terminate within the same county. Local traffic may use all types of roadways.

An understanding of the local, regional, and through-trip characteristics that predominate certain corridors and trip types can guide appropriate investment strategies. The differing needs and conflicts created by these differences require specific strategies and actions. The separation of through traffic from local traffic is critical to efficient system performance and user satisfaction. For example, US 13 through Dover carried approximately 9 percent through trips, 49 percent regional trips, and 42 percent local trips in 1995. The predominance of local trips on this major through and regional corridor has resulted in congestion, driver dissatisfaction, and overall system inefficiency during many hours of the day. The SR 1 bypass around Dover was constructed to relieve some of the through and regional trip needs that were competing for capacity with local trips on US 13. Indirect east-to-west access to many major through trip facilities, including those outside of Kent County (such as US 301), creates further mixing of through, regional, and local trips.

Tourist access, goods movement, and day-to-day needs of local residents challenge the creativity of solutions that direct appropriate trip purposes and development patterns to appropriate corridors. Even details of roadway design - turn radii, provision of sidewalks, paved shoulder width, signal spacing and timing, lane widths, etc. - are driven by the type of trips that will be made on the corridor. Using a "one-size fits all" design of roadways does not cater to the specific needs of different trip characteristics. Similarly, the broad solution - roadway network expansion, transit services, bicycle and pedestrian facilities,

ridesharing programs, Intelligent Transportation Systems (ITS) technologies, etc. - must be decided based upon the type of trip that the corridor is serving. The separation and distinct accommodation of trips for through, regional, and local trips must be a focus of long-range planning strategies.