

## **Traffic Network and Circulation**

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### **INTRODUCTION**

The relationship between the land uses and the circulation network is an important element of comprehensive planning. A community's quality of life is highly dependent on the efficient use of land as well as the effectiveness of its circulation network. In order for a network to adequately serve adjacent land uses, it must be regularly evaluated as new development and redevelopment occur. Different land uses generate different levels of traffic, and addressing future transportation needs is dependent on a sound understanding of the current network.

Existing and proposed development areas must be considered when making future road programming decisions. In turn, future development patterns should not adversely affect the circulation system. It is necessary to follow appropriate design standards, improve existing roads and manage access so the road network will be capable of performing its intended function. Municipal and individual land use decisions are strongly influenced by existing or proposed circulation systems, while at the same time these same land use decisions can affect the circulation systems and the functions, which the roads are expected to perform.

The circulation system strongly influences how, where, and what type of development will occur. The location of residential, commercial, and industrial uses can influence how a road will function along with its design, condition, and maintenance requirements. In addition, how a community is perceived by visitors is affected by the circulation system: a municipality with narrow, winding roads abutting agricultural and wooded areas will be perceived as having a rural character. Relatively narrow streets, high traffic volumes, unsynchronized signalization, and lack of sidewalks or coordinated pedestrian crossings will create the impression of an unpleasant, gridlocked place. Where development has occurred without respecting or understanding the demands that will be made upon the circulation system, a perception of poor planning and frustration will result.

There are a number of regional influences affecting traffic circulation in the Shippensburg area. In addition to the current circulation system within the Borough, improvements to Walnut Bottom Road and the I-81 interchanges may result in increased development pressure and traffic volumes, leading to the use of side roads by thru traffic trying to avoid these areas. Traffic volumes will also increase due to new developments along Baltimore Road and in the area of the University.

### **IMPORTANCE OF TRANSPORTATION**

There are three principal benefits to addressing transportation issues:

- Enhancing the quality of life for the region's residents by facilitating traffic circulation and making travel safer;
- Making the region more attractive to visitors; and
- Supporting economic development. The US Route 11 (King Street) and PA Route 174 (Walnut Bottom Road) corridors are the main economic growth corridors of the region. Providing an adequate multi-modal transportation system is necessary to support optimum economic development. Freight rail, the roadway system, and transit systems should be maintained and improved and connections should be provided among these systems.

## **KEY TRAFFIC GENERATORS AND CONGESTED AREAS**

### **Interstate Route 81**

Interstate 81 has had a major influence on the development of western Cumberland County since late 1950's. It has developed into the primary traffic route serving the Cumberland Valley, and the route along which most of the commercial and industrial development in the region has taken place. As the I-81 corridor continues to develop, it becomes more congested and difficult to travel. As drivers seek alternative routes to and from I-81, development occurs outside of the corridor, creating higher traffic volumes on other roads in the region. Roads which once wound through agricultural areas, woodlands, and areas of open space are now lined with residential subdivisions and are subject to the traffic they generate. The challenge is to allow for the development of a circulation that is capable of accommodating an increasing level of demand without neglecting the needs and desires of local residents, particularly those who live along these roads. Interstate Exit 29 (PA Route 174, Walnut Bottom Road) is located at the extreme eastern point of Shippensburg Township.

In April 2001, work began to rebuild the interstate from Exit 20 to north of Exit 24 (PA Route 696, which becomes Fayette Street). The \$25.4 million project included complete pavement removal and concrete replacement on the northbound and southbound lanes and shoulders, extension of the ramps at two interchanges, bridge improvements, new drainage, improved guide rails, and updated signing. Bridges carrying Pine Stump Road, PA 696, and Mainsville Road were also rehabilitated. The work was completed in the autumn of 2003.

Additionally in 2001, the Pennsylvania Department of Transportation began a process of widening the highway to six lanes on a 77-mile section in southern Pennsylvania from the Maryland state line to PA 581, and from I-83 to I-78. The ramps onto and off of the Interstate would also be lengthened to current standards. Pennsylvania would join Virginia, West Virginia, and Maryland in widening the current four-lane Interstate. PADOT also recommended to the Pennsylvania Transportation Commission that the study be given "immediate priority status" on the commission's 12-year plan. State and federal money will fund a \$2 million study and take up to two years to complete. In 1998, a multi-state task force recommended a Pennsylvania study to widen the highway, however PADOT emphasized improving the highway surface. The current study will not only address deficiencies with the highway but evaluate existing and proposed land uses along the corridor. The entire project could cost between \$200 and \$400 million and take 10 years to complete.

### **Shippensburg University**

The University was founded in 1870 and has a student population of 7,500 students, including 6,500 undergraduate and 1,000 graduate students. Approximately 2,500 undergraduates live on campus. Many of the remaining students live off-campus within the Borough or Township, and a smaller number commute from outside the region. A number of construction projects are currently underway on the University that will have an impact on the region. Construction has begun on a new Performing Arts Center. This 1,500-seat facility will sponsor special music and theater events and will be open to the general public. When fully operational, it is expected that the Center will host eighty events annually, drawing up to 90,000 people from a seventy-five mile radius. Work has also begun on a new loop road that will extend Adams Drive from the McLean Hall parking lot around Seavers to the new Performing Arts Center. The project will include rerouting of Old Main Drive directly to the Adams Drive/North Prince Street intersection and making Lancaster Drive two lanes from the York Drive/Route 696 intersection to Bucks Drive. This work is scheduled to be completed by mid-2004.

## Schreiber Foods

Schreiber Foods, located on East Dykeman Road in Shippensburg Borough, is part of the L.D. Schreiber Cheese Company of Green Bay, Wisconsin. Founded in 1945, the company is a \$2 billion global enterprise and the world's largest privately held cheese company. Over the past ten years, Schreiber has grown at a rate of close to one new manufacturing facility per year.

## Ship Market Place

Ship Market Place (Giant) is located on a 9.7-acre site along Baltimore Road in Shippensburg Township. The shopping center includes a Giant Supermarket, a pizzeria, a bank, and a number of other stores.

## Shippen Town Centre

Shippen Town Centre is located on the north side of Route 174 (Walnut Bottom Road) in Shippensburg Township. The anchor of the shopping center is a new Wal-Mart store. There are properties within and adjacent to the Centre with commercial development potential and will generate additional vehicle trips if and when they are developed.

## COMPOSITION OF THE CIRCULATION NETWORK

Shippensburg Borough contains 13.8 miles of roads, including a high volume arterial US 11 (King Street), major collectors such as Route 696, Queen Street, and Baltimore Road, and narrow residential streets. Shippensburg Township contains 13.1 miles of roads, of which 6.6 miles are owned and maintained by the State. The circulation system in the Shippensburg Township consists of a variety of roads, from the high volume Route 174 (Walnut Bottom Road), to major collectors such as Route 696 (East Earl Street) and Baltimore Road, to rural roads in the Township which tend to be narrow and winding. All of the roads, with the exception of Interstate 81, are two lanes and serve a combination of regional and local traffic. Road mileage data are found below in Figure 15.1.

**FIGURE 15.1: PUBLIC ROAD MILEAGE**

	BOROUGH	TOWNSHIP	REGION TOTAL
State roads	4.6 miles	6.6 miles	11.2 miles
Municipal roads	9.2 miles	6.5 miles	15.7 miles
<b>TOTAL ROADS</b>	<b>13.8 miles</b>	<b>13.1 miles</b>	<b>26.9 miles</b>

SOURCE: Tri-County Regional Planning Commission, 2004

## East-West Transportation Corridors

The highest volume east-west roads passing through the region are Walnut Bottom Road (PA Route 174) in the Township and King Street (US Route 11) in the Borough. Walnut Bottom Road functions as the main collector from I-81 to King Street and is important as it provides access to the regional transportation network as well as county and regional employment centers. King Street is the Borough's main collector to I-81, provides access to the regional network, and also accommodates local traffic. East of Walnut Bottom road, King Street intersects and then coincides with Route 533 and becomes the Ritner/Molly Pitcher Highway (Routes 11 and

533). This links local traffic to Walnut Bottom Road and employment centers in Franklin County to the west. It is also an alternative route to I-81 in the east, linking the Township to the Carlisle area.

Other significant east-west routes include Orange Street, Fogelsanger Road, and Olde Scotland Road

## North-South Transportation Corridors

The east-west routes have historically been the most heavily traveled through the area, but there are still some important north-south routes. North Earl Street (PA Route 696), Britton Road, Queen Street, and North Morris Street are the most significant. North Earl Street crosses the western portion of the Township and facilitates inter-county travel, linking the PA Turnpike to the north (via PA Route 997) with I-81 to the south. Britton Road connects PA Route 641 and points north with I-81 to the south. It also intersects with Queen Street in the Borough (Baltimore Road in the Township) and provides access to Walnut Bottom Road and I-81 via King Street to the east and the Gettysburg area to the south.

Other important north-south traffic routes include North Prince Street, Rowe Road, and Lurgan Avenue.

## EXISTING ROADWAY CLASSIFICATION

Transportation engineers have developed a road classification system based upon the volume of traffic they accommodate. Figure 15.2, the Functional Classification and Traffic Volume Map depicts the regions road classifications.

Expressways - Expressways are limited-access highways that carry the highest volume of traffic at the highest allowed rate of speed. They are primarily intended for interstate and inter-regional travel, as access to these roads is possible only at widely spaced, fully controlled, and grade-separated interchanges. Interstate Route 81 is the only expressway in the Shippensburg Region.

Arterial Roads - Arterial roads can be sub-classified as principal or minor arterials. They provide for the movement of a high volume of traffic over longer distances and usually have direct access to the expressway network. Driveway access is usually strictly controlled in densely developed areas, although access is necessarily provided in rural areas. Traffic speed is relatively high, but tends to be slower than the expressways due to traffic signals and intersections.

Principal arterials in the Shippensburg Region are US Route 11 (King Street), PA Route 174 (Walnut Bottom Road), and a portion of Ritner/Molly Pitcher Highway (Routes 11/533). Minor arterials consist of the portion of Ritner/Molly Pitcher Highway that is not a principal arterial, North Earl Street, North Morris Street, Fayette Street north of Olde Scotland Road, and Olde Scotland Road.

Collector Roads - Collector roads serve moderate traffic volumes and act to move traffic from local neighborhoods to the arterial network. Collectors are also sub-classified into "major" and "minor." Major collectors provide for a higher volume of traffic at a higher rate of speed; minor collectors serve to collect traffic within an identifiable area and serve primarily short distance travel.

Britton Road, Roxbury Road, North Queen Street/Baltimore Road, North Prince Street, Orange Street, Richard Avenue, and a portion of South Fayette Street are all major collectors. No roads in the Shippensburg Region are classified as minor collectors.

Local Roads - Local roads are, by far, the most numerous of the various highway types. These streets provide access to individual properties and serve short distance, low speed trips. All roads in the Shippensburg Region not named above are local roads.

Figure 15.3 shows the design features for these functional classifications recommended by the Cumberland County Comprehensive Plan. Note that the County includes expressways as a type of arterial.

**FIGURE 15.3: RECOMMENDED DESIGN FEATURES BY FUNCTIONAL CLASS**

FUNCTIONAL CLASS	DESIGN SPEED	DESIGN FEATURES	TRAVEL TYPE	RELATIONSHIP TO OTHER TYPES
Arterial	45-65 mph	Limited, partial, and unlimited access controls; widest rights-of-way, cartways, and shoulders; often multiple lanes in each direction.	Minimal interference to through travel; local travel discouraged, particularly on expressways.	Important connections with other arterials and collectors, usually via grade-separated interchanges or signalized intersections.
Collector	35-45 mph	No access controls; moderate to minimal right-of-way, cartway, and shoulder widths; usually one lane in each direction.	Balance of through traffic and local travel.	Connects with arterials and local roads; intersections with arterials and major collectors typically signalized; intersections with minor collectors and local roads usually controlled by "stop" signs.
Local	25-35 mph	No access controls; minimal right-of-way, cartway, and shoulder widths; one lane in each direction.	Through travel discouraged; strong orientation to local travel.	No direct connection to expressways, and rarely intersects with arterials or major collectors; connects with most minor collectors and all other local roads; intersections controlled by "stop" signs, signals are rare.

SOURCE: Tri-County Regional Planning Commission, 2004.

## ONE-WAY STREET PATTERN

The Borough has established a system of one-way streets in an effort to streamline traffic flow and minimize traffic conflicts. Figure 15.4 shows the Borough streets that have been designated for one-way travel.

**FIGURE 15.4: ONE-WAY STREETS**

STREET NAME	FROM:	TO:	DIRECTION OF TRAVEL
W. Neff Ave.	S. Fayette St.	Locust St.	westbound
McCreary Ave.	W. King St.	W. Martin Ave.	northbound
N. Seneca St.	W. King St.	W. Martin Ave.	northbound
S. Seneca St.	W. King St.	W. Neff Ave.	southbound
W. Martin Ave.	N. Seneca St.	N. Earl St.	eastbound
E. Martin Ave.	N. Earl St.	N. Washington St.	eastbound
E. Martin Ave.	N. Walters Ave.	N. Queen St.	eastbound
N. Apple Ave.	E. King St.	E. Martin Ave.	northbound
S. Apple Ave.	E. King St.	E. Orange St.	southbound
W. Neff Ave.	S. Earl St.	S. Seneca St.	westbound
E. Martin Ave.	S. Prince St.	S. Earl St.	westbound
Burd Street	N. Queen St.	N. Fayette St.	westbound
S. Gettle Ave.	E. Orange St.	E. Neff Ave.	northbound

SOURCE: Tri-County Regional Planning Commission, 2004.

## **HARRISBURG AREA TRANSPORTATION STUDY (HATS)**

The Harrisburg Area Transportation Study (HATS) is an organization comprised of federal, state, and local agencies, and officials from Cumberland, Dauphin, and Perry Counties, the City of Harrisburg, and Capital Area Transit. Established in 1965, HATS is commonly referred to by its official federal designation of "MPO" or Metropolitan Planning Organization.

The HATS planning process emphasizes short and long-term problem solving and involves the public in the development of a Transportation Plan, Transportation Improvement Program, Short Range Transit Plan, and Congestion Management System. The planning process culminates in the preparation and approval of a biennial Transportation Improvement Program, which constitutes the first four-year period of the Commonwealth's Twelve Year Program. HATS have also developed a Bicycle and Pedestrian Plan.

## **TRAFFIC VOLUMES**

Traffic volumes are determined through traffic counts taken at specific locations within a defined transportation corridor. The volume is usually portrayed in terms of average annual daily traffic (AADT). This represents the average count for a 24-hour period, factoring in any fluctuations due to the day of the week or month of the year. The AADT is an important factor that, in conjunction with the previous factors outlined, helps to determine the functional classification of a road. Comparing traffic volumes from different time periods helps to illustrate how growth is affecting circulation patterns.

Information on traffic volumes helps to identify potential capacity problems. Roads that are not used for the purpose for which they have been designed can experience capacity problems. This is particularly evident in areas experiencing a significant amount of new development without concurrent upgrades to the road network. Capacity problems become particularly evident when the number of lanes is reduced and traffic is funneled from a roadway with a higher number of lanes to one with a lower number of lanes.

Though the Shippensburg Region is growing, capacity on the region's roads is more affected by traffic originating outside the area. Roads most likely to experience capacity problems are Walnut Bottom Road, King Street, Queen Street, Ritner/Molly Pitcher Highway, and North Earl Street. These roads are carrying local as well as regional traffic at increasingly higher volumes. Traffic volumes are beginning to increase on other roads in the region as well.

The Annual Average Daily Traffic (AADT) information available from PA DOT for the Shippensburg region include the following roads:

- Route 174 (Walnut Bottom Road) - 7,100 daily trips
- US Route 11 (King Street) - 6,500 daily trips
- Route 696 (Newburg Road)- 3,200 daily trips
- Britton Road - 1,100 daily trips.

Traffic volumes are also shown on Figure 15.2, the Functional Classification and Traffic Volume Map.

## **Roadway Conditions**

An inventory of roadway conditions is necessary in order to identify problems within the circulation system and to address these problems as appropriate. Roadway conditions are

generally evaluated from three perspectives: safety, access management, and corridor segments.

***Safety*** - Safety concerns are evident at locations within the circulation system that may be hazardous due to poor road alignment, limited sight distance, inappropriate design, structural deficiencies, lack of shoulders, or obstacles near the roadway. These factors may also impede traffic, cause congestion, and contribute to accidents.

***Access Management*** - Access management problems are the result of conflicts between mobility and access, resulting in congestion and safety concerns. Access management problems typically occur on roads serving high volumes of high speed traffic where they abut intense trip-generating uses, such as Walnut Bottom Road and North Earl Street. An example of an access management problem would be where commercial development occurs on a road and the mobility of traffic is adversely affected by the increase in the number of driveways from adjacent lands. As the number of driveways increases, the safety and efficiency of the road will usually diminish. Access management is a growing concern on roads in developing areas.

***Corridor Segments*** - Corridor segment issues arise in more densely developed areas when congestion, access, and safety issues are all present. Corridor segment problems can include those roads that may possess maintenance issues or exhibit structural problems. Because of a number of access and safety problems, Walnut Bottom Road, Ritner/Molly Pitcher Highway, North Earl Street, and Baltimore Road are key corridors requiring attention.

## ALTERNATIVE FORMS OF TRANSPORTATION

A comprehensive plan for circulation must address multi-modal accommodations, such as bicycle-pedestrian, transit-pedestrian, and bicycle-transit opportunities.

### Bus Service

Raider Regional Transit (RRT) is a local bus system serving Shippensburg University and the Shippensburg community. RRT is jointly sponsored by the Shippensburg University Student Association, Shippensburg University, Shippensburg Borough, Shippensburg Township, Cumberland County, Southampton Township (Franklin County), and Capital Area Transit. Additional funding has been provided by the Pennsylvania Department of Transportation (PennDOT).

RRT provides service along four routes Monday through Saturday during Shippensburg University's regular academic year and on Tuesdays and Thursdays (modified schedule) during the summer and fall as well as during the University's spring and holiday breaks. Service is provided around campus and the Shippensburg community. Using Saturday service, riders may go to local shopping areas as well as the regional Chambersburg Mall. Schedules are available through Shippensburg University and on the internet at [www.ship.edu/RRT](http://www.ship.edu/RRT).

Capitol Trailways provides daily and weekend service between the Shippensburg and Harrisburg, Philadelphia, New York, and Washington, D.C. Greyhound and Capitol Trailways utilize J & J Computers on East King Street in Shippensburg Borough as a stop.

## **Rail Service**

Norfolk-Southern provides daily rail freight service to the community via the local line known as the Lurgan Branch. A study by the Capital Area Transit (CAT) Authority is underway to explore the viability of introducing commuter (i.e., passenger) rail service to Cumberland County. The proposed rail line, called CORRIDORone, would extend from Carlisle to Lancaster through Harrisburg. Preliminary engineering and an environmental impact analysis are currently underway.

Inter-regional commuter rail service is currently only available in the Harrisburg area via Amtrak with two train stops, one in Middletown and the other at the Harrisburg Transportation Center in downtown Harrisburg.

## **Airport Services**

The Shippensburg Airport is located three miles east of the Borough in Southampton Township (Cumberland County). The airport contains an unpaved (grass surface) runway 2,300 feet long and 170 feet wide. Approximately seven privately owned aircraft are based at the field. The airport offers very limited aviation services. The airport was recently purchased by Prologis, and at the time of the release of this Plan, the future of the facility is uncertain.

The closest airport offering commercial passenger service is at Hagerstown, Maryland. The nearest international airport is Harrisburg/Middletown.

## **Pedestrian and Bicycle Facilities**

The Transportation Map shows the existing sidewalk and pathways in the region. This system is based on the existing development pattern, but in many cases there are only isolated sections of sidewalks. It is particularly critical to close gaps between existing sidewalks and pathways along routes to community facilities. It is also important to recognize the Amish and other plain sect cultures in the region by accommodating horse and buggy traffic where possible.

The municipalities also have the opportunity to explore the feasibility of a trail system that would link existing sidewalks and pathways to a number of community facilities and natural treasures, such as Middle Spring Creek and Burd Run. The trail system available to the public is very limited at this time, although residents have expressed interest in a larger trail network. The Cumberland Valley Rails-to-Trails Council (CVRTC) is a non-profit, all-volunteer charitable corporation whose mission is to develop the 11-mile Cumberland Valley Trail, from Shippensburg to Newville, in Cumberland County.

There are also a number of areas within the region that could be more "pedestrian friendly," especially the areas along Walnut Bottom Road, the Ritner/Molly Pitcher Highway, the Borough side of Baltimore Road, and North Earl Street. RRT provides service in these areas and it is extremely difficult for transit users to access this service if they need to cross these roads. The Township should coordinate with PennDOT to facilitate pedestrian access across these corridors. The Borough should consider additional pedestrian enhancements for areas adjacent to Shippensburg University.

## **AREAS OF CONCERN**

The Future Traffic Circulation Map, Figure 8.1 in Chapter 8, illustrates some roadway and pedestrian concerns for the region including poor alignment, sight distance problems, areas with poor surface condition, one-lane bridges and underpasses, narrow streets, at-grade rail crossings, excessive vertical curves, excessive grades at intersection approaches, and areas where sidewalks or pedestrian crossings should be provided.



Notable intersections or roads in need of improvement and alignment include:

- Walnut Bottom Road (alignment for proposed inner loop intersection)
- Walnut Bottom Road and East Orange Street (intersection improvement)
- Walnut Bottom Road and King Street (intersection improvement)
- King Street and Conestoga Drive (intersection improvement)
- Baltimore Road (alignment for proposed inner loop intersection)