Chapter 8
Transportation and Circulation Inventory

This Chapter analyzes the existing circulation system of New Garden Township. The inventory provides an assessment of the Township road network including the location, ownership, and condition of roadways which serve existing and projected populations. As the Township continues to grow, increases in traffic volumes and changes in traffic patterns must be monitored to mitigate congestion and hazardous conditions while maintaining the scenic character of the Township and standard of living for residents. An understanding of existing conditions including safety, traffic volumes, and function of the Township roadways allows for the development of strategies to address future transportation and circulation needs.

Planning for transportation and circulation needs provides the opportunity to maintain a safe and efficient transportation system that is sensitive to the scenic characteristics of the rural portions of the Township, while providing an effective roadway system that manages traffic volumes through the more developed portions of the Township. The needs identified by the planning implications at the end of this Chapter are addressed by the recommendations in **Chapter 14, Transportation Plan**.

CIRCULATION SYSTEM AND FUNCTIONAL CLASSIFICATION

This section provides an overview of the circulation facilities of the Township and a detailed analysis of select intersections. From this analysis, specific planning issues are identified which must be addressed within the circulation plan.

The Township circulation system is comprised of 67 miles of public roadway. Of this, 45 miles are owned and maintained by the Township. These roadways tend to be small rural roads with low vehicular capacities and limited shoulder widths. The remaining 22 miles comprise nine separate roads that are state-owned and maintained. These roadways serve as the principal routes of movement throughout the Township.

Functional Classification

Roadways are classified according to the function and purpose they serve. The Existing Highway Functional Classification System was established by the Transportation Plan from the 1993 Comprehensive Plan. The following factors are used to determine functional classification for roads:

- Volumes of traffic
- Mobility
- Accessibility
- Corridor length
- Relationship and connection to other roadways
- Truck traffic
- Road layout and design
- On-street parking
- Amount of through traffic
- Vehicle speed, and
- Bicycle and pedestrian access.

The functional classification system is comprised of the following classifications:

Expressways serve the highest volumes of traffic. Access is limited to interchanges. They service the longest trip lengths and facilitate traffic on an interstate and inter-regional basis. Expressways provide optimum mobility and provide for highest travel speeds.

US Route 1 is classified as an expressway because of the heavy, long distance volumes of traffic it carries over its four lanes. Access is very limited and there is only one access point in New Garden. This access occurs at the intersection of US Route 1 with Newark Road in the northern end of the Township. New Garden has 2.96 miles of US Route 1 running across its northern boarder, just south of the Township line.

Major Arterials serve large volumes of traffic at relatively high rates of speed. They provide higher types of services and facilitate traffic over long distances on an intercounty or interstate basis. Access points are somewhat limited and controlled.

PA Route 41 is classified as a major arterial road. The highway has two travel lanes and carries relatively high volumes of traffic. Access is a growing concern as development along Route 41 continues, and may effect traffic flow on an interstate basis between Pennsylvania and Delaware. Limestone Road intersects with Route 41 in the southeastern corner of the Township and heads south into Delaware, where it becomes Delaware Route 7. Route 7 turns into a four-lane road in Delaware and connects the Township with important employment and shopping centers in Delaware.

Minor Arterials interconnect with and augment the principal arterial system. These roads provide services to trips of moderate length and have controlled access points. Minor arterials provide greater access to adjacent land than principal arterials.

Baltimore Pike is classified as a minor arterial road. Baltimore Pike connects Kennett Square and eastern locations with Avondale and other western locations. Baltimore Pike is 3.6 miles in length through the Township and splits from a two-lane roadway to two two-lane one way divided sections east of Chambers Road.

Major Collectors connect municipalities and incorporated centers. These roads are the major feeders to arterial traffic and carry fairly heavy traffic volumes at moderate rates of speed. Access points are usually controlled and it is not uncommon for a major collector road to span the entire length of a community.

Newark Road is the primary north-south route through the Township and is a State roadway. It carries high volumes of traffic despite its two lane width and rolling nature as it connects Route 41 with the US Route 1 bypass and is a means for traffic to circumvent the Borough of Avondale.

Minor Collectors facilitate relatively low volumes of traffic at lower speeds. They gather traffic from local roads and direct it to the arterials and major collector road networks. Minor collectors often provide traffic circulation between and within residential neighborhoods.

New Garden contains two minor collectors within its boundaries, including Hillendale Road and Broad Run Road. Broad Run Road is a state owned roadway west of Newark Road, while the Township owns Hillendale Road.

Distributors provide a connection from neighborhoods to collector and arterial roadways. Local distributors provide for short distance, low speed connectivity to other principal roadways within a municipality.

The majority of distributors are found in the southern portion of the Township. These include Bucktoe Road, Laurel Heights Road, Sunny Dell Road, Southwood Road, and sections of Broad Run Road and Buttonwood Road. In addition, Line Road, Church Road, Cedar Spring Road, and Scarlett Road are local distributors found in the northern half of the Township.

Local roads provide the greatest access to individual properties within a municipality. These roadways include small rural roads and streets within a development.

The remaining Township roads in the municipality are identified as local roads. They are mainly used to handle local traffic and by individuals accessing residential or rural areas.

The functional classification of roads in the Township are displayed on **Map 8-1**.

Commuting Patterns

An understanding of the travel patterns within the Township will assist in evaluating the road network from level of service and future function perspective. Comparing 1990 and 2000 US Census data can identify important changes and patterns. A significant number of Township residents commute into Delaware, particularly the cities of Newark and Wilmington. The 2000 Census reported that 36 percent of employed Township residents traveled outside of the Commonwealth for employment. Compared to 24 percent in 1990, this demonstrates an increasing pattern of employment dependence on out-of-state employment destinations. The largest area of resident employment was in New Castle County, Delaware (32%), followed by New Garden Township (24%). Other large employers of Township residents include: Kennett Square Borough (5.4%), Kennett Township (5.2%), West Goshen Township (2.9%), and the City of Philadelphia (2.2%). Generally, the areas of New Castle County, Delaware, the Township, and neighboring municipalities can be identified as primary areas of employment. Secondary areas of employment include the municipalities along the Route 202 Corridor and Delaware County.

For a full understanding of commuting patterns, it is important to understand where those who work in the Township originate. Many workers employed in the Township also reside in the Township (24%). Other areas drawing workers to the Township include New Castle County (28%); Kennett Square (5%); and Kennett Township (5%). Notably, the strong presence of New Castle County residents infers that there is a significant amount of workers coming from Delaware for employment in the Township.

Dependency on the car is an increasing trend in the Township. The average number of vehicles per household increased slightly from 1.88 (1990) to 1.98 in 2000. In addition, the number of workers driving alone to work increased from 64 percent in 1990 to 77 percent in 2000. This increase in car dependency caused notable drops in carpooling, from 14.9 percent (1990) to 10.1 percent, and walking, from 15.6 percent (1990) to 6.6 percent in 2000. However, the percentage of carpooling and walking remains above the 2000 Chester County averages of 9.6 percent and 2.5 percent respectively. The use of public transportation as a means of getting to work remained low at 0.2 percent. Further discussion on alternative forms of transportation is located in the Alternative Forms of Transportation section of this Chapter.

Car dependency, coupled with the magnitude of development in the Township, has impacted the amount of time residents are in their cars. The average travel time it takes to get to work for Township residents has increased since 1990, from 17.3 minutes to 24.7 minutes. This increase in commute time is also impacted by the increase in the number of residents who work in Delaware. Despite its average commute time, the

Township has a high percentage of workers who get to work in less than 5 minutes (11 percent) compared to a County average of only 3 percent. This figure reinforces the observation that many Township residents work within the Township.

Overall, a trend of increased car dependency and longer commutes is prevalent within the Township. The data suggests the following trends: 1) there is a noticeable increase of low-density residential housing in the Township, which relies on vehicular commutes; and 2) there is an increasing reliance of residents to seek employment in the State of Delaware.

TRAFFIC VOLUMES AND LEVEL OF SERVICE

Intersection Counts

Specific intersections were selected for study under this plan update. In order to understand the current circulation conditions, it is necessary to have an understanding of Township traffic trends. From the data obtained at these intersections, it was possible to determine a variety of useful information. This information includes the peak traffic hours for the morning and evening, measuring the percentage of trucks that travel on the roads, and developing a capacity indicator called Level of Service.

For the purposes of this plan, four intersections were studied:

- Baltimore Pike and Newark Road
- Baltimore Pike (Eastbound) and Scarlett Road
- Baltimore Pike (Westbound) and Scarlett Road
- Newark Road and Buttonwood Road

These intersection counts, in addition to other recent traffic counts on Route 41 and Limestone Road, provided a thorough foundation for the analysis. A tube counter was placed on Hillendale Road near the intersection of Hillendale Road and Newark Road. **Figure 8-1** shows the traffic each intersection experiences during peak hours for both the morning and evening.

The morning (AM) peak figures indicate a general pattern of traffic heading east or southward. On average, the intersection counts revealed a morning peak in traffic around 7:15-8:15 AM. The dominant AM traffic flow is heading southward on Route 41. Several collector roadways, Newark Road, Sunny Dell Road, and Starr Road, serve significant amounts of traffic headed for Delaware. Traffic volumes on Route 41 reach their highest figure approaching the Limestone Road interchange where substantial amounts of traffic head south on both major roadways. As the US Census data indicated, there is a significant amount of traffic also heading north, especially from Limestone Road, into the Township.

The other major traffic pattern during the AM peak is a substantial flow heading east on Baltimore Pike and the Route 1 Bypass. Traffic on these roadways is generally headed toward the neighboring municipalities of Kennett Township and Kennett Square along Baltimore Pike or to other large employment centers such as the 202 Corridor or Delaware County using US Route 1.

An unusual pattern observed at the intersection of Newark Road and Buttonwood Road was a pattern of northbound commutes on Newark Road from Buttonwood Road. A reciprocal flow of return trips is also identifiable during the PM peak. In addition, this intersection experienced an early AM peak between 7:00 AM and 8:00 AM. This observation reiterates that residents in areas south of the Township in Delaware and Maryland are traveling to New Garden for employment.

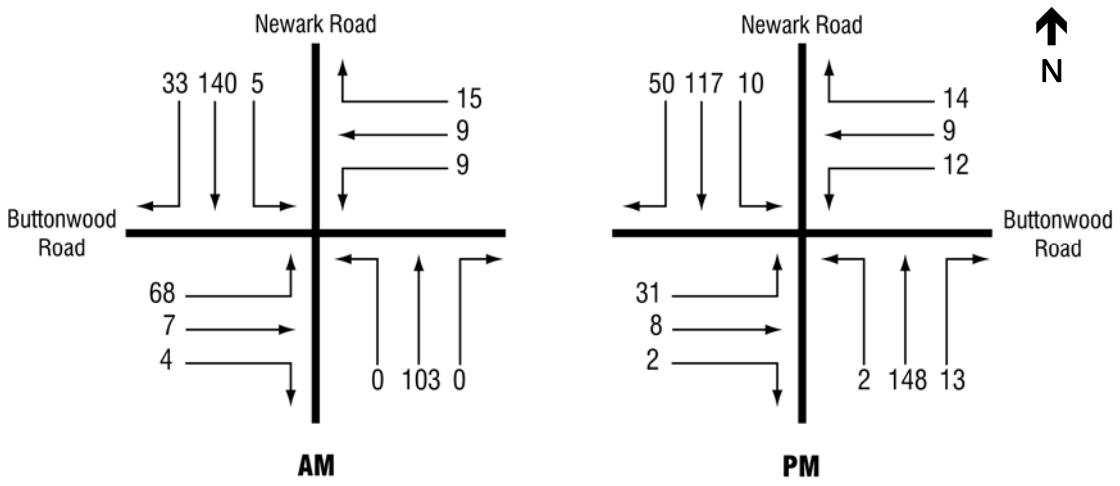
The intersection counts revealed less predictable traffic patterns during the evening (PM) peak, along with greater overall traffic volumes. Certain reciprocal movements, such as large volumes returning from

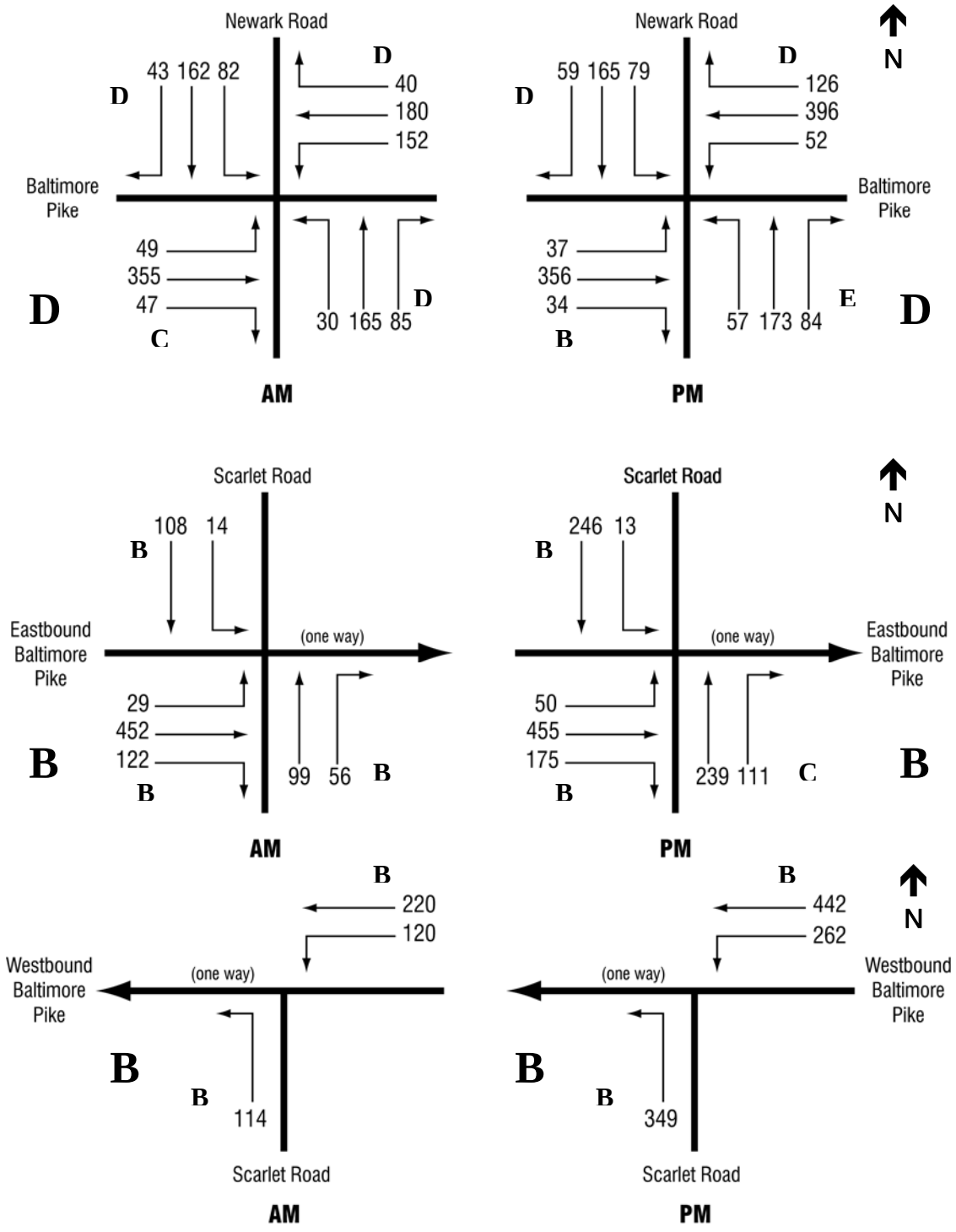
Delaware via Route 41 and Limestone Road, were evident as expected. Along Route 41, the amount of left-hand turns onto collector roadways like Sunny Dell Road and Starr Road is particularly concerning. The high-speed nature of Route 41, combined with substantial left-hand turns, yields concerns of traffic safety and congestion.

The study of the Route 41 and Limestone Road interchange revealed an unexpected pattern. While a reciprocal flow of traffic from Delaware was identified as expected, traffic counts revealed a substantial flow heading southbound on Limestone Road. Traffic volumes on the ramp from Route 41 south to southbound Limestone Road indicated that traffic volumes were higher during the P.M peak than the A.M peak. This pattern was confirmed by an intersection count south of the interchange at Limestone Road and Southwood Road. This pattern suggests again that the relationship between the Township and New Castle County is becoming increasingly significant. In addition, attractions such as tax-free shopping in Delaware may draw Township residents to the large areas of commercial development along Delaware Route 7.

Intersections along Baltimore Pike identified an expected reciprocal flow heading westward from Kennett Square. However, volumes throughout Baltimore Pike were noticeably higher for all turning movements during the PM peak. This noted increase can be explained by the concentration of commercial areas along Baltimore Pike and increasing residential development throughout the region. Commercial areas tend to alter commuter travel patterns during the afternoon drive home. For example, a resident living in West Grove and working in Kennett Square may take US Route 1 in the morning, but may choose to return home via Baltimore Pike in order to run various errands after work. This pattern is noticeable at the intersections of Baltimore Pike and Scarlett Road during the PM peak.

Figure 8-1: New Garden Township, Traffic Counts, 2003





Source: Chester County Planning Commission, 2004

Level of Service

Level of service analysis is used to establish the efficiency of traffic mobility on a roadway segment, intersection, or roadway interchange. Level of service (LOS) is a comparison between the volumes of traffic that use a road or intersection and the maximum capacity that the same road or intersection is able to handle. The capacity of an intersection or roadway is based on a series of criteria, including the number of lanes, the width of the lanes, the presence or absence of any turning lanes, the percentage of trucks that are present, the type of signaling device, and various other factors.

LOS is expressed using the letters A through F. A is considered to be the best possible driving situation in which a driver may move totally independent and without the influence of any other motor vehicle. With a LOS of A, a driver feels the least amount of anxiety because of the ability to drive at any desired speed without pressure from outside influences. As the LOS moves closer towards F, driving becomes more difficult. It is necessary to move at the same speed as other vehicles, and it is difficult to maneuver from one lane to another. Driving at LOS B is more difficult than A, C is more difficult than B, and so on until a LOS of F is reached. At a LOS of F, volumes of traffic become too large for the capacity of the road or intersection. Traffic at a LOS of F is forced, and heavy traffic back-ups result. **Figure 8-1**, above, shows the LOS for the signalized intersections counted in the summer of 2003. Newark Road and Buttonwood Road does not have a traffic signal so LOS was not calculated for that intersection.

The intersection of Newark Road and Baltimore Pike experienced an overall LOS of “D” for both the AM and PM peak hour. A level of service of “D” occurred at a majority of movements during both peak hours. Eastbound Baltimore Pike experienced a lower level of service “C” during the AM peak hour, partially due to the lower number of turning movements in this direction and the lower volume on westbound Baltimore Park during the AM peak. Despite lower volumes, westbound Baltimore Pike experienced a LOS of “D”, most likely because of the amount of left hand turns which conflict with the higher through volumes on eastbound Baltimore Pike. Both northbound and southbound Newark Road experienced a LOS of “D” except the LOS of “E” on northbound Newark Road in the PM peak hour. Despite the lower volume than Baltimore Pike, the tight turns and the grade of the northbound leg of Newark Road clearly cause issues resulting in a lower level of service. The amount of trucks on this road exacerbates this problem.

The intersection of Baltimore Pike with Scarlet Road occurs at two locations because of the two one-way separated sections of Baltimore Pike. All overall LOS calculations resulted in an LOS of “B” despite the relatively high traffic volumes at these two intersections. The one-way nature of Baltimore Pike reduces conflicts between turning movements, coupled with two lanes in each direction and actuated signals for Scarlet Road, resulting in intersections that function at acceptable levels.

Truck Volumes

Truck volumes are an essential part of any traffic study. Trucks pose an additional set of concerns than those associated with the passenger automobile. They reduce traffic flow and speed, cause more damage to the road surface, and create more noise problems. While the traffic volumes were counted for this comprehensive plan, trucks were counted separately from passenger automobiles. All vehicles were counted as trucks if they possessed more than two axles. This included any vehicle pulling a trailer. School buses were also counted as trucks because of the constraints they put on other motorists.

Figure 8-2 shows the overall truck volumes at each intersection for the AM peak hour, PM peak hour, and the total period studied. Data is included from traffic counts completed in 1993, 1998, and 2003 to provide a comparison and identify trends. Both Route 41 and Baltimore Pike have been designated as priority truck routes by PennDOT. This designation identifies routes that have no constraints for trucks. Because of this assignment, these roads should have higher truck percentages than the remaining roadways. Route 41 has

the highest percentage of trucks, with counts recording as high as 25 percent of traffic volumes for a 24-hour period for light trucks and 9 percent for heavy trucks. It is evident that truck traffic has risen on Route 41 over time and that these high levels of truck traffic will remain an issue due to the importance of Route 41 as the primary connection from Wilmington to central Pennsylvania and to more remote locations beyond.

The 2003 traffic count at Baltimore Pike and Newark Road shows that truck traffic continues to increase in comparison to the 1993 data. Additionally, the trend of significantly more truck traffic during the AM peak hour continued between 1993 and 2003. This trend was also identified at the intersection of Newark Road and Buttonwood Road, although volumes at that intersection were much lower.

Figure 8-2: New Garden Township; Truck Traffic Percentages, 2003 (1993)*

Intersection	AM Peak Hour	PM Peak Hour
Newark Rd. & Buttonwood Rd.	3.6%	0%
Newark Road	4.3%	0%
Buttonwood Road	1.8%	0%
Newark Rd. & Baltimore Pike	14.2% (9.9%)	6.1% (4.4%)
Newark Road	13.4% (11.8%)	4.7% (3.8%)
Baltimore Pike	14.2% (10.9%)	6.9% (4.7%)
Baltimore Pike (Westbound) & Scarlett Road	13.0%	2.0%
Baltimore Pike	12.6%	2.1%
Scarlett Road	14.0%	1.7%
Baltimore Pike (Eastbound) & Scarlett Road	11.0%	2.8%
Baltimore Pike	11.1%	4.3%
Scarlett Road	10.8%	1.1%
PA 41 and Newark Road (1993)*	(15.1%)	(9.4%)
PA 41	(18.6%)	(10.7%)
Newark Road	(8.0%)	(5.8%)
Baltimore Pike and PA 41**	20.1%	
Baltimore Pike	12.6%	N/A
PA 41	22.0%	
PA 41 and Penn Green Road***	11.5%	
PA 41 (Total for both peak hours)	12.8%	N/A
Penn Green Road (Total for both peak hours)	6.3%	
Route 41 (just north of Kaolin Road)****	25% light trucks 9% heavy trucks	-

Source: Chester County Planning Commission, 2003.

* 1993 New Garden Comprehensive Plan

** 1998 Intersection Count of AM Peak (10:00 AM – Noon) only; CCPC.

*** 2002 Traffic Impact Study for proposed Happy Harry's Pharmacy, prepared by Brandywine Valley Engineers.

**** I-95, US 202, and PA 41 South Cordon Stations and Chester and Delaware Counties, Report 2; Delaware Valley Regional Planning Commission. September 2002.

Traffic Volumes and Anticipated Traffic Growth

An analysis of historical Average Daily Traffic Volumes (ADT), conducted by the Chester County Planning Commission and Delaware Valley Regional Planning Commission, can identify increases in traffic volume on major roadways within the Township. **Map 8-2** shows a summary of ADT traffic volumes in the Township. Notable increases can be identified on all of the Township's major roadways: Route 41, Baltimore Pike, Limestone Road, and US Route 1. Baltimore Pike, from Newark Road to Thompson Road experienced the most significant increase, approximately 83 percent between 1990 to 2002. The Township's growing population and an increase in commercial development activity can explain traffic increases in this area of Baltimore Pike.

While traffic volumes on Route 41 increased at a lower rate, the overall traffic volume and amount of truck traffic continues to become an increasing concern. With the exception of US Route 1, the stretch of Route 41 from Sunny Dell Road to Limestone Road has the highest ADT in the Township. The mixture of through truck traffic, local residential, and commuting traffic creates significant safety and congestion concerns. In addition, because of the substantial volume on Route 41 only minor increases in traffic volume can lead to significant problems.

Traffic volume increases on the Township's collector roadways indicates the added stress of increased residential development. Concerns over congestion in Avondale Borough and Toughkenamon have caused Penn Green Road, Newark Road, and Hillendale Road to become popular alternative routes. Increases in volume on these roadways is particularly concerning because these roadways have narrow shoulders, rolling topography, and some sharp turns which are not designed for higher speeds.

By examining past traffic volumes from historical count data and building activity, it is apparent that traffic volumes will continue to grow in New Garden Township. If the existing pattern of growth continues the Township's major roadways, Route 41, Baltimore Pike, US Route 1, Limestone Road, and Newark Road, will continue to see more significant growth in traffic volumes than the minor roads in the Township. Percentage increase from roughly 1993-2003 include 10-16 percent for Route 41, 12 percent for Baltimore Pike west of Newark Road, up to 83 percent on Baltimore Pike east of Newark Road, 22 percent on Newark Road between Baltimore Pike and Route 41, and 16 percent on US Route 1. It is expected that these trends will continue due to continued commercial development along the Route 41 and Baltimore Pike corridors, and continued residential development within the Township and in the surrounding region. Continued residential growth will also contribute to increases in volume on the Township's collector and local roads. Increased traffic volumes, as a consequence of residential growth, is concerning, because the Township's small rural roadways and bridges are not designed for high speeds or significant volumes.

Accident Data

Summary accident data from PennDOT is displayed on **Map 8-3** for 1996-2000. Summary data, compiled by PennDOT on reported accidents within the Township, was used to identify roadway areas of special concern. Frequency of Accidents is an indicator of road safety. A number of accidents at a single location may indicate problems in the physical characteristics of the roadway at that particular point, although accidents can occur due to any number of factors. Accidents are reported only when they involve injuries, fatalities, or excessive property damage. The total number of accidents that actually occurred may be higher. Data is reported on **Map 8-3** in scaled categories for both mid-block road segments and intersections.

Between 1996 and 2000 there were 113 mid-block and 213 intersection accidents for a total of 326 accidents over the five-year period. This represents an average of 65 accidents per year. Although there appear to be numerous accidents throughout the Township on **Map 8-3**, a majority of these are in the lowest category of one to three accidents over a five year time period. The few mid-block sections that

recorded significant numbers of accidents include the Baltimore Pike corridor, Hillendale Road, Scarlet Road, and the Route 41 corridor. In some cases, such as Hillendale Road, there were additional accident reports that did not specify accurate locations, yet identify potential issues on certain roads due to the number of reported incidents.

The intersection of Route 41 and Penn Green Road has one of the highest accident rates. This may be, in part, due to traffic volumes and speeds along Route 41 and the slight offset angle of the intersection affecting sight distance for motorists on Penn Green Road. The intersection of Baltimore Pike and Bancroft Road is a second intersection with high accident volumes due to high traffic volumes and speeds on Baltimore Pike. This intersection may be in the process of a signal warrant by PennDOT in the near future. The intersection of Newark Road with both New Garden Road and Bucktoe Road has a high number of accidents, potentially due to the five-point intersection, traffic volumes on Newark Road, and the tendency for speeding on Newark Road.

A number of intersections experienced moderate accident problems. The intersection of Baltimore Pike with Penn Green, Chambers, and Scarlet Roads all fall into this category, primarily due to traffic volumes and speeds along Baltimore Pike. In particular, the intersection of Baltimore Pike with Center Street in Toughkenamon is of issue. The probable reason for accidents at this location is that motorists use the local streets of Toughkenamon as a cut-through to avoid the intersection of Baltimore Pike and Newark Road. As traffic volumes increase, this may become an escalating issue for Toughkenamon.

The intersection of Newark Road and Hillendale Road falls into the moderate category. This intersection occurs both at the peak of a ridge line, as well as a curve in the roadway, thus a majority of accidents at this location occur due to poor sight distances. The intersection of Route 41 with Sharp Road and Sheehan Road is another five-point intersection that experiences problems due to confusion because of the alignment of the intersection in conjunction with traffic volume and speed on Route 41. The ramps at the intersection of Route 41 and Limestone Road experience problems, particularly with left hand turns having to cross the heavy movements along Limestone Road. The intersection of Penn Green Road and Starr Road, in the western portion of the Township, is the lone outlying intersection that experiences higher levels of accidents.

ROAD AND BRIDGE CONDITIONS

Roads

Township residents showed considerable concern for traffic and road conditions in the 2003 Public Opinion Survey. Specifically, capacity and congestion concerns were identified more often than complaints of poor road conditions. The condition of both state and Township roadways were identified as either “Excellent” or “Good” by over three-quarters of the survey respondents. Conditions and priorities are continually changing and it is imperative that these needs be met for safety as well as efficiency reasons.

The Township road network was surveyed for this comprehensive plan. Many qualities were assessed including sight distance, surface conditions, alignment problems, and access management issues. Overall, the Township has a solid circulation base. Most roads, including the local roads are sufficient in width and most are surfaced appropriately, however shoulder width is lacking on many roadways. This is a concern, particularly in terms of pedestrian traffic with both bicyclists and residents walking along roadways. It is evident that both the Township and PennDOT are meeting the expectations of Township residents with respect to maintenance, however, the continuing increase of traffic volumes and safety problems need to be addressed.

The current local road network (those roads that do not serve a higher function such as arterial or collector) has become an important part of the culture of the Township. From a historical aspect, the local roads serve as a link to the past. They represented old property lines, farm lanes, or trails that connected local properties and many bear the names of the early settlers. Now the local roads primarily serve motorists traveling within the Township, but the local roads also hold a recreational role because of the scenic qualities they possess. They provide a direct connection to the scenic fields, woodlands, and stream valleys of the Township.

These scenic qualities are an important aesthetic resource for the Township, but also create concerns. The biggest safety concern is those intersections that are located on or adjacent to steep slopes. Two examples of this are Newark Road at Baltimore Pike and Walnut Run Road at Landenberg Road. For any vehicle, especially heavy trucks, this makes stopping difficult during rainy, icy, or even normal conditions. Roadways running adjacent to steep slopes are dangerous when no guardrail is present.

Maintaining safe sight distance is a constant safety concern. Vegetation is an issue at many intersections. There is an ongoing need to ensure appropriate sight distances at all intersections. It is also necessary, at some intersections, to further grade adjacent ground for improved sight distance. The same scenic qualities that are so valued create many intersections with poor alignments, such as the intersection of Buttonwood Road and Broad Run Road.

Access to the road network has generated both safety and mobility concerns in the Township. Access management is the process of creating an efficient and safe interaction between automobiles traveling on a roadway and conflicting turning movements created by access points. Currently, there are numerous businesses and homes located directly adjacent to the most frequently used roadways in New Garden. As the number of entrances along routes such as Baltimore Pike, Route 41, or Newark Road grow, there is the potential for both reduced mobility and increased accidents. Most access problems exist along Baltimore Pike, because of the number of residential and commercial properties with individual access to the road. It is not a coincidence that this corridor has the greatest number of reported accidents. The concerns are currently not as great with access on Route 41 and Newark Road, but development along the road frontage is increasing on both of these routes. Furthermore, the higher rate of speed and traffic volumes on Route 41 increases the need to consider access management on this primary roadway through the Township.

Other problem areas are the Newark Road interchange of US Route 1 and the interchange of Route 41 and Limestone Road. Vehicles traveling at high speeds conflicting with automobiles entering and exiting the highway often cause problems at interchanges such as these.

Bridges

Within the Township, there are approximately seventeen bridges. Three of the bridges are owned and maintained by the County; the remaining fourteen are owned and maintained by PennDOT. There are no bridges that are owned or maintained by the Township. Many of the bridges found in the Township were constructed for the Route 1 Bypass.

There are two bridges in the Township which have structural limitations: Watson Mill Road over Broad Run, a County-owned bridge constructed in 1915; and Landenberg Bridge over the East Branch of the White Clay Creek. The Landenberg Bridge, a PennDOT-owned bridge constructed in 1898, was closed in 1999 until structural improvements could be made. Rehabilitation efforts are underway for the restoration of this historical landmark. Once the rehabilitation is complete the ownership and maintenance of the bridge will be taken over by the Township. Additionally, there are three bridges that are located just over the Kennett Township line. These bridges, on Chambers Mill Road, Hillendale Road, and Bucktoe Road, are all due for repairs and may temporarily alter traffic patterns.

Capital Improvements

In previous years, the Township has not generally budgeted a set amount for roadway improvements; instead, amounts were budgeted based on specific improvement projects. The Township Public Works Director is responsible for identifying necessary roadway improvements. Recently, the Public Works Director and Engineer have established a priority system for Township road improvements and regular annual allocations for roadway improvements will be implemented.

PennDOT identifies future improvement projects in the Pennsylvania Twelve Year Transportation Program. Local projects are listed in **Figure 8-3** with project description, type of improvement, and projected time frame.

Figure 8-3: New Garden Township, Capital Improvements – PennDOT 12-Year Plan

Project	Improvement Type	Phasing
Old Baltimore Pike Bikeway	Pedestrian/Bicycle Improvement	1-4 years
Route 41- Land Use Study	Study/Highway Reconstruction	1-4 years/5-8 years
Route 41 – Installment of ITS Technology Deployment	Intelligent Transportation System	1-4 years
Newark Rd at Hillendale Road	Congestion Reduction/Channelization	1-4 years
Landenburg Road Bridge over East Branch of White Clay Creek	Bridge Rehabilitation	1-4 years

Source: 2003 Pennsylvania Twelve Year Transportation Program

Scenic Roads

The Township's 1993 Open Space, Recreation and Environmental Resources Plan identified the following road segments as containing resources that qualified them as scenic roads:

- Broad Run Road, between Newark Road and Southwood Road
- Penn Green Road, from Laurel Heights Road to the southern Township boundary
- Laurel Heights Road, between Walnut Run Road and Skyline Drive
- Bucktoe Road, from Sharp Road to the eastern Township boundary
- Hillendale Road, from Sharp Road to Chambers Road
- Polo Road, from Newark Road to Church Road

If an increase in traffic volume warrants improvements to these roadways, those improvements must consider the scenic qualities of these roadways in the improvement design. In addition, development adjacent to these roadways should be sensitive to the woodlands, stream corridors, farmland, and open space that define these roadways as scenic. Additional discussion about scenic resource preservation can be found in **Chapter 14**, **Transportation Plan**.

Alternative Forms Of Transportation

While the majority of Township residents utilize the automobile as their primary form of transportation, 2000 US Census data indicated a significant amount of residents walk to their place of employment. In

addition, it is important to note that children, who are also large users of alternative forms of transportation, are also omitted from Census data. The largest concentration of walking and biking is found around Toughkenamon and along Baltimore Pike. As noted in the Capital Improvements section, PennDOT has identified the need for shoulder improvements along Baltimore Pike to accommodate biking and walking demands. The only recognized trail in the Township is the Mason-Dixon Trail that follows the southern border of the Township. The County's *Linking Landscapes* proposes a trail corridor that would follow the London Grove Township/New Garden Township line into the White Clay Creek Preserve; however, there has no been significant action to begin this trail establishment.

The Southern Chester County Organization on Transportation (SCCOOT) bus route is the primary means of public transportation in the Township. This bus service provides weekday service from Oxford to Chadds Ford mainly during the morning and afternoon peak hours. The bus route has stops in the Township at the New Garden Shopping Center and the intersection of Baltimore Pike and Newark Road. Connection service at Chadds Ford allows SCCOOT riders to transfer buses onto the SEPTA 314 bus service, giving riders the opportunity to travel to West Chester. In addition, the Chester County Paratransit System is also used. Chester County Paratransit may be used by anyone for any destination within the county. It is necessary to make advanced reservations and it is advised that groups ride together for discounted rates.

The closest public transportation serving the New Castle County/Wilmington area is a transit center located in Hockessin, DE. There also is a Park and Ride lot at the Hockessin location for commuter trips. Additionally, there is a Park and Pool lot located on Delaware's Route 7, a few miles south of the Pennsylvania state line.

There is one active freight rail line in the Township that runs parallel to Baltimore Pike. Currently, the rail line is owned by SEPTA, but is being leased to another freight operator. Since the line is owned by SEPTA, it could serve as a light rail line if future demand warrants its establishment.

The New Garden Airport is the Township's only airport. The owner of this privately owned airport is creating a master plan to guide the airport's future. The airport remains a Township asset for recreation and flight training.

PLANNING IMPLICATIONS

This section has identified several planning issues relating to circulation. The implications that follow will be further considered in the recommendation section of the Plan:

- **Roadway Functional Classification -** The roadway functional classification needs to be updated to reflect the current function of roadways and to provide for projected traffic volumes, traffic movements, and roadway improvements.

- **Access Management -** Due to the proliferation of access points along many of the roads throughout the Township, there is a need to review and enhance access management techniques and strategies to reduce the negative impacts of existing access points and manage new access points, particularly on roadways of higher functional classification.

- **PA Route 41 -** The high rate of speed and traffic volumes on Route 41 increases the need to consider access management on this primary roadway through the Township

- **Intersection Improvements -** There are a variety of intersections throughout the Township that are in need of improvements. These range from large realignment issues such as Newark Road just north of

the intersection with Baltimore Pike, to smaller improvements such as minor regrading and removal of vegetation to improved sight distances. There is a need to provide a strategy for the identification and prioritization for these intersections.

- **Growth and Development -** As development occurs in the Township and the surrounding municipalities, traffic volumes and congestion will become a more pressing issue on the Township's roadways. Municipal officials will need to monitor this development, work with the surrounding communities to reduce traffic volume and congestion, and seek functional reclassification and improvement of roadways according to the appropriate function and traffic volume, as needed.

- **Commercial, Office, and Industrial Development -** Non-residential development needs to be located in appropriate areas to maximize the effectiveness of the roadway system and other forms of transportation, including the railway and airport.

- **Alternative Transportation Methods -** There is a need to address the limited amount of public transportation service in order to alleviate traffic congestion and pollution problems. Pedestrian and bicycle transportation needs should also be identified through the provision of trails and sidewalks.

- **Long Range Circulation Planning -** The Township needs to a long-range planning program in order to sufficiently plan and fund transportation improvements.

- **Regional Planning -** There is a need to participate in regional transportation planning efforts and initiatives to effectively address transportation issues facing the Township.

- **Preservation of the Local Road Network -** New Garden has a series of local roads that contribute to the Township character. Measures need to be taken to insure that the current scenic and aesthetic quality of the local road network remains as a scenic and cultural resource.

- **Gateways -** New Garden has an opportunity to establish “gateways” at the main entrances along the major corridors into the Township in an effort to define the arrival point as a destination. Gateway planning will need to address landscaping, lighting, architecture, signage, and visual amenities to promote a positive image.