



Chapter Nine

Transportation Inventory and Plan

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Introduction

The Oxford Region has experienced a more moderate level of development than most other areas in Chester County where residential uses have become the primary land use. The Region has retained a majority of its rural and agricultural character and the transportation resources are reflective of this fact. This Chapter provides an inventory and analysis of transportation resources at a regional level and an action plan for the consistent maintenance, management, and improvement of the transportation system in accordance with the following Goal:

Plan for a safe, efficient, effective, and diversified transportation system that is compatible with land use strategies and addresses both current and future transportation needs of the Region and adjacent communities, regions, counties, and states.

Plan Objectives

This Plan Chapter focuses on how best to achieve the following Objectives:

- 9-A** Develop an interconnected roadway, transit, and trail network, which reflects the current and future transportation needs of the Region, promotes efficient transportation movement, and respects the natural and cultural objectives of the community.
- 9-B** Coordinate transportation needs and funding on a regional basis to prioritize and promote effective and efficient improvements that maximize transportation objectives and funding opportunities.
- 9-C** Maintain and enhance a roadway network that safely and effectively accommodates vehicular traffic while supporting (and where possible, facilitating) other community development objectives.
- 9-D** Manage roadway design, speed, volumes, and safety in the Borough and in and around areas with increased pedestrian activity such as schools, parks, villages, and centers.
- 9-E** Enhance pedestrian and bicycle opportunities by developing additional facilities in coordination with roadway projects, subdivision and land developments, park improvements, trail developments, and other related improvements to increase alternative modes of transportation, add recreational opportunities, and promote healthy lifestyles.
- 9-F** Enhance opportunities for transit through cooperation with local, regional, state, and federal agencies, changes to municipal design features, increases in intermodal connections, and coordination between transportation improvements and land use patterns and densities.

Inventory of Existing Transportation Conditions

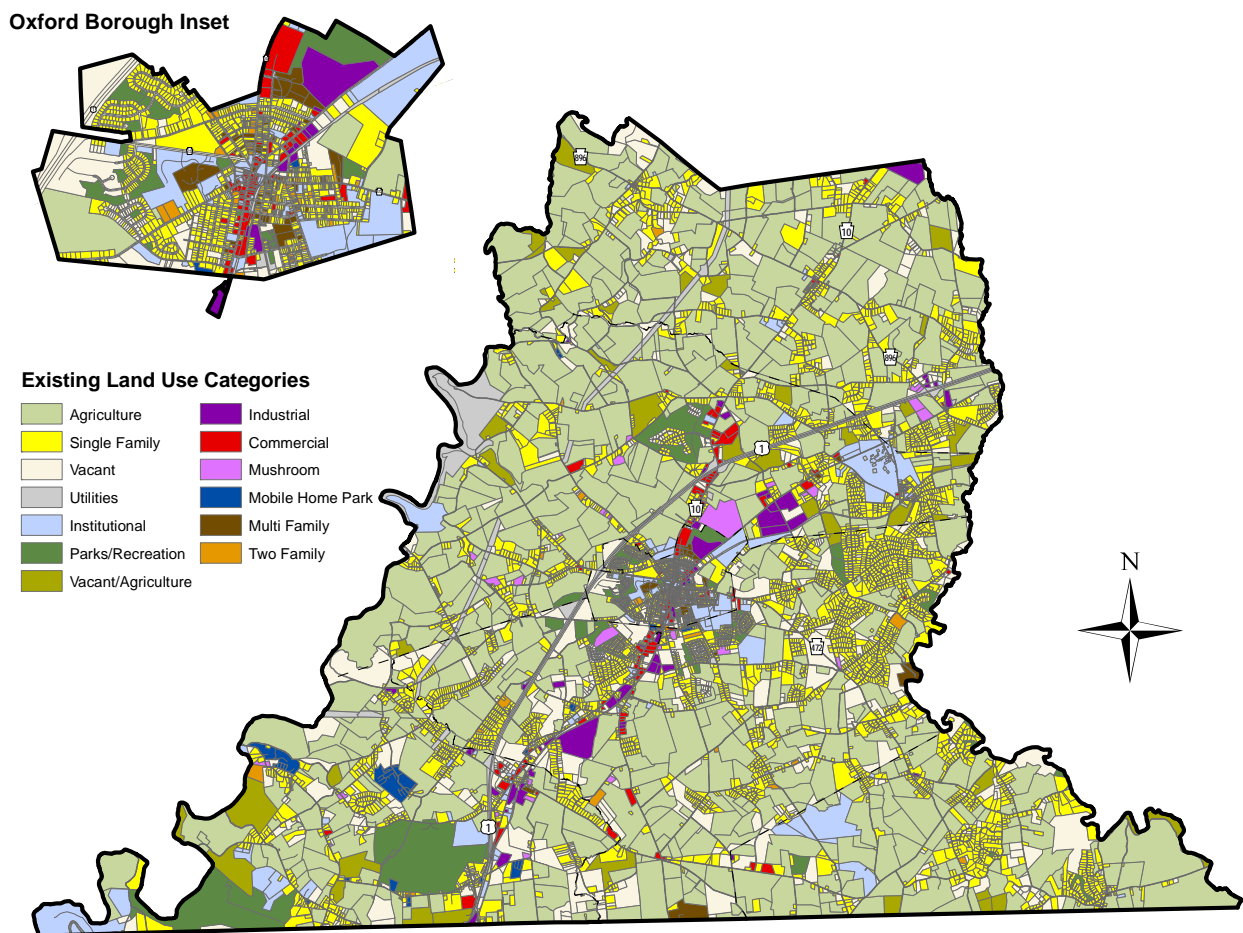
The effective use of land and quality of life in the Region are dependent on an efficient transportation network. Planning for transportation and circulation needs of the Region is closely connected and influenced by the Region's land use pattern. Land use influences the modes of transportation, circulation system, and traffic volumes found on any roadway. Therefore, the study of these factors helps in identifying inconsistencies between land use and transportation, and helps in enhancing the quality of life and livability of the Region. The existing conditions presented in this section were taken into consideration when developing the recommendations for addressing the future transportation needs of the Region.

Transportation planning can also achieve greater regional consistency by resolving differences between municipal road functional classifications and design standards; protecting scenic and historic resources; increasing the opportunities for possible funding for transportation projects; planning for public transit needs; and helping the Region achieve its economic potential.

Land Use Patterns

The Oxford Region maintains a largely agricultural and rural land use pattern with some suburban residential development occurring primarily east of U.S. Route 1. Higher density development along with commercial and industrial development occurs in and around Oxford Borough in the center of the Region, trailing to the north along Route 10 and to the south along Baltimore Pike to Nottingham Village as indicated in Figure 9-A. As a result of these patterns, Baltimore Pike and Route 10, particularly south of U.S. Route 1, experience the largest traffic volumes and greatest congestion of all roadways in the Region. Similarly, as the Borough is at the confluence of many of the Region’s major roadways and is the area of highest density, traffic congestion is an issue within the Borough and the surrounding developed areas.

Figure 9-A: Existing Land Use



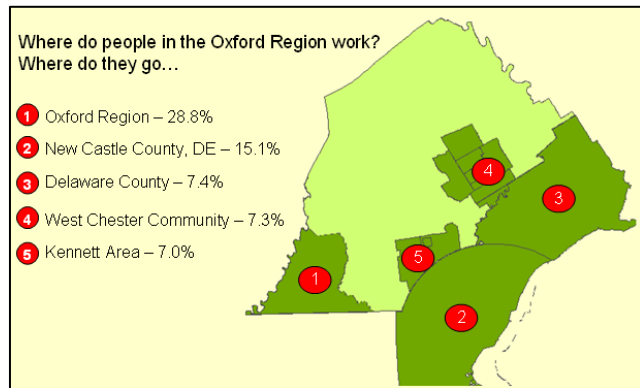
Issues/Analysis: More recent development activity in the Region has largely consisted of suburban residential subdivisions. Regional decentralization, a lack of roadway connections, and a growing need for pedestrian facilities and connections are all outcomes of this development pattern. Because agriculture is the predominate land use (about 56% of the Region) and its retention and expansion a primary focus of this Plan, there is a need to

accommodate agricultural vehicles and truck traffic associated with moving goods and services, particularly in the Resource Protection areas shown on Figures 9-I and 9-Q.

Commuting Patterns/Mode of Travel/Demographics

Work trips are a key piece of data that can be measured using census data and show accurate information about where residents of the Oxford Region travel to work. This information, as shown in Figure 9-B, can help determine how far people drive, in which direction, and which roads may be more important in regard to commuting. Almost 30% of the Region’s residents work within the Region. Conversely, a majority (roughly 70%) of employment is located outside the Region and the pattern for those working outside the Region is to the south and east¹. This data emphasizes the importance of Route 1 as an expressway linking the Oxford Region with the rest of the Delaware Valley.

Figure 9-B: Top 5 Work Locations for Oxford Region Residents



Source: U.S. Census Bureau, 2000

In comparing the findings of the 2000 Census to the 2005-2009 American Community Survey (ACS), in regard to commuting patterns, the results indicate that more workers drove alone and the Carpool and Walked [to work] categories decreased by 4% and 1%, respectively, since 2000. While the data indicates that the Region surpasses the County average in regard to carpooling and walking, the majority of residents remain dependent on the use of single occupancy vehicles as a means of reaching employment destinations.

Figure 9-C: Journey to Work for Oxford Region Residents

Journey Type	Oxford Region 2000 Census	Oxford Region 2005-2009 ACS		Chester County 2005-2009 ACS	
	Percent	Number	Percent	Number	Percent
Drove Alone	75%	8,794	80%	198,004	81%
Carpooled	13%	959	9%	18,740	8%
Public Transportation	1%	60	1%	6,433	2.5%
Walked	5%	480	4%	6,247	2.5%
Other Means (Bicycle, etc)	<1%	67	<1%	2,083	<1%
Worked at Home	6%	668	6%	12,653	5%
Totals	-	11,028		244,160	

Source: U.S. Census Bureau, ACS, 2005-2009

¹ US Census, 2000

Issues/Analysis: The Oxford Region leads the County in percentage of workers carpooling. This may be partly due to the fact that there are two park-and-ride lots located in the Region while there are only a limited number of park-and-ride lots throughout the rest of the County (See Figure 9-Q), reinforcing the demand and need for additional opportunities for workers to reach employment destinations outside of the Region. Because residents of the Oxford Region travel further to work there is a need for alternatives to trips via single-occupancy vehicles.

At the same time, 29% of workers who live in the Region also work within the Region as shown in Figure 9-B. Similarly, of the employment opportunities within the Region, 52% of these are filled by residents of the Region; this figure is the highest in the County. The Oxford Region has a higher percentage of households where no vehicle is owned (9.8%) as compared to the County (5.2%). This data may also reflect the higher percentage of households in the Region making less than \$40,000.00 per year (38.7%) which is much higher than the County's 28.2%. These facts reiterate the need for both additional pedestrian connections within the Region as well as increased alternatives to driving such as transit opportunities for local trips that could be coordinated with the needs for workers traveling outside the Region.

Roadway Conditions

The Oxford Region's transportation resources primarily consist of smaller rural roadways similar to the image on page 9-1. The exceptions are U.S. Route 1 and Routes 10, 896, 472, and

The US Route 1 Expressway was constructed in the 1960s, and has served as a key factor in both the economy and development of the Region.

272, and Baltimore Pike, an important regional roadway that once served as the primary road between Philadelphia and Baltimore, Maryland (see Traffic Volumes). As seen in commuting patterns, other than those residents who work in the Region, a majority of the remaining work trips are to the east and south of the Region, with many residents

using U.S. Route 1 to travel to work. Figure 9-D shows the miles of roadway in each municipality and indicates the level of responsibility for maintenance. Further, this mileage is used in the equation for liquid fuels funding [per mile] that each municipality receives from the state for annual road maintenance.

Issues/Analysis: Road maintenance and improvements are costly yet important and necessary aspects of every municipality's responsibilities. While 37% of the Region's roads are owned and maintained by PennDOT, the majority (63%) of roads are a municipalities' responsibility. Further, some municipalities have a decidedly larger number of miles to maintain (East Nottingham and Lower Oxford) while others have a greater percentage of municipal roads in proportion to PennDOT roads (West Nottingham). Traffic volumes and truck traffic are also contributors to increased road maintenance, however, the roads with the highest numbers for these two categories are predominately PennDOT roads.

Figure 9-D: Miles of Roadways in the Region

Municipality	Municipal Roads	PennDOT Roads	Total Roads
East Nottingham	60	28	88
Elk	15	11	26
Lower Oxford	35	24	59
Upper Oxford	28	23	51
West Nottingham	30	7	37
Oxford Borough	8	8	16
Total for Region (miles of roads)	175	101	276

Source: 2011 Official Directory, Chester County Association of Municipal Officials

Liquid fuels funding from the state is not sufficient to cover road maintenance and the increasing costs of materials makes maintenance a struggle for municipal officials. This Plan identifies the need for both prioritizing maintenance and improvements and collaborating on a regional basis to 1) focus limited funding on the most effective solutions, 2) maximize the potential for cost sharing and shared bidding, and 3) purchasing bulk materials and similar strategies. Municipalities should adopt a “fix it first” strategy and other principles of PennDOT’s Smart Growth Principles. (See Appendix 9-B) Lastly, new roads should be constructed to suit their function and to provide for appropriate facilities and alternative modes of transportation, such as traffic calming devices, proper access management, sidewalks, and bike routes or lanes, as appropriate.

Crash Data (Problematic Intersections)

Crash data is available from PennDOT and released in summary format depicting levels of accidents for particular areas but not designating individual accidents nor specific information on a given crash incident. Figure 9-E displays areas within the Region with higher incidences of crashes.

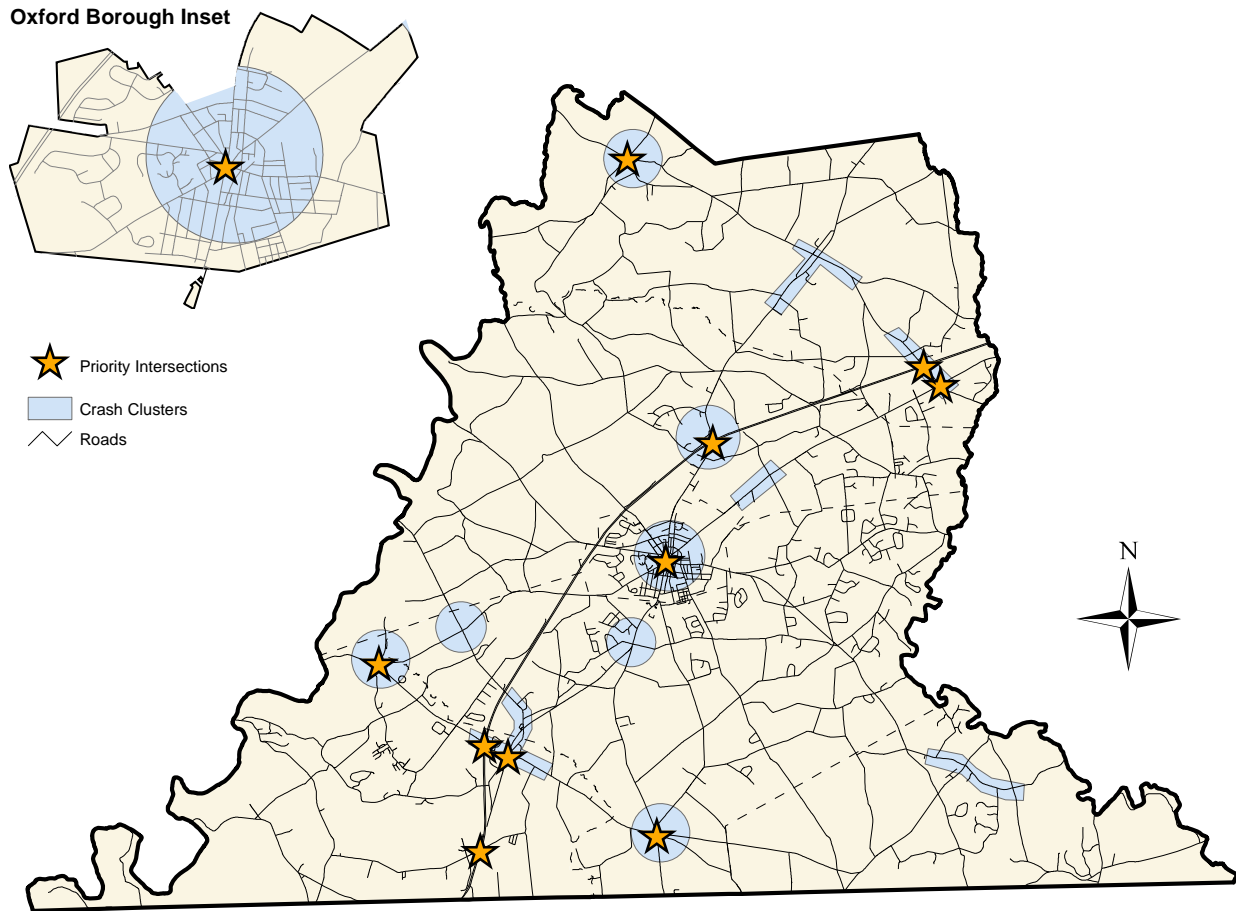
14 intersections in the Region were identified by the Planning Committee as having a congestion or safety issue

Transportation Survey

A majority of these crashes occur on the larger roadways with higher traffic volumes and at the intersections of these same roadways. This information is useful in targeting and prioritizing roadway and intersection improvements. In addition to the PennDOT crash clusters shown on Figure 9-E on the following page, a survey conducted in conjunction with this planning effort identified (14) intersections that have either congestion or safety

issues. The “priority intersections” that appear in Figure 9-E designate priorities for safety and congestion mitigation based on locations where priority intersections identified in the survey coincide with crash clusters. This information is helpful to identify potential safety issues and provide a basis for requested improvements and funding. The crash data directly correlates with many of the improvements listed in the 2011 TII. (See Appendix 9-A)

Figure 9-E: Crash Data Clusters



Issues/Analysis: Participants of the Comprehensive Plan process were surveyed regarding potential areas for roadway improvements. By and large, their responses were confirmed by generalized PennDOT crash data displayed in Figure 9-E. This information may be used to prioritize, garner support for, and secure funding to implement appropriate improvements. The crash data directly correlates with many of the improvements listed in the 2011 TII. (See Appendix 9-A)

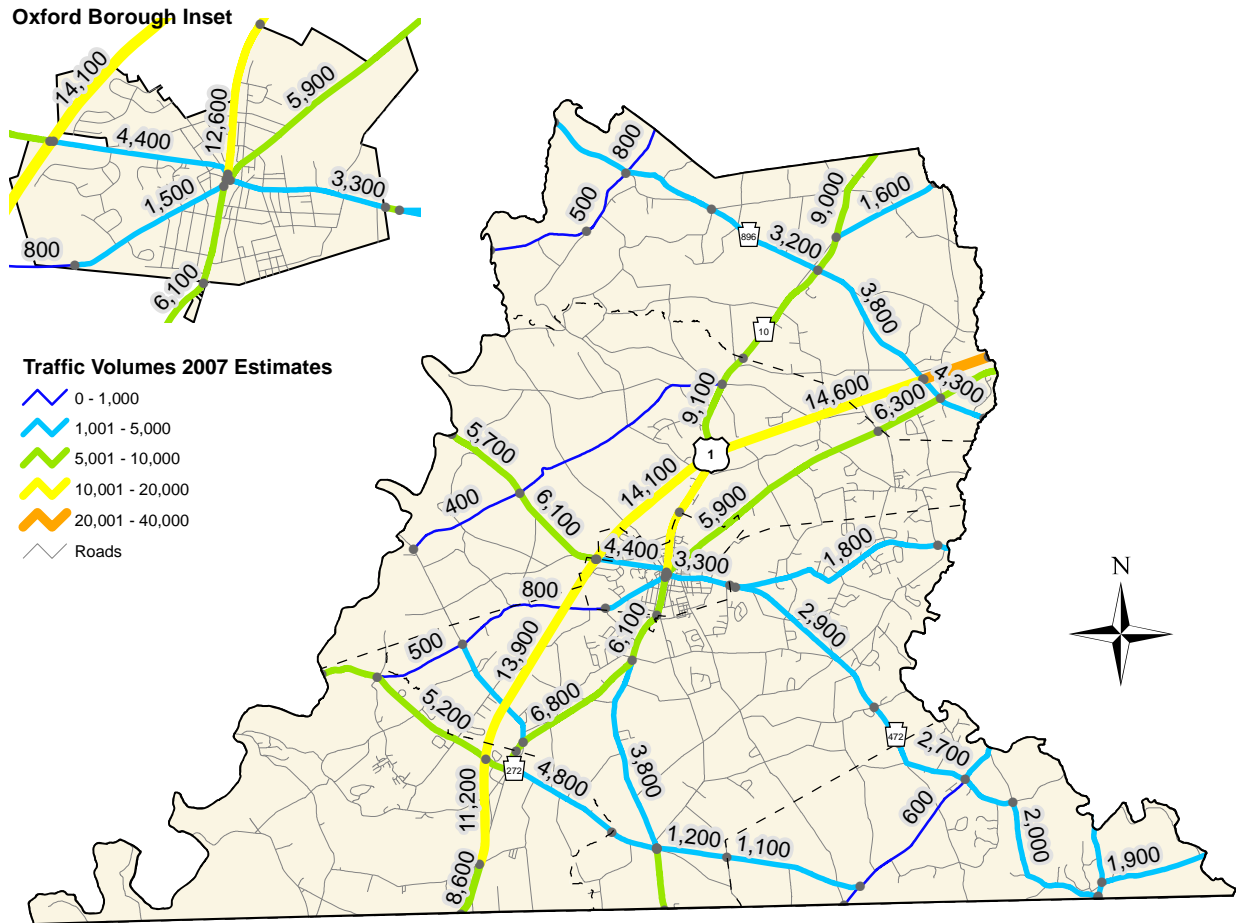
PennDOT County-wide Analysis. Portions of Forge Road and Old Baltimore Pike in West Nottingham Township were identified as having high crash clusters in a county-wide analysis of Chester County.

Traffic Volumes

Traffic volumes and estimates are available from both the Chester County Planning Commission (CCPC) Transportation Division and the Delaware Valley Regional Planning Commission (DVRPC). Estimates use recent year traffic counts and approximate growth levels for a specific roadway to provide more accurate numbers where recent counts are not available. Most of the counts are taken on larger roadways such as numbered state roads. Although counts are available for some of the smaller roads, most of these counts are 3,000 vehicles per day (VPD) or less. Figure 9-F shows average daily traffic volumes for major roadways within the Region.

Daily traffic volume data represents the number of trips, in both directions, for a 24-hour period.

Figure 9-F: Average Daily Traffic Volumes



Issues/Analysis: Aside from U.S. Route 1, Route 10 and Baltimore Pike are the two primary transportation corridors within the Region as evidenced by their length, traffic volumes, and adjacent land uses. (See Figure 9-A) In addition, there are high average daily traffic (ADT) flows in the Borough, due to the Borough being the confluence of most of the Region’s major roads. Improving the safety and efficiency of major road corridors, while facilitating local alternative roadways and connections, is essential. Encouraging alternative modes of travel in appropriate places, particularly within the Borough and immediately surrounding areas, is equally important.

Transit and Carpooling

Passenger rail service ran to Oxford Borough from Philadelphia beginning in 1860 and ending in 1948. The only recent public transportation in the Region is in the form of the SCCOOT bus run by the Transportation Management Authority of Chester County (TMACC). This service runs from Oxford Borough to the West Chester area primarily along Baltimore Pike, stopping at various boroughs and development centers along the way.

The nearest Southeastern Pennsylvania Transportation Authority (SEPTA) route is the Wilmington/Newark Line that provides rail service to Philadelphia in Newark, Delaware. An Amtrak station in Parkesburg Borough, approximately 14 miles to the north of the Region, is another commuter rail option for the Region's residents.

TRANSIT: For the purpose of this plan, transit is considered any alternative means of motorized travel aside from a single occupancy vehicle.

There are two park and ride lots within the Region, one at the intersection of U.S. Route 1 and Route 272 and another at Route 1 and Route 472. (See Figure 9-P) These facilities are well used as indicated by carpooling in the Region that accounts for 9% of the Region's work trips. (See Figure 9-C)

Issues/Analysis: As identified in the Commuting Patterns discussion on page 9-4 and in addition to other observations in this chapter, there is a general lack of alternatives to driving within the Oxford Region. Further, data on travel time to work provides useful information. Although roughly 29% of all work trips begin and end in the Region, as indicated in Figure 9-B, there are little if any transit opportunities for these travelers. Similarly, nearly half of all workers in the Region drive more than thirty minutes to work, which is even greater than the County average as shown in Figure 9-G. Further, the Oxford Region had the highest average mean travel time to work in the County in the 2000 Census. This information may indicate a need for a variety of transit opportunities both within the Oxford Region and to primary employment destinations outside the Region.

Figure 9-G: Travel Time Data

Travel Time to Work	Oxford Region 2005-2009 ACS		Chester County 2005-2009 ACS	
	Number	Percent	Number	Percent
Less than 15 Minutes	2,846	27%	58,856	26%
15-30 minutes	2,424	23%	77,315	33%
30-45 minutes	1,969	19%	49,619	21%
45-60 minutes	1,688	16%	22,691	10%
60+ minutes	1,433	14%	23,026	10%
Average Time to Work	30.7 minutes		27.8 minutes	
Total Workers	10,360		231,507	

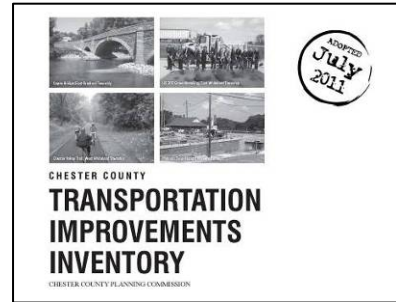
Source: U.S. Census Bureau, ACS, 2005-2009

Transportation Improvement Inventories and Programs: TII and TIP

The CCPC Transportation Improvements Inventory (TII) is an inventory of proposed improvements submitted by municipalities to the County Planning Commission that are combined into a single report

The TIP is approved by the Pennsylvania legislature and Federal Highway Administration every other year: 2007, 2009, 2011, etc..

which is updated every two years. The TII is the first step for a project to become listed in the DVRPC Transportation Improvements Program (TIP) to receive state and federal funding for implementation. The TII also



serves as the basis for CCPC recommending the advancement of transportation feasibility studies and highway occupancy permit (HOP) improvements. The 28 projects in the 2011 TII for the Oxford Region are listed in Appendix 9-A. Only a few of these projects are likely to receive funding in the 2011 TIP as each project must compete with all of the 464 projects in the County and amongst all of the projects in the DVRPC region.

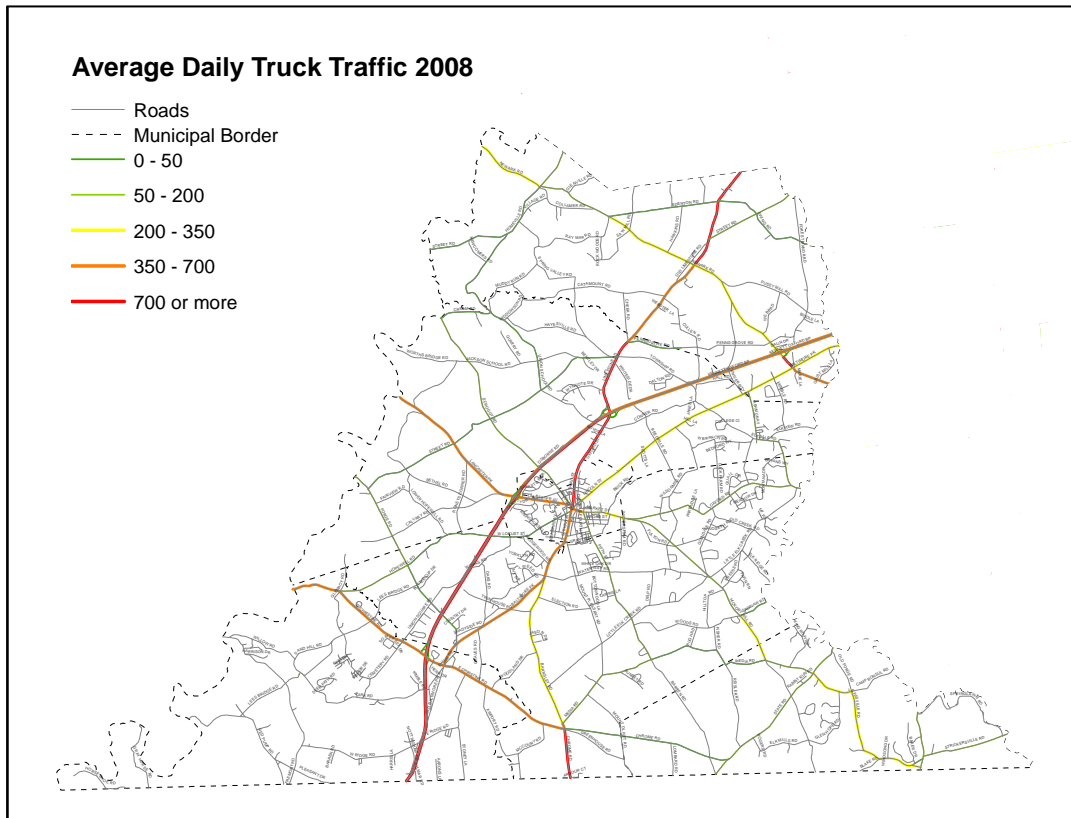
Issues/Analysis: While the TIP remains a primary means of funding and implementing major transportation improvements, it should not be relied upon for the majority of initiatives. There is increasingly limited funding for the TIP and the program is very competitive. In light of this, the Region should prioritize its transportation improvements and continue to submit them for inclusion on the TII which could both lead to future TIP funding as well as opportunities for other means to implement improvements. Further, the municipalities of the Region should investigate other opportunities to secure funding for future transportation projects.

Truck Movements

Trucks are an issue in the Borough due to their slow acceleration, size, and large turning radius. There is a propensity for trucks to cut through the Region using Route 10 to travel between the Pennsylvania Turnpike to the north and Interstate 95 to the south. Similar issues exist on Routes 272, 472, and 896. Despite these routes being the roadways of higher functional classification in the Region, (See Figure 9-I) they are generally not ideal roadways for carrying heavy truck traffic. Sharp bends, poor sight distance at crossroads, and routes through villages are all issues with truck traffic on local roads. Because agriculture remains a key industry in the Region, movement of farm vehicles and related goods is an issue on public roadways, particularly in regard to safety. Because of the Amish community in the Region and surrounding areas, the presence of horse and buggies on local roadways is a safety issue that must be addressed.

Results of the Transportation Survey indicated that while municipal officials thought that “trucks were necessary,” issues were identified that there are “too many trucks in downtown Oxford” and that those “trucks travel too fast.”

Transportation Survey

Figure 9-H: Truck Volumes

Source: PennDOT, 2008

Issues/Analysis: Figure 9-H displays recent data regarding truck volumes on the Region's roadways. In general, there are only a few road segments outside of U.S. Route 1 that exceed what is considered a threshold (more than 10% traffic volumes) for potential truck issues. Where this percentage is exceeded, the figures are primarily only a fraction above 10%. However, this does not minimize issues with truck traffic, particularly in the Borough, the existing villages, and at certain intersections and road segments in the Region. Truck volumes are generally an issue on state roadways, particularly Route 10 and Routes 472 and 272. The volumes on Route 272 are indicative of that road being a connector from the city of Lancaster, Pennsylvania to Wilmington, Delaware as well as to the Interstate-95 corridor.



Identifying and improving intersections and road segments in relation to trucks should be an ongoing regional effort. Providing for a safe and efficient means for trucks to travel through or around the Borough should be a priority. Because the maintenance and expansion of the agricultural industry is a primary goal for the Region, providing for the movement and safety of farm vehicles and buggies is a concern in light of anticipated overall future growth in traffic volumes.

Overview of Transportation Plan

While the Land Use Plan identifies existing land uses and future (planned) land uses, the Transportation Plan identifies the proposed transportation network and actions which have been designed to meet the future transportation needs generated by the planned land uses. The integration of transportation and land use planning is illustrated by the Transportation Plan Map (see Figure 9-Q). This map identifies existing and future activity centers (parks, etc.), commercial centers and corridors, villages, and the area surrounding Oxford Borough making up the designated growth area that will accommodate higher traffic volumes and existing and planned transit services.

Relationship Between Resources

It is important to understand that transportation resources must be looked at in a comprehensive and interrelated manner for them to function at maximum efficiency and effectiveness. While looking at each mode on an individual basis is essential in providing the appropriate focus to achieve implementable results, this plan strives to enhance the relationship and planning between all modes, establish new facilities, and provide for the needs of the Region.

Note: Throughout the Transportation Plan are references to the Smart Growth (SG) and Smart Transportation (ST) policies following each action or set of actions. (See Appendices 9-B and 9-C) Smart Growth policies come from a growing national program focusing on more sustainable development. Smart Transportation policies are adopted by PennDOT at the state level and apply more directly to transportation-related issues. These references are important to secure future funding by establishing consistency between these local actions and state and national policies.

Key Transportation Issues and Deficiencies

In light of the information presented within this Chapter, three key deficiencies have been identified: 1) Regionally prioritized improvements; 2) Progressive and consistent regulation and coordinated land use planning; and 3) Expanding transportation options and alternatives.

The Oxford Region is fortunate in that it has not been inundated with or overwhelmed by traffic congestion and is in a position to be proactive rather than reactive to most of its future transportation needs and issues.

Regionally Prioritized Improvements. The Region needs to prioritize key intersection improvements to both reduce congestion and improve safety at identified critical locations. In order to provide the greatest opportunity to implement these improvements and secure funding to ensure their success, improvements must be evaluated to determine which will provide the greatest overall benefit to the Region.

Progressive and Consistent Regulation and Coordinated Land Use Planning. New policies should be implemented and regulatory changes instituted. Zoning and subdivision regulations should be amended to either include additional regulatory tools or make modifications to ensure consistency or implementation of specific actions. It may be possible to rectify certain past mistakes, but it is essential that future land development and improvements do not precipitate the increase of poor transportation policies and inadequate or improper infrastructure. There are a variety of actions that direct specific regulatory changes to provide for appropriate development in terms of the provision of transportation resources. Further, there are actions directing land uses to the appropriate places that will help guide future development in accordance with the policies of this Plan.

Expanding Transportation Options and Alternatives. Improving transportation options and reducing single-occupancy vehicle trips by encouraging alternative modes of travel such as carpooling, vanpooling, transit use, bicycling, and walking should receive a higher degree of prioritization. As indicated in the Journey to Work section, roughly 29% of the Region's residents work within the Region and this number may possibly expand with additional local developments and employment potential. This provides an opportunity to reduce vehicle miles traveled, decreased carbon emissions, and improve public health by providing alternative transportation options other than single-occupancy vehicles. Further, providing for safe routes to school, better accommodating existing users (4% of residents do walk to work), and recreational opportunities is essential. It has been the case all too often that communities identify the need to incorporate a balanced transportation approach that includes transit and pedestrian facilities too late in the game. It is much easier and more efficient to be proactive and provide these options and infrastructure as a community grows than to retrofit a transportation system and infrastructure after the demand has peaked. The Oxford Region has the chance to learn from what has occurred in other regions and "get ahead of the game".

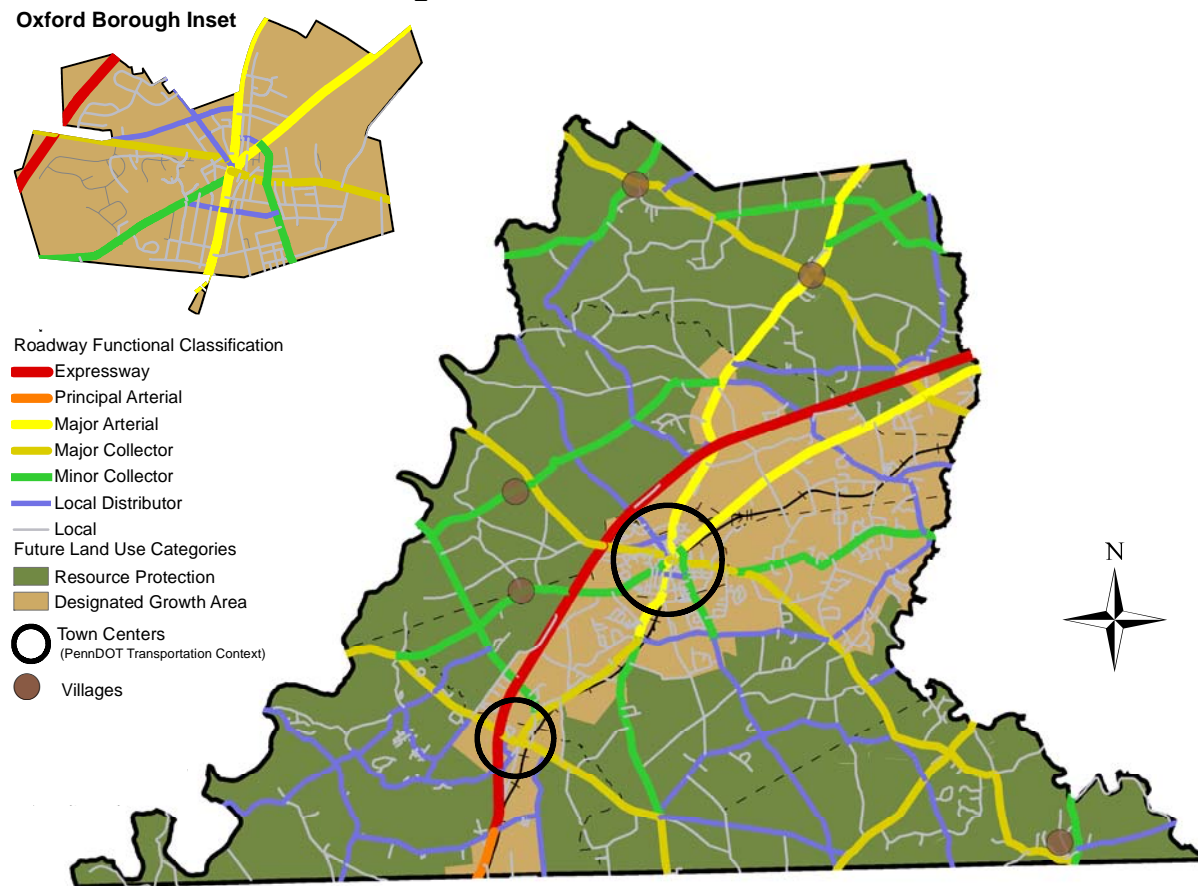
System-Wide Recommendations

System-wide recommendations are general recommendations that provide overarching principles or apply to the Region as a whole.

Regional Functional Classification

Roadway functional classification is an important land use and transportation planning tool that establishes a hierarchy of roads based on their mobility and accessibility. This hierarchy establishes a classification of roads based on function in order to identify, for planning purposes, the preferred design of each class of road so that roads can be improved appropriately. Municipalities use functional classification in zoning and subdivision and land development ordinances. Functional classification can also be used in conjunction with an official map(s).

Figure 9-I: Functional Classification



Determining the functional classification of roadways assists in setting 1) capital improvements, access management and maintenance priorities, as well as 2) design standards in respect to traffic volumes, adjacent land use, and the function and intent of roadways. PennDOT has consistently taken steps towards deferring to local policy in regard to road improvements; thus having an updated regional functional classification is an essential tool towards guiding future

roadway improvements. A comprehensive description of each functional class is included in Appendix 9-E which provides criteria for each classification of roadway in conjunction with Figure 9-I on the previous page.

Functional Classification is related to the policies and land use categories set forth in the Land Use Plan. For the purposes of the map in Figure 9-I included are the two main categories of land use: Resource Protection (Agricultural, Rural, Village) and Designated Growth Areas (Suburban, Town Center, Town Residential, Village Center, and Commerce). Appropriate design standards for roadways, such as cartway and shoulder widths, for each functional classification should be developed in addition to other applicable criteria in relation to location. These additional criteria are an important deviation from functional classification strategies of the past that focused primarily on automobile-oriented mobility and speed.

PennDOT Land Use Planning and Functional Classification

PennDOT's *Smart Transportation Guidebook*

(<http://www.smart-transportation.com/guidebook.html>) and updated Design Manuals consider land use context and roadway functional classification determining roadway design. This practice provides a more context sensitive roadway design where, for instance, Route 10 in Oxford Borough is designed differently than portions of Route 10 in Upper Oxford. In order to ensure accurate and consistent interpretation of this Plan, Figure 9-J provides a comparison between the Plan's highway functional classification and PennDOT's roadway classifications. Figure 9-K provides a comparison between the Plan's future land use and PennDOT's land use contexts.

Context Sensitive Design is an approach that leads to preserving and enhancing scenic, aesthetic, historic, community, and environmental resources, while improving or maintaining safety, mobility, and infrastructure conditions.

Figure 9-J: PennDOT Functional Classification Terminology

Functional Classification	
Oxford Region	PennDOT
Expressway	Expressway
Major Arterial	Regional Arterial
Minor Arterial	Community Arterial
Major Collector	Community Collector
Minor Collector	Collector Neighborhood
Local & Local Distributor	Local

Source: PennDOT Smart Transportation Guidebook, March 2008.

Figure 9-K: PennDOT Land Use Category Terminology

Land Use Categories	
Oxford Region ²	PennDOT
Small Town Center & Village Center	Town Center
Small Town	Town/Village Neighborhood
Regional Commerce & Suburban	Suburban Center
	Suburban Corridor
	Suburban Neighborhood
Agriculture & Rural	Rural

Source: PennDOT Smart Transportation Guidebook, March 2008.

☑ RECOMMENDATION FOR REGIONAL FUNCTIONAL CLASSIFICATION

Action 9-1 Implement a regionally-consistent set of roadway functional classification design standards to meet the objectives of this Plan.

✓This action addresses the following Smart Growth and Smart Transportation Initiatives: **SG-2, 4, 5, 8, 9; ST-2, 4, 5, 6, 7, 8, 9, 10**

Regional Collaboration and Funding

Transportation funding is very limited and extremely competitive. Therefore, in order to successfully leverage transportation funding, the Region’s municipalities should work cooperatively to prioritize and implement transportation improvements.

Prioritization of Transportation Improvements

Use the Oxford Region’s “united voice” to vote or petition legislators for the benefit of transportation issues within the Region, to communicate unified requests for improvements through the TIP, and other similar efforts. This approach has been very successful for municipalities in other regions including the Kennett Region and the West Chester Council of Governments (COG). Communication with CCPC, DVRPC, and/or PennDOT on any project should be initiated as early as possible so that any potential issues are identified and information sharing may occur, generally leading to a more constructive and efficient process.

☑ RECOMMENDATIONS FOR THE PRIORITIZATION OF TRANSPORTATION IMPROVEMENTS

Action 9-2 Continue to collaborate as a Region to identify and prioritize improvements while working directly with CCPC, DVRPC, and PennDOT, as appropriate.

✓This action addresses the following Smart Growth and Smart Transportation Initiatives: **SG-3, 4, 5; ST-1, 2, 3, 7, 9, 10**

² See Chapter 5 for a full explanation of the Oxford Region Land Use categories.

Regional Transportation Planning Efforts

To further the policies of this Comprehensive Plan, the Region should consider additional transportation planning efforts that expand on the recommendations of this Plan Chapter or provide more specific detail regarding particular transportation issues. Future efforts should address all modes of transportation as well as integration and interconnections between transportation modes (pedestrians, cyclists, buses, rail, trails, sidewalks, etc.). The scope of additional plans may be tailored to focus on certain issues that are of more immediate concern with less detail on issues of lower priority. An example may be a specific access management plan or traffic calming plan for Oxford Borough, or a corridor plan for Baltimore Pike. Additional transportation planning will further promote efficient and effective measures to provide for the transportation needs of the Region and increase the potential for funding identified improvements. For a list of recommended Projects and studies for the Region to consider, please see Figure 9-L.

Examples: Route 896 Corridor Plan (2006) and the Route 10 Safety Audit (2008).

RECOMMENDATION FOR REGIONAL TRANSPORTATION PLANNING EFFORTS

Action 9-3 Consider additional, expanded, or more specific regional transportation planning efforts.

✓ This action addresses the following Smart Growth and Smart Transportation Initiatives: **SG-3, 4, 5, 6; ST-1, 2, 3, 7, 9, 10**

Figure 9-L: Recommended Projects and Studies

Concept	Action
Improvement study for priority intersections (See Figure 9-4)	n/a
Closed loop traffic signal system for Oxford Borough/Baltimore Pike (BP)	9-16
Feasibility study for community connector around northern edge of Oxford Borough	9-18
Access management study for Baltimore Pike (Nottingham Village to Oxford Borough)	9-19
Access management study for PA 272 (Nottingham Village)	9-19
Access management study for PA 10 (U.S. Route 1 to Oxford Borough)	9-19
Traffic calming study for Baltimore Pike (Nottingham Village to Lincoln University)	9-22
Roundabout feasibility analysis (BP/PA 896; BP/PA 272; PA 272/Barnsley Chrome Road)	9-24
Bicycle, Pedestrian, Trail Study for Nottingham Park to Nottingham village	9-33
Bicycle, Pedestrian, Trail Study for Oxford Borough to Oxford Area Regional Park	9-33
Bicycle, Pedestrian, Trail Study for Baltimore Pike (Nottingham Village to Lincoln U.)	9-33
Plan for Park n' Ride at U.S. Route 1 /PA 10	9-42
Plan for Park n' Ride at U.S. Route 1 /PA 896	9-42

Source: CCPC, 2011

Technical Evaluation of Identified Priorities

As funding continues to be an issue, the Region should consider having currently listed priorities analyzed as a first step towards gaining additional funding or leverage for moving projects forward. For example, for an intersection that is identified as a location where a

roundabout may be a potential option, the Region could contact CCPC to do a preliminary analysis to evaluate the viability of a roundabout. A relatively simple analysis using GIS (Geographical Information Systems) could provide information regarding impact from additional right-of-way needed, adjacent structures, topography, and other issues that may determine whether a roundabout is feasible before moving forward with additional efforts. The analysis may determine that a project is not feasible before significant cost is incurred or provide supporting evidence for an alternative to the existing conditions.

Where appropriate, coordination between municipalities should be encouraged, particularly where a project may directly affect another municipality. In addition, communications with CCPC, DVRPC, and PennDOT should be initiated at this stage to promote coordination for funding and implementation. (See also Action 9-2)

☑ RECOMMENDATION FOR SEEKING TECHNICAL EVALUATION OF IDENTIFIED PRIORITIES

Action 9-4 Pursue technical evaluation of identified priorities and share recommendations with the appropriate municipalities and agencies.

✓This action addresses the following Smart Growth and Smart Transportation Initiatives: **SG- 3, 4; ST-1, 2, 3, 4, 7, 9, 10**

Transportation Improvements Inventory (TII)

The County requests municipal and regional submissions to the TII every other year. Municipal officials should maintain awareness of this ongoing effort and be prepared in advance of the bi-annual request for submission to the TII. While each municipality should

Submission of a project by the Region may provide increased funding opportunities and improve the chance the project is approved as there is an emerging trend towards prioritization of Regional projects.

continue to provide individual submissions to the TII, there should be regional coordination for any Development of Regional Significance and Impact. This action should be implemented in part in conjunction with Action 9-10 that recommends annual road audits by each municipality. Prior to the TII submission, the municipalities of the Region should coordinate to determine if there are any projects that

should be prioritized for support by the Region as a whole and submitted as such to the TII. (See Appendix 9-A)

☑ RECOMMENDATION FOR PARTICIPATION IN THE TRANSPORTATION IMPROVEMENT INVENTORY

Action 9-5 Submit identified transportation projects to the Chester County Planning Commission for placement on the Transportation Improvement Inventory (TII).

✓This action addresses the following Smart Growth and Smart Transportation Initiatives: **SG-3, 4; ST-1, 2, 3, 4, 7, 9, 10**

Traffic Impact Ordinance (Act 209)

The adoption of a Traffic Impact Ordinance, which is enabled by Act 209 of 1990, permits municipalities to assess a transportation impact fee during the land development approval process for the funding of transportation improvements. PennDOT's *Traffic Impact Fees: A Handbook for Municipalities* provides a thorough explanation of determining whether a Traffic Impact Ordinance is appropriate for each municipality, the steps required for preparing an ordinance, and how to administer the ordinance. According to Chester County Planning Commission records, 11 municipalities in Chester County have adopted Traffic Impact Ordinances, including neighboring Townships to the east, New London and Franklin townships.

☑ RECOMMENDATION FOR THE DEVELOPMENT OF TRAFFIC IMPACT ORDINANCES

Action 9-6 Evaluate the development of a Traffic Impact (Act 209) Ordinance for designated growth areas.

✓This action addresses the following Smart Growth and Smart Transportation Initiatives: **SG-3, 4, 9; ST -1, 2, 3, 5, 7, 9, 10**

Highway Occupancy Permits

Coordinate with PennDOT's highway occupancy permit program to plan for access points on state roads. Each municipality should inform and coordinate with PennDOT concerning access management plans and proposals so that municipal interests are properly considered in the design of access points. Municipalities may adopt and apply more stringent access management requirements for both state and local roads than those required by PennDOT. When municipalities adopt updated access management regulations through local ordinances, it becomes even more important to communicate with PennDOT concerning these local requirements. The municipalities could also implement access permits for local roads similar to those required for state roads. This action is consistent with the Smart Transportation theme of developing local governments as strong land use partners.

☑ RECOMMENDATIONS FOR COORDINATION WITH PENNDOT: HOP PERMITS

Action 9-7 Coordinate with PennDOT regarding highway occupancy permits (HOP) on an individual municipal basis, while communicating as necessary with the municipalities of the Region.

✓This action addresses the following Smart Growth and Smart Transportation Initiatives: **SG-3, 4; ST-2, 4, 7, 9, 10**

Municipal Transportation Updates: Education of Residents

Updates on transportation planning, improvements, and emergencies could be placed on municipal websites, in newsletters, or at municipal buildings, in addition to other educational materials, such as the PA Ombudsman brochure that provides information to potential new residents about moving to a rural community. See Chapter 3: Coordination and Regional Policies.

☑ RECOMMENDATIONS FOR MUNICIPAL TRANSPORTATION UPDATES

Action 9-8 Establish “Transportation” updates or areas on municipal websites to update and/or educate residents on transportation issues, improvements, and alternatives.

✓This action addresses the following Smart Growth and Smart Transportation Initiatives: **SG-3, 4, 8; ST-7, 9, 10**

Funding Opportunities

Due to the increasing trend towards maintenance and rebuilding of infrastructure in lieu of the addition of new infrastructure and competition for federal transportation funding, it is essential that the Region be proactive. To implement the actions of this Plan the Region must actively seek out a variety of funding sources, and to work together as a Region to both increase the amount of potential funding and the viability of securing funding. Due to the instability of and constant change in funding programs, specific sources are not listed in this plan. The Chester County Planning Commission and DRVPC should be contacted for assistance in identifying current funding opportunities. Following the Commonwealth of Pennsylvania Keystone Principles and PennDOT’s Smart Transportation Principles (Appendix 9-c) and incorporating aspects of these principles into requests for funding should be a priority both in directing future improvements and for providing justification for financing projects.

☑ RECOMMENDATIONS FOR THE IDENTIFICATION AND ACQUISITION OF FUNDING OPPORTUNITIES

Action 9-9 Apply for funding to move forward with transportation initiatives, and utilize regional cooperation as a means to increase funding opportunities.

✓This action addresses the following Smart Growth and Smart Transportation Initiatives: **SG-3, 5; ST-1, 2, 3, 7, 9, 10**

Roadway Recommendations

Maintenance and Operations

Maintenance of the existing transportation system is a critical component in preserving the public’s investment in the transportation infrastructure. Proactive maintenance strategies can curb problems, such as signal timing delay and roadway drainage, while potentially improving roadway safety through low-cost initiatives.

Annual Municipal Road Tours

Each municipality should have at least one tour of the roads with the roadmaster by the governing body per year. The purpose of the annual “municipal road tour” is to identify and prioritize road and safety improvements. These may include a wide range of measures from resurfacing to signage or restriping. If



possible, the tours should be coordinated with PennDOT maintenance personnel. Additionally, municipalities should share the information gathered during the tours with one another, particularly where identified issues are near a municipal border or along a roadway that traverses more than one municipality.

This action may also serve as the preliminary step towards the bi-annual submission to the County TII (and eventually the TIP). The road tours, particularly in years where TII submissions are due, should occur before the TII submission as a means of identifying potential projects for placement on the TII. The municipalities of the Region should coordinate prior to the TII submission to determine if any projects have multimunicipal issues, effects, or impacts that need to be addressed in addition to the potential for a multimunicipal submission which can carry more weight than an individual municipal submission. For this reason, regional coordination and prioritization should be an essential part of transportation planning.

☑ RECOMMENDATIONS FOR ANNUAL MUNICIPAL ROAD TOURS

Action 9-10 Conduct annual road “tours” or “safety audits”, preferably with PennDOT maintenance personnel, to evaluate conditions and identify issues.

✓This action addresses the following Smart Growth and Smart Transportation Initiatives: **SG-3, 4; ST-2, 3, 4, 7, 9, 10**

See also Actions 9-2 and 9-5

Alternative Roadway Maintenance Strategies

Municipal Roadway Turnover. PennDOT accepts requests to turn state roadways over to municipalities. This option may provide some relief (from Federal or State requirements) in regard to making modifications or improvements to certain roadways with the understanding that it will become the municipalities’ responsibility to maintain roadways that are turned back. Oxford Borough, in particular, may gain certain advantages, such as more control over placement of traffic calming features and stop signs, without having to comply with PennDOT requirements and procedures. This action may also be a means for the preservation of scenic roads.

Example: Kennett Square Borough is an example of a Chester County municipality that has accepted PennDOT roadways in order to facilitate local roadway initiatives.

PennDOT pays a maintenance fee of \$4,000 per mile of roadway in the turnback program every two years following the date a road is turned back to municipal control.

Initiation of Maintenance Agreement. An alternative to a municipality taking back a state road is the initiation of a maintenance agreement, whereby the municipality can maintain, plow, or make improvements to a roadway without taking road ownership from PennDOT and, in turn, receive funding for these operations. If there are particular roadways where the Region is not satisfied with PennDOT services, this may be an alternative.

Downgrade of Paved Roadways. The cost of asphalt and continued maintenance of low-volume roads may be reason to consider permitting paved roadways to be turned back to gravel roads. In the case of roadways that are already deteriorating, a gravel surface may actually provide an increased level of service to residents in terms of road quality. Lowering the cost of maintenance on certain roads where deemed appropriate may permit funding to be oriented toward higher priorities, such as roads with higher functional classification, or problem areas.

Example: After determining that traffic volumes were low enough, North Coventry Township has turned a number of paved roads back to gravel, thereby, reducing the Township's paving and road maintenance burden.

☑ RECOMMENDATION FOR ALTERNATIVE ROADWAY MAINTENANCE STRATEGIES

Action 9-11 Consider alternative roadway maintenance strategies to reduce costs and achieve additional objectives.

✓This action addresses the following Smart Growth and Smart Transportation Initiatives: **SG-3, 4; ST-1, 2, 3, 4, 7, 9**

Low-Cost Safety Improvements

Municipalities should implement low-cost safety improvements where such measures provide an immediate impact on safety including, but not limited to:

- 1) Painting stop bars at intersections.
- 2) Installing advanced warning signs for intersections.
- 3) Installing signs at sharp bends.
- 4) Painting other appropriate text or symbols (e.g., lane edge markings, centerline striping).
- 5) Other similar low-cost measures, such as cutting vegetation for sight distance improvement at intersections, eg., clear sight triangle.

These projects can be identified by municipal elected officials, planning commissions, roadmasters, managers, or preferably through the road audits suggested by Action 9-10.

PennDOT should be contacted where such safety measures involve PennDOT roadways. Funding for low cost safety improvements should be investigated. See the DVRPC Route 10 Safety Audit as an example, for projects specific to Route 10, and for examples for other roadways.

☑ RECOMMENDATION FOR LOW-COST SAFETY IMPROVEMENTS

Action 9-12 Implement low-cost safety improvements.

✓This action addresses the following Smart Growth and Smart Transportation Initiatives: **SG-4; ST-1, 2, 3, 4, 9**

Sign Standards

Coordinating signs may reduce the occurrences of drivers becoming distracted leading to vehicles hitting “fixed objects,” improve aesthetics (in coordination with Chapter 14: Scenic Resources), and improve the readability of signs.

Similar to parking requirements, sign requirements are an often overlooked portion of zoning ordinances that can have unintended results. Excessive sign regulations may result in an excessive number of potentially uninspired signs that may be larger than they need to be. Billboard regulations are a particular section of sign regulations that should be regularly revisited, particularly in light of ongoing national and state court cases that affect regulation of these signs, most recently in regard to digital signs. In addition to providing adequate and positive direction to drivers in wayfinding and identifying businesses, the impact of signs on the aesthetics of a community is very important. The proliferation of signs or unclear signs may also lead to accidents due to their impact on drivers. Further, clear signage can serve to provide traffic calming by providing important information for visitors to the Region.



RECOMMENDATIONS FOR MUNICIPAL SIGN STANDARDS

Action 9-13 Evaluate opportunities to consolidate, coordinate, and update signs along roadways to reduce the number of individual signs.

Action 9-14 Ensure sign requirements are both appropriate and flexible.

✓These actions address the following Smart Growth and Smart Transportation Initiatives: **SG-3, 4; ST-9**

Maintenance of Traffic Signals

Poorly timed traffic signals can lead to unnecessary congestion on major roads and side streets. Regularly checking and updating the timing of traffic signals is a low-cost, high-return improvement towards reducing congestion.

Closed Loop System. A closed loop system is a means of coordinating and optimizing the function of traffic signals to promote traffic flow and reduce existing and future congestion issues. The installation of such a system should be considered and potential funding sources identified.

RECOMMENDATION FOR MAINTENANCE OF TRAFFIC SIGNALS

Action 9-15 Conduct regular routine maintenance and re-timing of traffic signals

Action 9-16 Consider a closed loop system for the traffic signals in the Oxford Borough/Route 10/Baltimore Pike corridor in the growth area.

✓This action addresses the following Smart Transportation Initiatives: **ST-2, 3, 4**

Municipal Parking Standards

In the past, guidelines from national organizations or widely used publications have been effectively used as definitive standards for parking regulations. In many cases, suburban

Shared Parking is defined as a public or private parking area used jointly by two or more uses such as a movie theatre and a place of worship.

and rural communities have adopted parking standards that result in more parking than what is necessary. Parking standards should be specifically tailored to local conditions and allow for flexibility, such as parking deductions for shared parking lots and reserve parking, and more specific arrangements for

Oxford Borough including on-street parking and parking garages. Inflexible and overstated parking standards lead to higher construction costs, underutilized facilities, and an unnecessary increase in impervious surface leading to additional stormwater runoff and other environmental concerns. (See Chapter 12: Natural Resources Inventory and Plan) For additional information see *The Automobile at Rest*, September 2008, by the Delaware Valley Regional Planning Commission.

☑ RECOMMENDATION FOR MUNICIPAL PARKING STANDARDS

Action 9-17 Review municipal ordinances for parking standards and amend as necessary to ensure parking requirements are both appropriate and flexible.

✓This action addresses the following Smart Growth and Smart Transportation Initiatives: SG-4; ST-6, 8, 9

New Connections

Currently, the Borough is the “hub” of the Region’s major road system, which is creating an increasing amount of congestion in the Borough. There is no effective alternative means of traveling around the Borough, particularly in the northern half. Through the realignment of several roads, in addition to the establishment of new roads as development occurs, a local alternative network could be developed. The goal of this effort is not to develop a “by-pass” or remove beneficial through traffic from the Borough

(that would be detrimental to the businesses and livelihood of the Borough), but to provide a local alternative for some local traffic to divert around the Borough. For example, to travel from the Oxford Mall north of the Borough to the future Oxford Region Park on Locust Street west of the Borough, a driver would need to travel through the Borough. It may be possible, through the addition of several local streets, for a local alternative to be developed to increase the effectiveness of transportation in and around the Borough. (See Figure 9-M. Note that the alignments in the figure are for illustration purposes only)

Figure 9-M: Connector Concept



Source: CCPC, 2011

The development of community connector roads should also take into account the potential need for associated traffic calming to remediate the creation of alternative routes through the Borough or designated growth areas by reducing speeds and increasing safety. It could be completed in coordination with the development of Official Maps for each municipality, through a prospective specific transportation plan (See Figure 9-L), or a special study in addition to changes to municipal subdivision and land development ordinances.

Municipal Official Map and Ordinance

See Chapter 5: Land Use for a complete discussion on the Official Map and Ordinance and related recommendations.

RECOMMENDATION FOR COMMUNITY CONNECTORS

Action 9-18 Identify and implement Community Connectors to establish a network of local roads to provide increased circulation opportunities around Oxford Borough.

✓This action addresses the following Smart Growth and Smart Transportation Initiatives: **SG-3, 8; ST-2, 7, 8, 9**

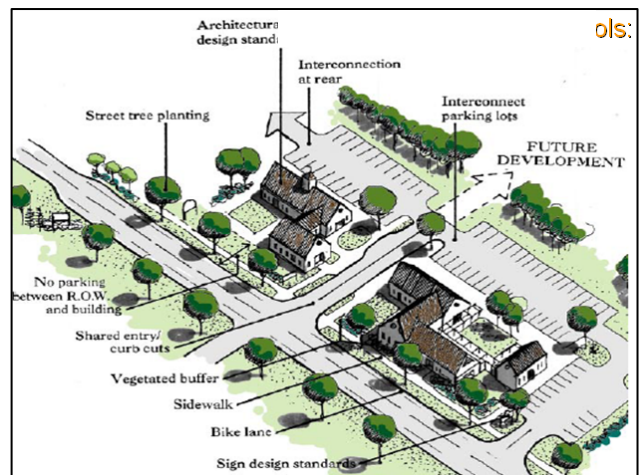
Access Management

Access management is a concept that has been underutilized in many cases and is often overlooked. The detrimental effect of improper or inefficient access management can quickly reduce effectiveness of roadways and neutralize improvements intended to enhance problematic road segments or intersections. Access management may be as rudimentary as providing proper intersection or driveway spacing or as complex as creating a hierarchy of flexible options based upon land use or road frontage.

Access management is the control of access points (driveways) onto a roadway in order to promote traffic flow, improve safety of pedestrians and motorists, and improve aesthetics by managing the location, quantity, type, and design of access points.

Access management standards should be included in all of the municipal ordinances, therefore a review of existing provisions is necessary to identify where improvements may be made. In light of this data, more specific access management strategies are necessary along the primary corridors within the Region, particularly Route 10 and Baltimore Pike, to promote the continued efficiency of these routes and ensure for the safety of all users. The Village of Nottingham and Oxford Borough should receive particular focus to help reduce traffic congestion in these areas and avoid future issues.

**Figure 9-N
Access Management Strategies**



Source: Massachusetts Highway Department, 2006

Regional Access Management Standards

At a minimum, each municipality should evaluate and update their access management regulations as necessary, and ensure all basic regulations are included. The development of a set of regional access management standards to be adopted as part of each municipality's zoning and/or subdivision and land development ordinances would be a more proactive way of implementing consistency in regard to access management. Minimum standards should include but not be limited to the following: minimum spacing between intersections, minimum distance between access points; parking lot separation and setbacks from cartways; and curb/buffer requirements. See PennDOT publication 574 (2-06): *Access Management, Model Ordinances for Pennsylvania Municipalities Handbook*.

Access Management Strategies for Designated Growth Areas

These regulations may be in addition to the general access management regulations included in Action 9-21, or they may be implemented through a zoning overlay district or corridor zoning overlay. Specific access management regulations or particular regulatory tools may be applied to individual road corridors within the Region. Access management standards may include the following:

- 1) Limitation on access points dependent on road classification
- 2) Restricting access to roadways of lower function
- 3) Requiring interconnections between parking areas
- 4) Defined access points
- 5) Clear pavement markings
- 6) Turn lanes
- 7) Medians

These strategies are critical to reducing traffic conflicts and increasing safety in the Borough (or Nottingham Village) and along particular corridors (e.g., Baltimore Pike). See PennDOT *Access Management Model Ordinances for Pennsylvania Municipalities Handbook*, Publication 574.

Figure 9-O: Examples of Access Management Improvements





Baltimore Pike from Nottingham Village to the Borough, along with Route 10 from the Borough to U.S. Route 1, and Route 272 within the designated Village District in West Nottingham Township could be considered as the “Primary Improvement Corridor” (See Figure 9-P) which should be the subject of an access management study or corridor study (similar to Route 896 Corridor Study). A zoning overlay district with specific access management regulations in addition to a design guide could be applied to implement the study or plan. In addition, a study or overlay district could also provide a means of garnering further funding for improvements.

☑ RECOMMENDATIONS FOR IMPROVING ACCESS MANAGEMENT

Action 9-19 Apply for an access management study from the Delaware Valley Regional Planning Commission (DVRPC)

Action 9-20 Ensure future development does not create detrimental access issues, increase congestion, or create safety problems.

Action 9-21 Consider more specific access management strategies for growth areas and designated roadways or corridors.

✓This action addresses the following Smart Growth and Smart Transportation Initiatives: **SG-2, 3, 4, 5, 8, 9; ST-4, 5, 6, 7, 8, 9**

Traffic Calming

Traffic calming is another established tool that has been, at times, used improperly or ineffectively. Unfortunately traffic calming sometimes carries a stigma due to negative reactions to the typical use of “speed bumps.” However, traffic calming is much more than simply installing speed bumps and offers a wide range of options that can prove to be simple, flexible, effective, and relatively inexpensive.

Although traffic calming may be used in the same location as access management strategies, generally these two tools are not compatible. Traffic calming is used to slow and control traffic speeds while access management is used to promote traffic movement in a controlled manner. The exception to this rule would be

Results of the Transportation Survey indicated that municipal officials are strongly in favor of passive traffic calming measures (such as additional signage) and they are also in favor of active measures (such as speed humps and rumble strips).

Transportation Survey



the use of both of these tools in villages or urban situations, otherwise they are primarily used on smaller local streets or where there is a specific issue, such as a sharp bend or important feature such as a school.

Traffic calming should primarily be used to increase safety within the designated growth areas where there are higher traffic volumes, an increased number of access points, and pedestrian activity.

Traffic calming techniques should be considered within the designated growth areas and in the Borough, Villages (Nottingham, Lewisville, Homeville, Russellville, and Lincoln University), and at specific locations for safety reasons. The placement of rumble strips, signs, speed humps, center and edge striping, stop bars, reflectors, bump outs, textured pavement, lighting, or painted text could be added to increase safety.

Traffic Calming Study. The Region should consider applying for a traffic calming study from the Delaware Valley Regional Planning Commission (DVPRC) as a preliminary measure to help identify areas where traffic calming should be considered, consider potential ordinance standards, and as a means to apply for funding for installation of approved measures.



Municipal Regulation. Consideration should be given to including standards for traffic calming measures in municipal ordinances. Criteria for placement should be included potentially with a map denoting priority areas. Adding a phrase such as “where determined necessary by the Township, the applicant shall provide traffic calming,” may prove useful. Regulations for the Borough or for certain corridors may be more specific or different from those for the townships. (See PennDOT publication 383: *Pennsylvania’s Traffic Calming Handbook*)

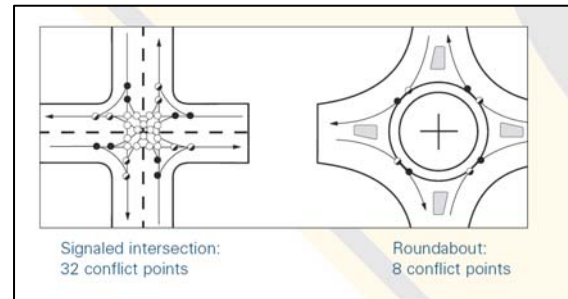
Neighborhood Traffic Calming Program. The municipalities may also wish to provide residents the capability of choosing traffic calming by request. Setting up a program whereby residents of a block or street may vote for the addition of traffic calming measures is a method that has been used in other parts of the country. A minimum percentage, such as 60% or 75% of the residents of the particular road section, must be set to approve the addition of traffic calming measures. The measures may be installed through grant money, during the next road improvement on a given roadway, or some other means.

Roundabouts

There are several potential locations within the Region where the use of a roundabout could mitigate traffic issues including the intersections of Baltimore Pike and Route 896, Baltimore

Pike and Route 272, and Route 272 with Barnsley Chrome Road. Roundabouts are proven to increase safety, but are not always suitable at every location due to size and setback limitations, traffic volumes, and other reasons. (See PennDOT publication 414: *Guide to Roundabouts*)

Figure 9-P: Roundabout Examples



Source: Federal Highway Administration

☑ RECOMMENDATIONS FOR TRAFFIC CALMING

- Action 9-22** Identify specific areas in the Region for traffic calming measures to provide advance warning of approaching intersections or sharp bends, to slow or discourage truck traffic, or reduce occurrences of excessive speeding.
- Action 9-23** Amend subdivision and land development ordinances to include consistent requirements for implementing traffic calming measures.
- Action 9-24** Consider roundabouts as alternative solutions for problematic intersections and conduct feasibility studies where appropriate.
- ✓These actions address the following Smart Growth and Smart Transportation Initiatives: SG-2, 4, 8, 10; ST-4, 5, 6, 7, 8, 9

Recommendations for the Movement of Goods and Agricultural Uses

Given the diversity of the Region's economy and the predominant role of agriculture, it is imperative to facilitate the appropriate movements of goods within the Region and address the safety and transportation needs of the Region's Plain Sect population.

Trucks: Routes and Mobility

Oxford Borough has taken steps to communicate with operations that initiate truck movements within the Region. This action should be expanded to provide additional efficiencies in the movement of trucks within the Region. See also Action 9-23 regarding traffic calming and Action 9-18 for community connector roads.

The Region should make an effort to improve signage directing trucks to use U.S. Route 1 to reach Interstate 95 and bypass Oxford Borough. Additional signs on Route 10 and Route 896, both in the Region and to the north should be considered. Communication with PennDOT and other municipalities will be necessary to implement this measure. Municipalities should communicate with known operations that generate significant through truck movements and coordinate regarding truck routes and movements. Coordination on a larger scale may be necessary, such as large industries surrounding the port of Wilmington which increase truck movements through the Oxford Region towards Harrisburg and the Pennsylvania Turnpike.

☑ RECOMMENDATIONS TO ADDRESS TRUCK TRAFFIC IN THE REGION

Action 9-25 Communicate with the operators of commercial and industrial facilities regarding issues with regular truck movements and designated routes.

Action 9-26 Continue to improve signage and coordination to direct regional truck movements toward U.S. Route 1 as the primary access to Interstate I-95.

✓These actions address the following Smart Growth and Smart Transportation Initiatives: **SG-7, 8; ST-4, 5, 6, 7, 9, 10**

Farm Vehicles and Buggies

The Oxford Region is a diverse agricultural community with a significant Plain Sect population . As such, the safe and efficient movement of farm vehicles and buggies along local roadways has consistently been a priority and concern for the Region’s municipal leaders.

“Trucks and cars travel too fast posing a danger to farm equipment and buggies.”
Transportation Survey

Communication

While several of the Region’s municipal leaders are directly involved in the agricultural industry, it is imperative that the entire agricultural community, including the Plain Sect, be asked to identify impediments to the movement of farm vehicles and buggies and solicit suggestions as to what can be done to improve the situation, including safety improvements, road shoulder expansion or improvements, and other strategies.

Share the Road

Similar to “share the road” signs placed for bicycles, additional buggy signs should be considered to be placed in coordination with existing or proposed signs in specific areas where buggy traffic is determined to be significant within the Region to promote awareness and safety.

Road Shoulder Width

Encourage the addition of appropriate road shoulders on roadways that are a priority for buggies and farm vehicles or provide safe places to pull off the side of the road if adequate shoulders are not available.

Roadside Obstacles

Mail boxes, signs (size and location), trees, shrubs, utility poles, and similar items should be kept back from the cartway or road shoulders, whenever possible. Municipal leaders should work with utility providers (PECO, Comcast, Verizon, etc) and PennDOT, as appropriate, to maintain utility poles on one side of roadways, and preferably to move them back and off of the road shoulder, as appropriate, from the cartway to reduce conflicts with farm vehicles. See the *Route 896 and Route 10 Corridor Studies* for more information (DVRPC).

Bridge Conditions

Ensure bridges are built to handle the appropriate types of vehicular traffic and trucks, where appropriate, in addition to farm vehicles, buggies, and pedestrians. PennDOT has been moving towards “right-sizing” projects and deferring to local regulations and input.

☑ RECOMMENDATIONS TO ADDRESS FARM VEHICLES AND BUGGIES IN THE REGION

Action 9-27 Communicate with farmers (Plain Sect and English) and the rest of the agricultural community (including equine) to identify transportation needs for the movement of farm vehicles and buggies.

Action 9-28 Place additional signage in conjunction with existing road signs to increase driver awareness of shared road use with buggies and farm vehicles.



Action 9-29 Identify impediments within the road right of way, such as embankments, to minimize conflicts with farm vehicles as well as promote additional safety for non-farm vehicles.

Action 9-30 Ensure that bridges have adequate weight limits, widths, and context sensitive design to support vehicles that transport agricultural products or resources.

✓These actions address the following Smart Growth and Smart Transportation Initiatives: **SG-4, 7, 8; ST-4, 5, 8, 7, 9**

See also Action 9-13).

Octoraro Rail Line: Freight Service

The rail line has played an integral role in the evolution of the Region and its industries. Passenger rail service ran to Oxford Borough from Philadelphia for nearly a century, from 1860 to 1948. Since that time, freight service has been active along the line and remains active with use by a limited number of commercial customers including the Herr’s Corporation in Nottingham Village.

☑ RECOMMENDATIONS FOR THE FUTURE OF FREIGHT RAIL SERVICE IN THE REGION

Action 9-31 Coordinate with the owner/operator of the Octoraro Rail Line to maximize the utility of the rail line in spurring appropriate economic development within the Region, including coordination of land use planning, in conjunction with the rail line.

Action 9-32 Promote the railroad for the purpose both provide economic development in the Region, as well as to promote the sustainability and profitability of the railroad to make improvements to the rail line for the following:

- 1) Increased capacity for use as a freight line.
- 2) Maintenance and improvements to the rail infrastructure.
- 3) The potential for future passenger rail service. Continue efforts to sustain and improve the existing rail line and the potential for future passenger rail service.

✓These actions address the following Smart Growth and Smart Transportation Initiatives: **SG-8, 9; ST-2, 6**

Recommendations for Alternatives to Driving

Pedestrian and Bicycle Facilities

The pedestrian environment affects everyone whether they are walking to a transit facility, store, school, or simply walking from a parked car to a building. Pedestrian activity is more likely in areas where key destinations are nearby, such as shopping opportunities, restaurants, or parks. People enjoy walking in places where there are sidewalks, lighting, interesting buildings or scenery to view, other people, local destinations, and a feeling of safety. Pedestrian improvements in areas that promote and are appropriate for pedestrian activities help to increase walking as a means of transportation and recreation. Land uses and street design that benefit pedestrians also help promote use of alternatives to automobile travel and contribute to the overall quality, vitality, and sense of community. Actions designed to support walking and cycling are also intended to benefit overall accessibility. Walkable communities offer public health benefits by providing opportunities for people to be active as a part of their everyday lives, lower vehicle emissions, and reduce traffic congestion.

While the results of the survey indicated that pedestrian facilities are not the highest transportation priority in the Region, an interest in creating a network of sidewalks, trails, and sidewalk connections was clearly stated.

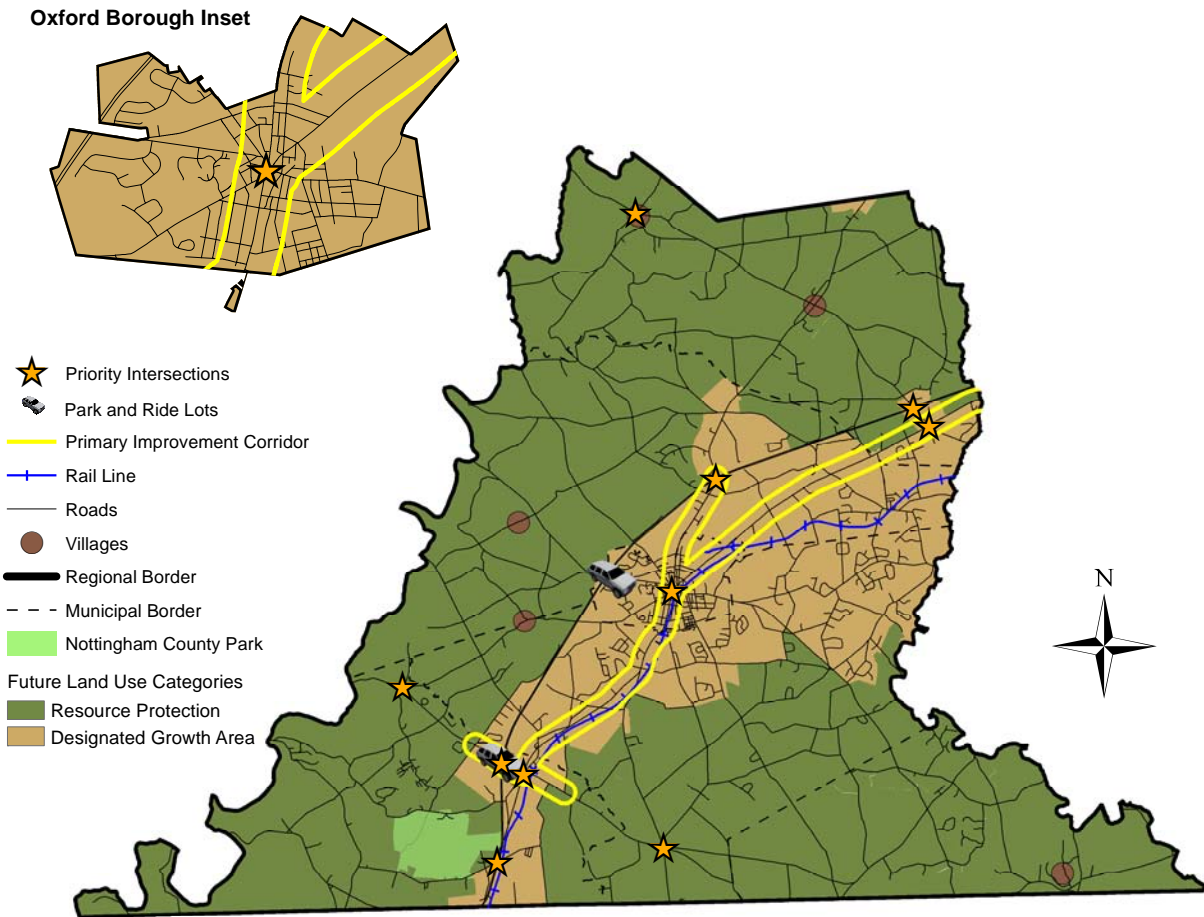
Transportation Survey

There should be a fundamental focus on interconnection between individual elements of the pedestrian network as the Region evolves. The implementation will take time, but even the addition of minor improvements will eventually lead to an interconnected system, particularly if the bigger picture is emphasized along the way. Improved walkability can be achieved through the pedestrian-oriented design of public and private projects in areas where higher levels of pedestrian activity are present or desired.

The Commuting Patterns and Mode of Travel discussion on page 9-4 and Figure 9-C, suggests more than 4% of workers within the Region walk to work. This figure does not include children who walk or ride bicycles to school, or would like to be able to do so; residents who walk or ride bicycles to shop, to visit friends or destinations, or for recreation; or Plain Sect residents who walk or bicycle for transportation aside from using buggies. Further, as almost 30% of workers within the Region also work within the Region, this suggests there is significant potential to increase non-motorized work trips and reduce the use of single-occupancy vehicles.



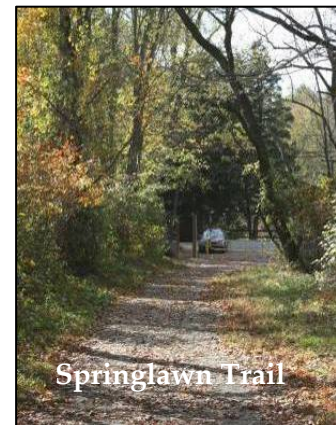
Figure 9-Q: Transportation Plan, Alternatives to Driving



Trails

There are few trails within the Region with a majority of them being within Nottingham County Park in West Nottingham Township. The only other formal trail is the Springlawn Trail in eastern Elk Township. Sidewalks are present in the Borough and some of the surrounding residential neighborhoods. However, sidewalks are inconsistent even within the Borough and some nearby neighborhoods with sidewalks do not connect to the Borough sidewalk network or other neighborhoods.

These facts point to a need for increased pedestrian connections and facilities within the Region, to address a need that already exists, and one that will inevitably increase. The Actions in this section should be considered in conjunction with those in Chapter 15.



Springlawn Trail

Trail and Pedestrian Plan

The Region should consider undertaking a more specific planning effort to develop a region-wide pedestrian facilities network. Funding is available from multiple sources including VPP Grants. A trail/pedestrian plan would provide a more specific focus to help guide these efforts to increase pedestrian access, establish a region-wide strategy, and secure funding.

It is recommended that the Region work with Regional hiking, equestrian, and bicycling organizations to ensure coordination and common understanding and involvement.

☑ RECOMMENDATION FOR THE DEVELOPMENT OF A PEDESTRIAN AND TRAIL PLAN

Action 9-33 Consider the development of a comprehensive trail/pedestrian/bicycle/equestrian plan that provides more specific guidance for an interconnected system of pedestrian improvements.

Action 9-34 Consider amending ordinances to require the retention of existing trails and the development of new trails and trail connections.

✓These actions address the following Smart Growth and Smart Transportation Initiatives: **SG-2, 3, 4, 8, 10; ST-1, 3, 6, 7, 8, 9**

Sidewalks

Major (10+ unit) residential commercial, industrial, and institutional land developments should be required to install sidewalks when new development occurs. The concept of

Sidewalks contribute to the overall pedestrian network and serve as “trails” within the built environment.

‘Complete Streets’ should be interwoven into municipal ordinances as applicable, more specifically in designated Growth Areas. (See Appendix 9-D)

Municipalities could install “infill” sidewalks when undertaking major road projects, using funding sources such as “Safe Routes to School,” and other similar programs. In addition, a project should be undertaken to inventory missing sidewalk links and methods to fill the gaps.

There are two immediate examples where infill sidewalks should be considered within the Region. The first is the Oxford Area Regional Park on West Locust Street to the west of the Borough. A strategy to provide sidewalks from the Borough to the Park should be coordinated. Secondly, Nottingham Village is proposed to be connected to Nottingham County Park in the West Nottingham Township Comprehensive Plan. A similar effort by the Region should be undertaken to consider methods of connecting the Park with Nottingham village, part of which may be accomplished through sidewalks potentially in combination with trails.



☑ RECOMMENDATIONS FOR THE IMPROVEMENT OF SIDEWALKS IN THE REGION

Action 9-35 Ensure municipal subdivision and land development ordinances contain requirements for sidewalks in appropriate locations.

Action 9-36 Encourage the addition of sidewalks within Oxford Borough and throughout the designated growth area where there are missing links or where sidewalks would facilitate appropriate connections to existing or potential neighborhoods and destinations (such as schools, local or regional parks, recreation facilities, or shopping centers).

✓These actions address the following Smart Growth and Smart Transportation initiatives: **SG-2, 3, 4, 8, 10; ST-1, 3, 6, 7, 8, 9**

Bicycles

Expanding and/or formalizing a bicycle network would increase safety for existing and future cyclists, provide for healthy recreation and increased opportunities for residents to use alternative transportation for local trips, promote tourism, and generally provide for an increased quality of life in the Region. Children (and adults) are likely already riding their bicycles despite unsafe routes, and lack of dedicated facilities, techniques, signs, etc.; thus planning to improve this situation is both legitimate and necessary in combination with other transportation recommendations.



Bicycle planning should occur in conjunction with other transportation recommendations including those dealing with updated road standards, capital improvements, and requirements for sidewalks, among others. Further, other additional improvements may serve to help achieve a better bicycle network/access including the placement of “share the road” signs along bike routes in conjunction with other signs. Funding for “share the road” signs is available from sources including PennDOT. The Chester County Bicycle Network Map may be used as a reference or starting point for this effort.

☑ RECOMMENDATIONS FOR BICYCLE FACILITIES IN THE REGION

Action 9-37 Consider the placement of appropriate road shoulders in conjunction with road improvements to facilitate safe bike routes.

Action 9-38 Work with local and regional bike organizations for information and promotion of bike routes and cycling activities, including connections between activity centers, recreation facilities, and parks.

✓These actions address the following Smart Growth and Smart Transportation Initiatives: **SG-2, 3, 4, 8, 10; ST-1, 3, 6, 7, 8, 9**

Transit and Carpooling

A regional transportation organization could be charged with gathering information to determine the regional need for public transit services and to serve as a conduit between municipal governments, the public, and CCPC, DVRPC, SEPTA, AMTRAK, and East Penn Railroad; facilitating the implementation of a full range of services as appropriate to meet demand. Increasing the number of park and ride lots, bus routes, shuttles to major employers or employment areas, assisting in an interconnected pedestrian network, and potentially facilitating future passenger rail service all could fall within the scope of the regional transportation organization. Perhaps an organization already in operation could serve as or evolve into such a regional organization.

Future Commuter Rail (Octoraro Rail Line)

The Region should communicate and coordinate with East Penn Railroad to ensure the viability of the rail corridor and improvements to the rail line. Utilizing a regional organization focused on investigating alternatives to driving to e liaison between the municipal governments, the public, and the railroad operator to both facilitate improvements to the rail line and to evaluate the potential for future passenger rail should be considered.

RECOMMENDATION FOR THE PURSUIT OF FUTURE TRANSIT SERVICE TO THE REGION

Action 9-39 Support a regional group to facilitate increased public transit alternatives to driving within the Oxford Region.

✓This action addresses the following Smart Growth and Smart Transportation Initiatives: **SG-8; ST-1, 2, 6, 9**

Park and Ride Lots

As progress occurs with improvements to U.S. Route 1, the Region should communicate a preference for park and ride lots at interchanges. Identifying specific locations may assist in the development of additional park and ride lots either through the subdivision and land development process or by gaining funding through various means.

Amend subdivision and land development ordinances to should be amended to require areas set aside for park and ride lots in significant developments above a certain size, for commercial, industrial, and residential areas. It may be preferable to provide incentives for park and ride locations, such as a parking requirement reduction, a compensatory increase in permitted building impervious surface, allowing an additional lot or slight density increase, or other acceptable measure.



One way to get more park and ride lots is to show that existing locations are well-used and to prove a need for more lots. More users = more demand = potential money/public pressure for more locations / increased capacity at existing locations. Documenting the use

The development of and use of park and ride lots may be the precursor to gaining future transit service, if significant use can be measured.

of existing facilities may be helpful in addition to taking a survey to gauge interest from residents and provide information about park and ride lots on municipal websites or in newsletters.

When road improvements and/or maintenance occurs, the development and/or expansion of park and ride lots may be facilitated through using extra available paving materials and equipment already dedicated towards a road improvement. If the Region’s municipalities condensed excess material or ordered extra material during road maintenance bids, these excess materials could be used to develop, expand, or maintain park and ride lots in conjunction with PennDOT or landowners.

☑ RECOMMENDATIONS FOR PARK AND RIDE LOTS

Action 9-40 Identify locations for future park and ride lots and advocate for the expansion and improvement of existing facilities.

Action 9-41 Consider amending ordinance regulations to require park and ride lots in conjunction with major commercial and/or industrial developments (e.g. Oxford Commons).

Action 9-42 Educate the public as to the location and utility of existing park and ride lots.

✓These actions address the following Smart Growth and Smart Transportation Initiatives: **SG-8; ST-1, 2, 6, 9**

Buses/Shuttles

Some large employers in Delaware currently provide shuttle service to work for employees who reside in Penn and New London Townships. The Region should determine which major employers of residents in the Region could be contacted to undertake or assist with potential shuttle service or ride sharing opportunities. The Region should communicate with these and other organizations to evaluate the potential for future transit services in conjunction with other related Actions.

The Region should gather information regarding work trips (ridership) on both AMTRAK (from Parkesburg) and the SEPTA station in Newark, DE, to investigate the potential for shuttle service to and from these locations and potentially Oxford Borough.

☑ RECOMMENDATIONS FOR BUSES AND SHUTTLES

Action 9-43 Support the TMAcc regarding routes, efficiency, effectiveness, marketing, and the operation and expansion of SCCOOT bus service.

- Action 9-44** Communicate with CCPC and TMACC, SEPTA, DART, and other public transit providers regarding future bus routes, shuttles, and other transit opportunities.
- Action 9-45** Investigate the potential for major regional employers to subsidize or provide shuttle service and ride-sharing to locations where numerous residents of the Region are employed.
- Action 9-46** Investigate the potential for shuttle service to existing passenger rail stations.
- Action 9-47** Continue efforts to sustain and improve the existing rail line and the potential for future passenger rail service.
- ✓These actions address the following Smart Growth and Smart Transportation Initiatives: **SG-8; ST-1, 2, 6, 9**

Summary of Website References

For more information on PennDOT's Smart Transportation Initiative:
<http://www.smart-transportation.com>):

For more information on the Smart Growth Network: <http://www.smartgrowth.org>

For more information on the National Complete Streets Coalition:
<http://www.completestreets.org>

To access PennDOT's *Traffic Impact Fees: A Handbook for Municipalities*
<ftp://ftp.dot.state.pa.us/public/Bureaus/Cpdm/ImpactFees.pdf>

PennDOT Smart Transportation Guidebook, March 2008. <http://www.smart-transportation.com/guidebook.html>

Figure (Map) Sources:

Figure 9-A: Existing Land Use

Data Sources: Municipal borders, Roads – Chester County GIS; Existing Land Use – DVRPC and ORPC, 2009.

Figure 9-E: Crash Data Clusters

Data Sources: Municipal borders, Roads – Chester County GIS; Priority Intersections – ORPC Survey, 2009; Crash Clusters – PennDOT, 2010.

Figure 9-F: Average Daily Traffic Volumes

Data Sources: Municipal border, Roads – Chester County GIS; Average Daily Traffic Volumes – PennDOT, 2007 Estimates.

Figure 9-I: Functional Classification

Data Sources: Municipal borders, Roads – Chester County GIS; Roadway Functional Classification and Future Land Use Categories – CCPC and ORPC; Town Centers – PennDOT Transportation Context.

Figure 9-Q: Transportation Plan – Alternatives to Driving

Data Sources: Municipal borders, Roads – Chester County GIS; Priority Intersections – ORPC, 2009; Composite Future Land Categories, Primary Improvement Corridors, Bike/Pedestrian Multi-Use Corridor, Potential Carpooling/Transit Corridor – ORPC and CCPC, 2009, 2010, 2011; Regional Recreation Facility – OARA, 2009.

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