

Chapter Five

TRANSPORTATION AND CIRCULATION CONDITIONS

There is a distinct correlation between land use and transportation planning. The efficient use of land as well as the local quality of life is highly dependent on an effective circulation network. In order for the network to adequately serve residents, it must be continually monitored as new development occurs. Different types of land uses require different road characteristics, and meeting future transportation needs is dependent on understanding the current network.

This chapter documents the transportation and circulation system as it presently exists in West Pikeland Township and analyzes the various factors that influence the system. The elements discussed include the following: Circulation System, Functional Classification of Roads, Traffic Volumes and Levels of Service, Roadway and Bridge Conditions, Alternative Forms of Transportation, Scenic Road Preservation

CIRCULATION SYSTEM

West Pikeland Township contains very close to 10 square miles of land area, is rural in character, and has approximately 34 miles of roads. The role of West Pikeland's road network in transporting people and goods was historically important to the County's development. Several of the earliest roads (like Horse Shoe Trail and Conestoga Pike) established in the County, as well as in the State, traverse the Township. The road system in West Pikeland evolved from the network of trails established by the early settlers in the area.

The scenic qualities of the Township, along with its proximity to the Pennsylvania Turnpike, Route 30 by-pass, and Route US 202, have helped to transform the primarily agricultural community into a residential community, one that serves residential needs but not necessarily employment needs. The 1990 Census estimated about 10 percent of the residents remain in the Township for employment purposes, the majority work in other communities.

The 1990 Census data indicated that approximately 82 percent of the Township residents rely on the automobile for travel between home and work, with only about 8 percent using public transportation or other forms of transport (such as walking and biking), and about 10 percent working at home. In 1990, over 75 percent of Township's residents drove alone between home and work, while less than 7 percent carpooled. The average number of vehicles per household in the Township in 1990 was 2.23, compared to 1.89 for Chester County.

Overall the commuting patterns discussed above for the Township reflect that of the County. The only notable difference is in the use of public transit: 11 percent of the County residents use public and other forms of transportation, whereas only five percent of the Township residents rely on non-automobile transportation. As indicated by the average number of vehicles per household, it is clear that the Township's residents continue to rely on the automobile as the dominant mode of transportation between home and work, with a large majority driving alone.

Due to this dependency on motorized transportation systems, roadways become a vital component of everyday living. Table 5-1 shows the road mileage and density of roadways within municipalities adjacent to West Pikeland. Of the close to 300 total miles of publicly owned roadway in the area, almost 209 (70%) miles are owned and maintained by the local municipalities and little over 91 (30%) miles are owned and maintained by the State. PennDOT has been in the process of transferring state owned

roadways to local ownership wherever possible, to facilitate management and maintenance. This is discussed further in Chapter Nine, Transportation and Circulation Plan.

The overall roadway density in West Pikeland is less than four linear road miles per square mile of area. Though West Pikeland has the least road miles in the area, the density is not the lowest, because of the difference in areas of the townships. It can also be noted that the gradual increase in suburban development in the Township has contributed to the increase in roadways. Uwchlan has the highest density of roadways, almost eight linear road miles per square mile of area, due to its suburban nature. The remaining municipalities in the region are similar to the suburban and marginally rural roadway densities in comparison with other municipalities in the County.

**TABLE 5-1
ROAD MILEAGE AND ROAD DENSITY
West Pikeland and Adjacent Municipalities**

| MUNICIPALITY | State Miles (%) | Municipal Miles (%) | Total Miles | Area (sq.mi) | Roadway Density * |
|----------------------|------------------------|----------------------------|--------------------|---------------------|--------------------------|
| WEST PIKELAND | 15.25 (45) | 18.32 (55) | 33.57 | 10.00 | 3.56 |
| Charlestown | 23.51 (57) | 17.99 (43) | 41.50 | 15.00 | 2.77 |
| East Pikeland | 13.86 (31) | 31.36 (69) | 45.22 | 8.80 | 5.14 |
| Upper Uwchlan | 7.87 (20) | 32.33 (80) | 40.20 | 12.12 | 3.32 |
| Uwchlan | 10.91 (14) | 69.69 (86) | 80.60 | 10.40 | 7.75 |
| West Vincent | 19.70 (34) | 38.85 (66) | 58.55 | 17.90 | 3.27 |

* Linear road miles per square mile of area

Source: Pennsylvania Department of Transportation, Roadway Inventory Summary (1998)

On a national basis, road ownership distribution is 76 percent local and 24 percent State and Federal, according to United States Department of Transportation, Bureau of Transportation Statistics. In Chester County, the breakdown is 69 percent local and 31 percent State and other. In the Township 45 percent of roadways are under PennDOT's ownership. This demonstrates that PennDOT owns and maintains a higher percentage of roads than the County average within the Township. This ratio may change in the future if the State continues transferring more roads to local jurisdictions. This will not only give municipalities greater responsibility for roadways, but will also give more control over their maintenance.

FUNCTIONAL CLASSIFICATION OF ROADS

Functional classification is the method of categorizing roads by the purpose they serve in order to provide for proper transportation planning. Roads vary by their function and intent, and that purpose should dictate the standards to which a road is either initially built, or improved. The functional classification assists in determining the best location for development in light of the circulation needs of current and future residents. It also allows municipal officials to prioritize road improvements and maintenance (like snow removal), thereby promoting the effective use of tax dollars.

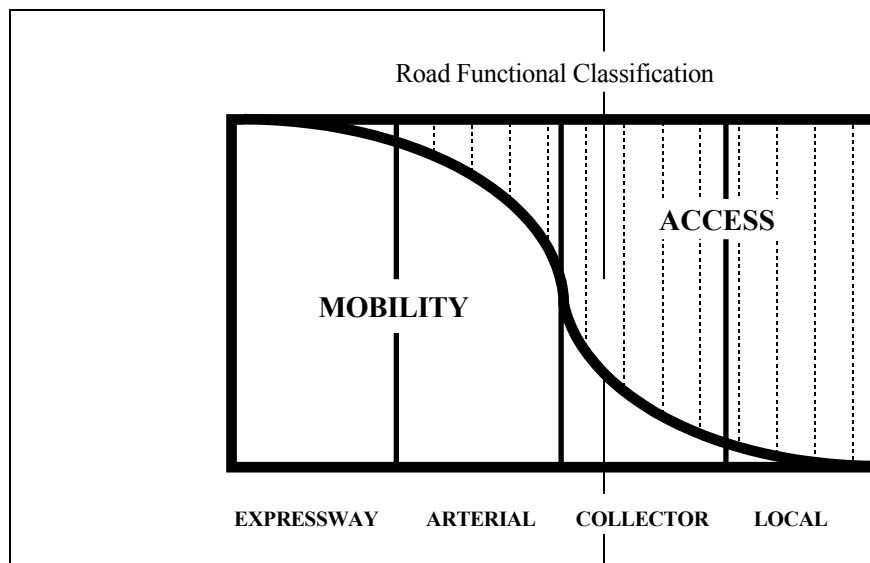
Road functional classification is based on the analysis of the following six factors.

- Traffic volumes
- Existing design of a roadway or its ability to carry traffic volumes
- Relationship to other roads in terms of the availability of another, more appropriate route
- Directness of route between major traffic generators
- Perceived average trip length
- Accommodation of accessibility or mobility

The West Pikeland Comprehensive Plan (1989) does not include any discussion on functional classification of roadways. The Comprehensive Transportation Study (Draft - 1989) prepared by Pennoni and Associates, Inc. designated functional classifications to major Township roads. This study was not adopted by the Township due to its aggressive recommendations. The study recommended extensive roadway and bridge improvements, that would have potential impacts that would not support the overall goal to maintain the unique rural character of West Pikeland. Selected inventory information included in the 1989 Transportation Study is used in this chapter.

One of the most important concepts in terms of functional classification is that of mobility versus access. Mobility is defined as the ability by which a road can move traffic between points, while access is defined as the ease by which traffic can enter and exit roadways. Traffic can move more efficiently and safely at higher speeds if access is limited, and conversely, traffic should move slower on roads that have many access points. These two measures inherently conflict, illustrating the need to identify the main purpose of each road. Identifying the function of the road in terms of access and mobility helps determine the types and intensity of land uses for those parcels adjacent to the road and leads to identification of the functional classification. Figure 5-1 illustrates this concept relative to different functional classifications.

FIGURE 5-1
RELATIONSHIP OF MOBILITY TO ACCESS



Source: Chester County Planning Commission, Highway Needs Study (1986)

Roads are generally classified as expressways, arterials, collectors or local roads. Depending on the degree to which a road meets the criteria, another level may be warranted in the classification system such as "major" or "minor". The Chester County Circulation Handbook (1994) suggests an "urban" and "rural" standard be considered as well.

A description of the general classifications as described in the Highway Needs Study (1986) is included in the following summary.

Expressways: These roads serve the heaviest volumes of traffic and have limited access to allow for higher speeds. Average daily trips range between 10,000 and 100,000. Expressways serve higher average trip lengths focusing on regional and interstate traffic. Expressways facilitate truck transport by providing the optimum conditions for truck traffic. The Pennsylvania Turnpike is the only expressway that passes through West Pikeland Township.

Principal Arterials: These roads serve heavy volumes of traffic often ranging between 10,000 and 40,000 trips per day. They provide a high degree of mobility, but offer more access than expressways. Principal arterials link urban centers and *usually* consist of more than two lanes. Chester County's Highway Needs Study (1986) classifies Route 113 as a principal arterial.

Minor Arterials: Arterials of this type also emphasize mobility and serve to link urban and rural centers, but their focus is more regional. They provide for traffic ranging from 5,000 to 15,000 trips per day with higher access than principal arterials, but still some access control. There are no minor arterials identified by the Highway Needs Study (1986) for the Township.

Major Collector: Its purpose is to collect traffic and move it to the arterials. A major collector links residential and commercial areas by "collecting" traffic from residential areas and moving it to arterials. This road classification accommodates traffic averaging 3,000 to 8,000 trips per day. The Highway Needs Study (1986) classifies Route 401 as a major collector.

Minor Collector: Minor collectors serve the same function as major collector, but on a smaller scale. These serve traffic in the range of 1,000 to 3,000 trips per day, collecting traffic from various access points mainly in residential areas, and distributing it to other residential and commercial centers. Minor collectors serve mainly local traffic. The Highway Needs Study (1986) indicates Byers Road and Clover Mill Road as a minor collectors.

Local: Local roads focus on access, and often help to define the municipality's unique character. Roads in neighborhoods, serving farms and estates, are considered local and provide direct access. They are intended for very short distance travel and usually do not carry through trips. A majority of the roads and lanes within the Township fall under this category.

The West Pikeland Comprehensive Plan (1989) does not include any discussion on existing or proposed functional classification. However, the Comprehensive Transportation Study (1989) proposed an existing classification system. PennDOT creates countywide functional classification maps for the State periodically, and the designations assigned in the 1995 PennDOT Chester County Functional Classification Map, are listed in the table below for comparison. This comprehensive plan update includes a recommended functional classification system for the Township based on this inventory information.

Table 5-2, lists the functional classification designations assigned by the Comprehensive Transportation Study (Draft - 1989), Highway Needs Study (1986), and PennDOT (1995) for major roads in the Township. Map 5-1 indicates the functional classification of major roads as designated by the three entities listed above.

**TABLE 5-2
COMPARISON OF FUNCTIONAL CLASSIFICATION DESIGNATIONS
West Pikeland Township**

| ROAD/ ROAD SEGMENT | Comprehensive Transportation Study | Chester County Highway Needs Study | PennDOT |
|--------------------------------------|---|---|--------------------|
| PA Turnpike | No designation | Expressway | Interstate Highway |
| PA Route 113 (north of Rt. 401) | Arterial | Principal Arterial | Major Collector |
| PA Route 113 (south of Rt. 401) | | | Minor Arterial |
| PA Route 401 (west of Byers Road) | Arterial | Major Collector | Major Collector |
| PA Route 401 (east of Byers Road) | | | Minor Arterial |
| Byers Road | Collector | Minor Collector | Minor Collector |
| Newcomen Road | Collector | No designation | No designation |
| Clover Mill Road | Collector | Minor Collector | No designation |

Source: Comprehensive Transportation Study (Draft – 1989), Chester County Highway Needs Study (1986), PennDOT Highway Functional Classification Map (1995)

The table above indicates that there are some inconsistencies between the designations for the same road by different entities. This is because the roads are designated at a larger regional perspective by the County and State, whereas the Township study designations reflect a local perspective. These inconsistencies are discussed and resolved in arriving at a unified, recommended Future Functional Classification map in Chapter Nine, Transportation and Circulation Plan.

TRAFFIC VOLUMES AND LEVELS OF SERVICE

Two key factors that determine road network effectiveness are safety and traffic congestion. Traffic congestion generally results when traffic volumes on a road segment exceed the capacity of that roadway or when heavy volumes of conflicting traffic movements occur at the intersection of two or more roads. To determine the current effectiveness of the road network, both traffic counts and intersection level of service analysis are useful tools.

Traffic volumes play a key role in determining function, design, and appropriate improvements. Traffic volume data helps determine the potential for capacity problems. Roads that are not used for the purpose for which they were intended can experience capacity problems. This is particularly evident in areas experiencing a significant amount of new development without concurrent upgrades in the transportation corridors.

Although West Pikeland is sparsely populated with only 232 people per square mile, capacity on Township roads is influenced by traffic originating from outside the borders. The two roadways most likely to experience capacity problems are PA Routes 113 and 401. Both of these roads are carrying local as well as regional traffic, and experiencing increasing volumes. No significant improvements have been made to these roadways in recent years.

Map 5-2 shows the traffic volume estimates for the major roads in the Township. These estimates are taken from the Daily Traffic Volume Estimates for Roads in Chester County, a list assembled by Chester County Planning Commission in March 1998. The list contains estimated traffic volumes on arterial and collector roads throughout Chester County. The data contained in the tables were assembled from various sources including PennDOT, Delaware Valley Regional Planning Commission, Chester County Planning Commission, and individual traffic consultants. Traffic volumes on particular road segments can change dramatically from year to year, month to month, and even day to day. Factors such as weather, road construction, detours, traffic accidents, and land development can dramatically alter travel patterns. For these reasons, and due to the different estimating techniques, it is recommended that the values from this map be used for general comparison purposes. Current estimates need to be obtained by conducting area specific study for purposes other than general comparison

Traffic Volumes

Traffic volumes are typically counted either at mid-block road segments or at intersections. The mid-block road segment count involves counts for twenty-four hour periods (“Average Daily Traffic” or “ADT”). These counts are typically done with automated traffic counters and provide information on traffic volumes on a given stretch of road over a full day period and during the morning and evening hours of peak volumes. Twenty-four hour counts were done at two locations:

- Byers Road – south of Route 401
- Davis Road – north of PA Turnpike

Intersection traffic counts involve counts that track all trips passing through an intersection, including through trips and turn movements. These counts are typically performed manually and only for two hour periods in the morning and afternoon, including the hours of peak traffic volumes. While these counts provide information on a complex set of movements, they are generally only available for the peak hours, although they can be extrapolated to determine approximate daily volumes on each approach to the intersection.

Ideally, when examining traffic volumes, it is useful to compare similar counts from different years. This enables the identification of past trends in traffic growth, which can be extrapolated into the future as well. Unfortunately, there is very little historical information available regarding traffic volumes in West Pikeland Township. The PA Route 113 Access Management Study (1991) conducted extensive counts all along PA 113. In West Pikeland counts were done at Pikeland Road and PA 401 along PA 113. These volumes are shown in Table 5-3. In addition to these historic counts, peak hour counts were conducted at three Township intersections for this Comprehensive Plan:

- Route 113 and Route 401
- Route 113 and Pikeland Road
- Route 113 and Davis Road

The peak hour volumes resulting from these counts are shown on Figure 5-2. The total volumes by leg travelling in both directions were calculated and these are the volumes compared in Table 5-3. The two directional evening peak traffic volumes is traditionally considered in traffic studies for traffic volume comparison and analyses, because evening peak traffic volumes are the heaviest traffic that flows through an intersection.

FIGURE 5-2
INTERSECTION TRAFFIC VOLUMES AND LEVELS OF SERVICE

Source: Chester County Planning Commission (1999).

TABLE 5-3
INTERSECTION TRAFFIC COUNTS
Comparison of Traffic Counts in West Pikeland Township (1990-1991)

| LOCATION | 1991 PM Peak Hour Traffic Volume* | 1999 PM Peak Hour Traffic Volume* | Percentage Growth | Average Annual Growth |
|--|--|--|----------------------|-----------------------------|
| Intersection at Route 113 and Pikeland Road | | | | |
| Route 113 – south bound | 937 | 1,313 | 40% | 4.3% |
| Route 113 – north bound | 921 | 1,035 | 12% | 1.5% |
| Pikeland Road – east bound | 48 | 57 | 19% | 2.2% |
| Pikeland Road – west bound | 28 | 53 | 89% | 8.3% |
| Intersection at Routes 113 and 401 | | | | |
| Route 113 – south bound | 965 | 1,244 | 29% | 3.2% |
| Route 113 – north bound | 1,196 | 1,396 | 17% | 1.9% |
| Route 401 – east bound | 610 | 900 | 48% | 4.9% |
| Route 401 – west bound | 809 | 1,032 | 28% | 3.1% |
| Intersection at Route 113 and Davis Road | | | | |
| Route 113 – south bound | NA | 1,578 | NA | NA |
| Route 113 – north bound | NA | 1,628 | NA | NA |
| Davis Road – east bound | NA | 45 | NA | NA |
| Davis Road – west bound | NA | 105 | NA | NA |

*All volumes are *two directional evening peak hour traffic* flowing through that leg of the intersection.
Source: Chester County Planning Commission (1991 and 1999)

On the whole, apart from Routes 113 and 401, traffic volumes are still relatively low on roads within the Township. As would be expected, the heaviest volumes in the Township are found on Routes 113 and 401, the highest functioning roads in the Township, with each carrying over 10,000 trips per day. The other roads have very small amounts of traffic with less than 100 trips during the evening peak hour, with the exception of west bound Davis Road to PA 113, which is a just over a 100 trips in the peak hour.

In examining traffic volumes, it is useful to compare similar counts from different years. This enables the identification of past trends in traffic growth which, in some cases, can be extrapolated into the future as well. As noted above, historic data on West Pikeland traffic volumes is very limited. As such, it is difficult to draw a conclusion about traffic growth that would be applicable throughout the Township. Nonetheless, the best data that is available indicates that traffic growth on major Township roads has been between 1.5 and 5 percent per year, notably higher than the two percent per year often used as a rule of thumb when predicting future traffic volumes. The one case, which is not the norm, is the west bound Pikeland Road traffic that indicates a 8.3% annual growth. This is due to the very small base number of 28 trips increasing to 53 trips in eight years.

It is important to note, however, that these growth figures are based on trends on Routes 113 and 401, key roads that carry significant through traffic and relatively low percentages of trips either originating or ending in West Pikeland Township. Hence, the relatively high rates of traffic growth found on these roads primarily reflect high rates of growth in regional traffic and could be significantly higher than rates on less regionally oriented roads within the Township. These figures may be of limited relevance in predicting future traffic volumes on more locally oriented Township roads in the coming decades, which are likely to be affected more by development within the Township than by regional trends in traffic growth.

Intersection Levels of Service

The concept of “Level of Service” (LOS) was developed by transportation engineers as a way of “grading” how well a given intersection is functioning. Factors that determine the LOS at a given intersection include traffic volumes, roadway capacity, the number and configuration of lanes entering and exiting the intersection, traffic volumes on conflicting travel movements, signal timing (where signals exist), the makeup of traffic using the intersection (percentages of cars and trucks), etc. Level of Service is expressed in six designations that are analogous to a scholastic grading system, with “A” meaning excellent and “F” meaning failure. Table 5-4 explains these designations more specifically.

**TABLE 5-4
LEVEL OF SERVICE CATEGORIES**

| | |
|---------|---|
| LOS “A” | Little or no delay for travelers / 40 percent or more reserve capacity. |
| LOS “B” | Short traffic delays / 30-40 percent reserve capacity. |
| LOS “C” | Average traffic delays / 20-30 percent reserve capacity. |
| LOS “D” | Long traffic delays / 10-20 percent reserve capacity. |
| LOS “E” | Intersection approaching failure condition with very long delays / less than 10 percent reserve capacity. |
| LOS “F” | Intersection in failure condition with extremely long traffic delays / no reserve capacity (intersection already at or above capacity). |

In many communities, a peak hour LOS of “C” or “D” at signalized intersections is considered acceptable. Some urban communities find LOS “E” to be an acceptable peak hour condition. For non-signalized intersections with two-way stop signs, it is not uncommon for the controlled movements (those forced to stop) to be at LOS “D” or “E” during the peak hour. Since there is only one intersection with traffic signals in West Pikeland, it is this latter type of intersection that is most important to this analysis. At such intersections, through movements (non-turning) and right turn movements on the uncontrolled approaches to the intersection tend to function very well, while the efficiency of uncontrolled left turns and all controlled movements depends on how heavy volumes are on the uncontrolled movements. Low volumes on the uncontrolled movements result in relatively unconstrained turns and movements from the intersection approaches controlled by stop signs. High volumes on the uncontrolled movements, on the other hand, result in very short “gaps” through which opposing left turns or controlled movements can pass, resulting in longer wait times and poorer level of service.

Based on the 1999 peak hour traffic counts discussed above, intersection LOS was analyzed for a total of three intersections. The results of this analysis can be seen on Figure 5-2. A brief discussion of each intersection follows:

Intersection of Route 113 and Pikeland Road

This is a traditional four way intersection with unconstrained movements on Route 113 and stop sign controlled movements on Pikeland Road. Because of heavy traffic volumes on Route 113 and relatively low volumes on Pikeland Road, levels of service for motorists on the Pikeland Road approaches to this intersection were bad. During the morning and evening peak hour, the overall movement from both sides of Pikeland Road were LOS “C”. All movements on Route 113 were at LOS “A”.

Intersection of Route 113 and Route 401

This is a traditional four way intersection with traffic signals on all four legs. There are no dedicated turn signals, and all four legs have through movement and turning movement from the two lanes. This makes this busy intersection an overall LOS “F”. Figure 5-2 indicates the AM/PM LOS for all legs. It can be seen that north bound PA 113 and west bound PA 401 have LOS “F” at the evening peak and vice versa in the morning peak traffic. This indicated the flow of traffic toward Great Valley Corporate Center and Philadelphia area for employment and return trips home in the opposite direction.

Intersection of Route 113 and Davis Road

This is a four way intersection with unconstrained movements on Route 113 and stop sign controlled movements on Davis and Fairfield Roads. Because of heavy traffic volumes on Route 113 and relatively low volumes on Fairfield Lane and Davis Road, levels of service for motorists approaching this intersection were bad. During the morning and evening peak hour, the overall movement from both sides of Route 113 were LOS “C” and “E” respectively. All movements on Route 113 were at LOS “A” and “B”.

Anticipated Traffic Growth

It is clear that as West Pikeland and surrounding municipalities continue to develop, traffic on Township roads will continue to increase. Applying reasonable assumptions about traffic growth on Township roads can lead to estimated future volumes. As discussed above, traffic has increased fairly rapidly on the few roads for which historic traffic counts were available. In recent years, traffic has increased 1.5% to 5% annually on Route 113 and Route 401. These increases are high compared to an assumption of 2% annual increases often used as a “rule of thumb” in traffic analyses. The *absolute* annual increase in trips has been significantly greater on Route 401 than Route 113, but because it had much higher volumes initially, the *percentage* increase was less on Route 113 than on Route 401. Growth rates tend to be higher on minor roads because their base volumes are so low that even small absolute increases can represent large percentage increases.

For the purposes of this analysis, an annual growth rate of 3.5% can be assumed for Routes 113 and 401, and a rate of 4% is assumed for all other roads. It should be noted that the methodology used here may be of limited value on the Township’s smaller local roads. While high functioning roads that connect population centers and lower functioning roads that connect higher functioning roads, carry traffic from areas throughout the Township and surrounding areas, smaller local roads generally carry traffic only from adjacent land uses to larger collector roads. As such, local roads may see very limited traffic growth from year to year, but a single large development located on either of these roads could exponentially increase traffic volumes in a very short period of time. As such, predicting traffic growth on these roads by assuming a steady growth rate is of limited value.

Accident Data

A significant indicator of road safety is accident data. Although accidents can be caused by any number of factors, a number of accidents at a particular location could be related to physical characteristics of the road at a particular point. Poorly aligned intersections, inadequate road signage, capacity, and access problems could all influence the accident potential.

Pennsylvania Department of Transportation (PennDOT) provided a summary of data on all reported accidents in the Township for the five-year period from 1993 through 1997. Accidents are reported only when they involve injuries, fatalities, or excessive property damage. The total number of accidents that occurred is likely to be much higher.

There were 81 reported accidents during the five-year period. These accidents have been grouped into two categories - intersection and mid-block accidents. Five accidents involved “major” injuries, with seven people sustaining major injuries. Another 29 accidents involved “minor” injuries, with 43 people sustaining minor injuries. Over the five-year period, no reported accidents resulted in fatalities. The majority of accidents involved no injuries or “moderate” injuries. Four accidents involved drivers under the influence of alcohol, and another five accidents involved deer or other animal in the roadway.

The general location of accidents in West Pikeland Township, compiled by PennDOT for years 1993-97, is shown on Map 5-2. The majority of the reported accidents occurred along the corridors of Routes 113 and Route 401. Accidents occurring along these routes may be expected due to the amount of traffic coupled with the amount of development that is established along the corridors.

ROADWAY AND BRIDGE CONDITIONS

Roadways

Based on a reconnaissance survey done in January 1999, a majority of the roads in the Township are in reasonably good condition and do not have significant safety problems. Due to the rural nature of many of the roads, however, there are a number of intersections with limited sight distances and a few roads with very narrow cartways. These limitations are not a problem on local farm roads and in fact contribute to the rural character of the Township. Such conditions would, however, be a safety hazard on collectors or other roads that carry significant traffic. Roadway surfaces are generally in good condition. Conditions potentially affecting traffic safety include access management problems, intersection alignment, limited sight distance, roadway surface condition, and sharp curves. Other features, such as steep grades, structures close to roads, and steep adjacent terrain can have an adverse effect on traffic safety, yet add to the scenic character and aesthetic value of those roads. Within most of the suburban residential subdivisions in the Region, roads have been engineered to standards that ensure reasonable traffic safety, yet do not continue the character of the rural roads from which they are accessed.

Safety concerns are evident at those locations within the circulation system that may pose hazards due to factors mentioned above. These factors can create hazardous conditions that can slow traffic and cause congestion, potentially leading to accidents. One of the problem areas in the Township is the intersection of Route 113 and Yellow Springs Road where they are poorly aligned. This intersection also sees a variety of turning movements within a relatively short road segment. Topographical conditions in the northern reaches of the Township can also result in safety problems. Steep roads, sharp curves, and heavy vegetation adjacent to the cartway are all potential safety concerns.

Map 5-1 illustrates roadway conditions that could affect safety and the general condition of roads.

**TABLE 5-5
ROADWAY CONDITIONS
West Pikeland Township (1999)**

| ROAD SEGMENT | CONDITION | DISCUSSION |
|---|----------------------------|---|
| Art School Road north of Pikeland Road | Road surface in disrepair | Paving and striping will improve the existing condition |
| Horseshoe Trail Road approaching Messner Road | Steep road | Proper signage and striping will improve existing condition |
| Horseshoe Trail Road bridge | Restrictive width | Proper signage, clear sight distance, and striping will improve existing condition |
| Horseshoe Trail Road | Sharp curve in road | Proper signage, clear sight distance, and striping will improve existing condition |
| Messner Road approaching Horseshoe Trail Road | Sight distance obstruction | Undulating road surface within a very sharp two-way turn with little site distance. |
| Messner Road approaching Route 401 | Sight distance obstruction | Poor alignment of intersection with little sight distance |
| Pikeland Road approaching Street Road | Sight distance obstruction | Steep hill approach from Street Road with little sight distance |
| Pikeland Road bridge | Restrictive width | Proper signage, clear sight distance, and striping will improve existing condition |
| Street Road | Steep road | Steep road leading into intersection with Pikeland Road |
| Yellow Springs Road bridge | Restrictive width | Proper signage, clear sight distance, and striping will improve existing condition |

Source: Chester County Planning Commission (1999)

Most of conditions listed above can be alleviated by signage, striping, shaving off shrubbery in the sight distance triangle, and other simple means. The major projects listed are already listed on the Chester County Highway Improvements Inventory. Some specific improvement projects are discussed in the Transportation and Circulation Plan.

Safety concerns can arise on a roadway when there are too many access points to facilitate safe travel. Access is a particular problem when the road frontage has been subdivided into numerous individual lots all with driveways accessing the road. In West Pikeland, access problems are most evident within the Route 113 corridor. A PA Route 113 Access Management Study was conducted in 1991 for the Route 113 corridor. The recommendations of this study needs to be implemented by the Township, to alleviate any future access management problems.

Bridges

PennDOT maintains a Bridge Management System (BMS) Inventory, which is an inventory of all bridges owned by the State, municipalities, and the County. The BMS inventory consists of detailed information of all listed bridges, in terms of their location, statistics, engineering specifications, and other related items. The inventory lists bridges by ownership (state, county or local municipality), whether posted or not posted, and closed bridges. There are several old bridges with historic value within the Township listed in the BMS.

According to the 1997 BMS inventory, there is one County bridge, one bridge owned by the PA Turnpike Commission, 14 State bridges and no Municipal bridges in the Township. These include bridges over waterways, roads, and railroads. Some bridges are “posted” with weight limitations to use the bridge for safety purposes. There are two posted state owned bridges in the Township. They are the bridge on Yellow Springs Road over Pickering Creek, with a posting of 25 tons, and the bridge on Clover Mill Road over Pickering Creek, with a posting of 35 tons. There are no closed bridges listed for the Township.

Capital Improvements

Capital improvements are scheduled by the state for highway, bridge, and transit networks. This schedule of improvements takes the form of the PennDOT Twelve Year Program. Each even-numbered year, PennDOT submits recommended projects for the next twelve fiscal years to the State Transportation Commission. After a public review process, the Commission adopts a list of projects, which includes a description of each project, estimated cost of the project, and time frame of project in the next twelve years. Project priorities in the Program are defined by the state, and in part on input from legislators, counties, transit operators, and municipalities.

The Chester County Highway Improvements Inventory is a capital improvements program, which includes County highway and bridge projects that have been recommended to the County by legislators, municipalities, and regional planning commissions. This inventory serves as the County’s input to PennDOT in the development of their Twelve Year program as described above.

Table 5-6 lists those highway and bridge projects included in the adopted PennDOT 1999 Twelve Year program. The tables also indicate the timing of the projects in the PennDOT program, and Chester County Planning Commission’s recommendation for their phasing.

**TABLE 5-6
1999 PENNDOT TWELVE YEAR PROGRAM
Proposed Projects in West Pikeland Township**

| PROJECT | TYPE OF IMPROVEMENT | TIMING | |
|---|----------------------|--------------|----------------|
| | | CCPC* | PennDOT** |
| Intersection of PA 113 and PA 401 | Safety Improvements | 1 to 4 year | 1 to 4 year |
| Yellow Springs Road bridge over Pickering Creek | Replacement | 5 to 8 year | Not on program |
| Clover Mill Road bridge over Pickering Creek | Replacement | 5 to 8 year | Not on program |
| Intersection of PA 401 and Messner Road | Realign intersection | 9 to 12 year | Not on program |
| Byers Road near Pickering Creek | Realign and widen | 9 to 12 year | Not on program |

* Suggested timing for Engineering, Right-of-way and Construction phases as recommended by the Chester County Planning Commission in 1998 to PennDOT.

**Proposed phasing for the project according to the adopted 1999 Twelve Year Program.

Source: Chester County Highway Improvements Inventory (1998); PennDOT 12 Year Program (1999).

While making recommendations for improvements, the impacts of bridge and roadway improvements to the Township should be considered. With improvements made to the existing bridges posted with weight limitations, truck and heavy vehicle traffic may increase. The roadway improvements will promote economic development and provide safety and access, whereas increased heavy vehicle traffic may effect the much desired quality of life.

ALTERNATIVE FORMS OF TRANSPORTATION

In West Pikeland, automobiles are the dominant mode of transportation. Alternative transportation facilities include railroad stations, bus stations, commuter lots and airports. It can also include non-motorized facilities such as sidewalks, trails and bikeways. The Township is not served directly by any public transportation. Reliance on the automobile is partly due to the lack of other alternatives and partly due to the development pattern experienced in the area. The most common pattern of land development in the Township is residential development on large lots, which limits transit opportunities. The large lot residential developments make walking to stores, bus or train stations, schools, places of work, or other destinations very difficult. The possibilities of providing transit opportunities are diminished due to the prevalent low-density land patterns and potential limited ridership.

For the Township, the closest bus service is the SEPTA Route 99, on Route 23 in Phoenixville. The Amtrak commuter train runs in the south along US Route 30 with stations in Coatesville, Downingtown, Whitford, Exton, and beyond. The closest airport is in West Chester, which is a general aviation or reliever airports, with no scheduled carriers. The closest commercial service airport would be the Philadelphia International Airport.

There is no pedestrian circulation system in West Pikeland Township, other than the historic Horseshoe Trail traversing the Township. No formal trail system exists outside of the subdivisions in the Township, although many of the scenic roads in the Township are now being used extensively by bicyclists. The Open Space, Recreation and Environmental Resources Plan (1992) includes recommendations for potential trails and trail corridors.

SCENIC ROAD PRESERVATION

Public roads provide the easiest access to experience and enjoy scenic resources like stream corridors, scenic roads, views, and vista points. The Township's Open Space, Recreation, and Environmental Resources Plan (1992) contains a scenic resources map that identifies "scenic roads". Scenic roads are identified in accordance with the Chester County Scenic Roads Handbook (1984). The scenic roads were identified and delineated by the open space task force in the Township. Identified resources included roads that traverse through scenic corridors of high aesthetic and cultural value.

The scenic roads identified in the Township include those that:

- Change dramatically in curvature and elevation;
- Allow the travel experience to change from confined roadways to open vistas;
- Wind through woodlands, pass along creek valleys, or have views of gently rolling meadows and pastures;
- Allow for travel along areas of cultural or historic interest; and
- Allow the experience of urban, suburban, rural and natural settings.

A majority of the roads in the Township, other than roads within residential subdivisions, meets these criteria and are considered "scenic roads". In addition to this broad definition of "scenic roads", several "visual accents" or scenic highlights visible from these scenic roads were identified, along with eight "vista points" which offered scenic views of several miles. These features are shown on Map 5: Scenic, Historic, and Cultural Resources, in Open Space, Recreation and Environmental Resources Plan (1992), or Map 4-3, of this Plan.

The very features that give a road its scenic character also often detract from its safety as a transportation corridor. This is not a conflict under current conditions for many of the Township's lightly traveled rural roads, but could become a key issue if traffic volumes increase on these roads. A challenge for the Township is balancing these competing values as development continues in the Township and volumes increase on roads that are currently lightly traveled and rural in character. When establishing functional classes and design and development guidelines, the scenic quality of the roads should also be taken into consideration. This will help enhance the driving experience and promote safe driving conditions.

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| PLANNING IMPLICATIONS |
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- Future land use and transportation planning for the Township should be coordinated, due to their strong influence on each other. Plans for each need to be interrelated in order to maintain the Township's rural road network, while accommodating increasing traffic volumes.
- When establishing functional classes and design, and development guidelines, the scenic quality of the roads should also be taken into consideration. This will help enhance the driving experience and promote safe driving conditions.
- The classification of higher functioning roads must be evaluated to ensure that they are improved to the standards appropriate for the type of traffic they carry.
- There is a need to identify important pedestrian connections and bike routes within and out of the Township. This can help in preparing an interconnected pedestrian trails and bike routes plan, linking destinations within and in the immediate vicinity of the Township.
- The Route 113 Corridor Study should be implemented and periodically updated to incorporate current trends, impacts, and future projections.
- Population growth will continue to put pressure on the existing circulation network, which will require the Township to plan for increased road maintenance and improvements.
- Access management techniques should be implemented to reduce negative impacts of frontage development, particularly on higher functioning roads.
- West Pikeland has a high number of road miles that are in relatively good condition, consistent with its rural character. Continual monitoring and safety improvements are required to ensure safe travelling conditions on all Township roadways.

