

SECTION 5 TRANSPORTATION AND CIRCULATION PLAN

A. Introduction and Statement of Goals

The history and growth of Radnor have been intimately tied to transportation as yesterday's Indian trails have grown into today's major roadways, and as trains that once connected "long-distance" travelers to Philadelphia and Lancaster now carry busy commuters through the "Main Line." It is evident that the transportation and circulation network has played an important role in defining past and present development patterns within the Township, and will continue to play a major role in Radnor's future. Since the Township last completed its Comprehensive Plan, the transportation network of the Township has been significantly altered by the opening of the Mid-County Expressway (Interstate 476), also known as the Blue Route, and its interchange across U.S. Route 30 in Radnor.

As residential, commercial, industrial and virtually all other forms of activity have always been influenced by their proximity to major transportation corridors within the Township, it is therefore essential that Township planning be sensitive to the relationship between land use and transportation to maintain efficient circulation patterns, as this relationship will continue to be intertwined in the future. Accordingly, this Chapter provides an inventory and evaluation of the current transportation and circulation network in Radnor Township, which includes both an evaluation of vehicular facilities (i.e., roadways and intersections), transit opportunities, and multi-modal facilities (i.e., pedestrian and bicycle facilities) and provides recommendations to address the future needs of the Township. Discussions regarding traffic calming, parking, access management, regional influences, and funding mechanisms for transportation improvements have been included and both general and specific recommendations are provided throughout the text and again at the end of this discussion.

1. Goals

This Chapter focuses on the following set of Goals facing the Township as it plans for the future and seeks to establish policies and planning/design criteria for the future transportation and circulation plan.

Goals

Develop a transportation capital improvement plan with recommendations for safety and capacity-related traffic improvements to accommodate future traffic demands.

Implement traffic improvements for key roads and intersections to improve traffic flow and to encourage traffic to remain on the major routes.

Develop traffic calming strategies for implementation, as appropriate, to help preserve neighborhoods.

Use landscaping, gateways, and street furniture, etc. to integrate the road system and traffic within the community to enhance and preserve the rural and scenic character of the streets, without sacrificing safety.

Preserve the rural and scenic character of the streets, without sacrificing safety.

Improve pedestrian circulation by implementing of pedestrian facilities as well as planned trail and bicycle facilities.

Encourage increased use of public transit.

Encourage opportunities for transit-oriented development and limit intensive uses to areas close to public transit where such uses are compatible with adjacent uses and would cause no adverse impact on the residential neighborhoods.

Enhance regional rail use through accommodation of commuter parking needs in a manner consistent with the Comprehensive Plan.

Promote ride sharing or carpooling as well as other trip reduction strategies to reduce single occupant, private vehicle commuting by employees of major businesses.

Support a coordinated/planned private transit service through a cooperative partnership between the major employers, institutions and the Township.

Existing weekday morning and afternoon, commuter peak hour traffic volumes were collected for 16 key intersections selected by the Township and the Steering Committee. Capacity/level-of-service analyses were performed and transportation improvements have been recommended, as necessary. Furthermore, 20-year traffic volumes were forecasted for these intersections, and the intersections were reanalyzed to identify needed future improvements.

B. Road Network

Vehicular use constitutes the primary form of circulation and transportation in Radnor, which is common for many suburban communities in the region. As such, it is important to ensure that the roadways within the Township operate safely and efficiently. Furthermore, it is important that the Township plan accordingly to implement strategies and improvements necessary to accommodate existing and future traffic and, where feasible, to encourage more use of public transit, ridesharing, bicycling, walking, and alternative work arrangements to reduce future traffic.

1. Current Roadway Inventory

Currently, there are approximately 140 linear miles (see Existing Land Use chapter for road coverage within Radnor Township) of roadway within the Township, which includes state and local roadways. The primary roadways, which comprise important transportation links through Radnor Township, as well as some of the operating characteristics of each of these roadways, are summarized in Table 5-1.

Table 5-1. Existing Roadway Inventory and Classification

Roadway	Route Number	Current Ownership	Functional Classification ¹	Current ADT ²	Potential Reclassification ³
Mid-County Expressway	Interstate 476	State	Expressway	122,400 ⁽²⁰⁰⁰⁾	---
Lancaster Avenue	U.S. Route 30	State	Arterial	38,700 ⁽¹⁹⁹⁷⁾	---
Sproul Road	PA Route 320	State	Arterial	13,800 ⁽²⁰⁰⁰⁾	---
Spring Mill Road	PA Route 320	State	Arterial	8,600 ⁽¹⁹⁹⁷⁾	Major Collector
Conestoga Road	S.R. 1019	State	Major Collector	13,600 ⁽²⁰⁰²⁾	Arterial ⁴
Bryn Mawr Avenue	S.R. 1032	State	Major Collector	15,900 ⁽¹⁹⁹⁷⁾	Arterial
Radnor-Chester Road	S.R. 1021	State	Major Collector	6,500 ⁽²⁰⁰⁰⁾	---
Godfrey Road	S.R. 1036	State	Minor Collector	---	---
Darby-Paoli Road	S.R. 1015	State	Major Collector	7,800 ⁽¹⁹⁹⁸⁾	---
Goshen Road	S.R. 1034	State	Minor Collector	---	Major Collector ⁽⁴⁾
North Wayne Avenue	S.R. 1046	State	Major Collector	8,500 ⁽¹⁹⁹⁸⁾	---
South Wayne Avenue	S.R. 1046	State	Major Collector	3,400 ⁽¹⁹⁹⁸⁾	---
Eagle Road	S.R. 1042	State	Major Collector	5,600 ⁽²⁰⁰²⁾	---
King of Prussia Road	S.R. 1021	State	Major Collector	18,000 ⁽²⁰⁰²⁾	Arterial
Matsonford Road	S.R. 1038	State	Major Collector	7,800 ⁽¹⁹⁹⁸⁾	---
Newtown Road	S.R. 1021	State	Minor Collector	6,400 ⁽¹⁹⁹⁸⁾	Major Collector ⁴
Brooke Road	S.R. 1046	State	Minor Collector	---	---
County Line Road	S.R. 1001	State	Major Collector	28,200 ⁽¹⁹⁹⁷⁾	Arterial
St. Davids Road	S.R. 1046	State	Minor Collector	2,300 ⁽²⁰⁰¹⁾	Major Collector ⁽⁴⁾
Sugartown Road	S.R. 1044	State			
Gulph Creek Road	S.R. 1040	State			
Coopertown/Landover Roads	S.R. 1009	State			
Upper Gulph Road	---	Township	Major Collector	5,300 ⁽¹⁹⁹⁹⁾	Arterial ⁽⁴⁾
Clyde Road	---	Township	Minor Collector	---	---
Iven Avenue	---	Township	Minor Collector	---	---
Lowry's Lane	---	Township	Minor Collector	---	---
Malin Road	---	Township	Minor Collector	1,800 ⁽²⁰⁰¹⁾	---
Maplewood Road	---	Township	Minor Collector	1,200 ⁽²⁰⁰¹⁾	---
Newtown Road	---	Township	Minor Collector	---	---
North Ithan Avenue	---	Township	Minor Collector	---	---
Wyldhaven Road	---	Township	Minor Collector	---	---
Pine Tree Road	---	Township	Minor Collector	---	---
Radnor Street Road	---	Township	Minor Collector	3,400 ⁽²⁰⁰¹⁾	---
Roberts Road	---	Township	Minor Collector	3,500 ⁽¹⁹⁹⁹⁾	---
Sinkler Drive	---	Township	Minor Collector	---	---
Church Road	---	---	Minor Collector	---	Major Collector ^{(4)?}
Mill Road	---	---	Local	---	Minor Collector ^{(4)?}
Saw Mill Road	---	---	Local	---	Minor Collector ^{(4)?}
South Aberdeen Avenue	---	Township	Minor Collector	---	---
South Devon Avenue	---	Township	Minor Collector	---	---
South Ithan Avenue	---	Township	Minor Collector	6,600 ⁽²⁰⁰¹⁾	---
Valley Forge Road	---	Township	Minor Collector	2,000 ⁽²⁰⁰¹⁾	---
West Wayne Avenue	---	Township	Minor Collector	---	Major Collector ⁽⁴⁾

¹ Based on the *Township of Radnor Subdivision and Land Development Ordinance*.

² Historic ADT (Average Daily Trips) data adjusted to reflect 2002 traffic conditions in some cases, actual year of traffic count shown (1998).

³ Reclassification may be justified based on current traffic volumes as compared to the Township’s traffic volume criteria. Further study recommended. Additionally, future traffic volumes should be monitored to determine the need for reclassification along all roadways.

⁴ Reclassification as recommended by the *Township of Radnor Comprehensive Plan, 1988*. Parenthesis ⁽⁴⁾ indicate that available traffic volumes alone do not constitute reclassification in accordance with Township criteria, or current traffic volumes are not available.

There are hundreds of intersections of public roadways within the Township, of which the majority are unsignalized intersections controlled by stop signs on the minor, side street approaches, or in some cases all-way stop control. The intersections of the most heavily traveled roadways within Radnor are controlled by traffic signals to move traffic through these intersections safely and efficiently. The intersections in the Township that are presently signalized are indicated in Table 5-2.

Table 5-2. Current Traffic Signal Inventory

Signalized Intersection	Signalized Intersection
Lancaster Avenue and Lowry’s Lane	Eagle Road and Radnor Street Road
Lancaster Avenue and Ithan Avenue	Eagle Road and King of Prussia Road
Lancaster Avenue and Villanova Parking Lot	King of Prussia Road and Matsonford Road
Lancaster Avenue and Sproul Road (PA Route 320)	Conestoga Road and West Wayne Avenue
Lancaster Avenue and Interstate 476 Northbound Ramp	Conestoga/Church Road/Iven Avenue/Aberdeen Avenue
Lancaster Avenue and Interstate 476 Southbound Ramp	Conestoga Road and Radnor Chester Road
Lancaster Avenue and King of Prussia Road	Conestoga Road and Sproul Road (PA Route 320)
Lancaster Avenue and Radnor Chester Road	Conestoga Road and Ithan Avenue
Lancaster Avenue and Genuardi’s Driveway (west)	Conestoga Road and Garrett Avenue
Lancaster Avenue and Genuardi’s Driveway (east)	Conestoga Road and County Line Road
Lancaster Avenue and Chamounix Road	Haverford Avenue and Bryn Mawr Avenue
Lancaster Avenue and Aberdeen Avenue	Bryn Mawr Avenue and Sproul Road (PA Route 320)
Lancaster Avenue and Louella Avenue	Bryn Mawr Avenue and Mill Road
Lancaster Avenue and N. Wayne/S. Wayne Avenues	Bryn Mawr Avenue and Malin Road
Lancaster Avenue and Bloomingdale/Banbury Avenues	Sproul Road and Clyde Road
Lancaster Avenue and Conestoga/Eagle Roads	Sproul Road and Godfrey Road
Lancaster Avenue and Sugartown/Old Eagle School Roads	Radnor Chester Road and Kravco Driveway
North Wayne Avenue and West Avenue	Matsonford Road and County Line Road
North Wayne Avenue and Eagle Road	Matsonford Road and N. Centennial Drive/Carroll H.S.
North Wayne Avenue and Station Road	Matsonford Road and S. Centennial Drive
North Wayne Avenue and Poplar Avenue	Sugartown Road and Morris Road

Current Functional Classification of Roadways

The functional classification is an organization method by which roadways are categorized into a system based on the function they serve. These systems designate roadways according to average daily traffic volumes, roadway design, relationship to other network roadways, and function (access versus mobility). Furthermore, highway functional classification is a means by which federal, state, regional, county and municipal planners describe the hierarchy of roadway importance based upon the level of service the roads are intended to provide.

The inverse relationship between access and mobility is the principal concept for the functional classification of a roadway. Accessibility relates to the amount of opportunities to enter or exit a

roadway from an adjacent property or a surrounding area. Mobility involves the ability or capacity of the roadway to accommodate traffic flow. Typically, the higher the roadway's capacity to facilitate traffic flows, the lower its ability to provide efficient access to adjacent properties and surrounding areas, and vice versa. The functional classification allows the prioritization of maintenance and improvements. The general classifications of roadways in terms of capacity/mobility from highest-order to lowest-order includes expressways, arterial roads, collector roads, and local roadways, and are more thoroughly described below. A second level of classification (i.e., major/minor or primary/secondary designations) is often utilized to more appropriately describe a roadway's function and to more precisely apply classification criteria.

Expressways have as their major function the movement of large volumes of traffic at relatively high rates of speed. These roads provide higher types of service and facilitate traffic over long distances on an inter-county and interstate basis. Access points are limited and controlled. The only road in Radnor Township that functions as an expressway is the Mid-County Expressway (Interstate 476). This highway is a limited access road that travels through Delaware and Montgomery Counties providing access to other regional expressways and other major roadways. Local access to the Mid-County Expressway is provided at the interchange located along Lancaster Avenue (U.S. Route 30). According to Township criteria, an expressway is classified as a roadway that carries an average daily traffic (ADT) volume of 10,001 or more vehicles per day.

Arterial Roads provide service to trips of moderate length, usually provide a high degree of mobility, and have relatively controlled access points. Arterial roads provide greater access to the adjacent roadway network than expressways, and are intended to carry the highest traffic volumes at the highest speeds, with the exception of expressways. According to Township criteria, an arterial road is classified as a roadway that carries an ADT volume of 10,001 or more vehicles per day, similar to expressways. Most arterial roads are owned and maintained by the State.

Major Collector Roads, in general, connect municipalities and major traffic generators. These roads are the major contributors to arterial traffic and convey fairly heavy traffic volumes at moderate rates of speed. Access points are usually controlled on collector roads. It is not uncommon for a major collector road to span the entire length of a municipality. According to Township criteria, a major collector road is classified as a roadway that carries an ADT volume between 3,501 and 10,000 vehicles per day. Most major collector roads are owned and maintained by the State.

Minor Collector Roads facilitate low volumes of traffic at lower speeds. They gather traffic from local roads and direct it to the arterial and major collector road networks. Minor collectors often provide traffic circulation between and within larger residential neighborhoods. According to Township criteria, a minor collector road is classified as a roadway that carries an ADT volume between 651 and 3,500 vehicles per day.

Local Roads provide the greatest access to adjacent land. They provide for short distance, low speed travel and constitute the majority of the Township-owned roads. The

number of access points is greatest on local roads. Local roads often have their own hierarchy and are reclassified accordingly because they serve various functions, such as primary and secondary distributor roadways within residential neighborhoods and subdivisions. Furthermore, the overdesign of a local road is costly and negatively affects the safety and residential quality of a neighborhood, the environment, and future maintenance costs. When a local road is excessively wide it encourages motorists to travel at higher speeds thereby reducing safety for pedestrians. Therefore, a hierarchy of local roads can positively affect the neighborhoods and the roads they serve; however, Radnor Township currently does not distinguish between the various types of local roads, other than *courts* (less than 100 vehicles per day). According to Township criteria, local roads carry an ADT of less than 651 vehicles per day.

Table 5-1 displays the existing functional classification and average daily traffic volumes of the major roadways within the Township, as well as some other roadways classified as local roads. The growth that has occurred in Radnor and in neighboring municipalities, and the completion of the Mid-County Expressway (Interstate 476), have contributed to the increase of traffic volumes in the Township, and may require some roads to be reclassified to higher-order roads in accordance with the Township criteria, as indicated in Table 5-1.

Future Functional Classification of Roadways

The Radnor Township *Subdivision and Land Development Ordinance* establishes the criteria for the classification of roadways based on daily traffic volumes. As such, the potential reclassifications noted in Table 5-1 are solely based on current (2002) daily traffic volumes. While actual current daily traffic volumes are often a satisfactory criterion for evaluating the use and purpose of a roadway, it is important that the Township must also consider the design, location and intended purpose of each roadway before reclassification, as well as the nature of the traffic volume increases and appropriateness of the potential reclassification. For example, a local road in a residential neighborhood experiencing traffic increases due to cut-through traffic avoiding congestion areas on higher-order roadways should not necessarily be reclassified to a higher-order street; rather, the congestion areas should be addressed.

Recommended Actions

Since the classification, design, and service of roadways should be determined based on a number of factors – including traffic volume, roadway design capacity, relationship of the roadway to other roads, and the function of the roadway (access versus mobility) – traffic generated by future development (occurring in the Township and the surrounding region) may affect these factors. Therefore, the Township should continue to monitor future traffic volumes and patterns along the local roadway network and take the following initiatives to maintain the adequacy of the roadway network:

- **Reclassify several roadways within the Township to reflect current traffic conditions and future needs (refer to Table 5-1 for potential reclassifications).**
- **Continue to monitor future traffic conditions to determine if reclassification is necessary.**

- **Upgrade roadways to satisfy the design criteria of newly reclassified roadways.**
- **Future development should be monitored and regulated so that subsequent traffic generation does not alter the designated function of individual roads unless the design can be upgraded and is consistent with both the future land use and circulation plans. Developments should not cause restrictions on the ease of entering or exiting a roadway from adjacent properties, or increase traffic to encroach upon or exceed the capacity of a road.**

2. Traffic Volumes and Operating Conditions

Traffic volumes provide valuable information when assessing a roadway network, as they indicate the level of usage of a particular roadway and are important for planning and design purposes. Traffic volumes are typically assessed for roadways on a daily basis while intersections are evaluated on a peak hour (the 60-minute period of the day that experiences the highest volume of traffic) basis, typically during the weekday morning and afternoon commuter rush hours.

Current Traffic Volumes

Traffic counts were collected along major roadways within the Township and at key intersections to establish current traffic volumes. Additionally, recent traffic counts have been examined to supplement the newly collected traffic data and to further assess traffic volumes for roads in the Township, including traffic volumes collected previously by Radnor Township, the Pennsylvania Department of Transportation, the Delaware Valley Regional Planning Commission, and other available recent traffic studies.

Daily traffic volumes that were adjusted according to seasonal variations are referred to as Annual Average Daily Traffic (AADT). Daily traffic volumes that were not seasonally adjusted are referred to as Average Daily Traffic (ADT) volumes. Figure 5-1 illustrates recent and historic traffic volumes for various roadway facilities consisting of either ADT or AADT volumes, which have been adjusted to reflect 2002 traffic volumes utilizing a traffic growth rate of one percent per year. These ADT and AADT traffic volumes have also been presented in Table 5-1.

Intersection manual turning movement counts were recently conducted at selected key intersections in the Township during the weekday morning and afternoon commuter peak hours. These key intersections are listed in Table 5-3. These peak hour traffic volumes were obtained from traffic counts conducted in February 2002. The summarized weekday morning and afternoon commuter peak hour traffic volumes are illustrated in Figures B-1 through B-16 for these key intersections within the Township, and are contained in Appendix B, hardcopy available at the Radnor Township building.

Table 5-3. Intersections Studied in the Comprehensive Plan

Reference No.	Intersection	Current Traffic Control Type
1	Lancaster Avenue and Old Eagle School Road/Sugartown Road	Traffic Signal
2	Lancaster Avenue and Conestoga Road/Eagle Road	Traffic Signal
3	Lancaster Avenue and N. Wayne Avenue/S. Wayne Avenue	Traffic Signal
4	Lancaster Avenue and Aberdeen Avenue	Traffic Signal
5	Lancaster Avenue and Radnor-Chester Road	Traffic Signal
6	County Line Road and Roberts Road	Stop Sign
7	County Line Road, Conestoga Road, Thomas Avenue, Glenbrook Avenue	Traffic Signal
8	County Line Road, Bryn Mawr Avenue, and Glenbrook Avenue	Traffic Signal
9	Conestoga Road and S. Wayne Avenue	Stop Sign
10	Conestoga Road and Brooke Road	Stop Sign
11	Conestoga Road, Iven Avenue, Aberdeen Avenue, Church Road	Traffic Signal
12	Conestoga Road and Radnor-Chester Road	Traffic Signal
13	Conestoga Road and Newtown Road	Stop Sign
14	Conestoga Road and Ithan Avenue	Traffic Signal
15	Darby-Paoli Road and Brooke Road	Stop Sign
16	Bryn Mawr Avenue and Sproul Road (PA Route 320)	Traffic Signal

Future Traffic Volumes

The significant increase in traffic volume levels resulting from the opening of the Mid-County Expressway (Interstate 476) will likely not be repeated anytime in the near future. Instead, development within Radnor and the surrounding region, coupled with natural increases in traffic (i.e., as a result of increased population, automobile ownership, etc.) will account for the majority of traffic increases along the Radnor roadway network in the near future. For the purposes of this evaluation, future traffic volumes were projected utilizing an annual traffic growth rate of one-percent, or 20 percent total, to reflect year 2022 traffic conditions. Examination of historic and current traffic volumes revealed an average traffic growth rate of nearly one-percent per year along major roadways within the Township. The 2022 future traffic volume projections are also summarized in Figures B-1 through B-16 (see Appendix B located at the Radnor Township building) for the weekday morning and afternoon peak hours.

Intersection Capacity

While traffic volumes indicate the use of a particular road or intersection, they do not fully describe traffic conditions or the capacity of the facility to accommodate traffic. A common method of analyzing operational deficiencies for the roadway network is to compare traffic

volumes to the designated capacity of the roadway. The volume to capacity (v/c) analysis, or the ratio of peak hour traffic volume to roadway/intersection capacity, is an indicator of congestion resulting in a reduction in vehicle speed or an increase in travel delay. Capacities are based upon the maximum number of vehicles, which can reasonably be expected to pass through a given segment or intersection under normal conditions. Control delay also provides a measure of traffic operations at intersections, which is expressed in terms of seconds of delay per vehicle per lane group, which is then expressed in terms of a level of service. The standard breakdown of control delay and levels of service is depicted in Table 5-4 and Table 5-5 for unsignalized and signalized intersections, respectively, based on the methodologies of the *Highway Capacity Manual, 2000*.

Table 5-4. Level of Service for Unsignalized Intersections

Level of Service	Description	Control Delay Per Vehicle (Sec)
A	Little or no delay	= 10.0
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delay	25.1 to 35.0
E	Very long traffic delay	35.1 to 50.0
F	Demand exceeds capacity of the lane or approach	> 50.0

Source: Transportation Research Board. Special Report 209, *Highway Capacity Manual*, Washington, DC, 2000.

Table 5-5. Level of Service for Signalized Intersections

Level of Service	Description	Control Delay Per Vehicle (Sec)
A	Very low delay, high quality flow	= 10.0
B	Low delay, good traffic flow	10.1 to 20.0
C	Average delay, stable traffic flow	20.1 to 35.0
D	Longer delay, approach capacity flow	35.1 to 55.0
E	Limit of acceptable delay, capacity flow	55.1 to 80.0
F	Unacceptable delay, forced flow	> 80.0

Source: Transportation Research Board. Special Report 209, *Highway Capacity Manual*, Washington, DC, 2000.

Current Levels of Service

The weekday commuter peak hour traffic conditions typically represent the worst-case operating conditions of the roadway network, and for most other hours of the day, the traffic conditions are generally improved. The results of the capacity/level-of-service analyses for the key study intersections (refer to Table 5-3) within the Township are illustrated on Figures B-1 through B-16 (see Appendix B located at the Radnor Township building) for the existing weekday morning and afternoon commuter peak hours.

Excluding the Mid-County Expressway (Interstate 476), Lancaster Avenue currently carries the highest volume of traffic through the Township on a daily basis and during the weekday morning and afternoon peak hours. Accordingly, the U.S. Route 30 corridor experiences the most significant delays during the peak hours due to the lack of capacity provided at some of the intersections along the corridor, which exacerbates operational problems along the corridor. For example, traffic congestion along U.S. Route 30 in the vicinity of its intersection with Radnor-Chester Road is partially a result of poor signal timings at the intersection (lack of coordinated signal progression), and due to the heavy traffic volumes along the corridor. As a result, traffic congestion and queues typically extend beyond other adjacent intersections, thereby creating traffic delays that would not otherwise be realized.

Some other intersections within the Township, which are not located along the U.S. Route 30 corridor, also experience delay. These delays are caused by several reasons, including outdated traffic signal timings and phasing, heavy traffic volumes at unsignalized intersections, multi-approach intersections, or lack of sufficient capacity (i.e., turning lanes and through lanes). Relative to the key intersections evaluated in the Comprehensive Plan, the intersections that are currently operating with poor levels of service (LOS E or F) are listed in Table 5-6.

Planned Short-term Improvements

- A traffic signal upgrade improvement project is currently being considered for 14 signalized intersections along Lancaster Avenue within Radnor, and is contained on the PennDOT *12-Year Transportation Improvement Program*. This improvement is the only improvement contained on the current *12-Year Transportation Improvement Program* to address capacity-related issues in Radnor Township. The traffic signal upgrade program is expected to add a closed-loop traffic control system that will interconnect the operations of the 14 traffic signals and improve capacity and efficiency, and is currently scheduled for implementation in 2004.
- There is an immediate traffic signal improvement project that the Township is currently in the processes of implementing. These traffic signal improvements consist of timing optimization and improved timing coordination along Lancaster Avenue at the signalized intersections between St. David's Square (westernmost access) and the Mid-County Expressway (Interstate 476) northbound on-ramp.

Recommended Actions

The Township should consider the following, to maintain efficient traffic operations along Radnor roads and at intersections within the Township:

- **The potential short-term intersection improvements contained in Table 5-6 should be further evaluated and considered by the Township.**
- **Traffic signal equipment (i.e., controllers, loop detectors, etc.) and programming (i.e., timings, phasing, offset timings, clocks, etc.) should be properly maintained to ensure proper operations.**

- **Pursue funding opportunities for identified roadway and intersection improvements (i.e., DVRPC Transportation Improvement Program and the PennDOT Twelve Year Transportation Improvement Plan). See the Highway Project Funding section of this Chapter.**
- **Improve interface between automobile traffic and pedestrian movement.**

Moreover, as traffic volumes increase in the future, there will be a need for additional capacity improvements (i.e., signal optimization, turning lanes, etc.), and other improvements, which will be evaluated under future conditions.

Table 5-6. Current Intersection Operating Deficiencies and Potential Short-Term Improvements

Intersection	Current LOS Deficiencies AM (PM)	Potential Short-Term Intersection Improvements
Lancaster Avenue and Aberdeen Avenue	LOS F(F) – Southbound Aberdeen Avenue approach	Optimize traffic signal timings.
Lancaster Avenue and King of Prussia Road/ Radnor- Chester Road ¹	LOS E (F)² – Overall; Poor LOS for multiple movements during both peak hours	Optimize signal timings to reduce delay and improve progression along Lancaster Avenue. Geometric/ widening improvements for additional lanes will also be necessary to eliminate all poor levels of service.
County Line Road and Roberts Road	LOS F(E) for the northbound Roberts Road stop-controlled approach.	Traffic signalization currently not warranted by existing traffic volumes.
County Line Road and Conestoga Road/Thomas Ave/ Glenbrook Ave	LOS F(F) – Overall; eastbound Conestoga Road approach	Optimize traffic signal timings.
County Line Road and Bryn Mawr Ave/ Glenbrook Ave	LOS (E) for the southbound Bryn Mawr Avenue through movement	Optimize traffic signal timings.
Conestoga Road and South Wayne Avenue	LOS E(F) for the stop-controlled South Wayne Avenue approach	Traffic signalization, as currently warranted.
Conestoga Road and Brooke Road	LOS F(E) for the stop-controlled Brooke Road approach	Traffic signalization in coordination with Conestoga Road/S. Wayne Avenue signalization, as traffic volumes do not satisfy signalization warrants as an isolated intersection.
Conestoga Road and Church Road/Iven Avenue/ Aberdeen Avenue	LOS D(F) – Overall; Poor level of service for the eastbound Conestoga Road approach and southbound Iven Avenue approach during the PM peak hour	Optimize traffic signal timings.
Conestoga Road and Newtown Road ¹	LOS F(F) for the northbound Newtown Road approach	Traffic signalization, as currently warranted.
Darby-Paoli Road and Brooke Road ¹	LOS F(F) for the southbound Brooke Road left-turn movement	Traffic signalization, as currently warranted.
Bryn Mawr Avenue and Sproul Road ¹	LOS F(F) – Overall; Poor levels of service for shared through/right-turn movements during both peak hours	Optimize traffic signal timings. Geometric/ widening improvements will also be necessary to eliminate all poor levels of service.

1 – Long-term improvements needed to address existing traffic as well as future traffic (See Table 5-7).

2 – Due to heavy volumes along U.S. Route 30, poor delays effect other adjacent intersections not identified by the analysis.

Potential Short-Term Improvements appearing in Table 5-6, as well as those Long-Term Improvements in Table 5-7, are based on accepted traffic planning and engineering methodologies, such as Level of Service standards. In some cases (e.g., intersection of Conestoga Road and Brooke Road), the potential improvements to these intersections may not be consistent with the rural nature of the roads themselves as well as the surrounding neighborhoods and may need additional consideration. In all cases, these intersection improvements should be viewed as “potential” or “preliminary.”

Future Levels of Service

As traffic volumes increase along roadways, the delay experienced by motorists will also increase without a future transportation improvement plan. To properly plan for the future and develop an efficient future transportation network, potential improvements to the roadway network must be considered, which include improvements such as traffic signal timing/phasing optimizations, geometric improvements at intersections and along roadways, installation of traffic signals, possibly new roadways, as well as ridesharing, mass transit and other means of traffic mitigation. Therefore, utilizing the future 2022 traffic volume projections previously described, capacity/level-of-service analyses were conducted for the key study intersections during the weekday morning and afternoon peak hours to determine future operating conditions and identify long-term improvements to accommodate these future traffic volumes.

The results of the capacity/level-of-service analyses for the key study intersections (as noted in Table 5-3) within the Township are illustrated on Figures B-1 through B-16 (see Appendix B, located at the Radnor Township building) for the 2022 future weekday morning and afternoon commuter peak hours. Furthermore, the base future conditions analyses conservatively do not include any potential short-term improvement recommendations, as presented in Table 5-6. Relative to the key intersections evaluated in the Comprehensive Plan, the intersections that are projected to operate with poor levels of service (LOS E or F) are listed in Table 5-7, in addition to potential long-term improvements required to remedy these conditions.

Planned Long-Term Improvements

- Currently, there are no long-term roadway/intersection improvements for roadways and intersections within Radnor that are contained on the PennDOT *12-Year Transportation Improvement Program*.
- Although none of the following improvements is currently planned for implementation, it is important to note that the previous Comprehensive Plan recommended for study the following new roadway alignments:
 - o A Major Collector roadway between Lancaster Avenue and Conestoga Road following the former rail right-of-way. This road would relieve Radnor-Chester Road and Iven Avenue of traffic traveling between King of Prussia Road and Lancaster Avenue and areas to the southwest of the Township.
 - o A Minor Collector roadway between Newtown Road and Godfrey Road at a location approximately midway between Sproul Road and Darby-Paoli Road. This road

would serve new development and carry neighborhood traffic to other collector streets.

- o A Minor Collector roadway of much less importance than the previous roadways would connect Mill Road from Bryn Mawr Avenue through to Wyldhaven Road, providing added access for the area. This roadway was recommended only if institutions in the area were developed more intensely or were redeveloped.
- o The second and third new roadway alignments should be re-evaluated to determine if their construction is still feasible and necessary. Additionally, if either of these roadways were to be constructed in the future, the long-term recommendations for improvements at nearby intersections may be affected.
- Every effort should be made to optimize the use of innovative traffic calming techniques in solving the mounting transportation and traffic problems throughout the Township.

Recommended Actions

The Township should consider the following improvements and issues, to maintain efficient traffic operations along roads and at intersections within the Township, making sure in all cases that proposed transportation improvements are consistent and compatible with all other Recommended Actions set forth in this Comprehensive Plan:

- **The potential long-term intersection improvements contained in Table 5-7 should be further evaluated and considered by the Township.**
- **As long-term improvements are selected for implementation by the Township, the Township should then pursue their selection by Delaware County, DVRPC, and PennDOT for their respective transportation improvement plans, as appropriate. Further discussion of this process is included later in this Chapter.**
- **Plan for the potential long-term improvements by acquiring the necessary right-of-way for geometric road configuration improvements, as necessary and when available.**
- **Pursue funding opportunities for identified roadway and intersection improvements (i.e., DVRPC *Transportation Improvement Program* and the PennDOT *Twelve Year Transportation Program*). See the Highway Project Funding section of this Chapter.**
- **In all of its roadway and intersection improvements, make sure that pedestrian movement is given a high priority.**

Table 5-7. Preliminary Long-term Intersection Improvements

Intersection	Preliminary Improvement Recommendations	Resulting Overall LOS¹ AM (PM)
Lancaster Avenue and Old Eagle School Road/Sugartown Road	Optimize traffic signal timings.	C(D)
Lancaster Avenue and Conestoga Road/Eagle Road	Widen Lancaster Avenue to provide a separate eastbound right-turn lane. ²	C(C)
Lancaster Avenue and N. Wayne Avenue/S. Wayne Avenue	Optimize traffic signal timings.	C(C)
Lancaster Avenue and Aberdeen Avenue	Optimize traffic signal timings.	B(C)
Lancaster Avenue and Radnor-Chester Road	Widen for additional through and left-turn lanes on Lancaster Pike in both directions; widen northbound Radnor Chester Road for separate left-turn lane; provide westbound right-turn overlap phase and northbound left-turn advance phase; optimize signal timings. ²	C(D)
County Line Road and Roberts Road	Traffic signal not warranted under existing or projected future conditions based on available data. Further study required.	--
County Line Road/Conestoga Road/Thomas Avenue/Glenbrook Avenue	Widen Conestoga Road to provide additional right-turn lane; optimize signal timings. (Through movements and left turns from Conestoga Road are not permitted but still occur – enhanced prohibitive measures should be evaluated.)	C(C)
County Line Road/Bryn Mawr Avenue/Railroad Avenue/Glenbrook Avenue	Widen northbound Bryn Mawr Avenue for separate right-turn lane; optimize signal timings.	C(D)
Conestoga Road and S. Wayne Avenue	Signalize and coordinate with future signal at Brooke Road/Conestoga Road; widen Conestoga Road for separate westbound right-turn lane. (Signal presently warranted.)	A(B)
Conestoga Road and Brooke Road	Signalize and coordinate with future signal at S. Wayne Avenue/Conestoga Road; widen Conestoga Road for separate eastbound right-turn lane. (Signal warranted under projected conditions.)	B(B)
Conestoga Road/Iven Avenue/Aberdeen Avenue/Church Road	Widen Conestoga Road for separate left-turn lanes in each direction; widen northbound Church Road for separate right-turn lane; optimize signal timings.	D(E)
Conestoga Road and Radnor-Chester Road	Widen Radnor Chester Road for separate left-turn lanes in both directions; widen westbound Conestoga Road for separate right-turn lane; provide southbound left-turn advance phase; optimize signal timings.	C(C)
Conestoga Road and Ithan Avenue	Widen Conestoga Road for separate westbound left-turn lane; optimize timings.	B(B)
Darby-Paoli Road and Brooke Road	Signalize; widen Darby-Paoli Road to provide a separate eastbound left-turn lane; current bridge along Darby-Paoli Road may require widening. (Signal warranted under existing conditions.)	B(B)
Bryn Mawr Avenue and Sproul Road	Widen all approaches to provide a separate left-turn lane and two through lanes ² ; provide left-turn advance phase on each approach; optimize signal timings.	C(D)

¹ – With implementation of preliminary improvements

² – Right-of-way is likely required, and therefore, further evaluation is needed to determine the feasibility of the improvements or alternative improvements should be identified.

3. Accident Locations and Deficient Roadway Conditions

The evaluation of accident locations is another measure of the efficiency and safety of the roadway network within the Township. Radnor maintains computerized records of reported and unreported accident locations on file at the Township Building. The Pennsylvania Department of Transportation also summarizes municipal traffic accident reports for State-owned and maintained roads. These two sources serve as an excellent database to examine accident locations.

Narrow cartways, skewed intersections, restricted sight distance, poor access/driveway configuration, multiple-approach intersections, or other geometric (horizontal/vertical alignment) deficiencies including sharp curves and steep grades are typical deficient conditions on roads within Radnor.

Planned Safety Improvements

- PennDOT 12-Year Transportation Improvement Program currently identifies one safety improvement within Radnor Township, which consists of aligning Goshen Road, in the vicinity of Darby-Paoli Road, to soften the curve presently signed at 10 mph in a 35 mph zone.

Recommended Actions

- **The Township should continue to periodically review accident reports to identify accident trends and safety issues.**
- **Solutions to the most prevalent roadway deficiencies should be examined and implemented to reduce the potential for accidents.**
- **Re-evaluate the merit of the Penn DOT 12-Year TIP improvement involving aligning of Goshen Road in the vicinity of Darby-Paoli Road, given the overall rural road context and neighborhood concerns.**

4. Regional Influences

The location of Radnor along major transportation routes has historically made the Township an attractive place to live and work, whether it was the availability of trails, convenient transit, or major thoroughfares and expressways. Therefore, future roadway improvements coupled with continued residential and commercial development in neighboring townships will continue to impact the transportation network in Radnor. Radnor will also face development and redevelopment pressure in the future and will also experience the traffic associated with growth in neighboring townships.

Lower Merion Township recently completed a transportation study of the Lancaster Avenue and Montgomery Avenue corridors within its municipal borders, which resulted in improvement alternatives for the corridors. Since any major improvements to either of these roadways will likely impact traffic conditions along Lancaster Avenue and other roadways within Radnor Township, **Radnor Township should coordinate with Lower Merion Township relative to any selected improvements, and address any related traffic impacts.** It is our understanding that at the present time, Lower Merion Township has not elected to implement any specific improvements along these corridors. Additionally, **Radnor should work to better coordinate all of its transportation**

planning with neighboring municipalities (Newtown, Marple, and Haverford in Delaware County, Easttown and Tredyffrin in Chester County, as well as Lower Merion in Montgomery County).

Recommended Actions

- **Radnor Township should continue to proactively plan for its future transportation network, including all modes of transportation, in a coordinated effort with surrounding municipalities, the Delaware County Planning Commission and Department, the Delaware Valley Regional Planning Commission, and the Pennsylvania Department of Transportation, and local and regional Transportation Management Associations.**

C. Transit

The primary means of transit that is available within Radnor is train service provided by the Southeastern Pennsylvania Transportation Authority (SEPTA). Additional transit opportunities available to Radnor residents include bus service and a shared-ride paratransit service.

1. Current Transit Services

The SEPTA R-5 regional rail line provides service between Philadelphia (and other connecting regional rail lines) and the Thorndale station located in Caln Township. There are four R-5 stations located within Radnor, including the Villanova Station, the Radnor Station, the St. Davids Station, and the Wayne Station. Amtrak train service is also provided at the nearby 30th Street (Philadelphia), Ardmore, Exton, and Paoli stations, each located along the R-5 rail line, and it provides service across the country. SEPTA also maintains Light Rail service along its Route 100 line within Radnor and the surrounding area, exclusive of the regional rail service, and provides service at the County Line Station, Radnor Station, Villanova Station, Stadium Station, Rosemont, Bryn Mawr, and Garrett Hill Station.

Transit provides a great benefit to the surrounding roadway network as it relieves traffic demand; however, the usage of transit depends upon a number of factors including location, convenience, accessibility, cost, etc. Due to the number of convenient regional rail stations located in the area, both within Radnor and the adjacent municipalities, it is important to evaluate more than just the four stations within Radnor. Also, it is important to consider that Radnor residents may not utilize the closest station to their home, but may utilize a station with more convenient parking or that is near a spouse's work or child's school, which may even be outside of the Township. This important factor should also be considered for non-Radnor residents using regional rail stations within the Township. The current operating conditions of the SEPTA R-5 rail service and SEPTA Route 100 Light Rail Service within the Radnor area are summarized in Table 5-8 and Table 5-9, respectively.

Table 5-8. Current Operating Conditions of the SEPTA R-5 Regional Rail Service¹

Station	Township	Available Parking ²	Parking Utilization Rate ²	Peak Fare (Off-Peak Fare)	Fare Zone
Strafford	Tredyffrin	Lot	N/A	\$4.50(\$3.50)	3
Wayne	Radnor	84	99%	\$4.50(\$3.50)	3
St. Davids ³	Radnor	57	93%	\$4.50(\$3.50)	3
Radnor ³	Radnor	82	100%	\$4.50(\$3.50)	3
Villanova ³	Radnor	89	94%	\$4.50(\$3.50)	3
Rosemont	Lower Merion	91	100%	\$4.50(\$3.50)	3
Bryn Mawr ³	Lower Merion	46	100%	\$4.50(\$3.50)	3
Haverford	Lower Merion	50	100%	\$3.75(\$3.00)	2
Ardmore	Lower Merion	Permit Only	N/A	\$3.75(\$3.00)	2

¹ Service provided in 30-minute intervals during the weekday morning and afternoon commuter peak periods.

² Based on information provided by SEPTA.

³ Express service to Philadelphia provided during the AM peak (inbound) and PM peak (outbound) at varying times.

Table 5-9. Current Operating Conditions of the SEPTA Route 100 Light Rail Service¹

Station	Township	Available Parking ²	Parking Utilization Rate ²	Fare	Service Type
County Line	Radnor	None	N/A	\$2.00	Local
Radnor	Radnor	20	N/A	\$2.00	Local
Villanova	Radnor	42	N/A	\$2.00	Local
Stadium	Radnor	None	N/A	\$2.00	Local
Garrett Hill	Radnor	None	N/A	\$2.00	Local
Rosemont	Radnor	None	N/A	\$2.00	Local
Bryn Mawr	Radnor	102	N/A	\$2.00	Local

¹ Service provided in six-minute intervals during the weekday morning and afternoon commuter peak periods.

² Based on information provided by SEPTA.

The majority of Radnor residents utilizing transit generally are employed in Center City Philadelphia and ridership along the R-5 is popular as it provides fast, direct service to the City. As a result, parking at the regional rail stations is often at or near capacity during the weekday morning and afternoon commuter peak hours.

The SEPTA Route 105-bus line is currently the only standard bus service provided within the Radnor area. The Route 105 bus line services the Lancaster Avenue corridor through Radnor Township, connecting between the 69th Street Terminal and Paoli Memorial Hospital. Although limited bus service is provided within Radnor, there are numerous convenient bus routes within adjacent municipalities providing connecting service to even more bus routes (including the Route 105 bus line), as well as service to other regional rail train stations.

The County shared-ride paratransit service provides rider-determined destinations and schedules (with a 24-hour advance reservation), and generally operates during weekday business hours. The fare structure is based on zones of approximately one square mile, and this service is available for free to senior citizens, and discounted fares apply to multiple riders.

2. Future Transit Services

As traffic volumes along major roadways within the Township and surrounding region increase, the desirability public transportation may increase if future traffic volumes cannot be accommodate efficiently by the future roadway network. Currently, there are no major plans to expand transit service within Radnor, although SEPTA is continually modifying schedules along its various rail and bus routes. However, the DVRPC TIP and PennDOT *12-Year Transportation Program* include several enhancement improvements to train stations along the R-5 regional rail line including the Wayne stations. Enhancements to the Radnor station have been completed.

Regionally, the proposed Schuylkill Valley Metro will provide train service between Philadelphia and Reading; however, no direct connections to this service are currently proposed within the immediate Radnor area. Given the concentration of jobs and people in Radnor, potential for a connection should be investigated (SEPTA is currently performing an alternatives analysis for an extension of the Route 100 line to King of Prussia, where it would connect with the proposed Schuylkill Valley Metro).

Recommended Actions

- **As the most popular and utilized form of public transportation, the R-5 regional rail service will continue to serve the majority of public transportation users. Accordingly, the Township should coordinate with the SEPTA and the adjacent municipalities to ensure that the best service possible is provided to its riders, which would include convenient train schedules, express service, etc.**
- **Major expansion or improvements to the R-5 regional rail service within Radnor is currently limited by the ability to expand parking, and therefore, the Township should support and encourage initiatives by SEPTA to provide adequate parking in the future, if done properly; any major improvements to transit service or increased parking initiatives implemented by SEPTA and/or the Township should first be available to residents of Radnor, before providing additional regional transportation service to non-Radnor residents.**
- **Due to the limitations of parking at regional rail stations within Radnor, the proximity of the stations to residential neighborhoods, and the traffic problems generated at peak hour in-bound commuting periods, expansion of service at regional rail stations must be carefully considered, especially at the Wayne, Radnor, and Villanova stations. For example, rail station-related actions in and around the Wayne station must be consistent with the plan for Wayne, as set forth herein. Priority should be given to AM arrivals at Radnor stations, possibly adding shuttles to major Township destinations.**
- **Given the concentration of jobs and people in Radnor, potential for a connection to the proposed Schuylkill Valley Metro should be**

investigated (e.g., the Township could request that project sponsors evaluate this issue).

- **Support and expand shuttle bus service during peak hours (including lunch time) from the major office parks and employment centers, to the Wayne Business District and rail station.**

D. Multi-modal Facilities

Multi-modal forms of transportation include non-vehicular means of travel including walking and bicycling. Safe, well-established non-vehicular networks serving these activities (i.e., sidewalks, trails, and bicycle lanes) can enhance the transportation network of a community, and in some cases, help to relieve traffic congestion.

1. Pedestrian Facilities

Sidewalks are provided along a significant amount of local roadways within Radnor, on at least one side of the roadway, or in some cases the traffic volumes are low enough such that pedestrian activity occurs within the roadway. However, with the exception of Lancaster Avenue, the provision of adequate pedestrian facilities is limited along higher-order streets. Sidewalks along many collector roads are provided sporadically, thus requiring pedestrians to walk within roadways with high traffic volumes or on shoulder areas.

Sidewalks are provided within the Wayne Business District; however, like many of the sidewalks throughout the Township, they provide little buffer between vehicular traffic and the pedestrian, and are often incongruent and sporadic. Open parking fields serving businesses along Lancaster Avenue frequently interrupt sidewalks and expose pedestrians to conflicts with traffic at these uncontrolled accesses. Given these various shortcomings, it is reasonable to conclude that the sidewalk network within Wayne does not encourage pedestrian activity within the Business District.

Adequate pedestrian facilities at major intersections are also important, particularly at signalized intersections where higher volumes of traffic intersect. Table 5-10 indicates the pedestrian facilities that are currently provided at signalized intersections within Radnor, including sidewalks, pedestrian crosswalks, and pedestrian traffic signal phasing. It is noted that pedestrian crosswalks and pedestrian traffic signal phasing are necessitated by traffic, pedestrian volumes, and intersection geometry, and are not appropriate or required at all signalized intersections.

Recommended Actions

- **The Township should complete a full inventory of its sidewalk facilities to determine the adequacy of the current sidewalk network.**
- **The Township should ensure to the extent feasible that all sidewalk facilities, namely curb cuts, are ADA compliant, provide an adequate buffer area between pedestrians and vehicular traffic, and are continuous to promote safe pedestrian travel.**

- **The sidewalk network within the Wayne Business District should be improved to provide a consistent design of sidewalks, which will help to encourage pedestrian traffic within the District, and should be considered in the implementation/adoption of any roadway/intersection improvements, streetscape enhancements, access management initiatives, and redevelopment applications.**
- **Explore the feasibility of providing a signalized pedestrian crossing along Lancaster Avenue between Aberdeen Avenue and Louella Avenue due to the heavy pedestrian and vehicular traffic levels and the lack of traffic signals to accommodate crossing of Lancaster Avenue; and/or provide pedestrian facilities (i.e., crosswalks and pedestrian signal phases) at the Lancaster Avenue/Louella Avenue intersection.**
- **Ensure that adequate sidewalks are available along the roadways surrounding public transportation facilities (i.e., train stations and bus stops) to encourage residents to walk to these facilities, which in turn would reduce the number of vehicle trips on the roadway network and reduce the parking demand in the area of these facilities.**

2. Bicycle Facilities

Currently, there are no exclusive bicycle lanes provided along roadways or other on-road bicycle facilities within Radnor. A connective network of sidewalk, trails, and bicycle facilities would provide a highly desirable multi-modal transportation and circulation network encouraging pedestrian, bicycle and other non-vehicular travel within Radnor.

Planned Improvements

- Currently, the DVRPC TIP and PennDOT *12-Year Transportation* Program identify the construction of a 10-foot wide bicycle/pedestrian trail along the former Philadelphia & Western railroad line between Sugartown Road and Radnor-Chester Road, which is 2.2 miles in length. This is scheduled to be constructed in 2003.
- Currently, there are no other trails or on-road bicycle lanes planned within the Township.

Recommended Actions

- **The Township should pursue providing on-road bicycle facilities on some of its collector and local roads to enhance bicycle mobility throughout the Township and provide links between other bicycle facilities and desirable destinations (i.e., recreational facilities, transit facilities, schools, businesses, etc.).**
- **The Township should create an Official Trail Map to establish current and future bicycle, pedestrian, and multi-use trails. This Trail Map should be incorporated into the Official Township Map.**

Table 5-10. Current Pedestrian Facilities at Signalized intersections¹

Intersection	Sidewalk along Approach				Pedestrian Crossing				Pedestrian Phasing			
	EB	WB	NB	SB	Ebs	WB	NB	SB	EB	WB	NB	SB
Lancaster Avenue/Lowry's Lane	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Lancaster Avenue/Ithan Avenue	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lancaster Avenue/Villanova	✓	✓			✓	✓	✓				✓	
Lancaster Avenue/Sproul Road												
Lancaster Avenue/I-476 NB						✓		✓			✓	✓
Lancaster Avenue/I-476 SB												
Lancaster Avenue/King of Prussia Rd												
Lancaster Avenue/Radnor Chester Rd	✓			✓	✓	✓	✓	✓			✓	✓
Lancaster Avenue/Genuardi's (west)	✓	✓	✓						✓	✓	✓	✓
Lancaster Avenue/Genuardi's (east)	✓	✓							✓	✓	✓	✓
Lancaster Avenue/Chamounix Road	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Lancaster Avenue/Aberdeen Avenue	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Lancaster Avenue/Louella Avenue												
Lancaster Avenue/N. Wayne/S. Wayne	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lancaster/Bloomingdale/Banbury												
Lancaster/Conestoga/Eagle	✓	✓		✓	✓	✓	✓	✓			✓	✓
Lancaster/Sugartown/Old Eagle School	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
North Wayne Avenue/Station Avenue	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓
North Wayne Avenue/Poplar Avenue		✓	✓	✓		✓		✓		✓		✓
North Wayne Avenue/Eagle Road												
Sugartown Road/Morris Road			✓	✓	✓		✓					
Eagle Road/Radnor Street Road												
Eagle Road/King of Prussia Road											✓	✓
King of Prussia Road/Matsonford						✓				✓		
Conestoga Road/West Wayne Avenue			✓	✓		✓		✓	✓	✓	✓	✓
Conestoga/Church Road/Iven												
Conestoga Road/Radnor Chester Road												
Conestoga Road/Sproul Road												
Conestoga Road/Ithan Avenue					✓	✓	✓	✓				
Conestoga Road/Garrett Avenue	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Conestoga Road/County Line Road	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Haverford Avenue/Bryn Mawr Avenue	✓	✓	✓	✓	✓	✓	✓	✓				
Bryn Mawr Avenue/Sproul Road											✓	✓
Bryn Mawr Avenue/Mill Road									✓	✓	✓	✓
Bryn Mawr Avenue/Malin Road												
Sproul Road/Clyde Road							✓		✓	✓		
Sproul Road/Godfrey Road									✓	✓		
Radnor Chester Road/St. Davids Ctr.		✓						✓				
Matsonford Road/County Line Road												
Matsonford Road/N. Centennial Drive												✓
Matsonford Road/S. Centennial Drive			✓	✓	✓		✓				✓	✓

1 – Source: Traffic signal permit plans obtained from PennDOT in December 2001.

3. Scenic Roads

Scenic roads provide drivers and residents with a sense of open space. The general population frequently enjoys scenic roads because they provide for sightseeing opportunities as well as enhancing the driving experience.

Roadways are scenic due to both the landscapes they traverse and the roads themselves. The roads can be rolling or curving, and/or lined with trees, stone walls, steep banks, or other aesthetic features. Radnor contains many roads that have high visual quality. The recommended

scenic roadways within Radnor Township, as defined in the 1988 Comprehensive Plan, are listed below and mapped in Figure 5-1.

- Conestoga Road
- Darby Paoli Road
- Spring Mill Road
- Upper Gulph Road
- Radnor Chester Road
- Maplewood Avenue
- North Wayne Avenue
- Sproul Road
- Roberts Road
- Newtown Road
- Eagle Road
- Brooke Road
- Saw Mill Road
- Bryn Mawr Avenue
- King of Prussia Road
- Church Road
- Iven Avenue
- Radnor Street Road
- Lancaster Avenue
- South Wayne Avenue
- Ithan and South Ithan Avenue
- Goshen Road
- Godfrey Road
- Matsonford Road
- Abrahams Lane
- Earles Lane

Recommended Actions

- **The Township should utilize conservation easements as well as special ordinance provisions as methods of protecting the scenic quality and openness of the landscape, minimizing the disruption of areas of high visual quality and maintaining the character along scenic roads.**
- **Preserve the rural and scenic quality of streets without compromising safety, and when possible, roadway capacity.**
- **The Township should periodically review its current Scenic Roadways designations for adequacy and make any appropriate adjustments.**

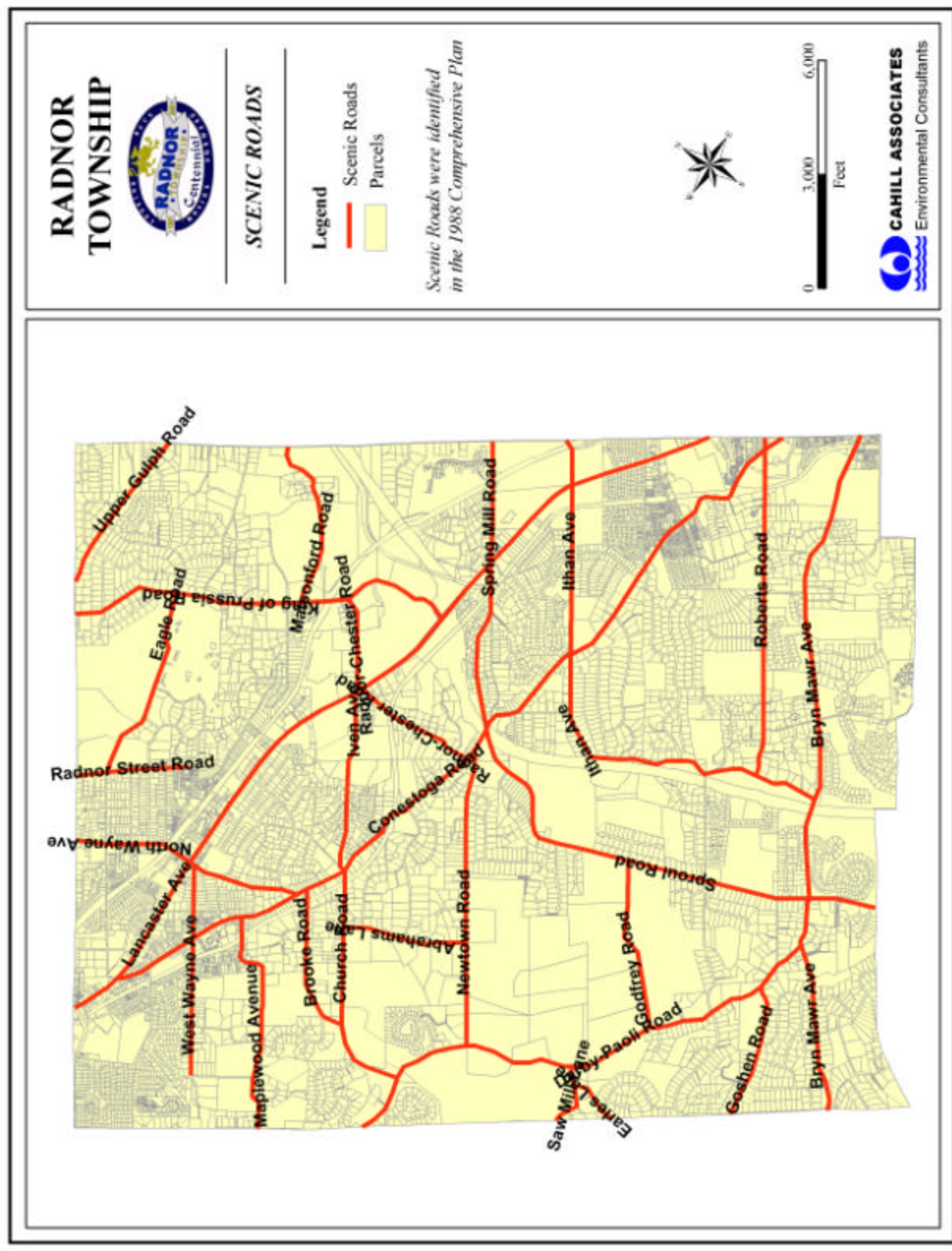


Figure 5-1. Recommended Scenic Roads, taken from Radnor Township 1988 Comprehensive Plan

E. Parking

1. Wayne Business District Parking Study, 2001

Based on a recent parking study of the district entitled, *Parking Study, Wayne Business District*, January 2001, parking within the Wayne Business District is limited, but generally adequate overall, as it serves local businesses, restaurants, schools, churches, and the Wayne regional rail train station. A combination of parking exists in Wayne, and includes on-street parking, off-street parking, short-term parking, long-term parking and unrestricted parking. While the Township has promoted shared-parking opportunities between some businesses and several new restaurant and retail establishments, surveys reveal that respondents believe there is insufficient parking and most support a parking garage. The conclusions and recommendations of the 2001 Wayne parking study reveal the following:

- Develop a Master Plan to guide growth and assist with implementation of additional parking.
- Encourage relocation of long-term parking to the western areas.
- Provide small, widely distributed, strategically located parking opportunities, rather than large concentrations of spaces.
- Evaluate removal of unnecessary uses such as the postal distribution center and their potential for providing parking.
- Increase the parking rates in the premium (central) locations, possibly with a digital parking meter program.
- Increase the fines for parking violations.
- Increase the parking enforcement.
- Implement a parking guide sign program to increase awareness of the parking in the western area, and offer public parking in the ATT Lot.
- Remove parking meters from the western end of West Avenue and West Wayne Avenue.
- Convert 20 spaces in municipal Lot-3 to two-hour parking.
- Install 15 two-hour parking meters on Louella Avenue north of Midland Avenue.
- The parking spaces on Louella Avenue adjacent to the athletic fields should be converted to permit parking only.
- Implement programs to promote increased transit use.

Overall, there is sufficient parking currently available within the Wayne Business District; however, there is insufficient parking within the central portion of the district during periods of peak demand, and this insufficiency will be exacerbated by continued redevelopment. At this time, there does not appear to be a sufficient demand to justify the construction of a multi-level parking facility or acquiring large parcels of land for additional surface parking. However, the need for additional parking (i.e., parking structure or surface parking) should be monitored as redevelopment occurs and should be re-evaluated if there are any major changes to the amount of parking within the district as a result of any future roadway improvements, streetscape projects, access management programs, etc.

Parking in the Wayne Business District consists of a significant amount of on-street parking along Lancaster Avenue, North Wayne Avenue, South Wayne Avenue, and many other streets.

On-street parking along these roadways consists of parallel parking, angle parking, and perpendicular parking. The parking in the district is inconsistent in terms of the type and design of parking, which disrupts the pedestrian and sidewalk facilities, as well as the flow of traffic along Lancaster Avenue and other roadways within the district.

Recommended Actions

- **The recommendations contained in the Parking Study, Wayne Business District, January 2001 report, where appropriate, should be implemented by the Township.**
- **The Township should encourage the use of parking cross-easements between businesses located in Wayne and along Lancaster Avenue.**
- **A detailed on-street parking plan for the Wayne Business District, and specifically along Lancaster Avenue and North Wayne Avenue should be developed in conjunction with the creation of any streetscape plans for the District.**
- **A consistent design of on-street parking along Lancaster Avenue in the Wayne Business District should be encouraged to the extent feasible.**
- **Coordinate with PennDOT for their final approval of the on-street parking along State Highways, specifically North Wayne Avenue and Lancaster Avenue.**

F. Highway Project Funding

The transition from project identification and estimated cost to the appropriation of project funds is essential in the completion of roadway improvements. The Township usually follows one of two directions once improvements are prioritized. Improvements to Township-owned roads require specific procedures to allocate and release funds. Potential projects must be identified as capital, safety, or maintenance projects. Each method involves a different implementation program.

Capital projects generally include all major construction projects such as drainage improvements, signalization, paving, bridge replacement, realignment, widening, roadway relocation and roadway reconstruction. Funding is dependent on the ownership and Federal designation of individual road segments.

Safety projects include any improvement that eliminate or alleviate hazardous conditions. Such improvements include warning signs, signalization, grading, and guide-rail installation.

Maintenance projects include shoulder repair, drainage and surface improvements, and are handled by the appropriate Township or State authorities primarily using Liquid Fuel Allocation Funds.

Identification and prioritization of highway improvement projects by the Township are the first steps in the process of securing funds. The project then must be endorsed by the County and placed on its suggested Program of Highway Improvements List. The suggested Program of Highway Improvements prepared by the Delaware County Planning Department is updated on an ongoing basis and gathers local input for highway projects affecting that municipality. Project costs are calculated and the proposal is included on a regional list of projects known as the Transportation Improvement Program. The project then must be placed on the State 12-Year Highway Program to receive funding. Because the State continually rearranges its priority list, timing for the pending improvement projects is subject to fluctuation.

Table 5-11 provides a description of current funding programs that are potential sources of funding for improvements. Recent Federal legislation, such as the Intermodal Surface Transportation Efficiency Act (ISTEA) and the Clean Air Act Amendments of 1990 and the Transportation Efficiency Act for the Twenty-first Century (TEA-21), emphasizes providing funding for transportation projects that are inter-modal and that improve air quality. Priority projects that should receive increased funding are bikeway and trail corridors, public transit, and park-and-ride facilities. This is not a complete list of projects; the listing indicates that the emphasis for funding transportation projects has shifted.

Table 5-11. Transportation Funding Opportunities

Source	Funding Title	Types Of Eligible Projects	Funding Split	Eligibility	Required Programming
Federal (TEA-21)	National highway system (NHS)	Construction or reconstruction of “major” roads	80% Federal 20% State	Roads must be on the designated National Highway System	PennDOT 12 Year Program, DVRPC TIP
Federal (TEA-21)	Surface transportation program (STP)	Construction, reconstruction, rehabilitation, resurfacing, restoration and operational improvements for highways and bridges; Transit capital costs; and travel demand reduction improvements	80% Federal 20% State or Local	For use on any federal-aid roads.	PennDOT 12 Year Program, DVRPC TIP, State Capital Budget
Federal (TEA-21)	Safety Component of STP	Various types of safety improvements which mitigate documented safety problems	80% Federal 20% State	For use on any federal-aid roads.	PennDOT 12 Year Program, DVRPC TIP, State Capital Budget
Federal (TEA-21)	Transportation enhancement activities	Bicycle and pedestrian facilities; Acquisition of scenic easements and scenic or historic sites; landscaping and beautification; and other environmental related programs	80% Federal 20% State or Local	Must relate to surface transportation	PennDOT 12 Year Program, DVRPC TIP, State Capital Budget
Federal (TEA-21)	Bridge	Construction, reconstruction or rehabilitation of bridges	80% Federal 20% State or Local	For any bridge on a public road	PennDOT 12 Year Program, DVRPC TIP, State Capital Budget
Federal (TEA-21)	Congestion mitigation and air quality improvements (CMAQ)	Transit improvements, bicycle and pedestrian projects, travel demand management strategies, traffic flow improvements, and public fleet conversions to cleaner fuels	80% Federal 20% State or Local	Projects which contribute to meeting the attainment of National Ambient Air Quality Standards	PennDOT 12 Year Program, DVRPC TIP, State Capital Budget
Federal (TEA-21)	Toll roads	Construction and rehabilitation of toll facilities including roads, bridges and tunnels	50% Federal 50% State or Local	For use on publicly owned facilities and in some cases privately owned facilities	PennDOT 12 Year Program, DVRPC TIP, State Capital Budget
Federal	Community Development Block Grant	Construction and rehabilitation of streets, bridges, pedestrian or parking facilities	100% Federal (HUD)	Project must benefit low-to-moderate income housing	Approval from County Office of Housing and Community Development and State Department of Community and Economic Development
State	Bridges	Construction, reconstruction or rehabilitation of bridges	100% State or 80% State & 20% Local	For use on State and Local Bridges	PennDOT 12 Year Program, DVRPC TIP, State Capital Budget

Table 5-11. Transportation Funding Opportunities, continued

Source	Funding Title	Types Of Eligible Projects	Funding Split	Eligibility	Required Programming
State	Cooperative agreements	Limited safety and maintenance improvements	Materials Provided by PennDOT, labor provided by municipality	State roads only, Less than \$5,000 cost	
State / Federal	Betterment or “3R”	Minor reconstruction or major resurfacing of roads and bridges	80% Federal 20% State	For use on State Roads	PennDOT 12 Year Program, DVRPC TIP (If Federal Funds are used)
County	Vision Partnership Program	Plans/Studies/ZO-SLDO Amendments	75% County 25% Municipality	Consult Chester County Planning Department	Grant Agreement, Scope of Work.
County	Bridges	Construction, reconstruction or rehabilitation of County Bridges	80% Federal 15% State, and 5% County	For use on county bridges	County Public Works Department
State / Municipal	Transportation partnership	Various safety and capacity improvements	Federal or state share varies by project	Based on the requirements of State Act 47 of 1985	PennDOT 12 Year Program, DVRPC TIP (If Federal Funds are used)
State/ Municipal	Traffic impact fees	Various capacity improvements as defined in the required Land Use and Traffic Studies conducted by the municipality	Funding share is determined in the capital improvements plan; maximum state participation is 50%	Based on the requirements of State Act 209 of 1990	Municipal Capital Improvements Plan, State Capital Budget, DVRPC TIP (if Federal Funds are used)
Municipal	Debt financing	Various capacity, safety or maintenance improvements as defined by appropriate statute	100% Municipal	Limit of indebtedness regulated by State statute; projects must be approved by the governing body and in some cases by the electorate	Municipal Budget
Municipal	General fund	Various capacity, safety or maintenance improvements as defined by appropriate statute	100% Municipal	Projects must be approved by the governing body; Restrictions are identified in the municipal code	Municipal Budget
Municipal	Liquid fuels fund	Construction, reconstruction or maintenance of bridges and roads	100% State Municipal Allocations Are Based On Legislative Formula	Projects must be approved by the governing body and PennDOT; Road must be on the approved liquid fuels system	Municipal Budget Program

Source: Chester County Planning Commission, 2001 and adjustment by Cahill Associates, 2002

G. Access Management Program

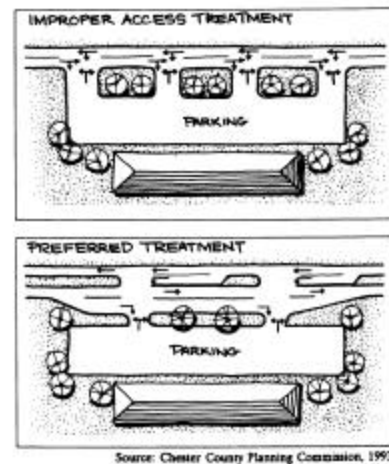
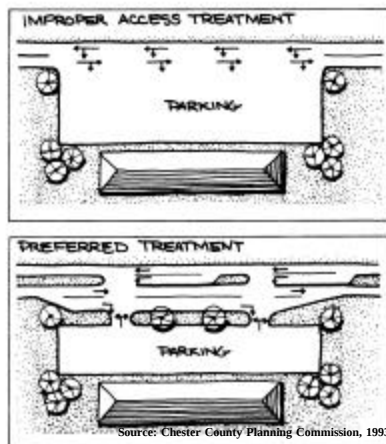
Access management in Radnor is important for both addressing safety issues and for maintaining traffic flow with a minimum of interruption, not only along major roadways within the Township, such as U.S. Route 30, but also on other roadways in the Township. Access management should apply to all roads in the Township, as practical. Reducing the amount of unnecessary curb cuts and access points can also help to reduce delays in traffic flow, accident levels, and pedestrian conflicts.

1. Methods

In developed areas, such as along Lancaster Avenue where existing businesses are involved, changes in access design may have to wait until a change in the use of a property occurs. Depending on the particular situation, a variety of techniques are available to address existing access problems. Some relatively simple methods for addressing existing access problems include the following:

- *Reduce Number of Access Points and Channelized Access*

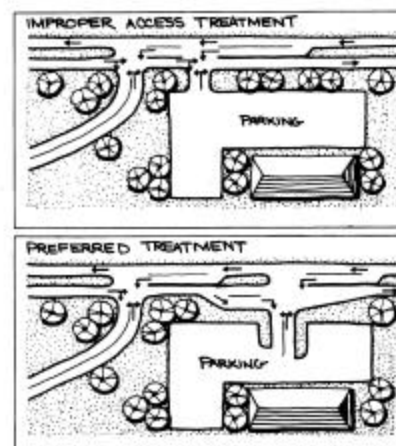
Eliminating excessive driveways and concentrating access at one location reduces the potential for accidents. Turning movements to or from large parcels without control of access can cause rear end accidents, sideswipe accidents, and queuing on the primary road.



In cases where the depressed curb is one continuous means of access across the site frontage, creating a limited number of access points would eliminate uncontrolled turning movements to and from the site.

- *Relocate Access Points*

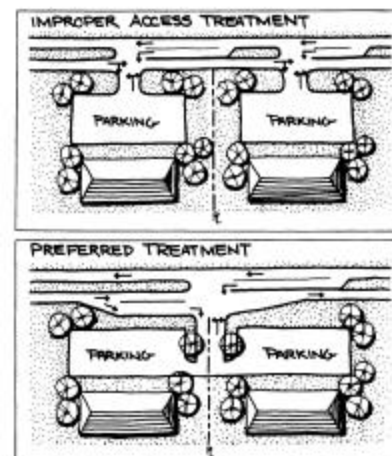
This technique involves shifting the access point to a safer, more convenient location. For example, if two access points are too close to each other, one can be moved farther away. When access points on either side of a road are slightly off-set, they can be relocated directly across from each other.



Source: Chester County Planning Commission, 1993.

- *Combine Access Points*

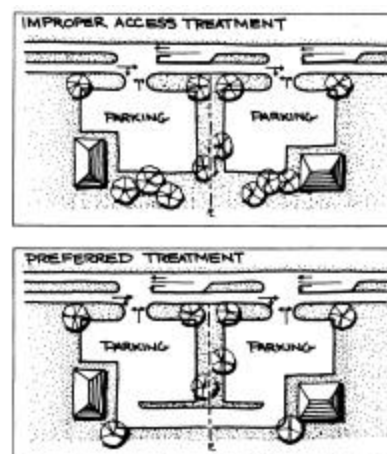
Where feasible, access points on the same parcel or on adjacent parcels should be combined to reduce the total number of access points on the road.



Source: Chester County Planning Commission, 1993.

- *Side Access*

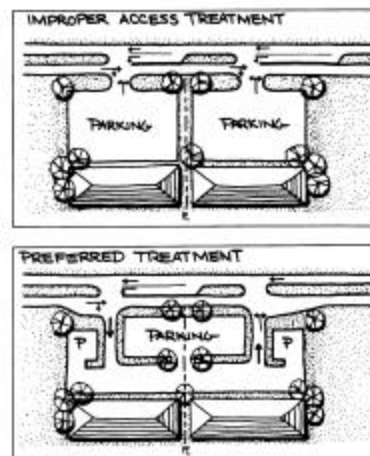
Side access refers to access between adjacent parcels allowing traffic to move from parcel to parcel (or store to store) without using the primary road. This does not involve any physical change in frontage access but reduces the need to use the primary road.



Source: Chester County Planning Commission, 1993.

- *Create One-Way Patterns*

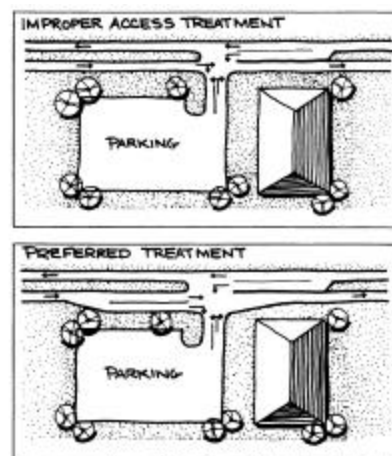
Separating ingress and egress movements can reduce accidents. For example, two existing two-way driveways could be converted into one-way in and one-way out drives. This can be done on one parcel or in combination with other parcels.



Source: Chester County Planning Commission, 1993.

- *Deceleration Lanes*

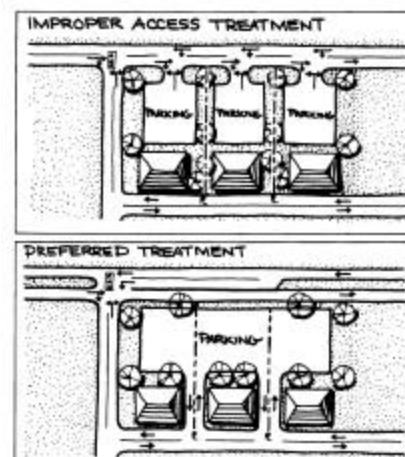
A deceleration lane separates through traffic from decelerating right-turn traffic on the primary road and can reduce rear end accident rates.



Source: Chester County Planning Commission, 1993.

- *Reverse Frontage Road*

Access to the primary road is denied along the property frontage and is, instead, directed to a roadway along the rear lot line.



Source: Chester County Planning Commission, 1993.

Given the high number of driveway accesses along Lancaster Avenue, particularly within the Wayne Business District, the Township should encourage access management techniques.

Recommended Actions

- **The Township should encourage such access management methods along U.S. Route 30 like side access, one-way access patterns, combination/relocation of access points, and provide access easements through adjoining parcels. The Township should require these techniques for re-developing land uses along Lancaster Avenue and possibly along other roadways within the Township.**
- **To the extent feasible, any streetscape initiative planned for the Wayne Business District should address access management issues along Lancaster Avenue and other roadways within the district.**
- **The Township should proactively work to promote and facilitate use of access management measures between adjacent but separately-owned parcels. The Township should encourage practical access management measures in its review of commercial developments.**

H. Traffic Calming

1. Background

Traffic calming has been defined in the *PennDOT Publication 383, Pennsylvania's Traffic Calming Handbook, January 2001* as “the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users.” More specifically, traffic calming has gained popularity in recent years as a method to reduce speeds of traffic along local roads or to decrease the amount of non-local traffic utilizing neighborhood streets as a cut-through route, especially as traffic congestion has increased on surrounding roadway networks forcing motorists to seek alternative routes.

When evaluating traffic calming measures, the Township should refer to the PennDOT publication, *Pennsylvania's Traffic Calming Handbook, Publication 383, January 2001* and the Institute of Transportation Engineers publication, *Traffic Calming – State of the Practice, 1999*. A toolbox of traffic calming measures is currently available to municipalities to address speeding and cut-through traffic concerns of residents, and are further described in the PennDOT and ITE publications. Accordingly, some of the available traffic calming measures include the following:

- Signing and pavement markings
 - o Roadway narrowing with pavement edge lines
 - o Transverse pavement markings
 - o Turn prohibitions
 - o Speed limit signing
- Horizontal Deflection

- o On-street parking
 - o Gateway
 - o Bulb-out/curb extension
 - o Chicane
 - o Raised median island
 - o Traffic circle/roundabout
- Vertical Deflection
 - o Textured crosswalk
 - o Speed hump
 - o Raised crosswalk
 - o Raised intersection
- Physical Obstruction
 - o Semi-diverter
 - o Diagonal diverter
 - o Right-in/Right-out island
 - o Raised median through intersection
 - o Street closure

The above traffic calming measures have varying levels of effectiveness in reducing traffic volume, speeds, and traffic conflicts. Additional issues to consider when selecting a traffic calming measure is the effect on emergency vehicles, roadway maintenance and snow removal, as well as standard issues such as cost and legal issues. Furthermore, the need for traffic calming is often a result of traffic problems on the surrounding roadway network, and therefore, these problems should be evaluated and subsequently addressed, if possible, prior to consideration of traffic calming measures.

Recommended Actions

- **The Township should increase attention to traffic calming solutions and should create a well-defined traffic calming master plan policy, educational campaign, and approval process to evaluate when and where traffic calming is appropriate, to avoid sporadic and ineffective traffic calming usage, and to provide the Township with standardized and consistent criteria for traffic calming decision making. Many municipalities have implemented a three-step process, as outlined below, which Radnor should consider as part of this traffic calming program:**
 - o Educating the public regarding the traffic problem (i.e., speeding through neighborhoods, etc.),
 - o Enforcing speed limits
 - o Engineering traffic calming solutions (study and design aspects)
- **Any streetscape initiative planned for the Wayne Business District should address traffic calming issues along North Wayne Avenue, South Wayne Avenue, Lancaster Avenue, and other roadways within the area.**

Specifically, these traffic calming measures within the district may include the following:

- ***Landscaped Median*** – along North Wayne Avenue between Lancaster Avenue and Station Road, which should be designed to accommodate the necessary turning lanes at intersections, a pedestrian crossing(s), and turning movements to/from the municipal parking lot.
- ***Raised Pedestrian Crosswalks*** – along roadways within the district, which may promote driver awareness of pedestrians, reduce vehicle speeds, and provide aesthetic benefits as well.
- **Public involvement throughout the process is recommended, as the implementation of traffic calming measures may be controversial.**
- **As with any improvement to a State roadway, PennDOT approval will be required for the implementation of traffic calming measures on any State roadways; therefore, the Township should work closely with the Department through the planning and design process.**

I. Recommended Actions

Below we revisit the Goals for the Transportation and Circulation Plan section, followed by the Recommended Actions for the Township. The Recommended Actions are categorized according to the individual elements within this Transportation plan.

Goals

Develop a transportation capital improvement plan with recommendations for safety and capacity-related traffic improvements to accommodate future traffic demands.

Implement traffic improvements for key roads and intersections to improve traffic flow and encourage traffic to remain on the major routes.

Develop traffic calming strategies for implementation, as appropriate, to help preserve the neighborhoods and communities.

Use landscaping, gateways, and street furniture, etc. to integrate the road system and traffic within the community to enhance and preserve the rural and scenic character of the streets, without sacrificing safety.

Preserve the rural and scenic character of the streets, without sacrificing safety.

Improve pedestrian circulation by implementing pedestrian facilities as well as planned trail and bicycle facilities.

Encourage increased use of public transit.

Encourage opportunities for transit-oriented development and limit intensive uses to areas close to public transit where such uses are compatible with adjacent uses and would cause no adverse impact on the residential neighborhoods.

Enhance regional rail use through accommodation of commuter parking needs.

Promote ride sharing or carpooling as well as other trip reduction strategies to reduce single occupant, private vehicle commuting by employees of major businesses.

Support a coordinated/planned private transit service through a cooperative partnership between the major employers, institutions and the Township.

Recommended Actions

Road Network

- Reclassify several roadways within the Township to reflect current traffic conditions and future needs (refer to Table 5-1 for potential reclassification of roadways).
- Continue to monitor future traffic conditions to determine if reclassification is necessary.
- Upgrade roadways to satisfy the design criteria of newly reclassified roadways.
- Future development should be monitored and regulated so that subsequent traffic generation does not alter the designated function of individual roads unless the design can be upgraded and is consistent with both the future land use and circulation plans. Developments should not cause restrictions on the ease of entering or exiting a roadway from adjacent properties, or increase traffic to encroach upon or exceed the capacity of a road.

Existing Traffic Volumes and Capacities

- The potential short-term intersection improvements contained in Table 5-6 should be further evaluated and considered by the Township.
- Traffic signal equipment (i.e., controllers, loop detectors, etc.) and programming (i.e., timings, phasing, offset timings, clocks, etc.) should be properly maintained to ensure proper operations.

- Pursue funding opportunities for identified roadway and intersection improvements (i.e., DVRPC *Transportation Improvement Program* and the Penn DOT *Twelve Year Transportation Improvement Plan*).
- Improve interface between automobile traffic and pedestrian movement.

Future Traffic Volumes and Capacities

- The potential long-term intersection improvements contained in Table 5-7 should be further evaluated and considered by the Township.
- As long-term improvements are selected for implementation by the Township, the Township should then pursue their selection by PennDOT, Delaware County, and DVRPC for their respective transportation improvement plans, as appropriate.
- Plan for the potential long-term improvements by acquiring the necessary right-of-way for geometric road configuration improvements, as necessary and when available.
- Pursue funding opportunities for identified roadway and intersection improvements (i.e., DVRPC *Transportation Improvement Program* and the PennDOT *Twelve Year Transportation Improvement Plan*).
- In all of its roadway and intersection improvements, make sure that pedestrian movement is given a high priority.

Deficient Roadway Conditions

- The Township should periodically review accident reports to identify accident trends and safety issues.
- Solutions to the most prevalent roadway deficiencies should be examined and implemented to reduce the potential for accidents.
- Re-evaluate the merit of the Penn DOT 12-Year TIP improvement involving aligning of Goshen Road in the vicinity of Darby-Paoli Road, given the overall rural road context and neighborhood concerns.

Regional Framework

- Radnor Township should continue to proactively plan for its future transportation network, including all modes of transportation, in a coordinated effort with surrounding municipalities, the Delaware County Planning Commission, the Delaware Valley Regional Planning Commission, and the Pennsylvania Department of Transportation, and local and regional Transportation Management Associations.

Future Transit Services

- As the most popular and utilized form of public transportation, the R-5 regional rail service will continue to serve the majority of public transportation users. Accordingly, the Township should coordinate with the SEPTA and the adjacent municipalities to ensure that the best service possible is provided to its riders, which would include convenient train schedules, express service, etc.
- Major expansion or improvements to the R-5 regional rail service within Radnor is currently limited by the ability to expand parking. Therefore, the Township should support and encourage initiatives by SEPTA to provide adequate parking in the future, if done properly. Any major improvements to transit service or increased parking initiatives implemented by SEPTA and/or the Township should first be available to residents of Radnor, before providing additional regional transportation service to non-Radnor residents.
- Due to the limitations of parking at regional rail stations within Radnor, the proximity of the stations to residential neighborhoods, and the traffic problems generated at peak hour in-bound commuting periods, expansion of service at regional rail stations must be carefully considered, especially at the Wayne, Radnor, and Villanova stations. For example, rail station-related actions in and around the Wayne station must be consistent with the plan for Wayne, as set forth herein. Priority should be given to AM arrivals at Radnor stations, possibly adding shuttles to major Township destinations.
- Given the concentration of jobs and people in Radnor, potential for a connection to the proposed Schuylkill Valley Metro should be investigated (e.g., the Township could request that project sponsors evaluate this issue).
- Support and expand shuttle bus service during peak hours (including lunch time) from the major office parks and employment centers, to the Wayne Business District and rail station.

Pedestrian Facilities

- The Township should complete a full inventory of its sidewalk facilities to determine the adequacy of the current sidewalk network.
- The Township should ensure to the extent feasible that all sidewalk facilities are ADA compliant, provide an adequate buffer area between pedestrians and vehicular traffic, and are continuous to promote safe pedestrian travel.
- The sidewalk network within the Wayne Business District should be improved to provide a consistent design of sidewalks, which will help to encourage pedestrian traffic within the District, and should be considered in the implementation/adoption of any roadway/intersection improvements,

streetscape enhancements, access management initiatives, and redevelopment applications.

- **Explore the feasibility of providing a signalized pedestrian crossing along Lancaster Avenue between Aberdeen Avenue and Louella Avenue due to the heavy pedestrian and vehicular traffic levels and the lack of traffic signals to accommodate crossing of Lancaster Avenue; and/or provide pedestrian facilities (i.e., crosswalks and pedestrian signal phases) at the Lancaster Avenue/Louella Avenue intersection.**
- **Ensure adequate sidewalks are available along the roadways surrounding public transportation facilities (i.e., train stations and bus stops) to encourage residents to walk to these facilities, which in turn would reduce the number of vehicle trips on the roadway network and reduce the parking demand in the area of these facilities.**

Bicycle Facilities

- **The Township should pursue providing on-road bicycle facilities on some of its collector and local roads to enhance bicycle mobility throughout the Township and provide links between other bicycle facilities and desirable destinations (i.e., recreational facilities, transit facilities, schools, businesses, etc.).**
- **The Township should create an Official Trail Map to establish current and future bicycle, pedestrian, and multi-use trails.**

Scenic Roads

- **The Township should utilize conservation easements as well as special ordinance provisions as methods of protecting the scenic quality and openness of the landscape, minimizing the disruption of areas of high visual quality and maintaining the character along scenic roads.**
- **Preserve the rural and scenic quality of streets without compromising safety, and when possible, roadway capacity.**
- **The Township should periodically review its current Scenic Roadways designations for adequacy and make any appropriate adjustments.**

Wayne Business District Parking Study

- **The recommendations contained in the Parking Study, Wayne Business District, January 2001 report should be reconsidered by the Township.**
- **The Township should encourage the use of parking cross-easements between businesses located in Wayne and along Lancaster Avenue.**

- A detailed on-street parking plan for the Wayne Business District, and specifically along Lancaster Avenue and North Wayne Avenue should be developed in conjunction with the creation of any streetscape plans for the District.
- A consistent design of on-street parking along Lancaster Avenue in the Wayne Business District should be encouraged to the extent feasible.
- Coordinate with PennDOT for their final approval of the on-street parking along State Highways, specifically North Wayne Avenue and Lancaster Avenue.

Access Management Program

- The Township should encourage such access management methods along U.S. Route 30 like *side access, one-way access patterns, combination/relocation of access points*, and provide *access easements* through adjoining parcels. The Township should require these techniques for re-developing land uses along Lancaster Avenue and possibly along other roadways within the Township.
- To the extent feasible, any streetscape initiative planned for the Wayne Business District should address access management issues along Lancaster Avenue and other roadways within the District.
- The Township should proactively work to promote and facilitate use of access management measures between adjacent but separately-owned parcels. The Township should encourage practical access management measures in its review of commercial developments.

Traffic Calming

- The Township should increase attention to traffic calming solutions and should create a well-defined traffic calming master plan policy, educational campaign, and approval process to evaluate when and where traffic calming is appropriate, to avoid sporadic and ineffective traffic calming usage, and to provide the Township with standardized and consistent criteria for traffic calming decision making. Many municipalities have implemented a three-step process, as outlined below, which Radnor should consider as part of this traffic calming program:
 - Educating the public regarding the traffic problem (i.e., speeding through neighborhoods, etc.),
 - Enforcing speed limits
 - Engineering traffic calming solutions (study and design aspects)
- Any streetscape initiative planned for the Wayne Business District should address traffic calming issues along North Wayne Avenue, South Wayne

Avenue, Lancaster Avenue, and other roadways within the area. Specifically, these traffic calming measures within the district may include the following:

- ***Landscaped Median*** – along North Wayne Avenue between Lancaster Avenue and Station Avenue, which will be designed to accommodate the necessary turning lanes at intersections, a pedestrian crossing(s), and turning movements to/from the municipal parking lot.
- ***Raised Pedestrian Crosswalks*** – along roadways within the district, which may promote driver awareness of pedestrians, reduce vehicle speeds, and provide aesthetic benefits as well.
- **Public involvement throughout the process is recommended, as the implementation of traffic calming measures may be controversial.**
- **As with any improvement to a State roadway, PennDOT approval will be required for the implementation of traffic calming measures on any State roadways; therefore, the Township should work closely with the Department through the planning and design process.**