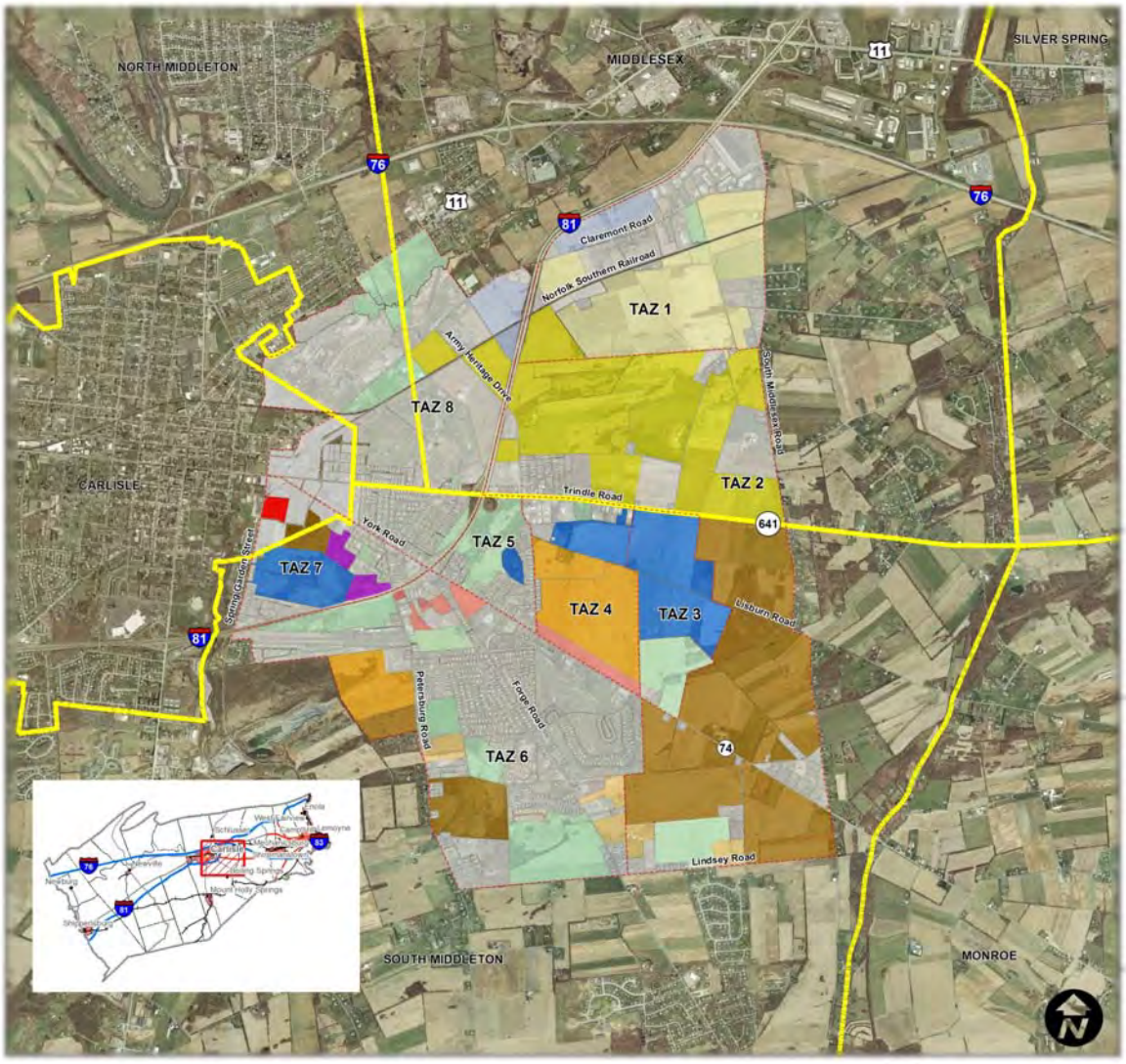
Cumberland County I-81 Corridor

Land Use, Transportation & Economic Development Study

CARLISLE | MIDDLESEX | NORTH MIDDLETON | SOUTH MIDDLETON



SEPTEMBER 2005

1.0 Executive Summary

Introduction

STRATEGIC DIRECTION: Manage growth in order to protect the area's rural quality of life and the performance of the transportation system.

I-81's Exit 48 and 49 in central Cumberland County are two half interchanges that function as a whole interchange in suburban Carlisle. In spite of the interchanges' configuration, the surrounding area has continued to develop, with the introduction of a new Army Heritage Museum and a 360,000 square foot commercial development known as Carlisle Crossing. As of this writing, a major, 2.5 million square foot warehouse development - Keystone Warehouse - has been proposed and is currently in litigation. South Middleton Township - the study area's primary municipality - grew by over a quarter during the 1990s and is Cumberland County's sixth most populous municipality.

All of these point to the attractiveness of the greater Exit 48 and 49 study area as a place for both business and residential development.

Background

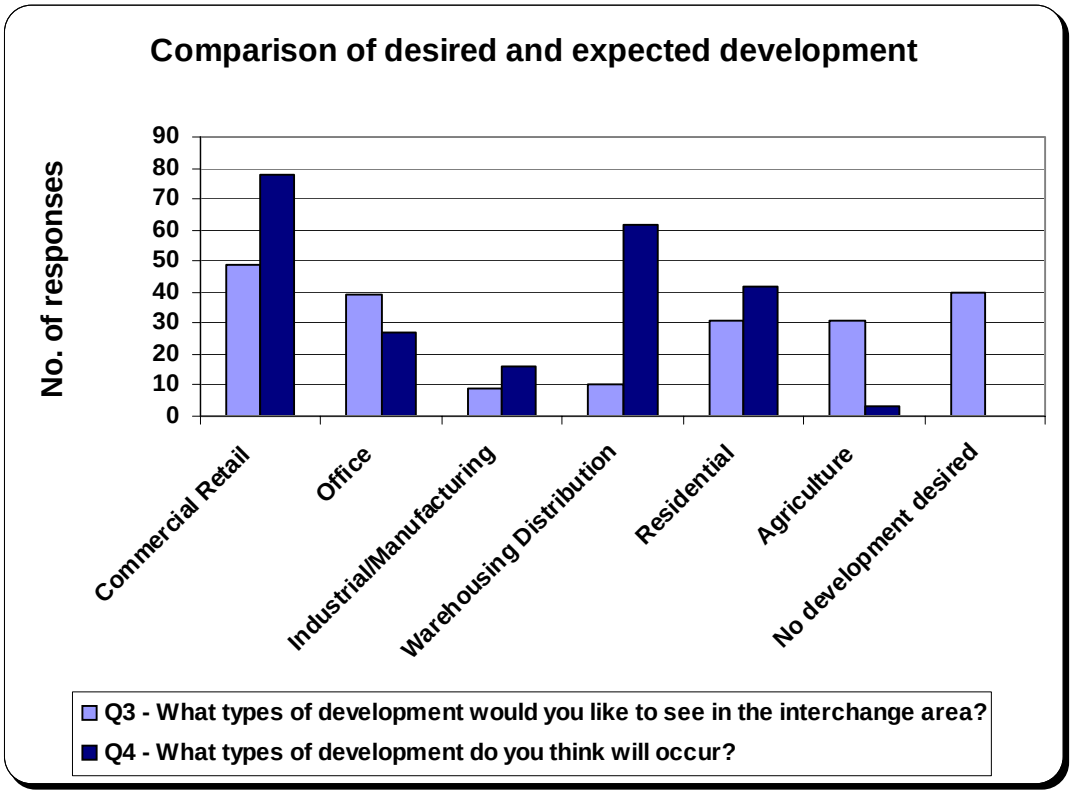
In recent years, the I-81 corridor has become a magnet for attracting warehousing and distribution facilities. Neighboring communities in Cumberland, Franklin and York Counties have struggled with the burdens of accommodating the travel demands posed by these new giant distribution centers. For the Exit 48 and 49 study area, demand for warehousing has been coupled with commercial retail and residential development. Local officials are considering several major land development plans, including sketch plans that developers submitted during the course of the study. All attest to the study area's dynamic nature.

The challenge for area planners and elected officials is to weigh the area's economic development needs with the ability of the transportation system to support it. Public preferences indicate support of efforts to focus and orient new growth around the Exit 48 and 49 interchanges, thereby preserving farmland and open space, as well as the residential integrity of outlying areas. A "development program" that outlines a recommended future land use pattern, coupled with a list of priority transportation improvements, was the goal of the study process.

Public Involvement

The study process included a public involvement program that elicited the issues and concerns of land owners within the Exit 48 and 49 study area. The study team held an initial public meeting in May 2004 to learn of public preferences as they related to the area's future development direction. Figure 1 below demonstrates that the public believes that the area will continue to develop commercially, with a majority predicting warehousing distribution. However, when asked what their preferences are for the area, a majority cited commercial, agriculture, or no development at all. The survey results affirmed the need for this study and its resultant recommended development program.

Figure 1: Comparison of Desired & Expected Development



Source: Study public survey results

Developing a Recommended Development Program

In "testing" public preferences for the area, the study team examined existing zoning ordinances to evaluate the permitted uses in each zoning district, as well as other land use control measures such as set-backs and maximum developable areas (for buildings). Alternative development scenarios were then tested using the ITE[1] Trip Generation Manual to calculate trip generation (as a function of land use and building size).

The study team also used the Tri-County Regional Planning Commission's regional travel demand model software (TDM) to estimate the impact of transportation improvements on the area highway network. The TDM shows where traffic would go and the corresponding volumes based on highway network changes. The team tested five alternatives for modeling analysis, including:

1. A Connector Road, linking the southbound off-ramp of Exit 49 with the southbound on-ramp of Exit 48
2. The Connector Road, plus a second connector road to the east of I-81, linking York and Trindle Roads between Fairview Street and Middlesex Road.
3. Full interchange at Exit 48
4. Full interchange at Exit 49
5. Full interchange at both Exit 48 and 49.

[1] Institute of Transportation Engineers

Recommendations

In line with the preferred future land use scenario, recommendations were developed for the Exit 48 and 49 study area. The recommendations are responsive to preferences and directions established through the public outreach and steering committee meetings. Recommendations should be considered by the study area municipalities as they continue their efforts to improve accessibility and mobility in the Exit 48 and 49 study area. Much of the study area lies within South Middletown Township. As such, most of the recommendations center on South Middleton Township, including recommended changes to the local zoning ordinance.

CATEGORY	RECOMMENDATIONS/ OPTIONS
ORDINANCE AND POLICY RECOMMENDATIONS	
Rezoning	• **South Middletown Township**: Rezone the 86-acre parcel on Spring Garden Street from Light Industrial to Village. ▪ Zoning classification would allow for development more consistent with existing, surrounding land use. ▪ This recommendation should be implemented in tandem with a new access connection created in the Exit 48 and 49 interchange study area to prevent traffic destined for I-81 northbound from traversing the Carlisle Mall property. ▪ Additional access through Giant Lane would be needed to allow residential development. This access is necessary even if a connector is built in the future. • **South Middleton Township**: Modify the existing Commercial zoning designation along York Road to encourage the development of small commercial businesses that are less regional in nature. ▪ Small scale commercial development would serve neighboring residential areas and provide a transition from the heavily developed interchange area to the agricultural areas to the east.
Development Infrastructure	• The **South Middletown Township Municipal Authority** should not extend water and sewer services any further east along PA 641, unless required for the health and safety of its residents. This would help preserve open space and agricultural land while discouraging high density development. Many residents would prefer no development in the area. The recommendation is consistent with the county and township future land use maps.
Open Space/ Agricultural Preservation	• Middlesex and South Middleton townships should, at a minimum, maintain the current extent of their Residential Farm and Agriculture/Conservation zoning districts. Consideration should be given to improving/strengthening agricultural zoning.

CATEGORY	RECOMMENDATIONS/ OPTIONS
	• This action would demonstrate a commitment to the expressed public preferences for maintaining the area's rural character while still allowing for some growth.
TRANSPORTATION RECOMMENDATIONS	
Interchange Improvements	• Construct a connector road linking the south bound off-ramp of I-81's Exit 49 with the south-bound on-ramp of Exit 48. • Estimated engineering costs (including preliminary engineering and construction) for this improvement are approximately $84,000,000. This estimate includes four new traffic signals and a 2,000 foot long soundwall. • Funding for preliminary engineering of Exits 48 and 49 is included in the region's TIP.
Access Management	• Access management is a concern in the study area, particularly along York Road. As the corridor develops, the township will need to enforce its access management ordinance which regulates the number of new driveways and access points that can be created along the roadway to maintain good traffic flow and safety.
Intersection Improvements	• Complete the intersection improvements associated with the Forge Road/ Westminster Drive extension project, including the signalization of the intersection with PA 74. • Additional residential growth to the south, coupled with the trips generated by Carlisle Crossing make this improvement necessary. • Realignment of the roadway will address safety concerns at the existing location. This point was frequently raised by the public. The traffic safety audit also indicated the need for signalizing the intersection.
Rail Crossing Safety	• Middlesex Township should continue to monitor conditions along Army Heritage Drive, including the condition of the cart-way and shoulders, as well as the at-grade rail crossing, given the likelihood of an increase in bus/tourist traffic destined for the new museum. • With regard to the public at-grade rail crossing, the township should make a request to the Harrisburg MPO for the crossing to be funded as a rail grade crossing safety project.
Traffic Safety	• Implement the safety-related recommendations from the corridor safety audit performed on the study area's two primary roadways: PA 641 and PA 74. They include guiderail replacement, sight distance limitations, and other facets of traffic safety addressed through PennDOT's routine maintenance programs.

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Acknowledgments

The Gannett Fleming project team expresses its appreciation to the following individuals for their guidance, insights and participation. Their active review of preliminary documents, constructive dialog and enthusiasm for this effort is greatly valued.

Exit 48 & 49 Study Steering Committee Members

- Fred Bean, Carlisle Borough
- Mark Carpenter, Middlesex Township
- Brian Dickson, Tri-County Regional Planning Commission
- Deborah Ealer, North Middleton Township
- Rick Frieben, Carlisle Borough
- Phyllis Givler, South Middleton Township
- Michelle Hornick, Carlisle Area Chamber of Commerce
- Dave Miner, PennDOT District 8-0
- Phil Robbins, DCED
- James Smedley, PennDOT Central Office
- Vic Stabile, Middlesex Township
- Kirk Stoner, Cumberland County Planning Commission
- Greg Vaughn, PennDOT District 8-0
- Barbara Wilson, South Middleton Township

Gannett Fleming Team

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2.0 Introduction

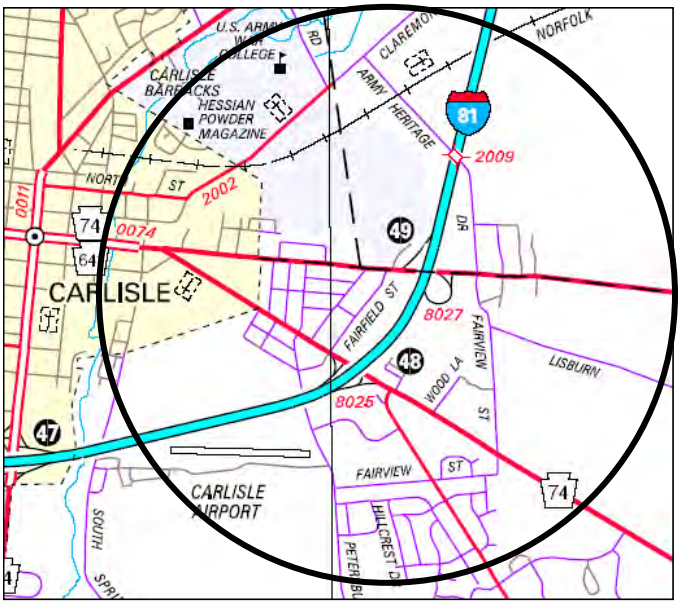
2.1 Study Background

In response to land development pressure throughout the I-81 corridor, the Cumberland County Planning Commission initiated a study of the 10 interstate interchanges. The Commission organized the study in three phases, including the development of a policy document for each interchange, a business park siting study, and a detailed assessment of land use, transportation and economic development opportunities at two interchanges.

STRATEGIC DIRECTION: Manage growth in order to protect the area's quality of life and the performance of the transportation system.

At the conclusion of the first phase, study steering committee members selected two interchange areas for further analysis and evaluation: Exits 48 and 49 east of Carlisle, and Exit 29 in the greater Shippensburg area.

For the Exit 48 and 49 area, the Commission formed a study steering committee with representatives from the four study area municipalities: Carlisle Borough, Middlesex Township, North Middleton Township and South Middleton Township. The steering committee also included representatives from Tri-County Regional Planning Commission, Cumberland County Planning Commission, the Department of Community and Economic Development (DCED) and the Pennsylvania Department of Transportation (PennDOT). The analysis began at the steering committee's April 8, 2004 kick-off meeting.



I-81's Exit 48 and 49 in central Cumberland County are two half interchanges that function as one full interchange in the Carlisle area. The surrounding area has continued to develop, with the introduction of a new Army Heritage Museum and a 360,000 square foot commercial development known as Carlisle Crossing. A major, 2.5 million square foot warehouse development - Keystone Warehouse - has been proposed and is currently in litigation. South Middletown Township has become one of Cumberland County's largest municipalities, with residential growth of 15 percent in the 1980s and an additional 25 percent during the 1990s. All of these factors point to the attractiveness of the greater Exit 48 and 49 study area as a place for business and residential development.

As the area has grown, so have the pressures associated with development. Current issues and concerns for residents and business owners include:

- the elimination of cut-through traffic,
- air quality,

- traffic noise,
- accessibility and mobility,
- safety,
- light pollution,
- farmland preservation, and
- general concerns over a perceived decrease in quality of life over time.

In spite of the area's rapid growth, there are 3,417 acres of undeveloped land within a mile of the interchange. Perhaps the most significant question is how should these areas develop over the next 25 years and what will be the impacts on the two interchanges. It is with these issues at stake that the Cumberland County Planning Commission and the study steering committee members sought to develop this holistic approach towards land use, transportation and economic development.

2.2 Study Purpose

The extensive amount of undeveloped land was a factor in selecting Exit 48 and 49 for detailed analysis. In recent years, the I-81 corridor has been a magnet for warehousing and distribution facilities. For example, Target now operates a 1.3 million square foot distribution center to the south of the study area in Franklin County. Construction continues in North Middletown Township, where several warehouses have been approved as part of Logisticenter of Carlisle. Southampton Township has also received proposals for 5 million square feet of warehousing space. In addition to industrial land development, the area has also experienced commercial and residential land development, including Carlisle Crossings.

Along with increased speculation in the Exit 48 and 49 study area are Cumberland County's efforts at preserving farmland and open space. The County has been active in this area through the placement of tens of thousands of acres into Agricultural Security Areas (ASAs) and through other farm preservation methods. Some of Middlesex Township's prime farmland is located within the study area along PA 641.

The Harrisburg Area Transportation Study (HATS) will begin its biennial update of the 2007 Transportation Improvement Program (TIP) during the summer of 2005. One study priority was aimed at developing candidate TIP projects. In addressing safety issues, there were also several maintenance-related projects identified to be funded through PennDOT's ongoing maintenance and Betterment programs.

In May 2004, PennDOT began efforts to retain an engineering firm to perform preliminary engineering services for the Exit 48 and 49 interchanges. This may include conceptual planning services, preliminary engineering, environmental services, final design and construction consultation for improvements to the interchanges. HATS has programmed $1.14 million in the 2005 TIP for this work. An important factor in the Interchange analysis then, is how well it provides direction for future stages of project development (i.e., preliminary engineering).

Through attention to these planning issues - land use management and transportation - the study area municipalities sought to develop a plan that anticipates and effectively accommodates development, rather than reacting to it.

2.3 Study Goals/Success Factors

At the outset, the study steering committee established study direction and defined success factors to guide the study. During its April 2004 kick-off meeting, the steering committee identified the following study objectives:

The study will be a success if…

- We achieve solutions that can be implemented with municipal buy-in
- The public participates in the process
- We develop positive results that feed PennDOT's preliminary engineering efforts
- We provide information for comprehensive planning, zoning and other municipal tools for positive changes
- We educate the public as to "why we're doing this"
- We define a good process for municipal/County cooperation.

2.4 Methodology

The first study phase entailed the collection of general background information, including existing land use, infrastructure, land use regulations, and traffic data from the I-81 Widening Feasibility Study. The study team examined all 10 of Cumberland County's I-81 interchanges. The study steering committee selected two interchanges, Exit 29 and 48/49, for in depth evaluation. The committee used the following criteria in making its selection:

- Available/Undeveloped land
- Development Pressure
- Potential Municipal Cooperation
- Innovations/Opportunities
- Transportation Challenges and Impacts
- Environmental Considerations
- Ability to Transfer to Other Interchanges
- Spatial Distribution.

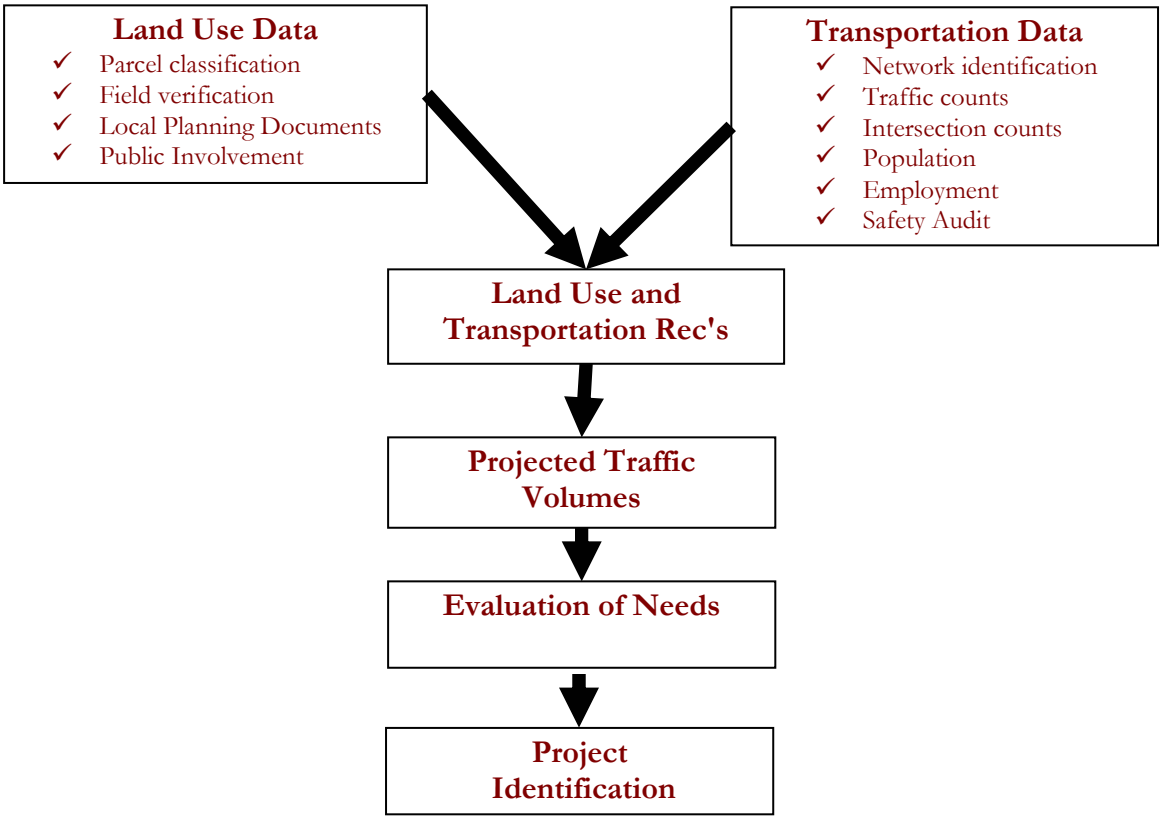
2.4.1 Chronology

The detailed interchange evaluation used the following approach for developing study recommendations:

1. The original study area from Phase 1 was expanded beyond the one mile radius in order to capture additional potential development impacts.
2. Existing land use of the expanded area was field-verified.
3. New traffic counts were performed at 13 locations throughout the study area including 6 intersections and 7 mid-block locations. Traffic engineers also conducted a safety audit of the study area's two primary corridors – PA 641 and PA 74.

4. Planners reviewed the provisions of the area's land use regulations, particularly zoning ordinances.
5. Steering committee members hosted a public open house at Lamberton Middle School on May 26, 2004. Attendees completed an exit survey.
6. An initial full build out "worst case" scenario was prepared, based on existing zoning ordinances.
7. Initial spreadsheet model runs of trip generation demonstrated that the interchange area's existing roadway network would be "overwhelmed" by the full buildout scenario by 2020. Economic models of IMPLAN (Economic Impact Model) and the Penn State Community Impact Assessment Model were also run to measure the impact of the development scenario.
8. A second build out scenario was prepared, based on the following –
    a) Reduced "buildable areas" of available land to allow for parking, setbacks, utilities, and other non-buildable areas.
    b) The incorporation of new development projects to provide greater accuracy.
9. Second model runs demonstrated that full build out based on existing zoning would still generate too many trips for the roadway network to accommodate.
10. The team evaluated 5 alternatives for the Exit 48 and 49 interchanges using Tri-County Regional Planning Commission's regional travel demand model. Study team engineers developed planning-level cost estimates for each potential option.
    a) A Connector Road, linking the southbound off-ramp of Exit 49 with the southbound on-ramp of Exit 48
    b) The Connector Road, plus a second connector road to the east of I-81, linking York and Trindle Roads between Fairview Street and Middlesex Road.
    c) Full interchange at Exit 48
    d) Full interchange at Exit 49
    e) Full interchange at both Exit 48 and 49.
11. Planners prepared recommendations based on trip generation data, model results and public preferences as expressed during the May 26, 2004 open house. The proposed study recommendations - if implemented - would significantly reduce trip generation, as well as provide increased capacity. The ITE Trip Generation Manual was utilized to verify the impact of the changes.
12. An initial recommendation package was distributed to study steering committee members on December 15, 2004 for municipal review and comment.
13. Planners modified the draft recommendations for endorsement at the study steering committee's January 20, 2005 meeting.
14. The study team presented draft final recommendations to the public at a second open house at the South Middleton Township building on April 18, 2005.
15. The study team prepared a final report based in part on comments received during the public open house and from the study steering committee members.

The methodology steps are discussed throughout the report within each section, and follow the study process chart below.



2.5 Document Organization

This report summarizes the existing land use, zoning, and traffic conditions for the greater Exit 48 and 49 study area. It is organized under the following section headings:

- Executive Summary
- Introduction
- Glossary of Terms
- Existing Conditions
- Public Involvement Results
- Development of Recommendations
- Choices for our Future
- Appendices.

3.0 Glossary of Terms

The following land use, zoning, and transportation terms are used throughout the report and are defined here for reference purposes.

Agriculture use the production, keeping, or maintenance, for sale, lease or personal use of plants and animals useful to man including but not limited to forages and sod crops, grains and seed crops; dairy animals and dairy products, poultry and poultry products; livestock including beef cattle, sheep, swine, horses, ponies, mules, or goats or any mutations or hybrids thereof, including the breeding and grazing of any or all of such animals; bees and apiary products, fur animals; trees and forest products; fruits of all kind, including grapes, nuts, and berries; vegetables; nursery, floral, ornamental, and greenhouse products; or lands devoted to a soil conservation or forestry management program.

Area and Bulk a zoning term that refers to regulations that dictate the physical dimensions of a building. **Area** refers to the total area taken on a horizontal plane at the level of the ground surrounding the main building and all necessary buildings, exclusive of uncovered porches, terraces, and steps. **Bulk** refers to the cubic volume of a building.

Buildout projected development of the buildable land in the study area. For this study's purposes the buildout scenario considered transportation impacts of all of the land being developed as currently zoned.

Commercial land use land use types that generally include establishments engaged in retail trade or services.

Gross building area refers to the actual amount of land that may be built upon in a given lot. The gross building area is the lot size minus setback and open space requirements.

HATS The Harrisburg Area Transportation Study (HATS) is the federally-designated metropolitan planning organization for the tri-county area that includes Cumberland County. HATS makes decisions on the programming of all transportation projects involving federal and state funds.

Impervious coverage refers to the percent of the lot area that does not absorb water. Impervious coverage can be determined by dividing the impervious area of the lot by the total lot area.

Indirect Effects occur when suppliers to a new business must increase their purchases from other businesses. Direct effects result directly from consumers' purchases at a business and can be expressed either as output generated (sales) or as the number of jobs created at the new business.

Induced Effects result from increased income paid to households by both directly and indirectly affected businesses. An induced effect occurs when this increased income is spent on other goods and services.

Industrial use this land use generally includes: (1) establishments engaged in transforming raw materials into new products, usually for distribution to other regions and not sold on-site, and (2) establishments engaged in wholesale trade, storage, or distribution with little or no retail trade or service. Because of their

	shipping, storage and processes that create noise, smoke, smells, or light pollution, industrial uses should not be located in close proximity to residential areas.
Institutional use	for purposes of this study, institutional uses refer to schools. Other common uses of institutional land include personal care centers, hospitals, places of worship, educational institutions, and government facilities.
Level of service	a traffic engineering term used by the Institute of Traffic Engineers (ITE) that rates a roadway or an intersection's ability to handle traffic flow. The system uses a rating system of A (best) through F (worst). A roadway's level of service is measured by comparing the volume of traffic against the capacity of the roadway. An intersection's level of service is measured by total control delay per vehicle at the intersection.
Light industrial use	manufacturing or storage uses that are characterized by uses of large sites, attractive buildings and inoffensive processes and can be compatible with neighboring residential uses. Differs from industrial by not having processes that have byproducts such as smell, noise, light, having larger lot sizes that allow screening techniques to be used between residential areas.
Lot	a designated parcel, tract, or area of land established by a plot or otherwise as permitted by law and to be used, developed, or built upon as a unit.
Office land use	a land use that involves administrative, clerical, financial, governmental, medical or professional operations.
Open space	any parcel or area of land set aside, dedicated, or reserved for public or private use or enjoyment or for the use and enjoyment of owners and occupants of land adjoining or neighboring such open space. Developers may be required to meet an open space requirement that ensures that a certain percentage of the lot area will remain as open space.
Peak period	traffic engineering term that refers to the time period when a certain roadway carries the most vehicles. Peak periods usually occur in the morning, 6 a.m. - 9 a.m., and in the evening, 3 p.m. - 6 p.m. The peaking characteristics of a roadway coincide with the time when the roadway sees the highest use, usually but not limited to the morning and evening rush hours. Roadways and the associated facilities should be designed to satisfactorily handle the peak period.
Retail land use	land use in which merchandise or goods are sold to the general public for personal or household consumption and rendering services incidental to the sale of such goods. An important component of a retail establishment is that it buys goods for resale.
TAZ	**(Traffic Analysis Zone)** a delineated area that has uniform land use, population/employment characteristics in which trip generation and distribution will be further analyzed.
TDM	A regional travel demand model (TDM) estimates future traffic volumes through existing and projected population and employment data. The Harrisburg TDM has been updated and calibrated to reflect a 2002 base year.

	The model is useful for identifying the (re)distribution of trips based on proposed improvements to the regional highway network.
TIP	A Transportation Improvement Program (TIP) is managed by the MPO and includes federally-funded projects occurring in the first four-year period of PennDOT's 12 Year Program. All major projects identified in HATS' Long Range Transportation Plan are implemented through the TIP, which is updated every two years.
Vacant land	this land use type includes lands that are not presently developed, such as wooded areas, unimproved areas not used for agriculture or recreation, and improved areas or buildings that are not occupied.
Warehousing	a break in bulk point for freight movement characterized by large storage buildings with convenient access to transportation facilities.

4.0 Existing Conditions

4.1 Land Use and Zoning

EXISTING LAND USE CONDITIONS HIGHLIGHTS

- **The study area's total land area is approximately 5,489 acres.**
- **Agricultural land comprises the majority of the existing land use, at 56 percent. There are nearly 330 acres of open space/vacant land within the study area as well.**
- **Each municipality has adopted a zoning ordinance.**
- **Approximately 15 percent of the study area is currently devoted to commercial uses.**

The first step in assessing the existing land use conditions was to develop a current land use map. The Cumberland County Planning Commission provided a GIS coverage of the tax parcels and the scanned images. Land uses were assigned to each parcel through a combination of aerial imagery interpretation and field verification. Land uses were assigned using detailed NAICS (North American Industrial Classification System) Codes. For the purposes of the final report, these codes were generalized.

4.1.1 Study Area Land Use

The study area covers approximately 5,489 acres or 8.6 square miles. Table 1 summarizes the land uses found in the study area.

Table 1- Existing Land Use

Land Use Code	Land Use	# of Parcels	Acres	% of Total
1000	Residential	1,402	848.0	15.4
1200	High Density Residential	69	67.1	1.2
1400	Open Space/Vacant	83	332.9	6.1
112	Agriculture	90	3,084.9	56.2
221	Utilities	5	25.7	0.5
231	Construction	3	4.7	0.1
321	Manufacturing - Wood	1	4.4	0.1
332	Manufacturing - Fabricated Metals	9	25.7	0.5
333	Manufacturing - Machinery	2	4.7	0.1
339	Manufacturing - Miscellaneous	14	28.0	0.5
421	Wholesale - Durable Goods	2	18.0	0.3
441	Retail - Motor Vehicles, Auto Parts	15	23.3	0.4
447	Retail - Gas Stations	5	5.7	0.1
453	Retail - Miscellaneous	26	61.8	1.1
454	Retail - Non-Store	1	4.3	0.1
481	Air Transportation	2	46.5	0.8

Land Use Code	Land Use	# of Parcels	Acres	% of Total
488	Support Activities for Transportation	1	12.7	0.2
493	Warehousing & Storage	7	90.7	1.7
520	Finance, Insurance, Real Estate	4	8.1	0.1
540	Professional, Scientific, Technical	7	20.4	0.4
610	Education	4	223.9	4.1
620	Health & Social Services	4	32.7	0.6
710	Accommodation/Food	7	83.0	1.5
720	Recreation	7	278.0	5.1
810	Other Services	18	91.9	1.7
811	Repair Services	10	13.9	0.3
920	Public Administration	4	48.7	0.9
TOTAL		1802	5,489.8	100.0

Source: Cumberland County GIS, NAICS

Agricultural

With over 56 percent of all land uses, **agricultural land** constitutes the most common land use within the Exit 48 and 49 study area. (For study purposes, agricultural land was not considered as vacant, or undeveloped.) However, it should be noted that these parcels could develop as residential or nonresidential land uses if they are no longer actively farmed and/or sold. This land would also have to be in a zoning district that permits such uses.

Open Space/Vacant Land

In addition to agricultural land is **open space** and **vacant land**. Together, these two land use types comprise slightly over 6 percent of the Exit 48 and 49 study area. The considerable amount of undeveloped land and strategic location along the I-81 corridor, coupled with the availability of public water and sewer services holds significant potential for further development. The development of this land must be planned along with the transportation infrastructure to maintain an efficient flow of people and goods.

Residential

Residential land uses constitute the most prevalent developed land uses, comprising over 15 percent of the study area. Expansion of the existing sewer and water infrastructure into unserved areas would likely increase residential development. A majority of the study area's residential uses is located in South Middletown Township along Forge Road. Significant residential development is expected to continue, particularly in South Middleton.

Commercial

A variety of **Commercial Retail and Mixed Use** development is the next most-common developed land use, yet represents the greatest generator of total trips. Existing commercial development in the area is anchored by a redeveloped Carlisle Plaza Mall (with a new tenant in Lowe's). Carlisle Crossings when completed will introduce an additional 300,000+ additional square

feet of commercial space, while commercial development has been proposed for the area between Seven Gables Park and I-81.[2]

Other

Land uses related to "Education" comprise nearly 224 acres of the study area, or approximately 4 percent. The US Army War College is a significant traffic generator. With nearly 50 acres, the Carlisle Airport is also a significant land owner in the study area. The airport expanded in 2004 with the purchase of 46 acres of former farmland between the facility and I-81. Airport officials are planning on constructing additional hangars and buildings on the site.

The remaining existing land uses constitute just under 9 percent of the total study land area.

[2] A recent sketch plan included a 105-acre development involving a 123,000 square foot big-box retail store, a 52,500 square foot grocery store and a 41,000 square foot movie theatre complex.

4.2 Social Environment

EXISTING SOCIAL ENVIRONMENTAL CONDITIONS HIGHLIGHTS

- **During the 1990s, total study area population growth rates were at 7.7 percent, slightly less than the county rate of 9.3 percent.**
- **The study area added over 3,400 new residents during the 1990s. Much of this new residential growth occurred in South Middleton Township, which added 2,600 new residents.**
- **By the 2020 Census, South Middleton Township is expected to overtake Carlisle Borough as the study area's largest municipality. By 2020, planners expect the Township to have nearly 19,000 residents.**

Demographic data was another key component of data collection related to existing conditions. Population and employment data were collected for the municipalities in the study area using 1990 and 2000 Census information. Demographic data is a key component of the travel demand modeling process as traffic is a function of both population and employment.

4.2.1 Population

Population growth is a broad and general indicator of a local economy's health and performance over time.

Table 2 and Figure 2 provide both historic (i.e., 1970-2000) and projected (2000-2020) population trend information for the study area municipalities and Cumberland County. During the 1990s, population growth in South Middleton Township exceeded the county's overall population growth rate of 9.4 percent. Growth in South Middleton masked declines in Carlisle Borough for the study area to post an overall population gain of 3,400 residents, or a growth rate of 25.1 percent. South Middleton Township's rate of gain was the fifth-highest of any municipality in Cumberland County during the 1990s.

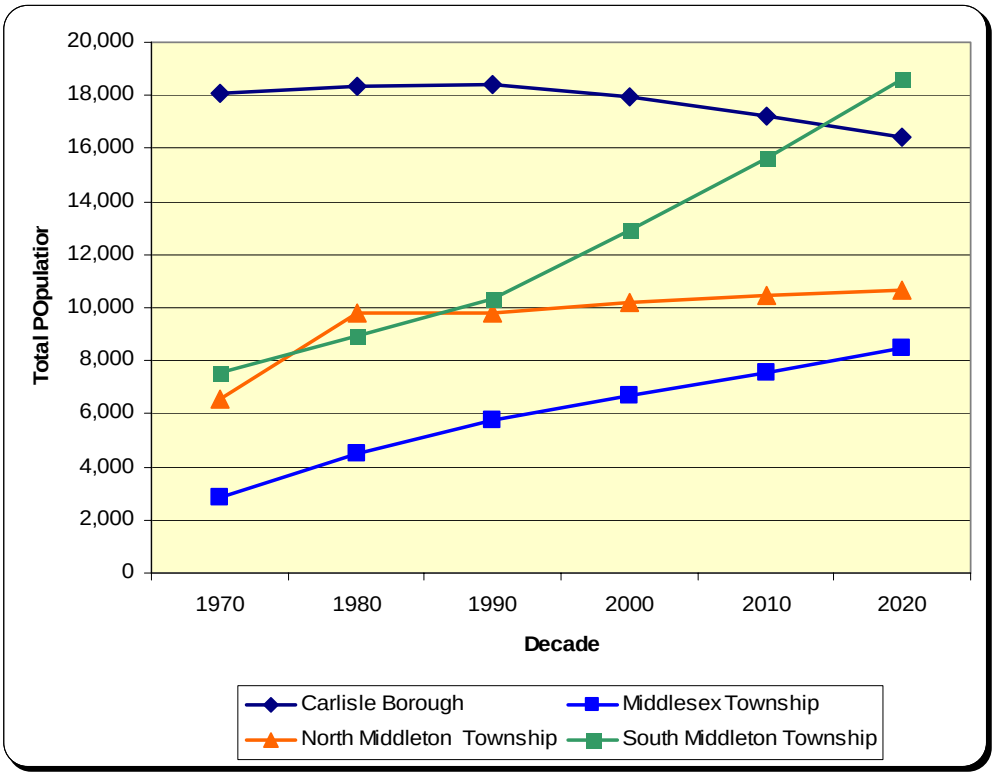
According to population projections from BonData, the area is expected to continue to grow over the next 20 years. South Middleton Township is expected increase by 50 percent between 2000 and 2020 while total population in Middlesex Township is expected to increase by over a quarter over the same period. North Middleton will have moderate growth, while Carlisle Borough is expected to continue the moderate population decline it has experienced since 1990. South Middleton Township is expected to overtake the county seat in size during the 2010s.

Table 2: Historic & Projected Population Change, 1970-2020

Municipality	1970	1980	1990	2000	2010	2020	Percent Change, 90-00	Percent Change, 00-20
Carlisle Borough	18,079	18,314	18,419	17,970	17,241	16,416	(2.4)	(8.6)
Middlesex Township	2,857	4,506	5,780	6,669	7,543	8,464	15.4	26.9
North Middleton Township	6,572	9,785	9,833	10,197	10,432	10,641	3.7	4.4
South Middleton Township	7,521	8,941	10,340	12,939	15,648	18,607	25.1	43.8
Total	35,029	41,546	44,372	47,775	50,864	54,128	7.7	13.3
Cumberland County	158,177	179,625	195,257	213,674	232,521	252,564	9.4	18.2

Source: U.S. Census Bureau; BonData

Figure 2: Study Area Population Growth Rates



4.2.2 Age Group Distribution

A key factor affecting the study area's population growth is the *distribution* of the total population according to the age of the residents. The size and distribution of each age group directly relates to the future growth and stability of the community.

An age group distribution for the study area municipalities is presented in Table 3. The young adult age group (20-44) represents the largest share of the study area's household formations. This is also the prime childbearing age group. Therefore, any decline in the number of persons within this age group will directly impact the area's birth rate. Furthermore, this age group represents the population cohort that comprises most of the local labor force and is most likely engaged in home buying or building activities.

According to data from the 2000 Census, the largest age group within the study area is between the ages of 35 and 54. This age group consists of nearly one-third of the study area's population (30 percent). Carlisle Borough has nearly half (41 percent) of the study area population over age 65. Although not shown in Table 3, South Middleton Township sustained minor population losses during the 1990s among younger age groups (e.g., ages 20-34).

Table 3: Study Area Population by Age Group, 2000

Age Group	Carlisle Boro	Middlesex Twp	North Middleton Twp	South Middleton Twp	Total
School Age Population					
< 5	910	376	560	696	2,542
5-14	1,878	908	1,356	1,838	5,980
15-19	1,598	403	695	786	3,482
Young Adult Population					
20-24	2,020	346	508	480	3,354
25-34	2,382	787	1,186	1,384	5,739
35-44	2,170	1,297	1,735	2,153	7,355
Mature Adult Population					
45-54	2,114	1,142	1,726	2,096	7,078
55-59	840	312	583	760	2,495
60-64	675	313	500	666	2,154
Senior Age Group					
65-74	1,357	478	771	1,178	3,784
75-84	1,362	326	489	775	2,952
85+	484	133	150	217	984

Source: U.S. Census Bureau

4.2.3 Housing Unit Growth

The study area's housing stock increased by nearly 15 percent during the 1990s. This was similar to the county's growth rate of 12.8 percent. Together, the four municipalities contributed to over a quarter of the county's new housing units during the 1990s. Growth in new housing units was led by South Middleton Township, which added over 1,300 new dwelling units. Clearly, a

continuation of this trend places further demands on land and the transportation system. Table 4 and

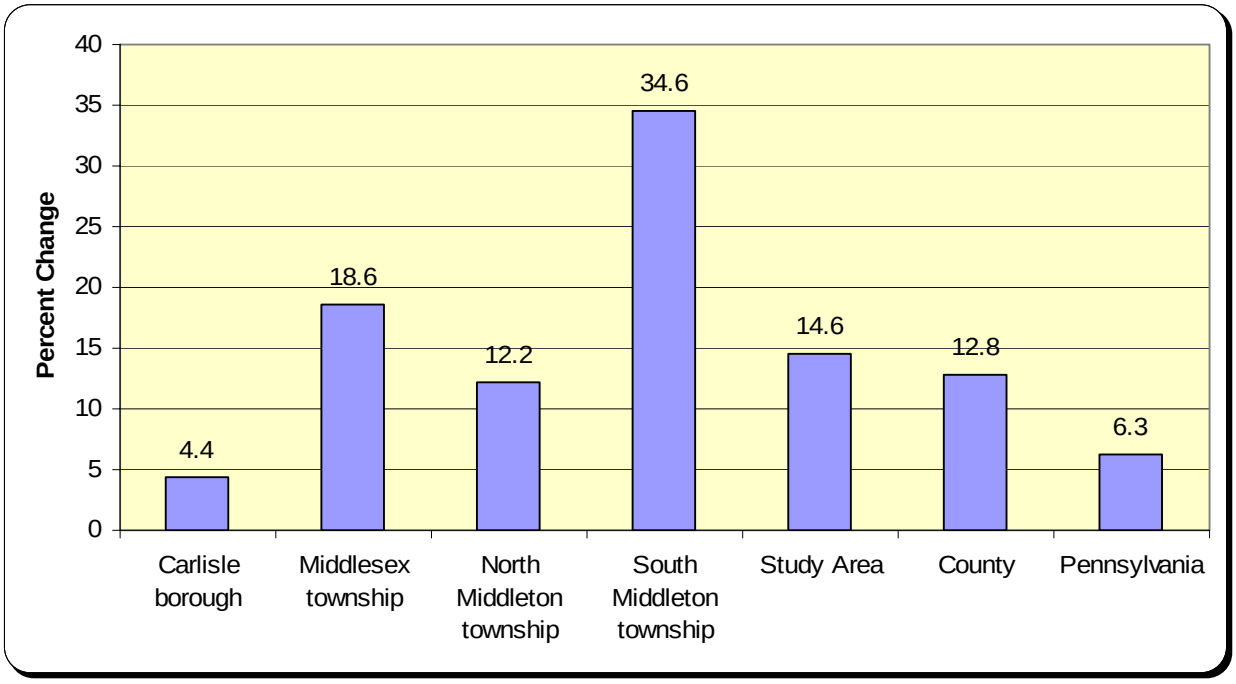
Figure 3 provide more information on change in housing unit growth in the study area during the 1990s.

Table 4: Housing Unit Growth Rate, 1990-2000

Municipality	1990	2000	Change	
			#	%
Carlisle Borough	7,690	8,032	342	4.4
Middlesex Township	2,017	2,392	375	18.6
North Middleton Township	3,755	4,213	458	12.2
South Middleton Township	3,939	5,302	1,363	34.6
Study Area	17,401	19,939	2,538	14.6
Cumberland County	77,108	86,951	9,843	12.8

Source: U.S. Census Bureau

Figure 3: Housing Unit Growth Rate, 1990-2000



Source: U.S. Census Bureau

4.2.4 Resident Employment by Industry

Resident employment is defined as all persons 16 years of age and older that are employed within a specified geographic area. It does not include those serving in the armed forces. Like the general population, the resident employment patterns identify the types and predominance of the major industry sectors in a given area.

The most current resident employment data for the study area municipalities and Cumberland County was collected from the 2000 Census and is presented in Table 5. This data reveals the resident employment of study area municipalities against county averages. To this end, the greatest proportions of study area residents are employed in the education, health, and social service sector of the economy. The area also has a greater share of those employed in the manufacturing sector as compared to the county as a whole. Also, the percentage of workers in Middlesex Township employed in the agricultural sector is nearly twice as high as the county rate. Otherwise, study area employment by sector is generally in line with county averages.

Table 5: Employment Distribution by Industry Type, 2000

Industry	Carlisle Boro		Middlesex Twp		North Middleton Twp		South Middleton Twp		Cumberland County	
	#	%	#	%	#	%	#	%	#	%
Agriculture, Forestry, Fishing	78	1.0	82	2.7	28	0.6	50	0.8	1,405	1.4
Construction	345	4.6	303	10.0	292	6.0	509	8.6	5,929	6.0
Manufacturing	771	10.3	357	11.8	829	17.1	957	16.2	10,734	10.8
Wholesale Trade	158	2.1	77	2.6	166	3.4	272	4.6	4,008	4.0
Retail Trade	979	13.1	385	12.8	781	16.1	496	8.4	13,166	13.2
FIRE	360	4.8	216	7.2	329	6.8	399	6.8	8,716	8.8
Pub. Admin.	707	9.4	282	9.4	484	10.0	633	10.7	10,691	10.8
Transportation/ Warehousing, Util	448	6.0	295	9.8	435	9.0	367	6.2	7,283	7.3
Other Services	398	5.3	147	4.9	196	4.0	317	5.3	5,223	5.2
Education/ Health, Social Services	2373	31.8	509	16.9	951	19.6	1,157	19.6	20,575	20.8
Professional, Scientific, Mgmt	844	11.3	352	11.7	350	7.2	733	12.4	11,426	11.5

Source: U.S. Census Bureau

4.3 Existing Transportation Conditions

EXISTING TRANSPORTATION CONDITIONS HIGHLIGHTS

- **Traffic volumes on PA 641 and PA 74 west of Fairview Street average 9,056 and 9,720, respectively.**
- **The busiest intersection in the study area is where PA 641 intersects with PA 74 in Carlisle Borough to form the "Point." Observed PM Peak Hour volumes there (3 - 6 PM) are as high as 2,030.**
- **Outputs from Tri-County Regional Planning Commission's travel demand model indicate that volumes on Fairview Street are expected to increase from 300 today to 1,360 in 2030.**
- **Volumes on Fairfield Street are expected to more than double over the next 25 years, from 4,500 to 9,500.**
- **Traffic engineers have noted the importance of improved access management along PA 74.**

4.3.1 Transportation System Data Collection Methodology

Transportation system data was collected through direct observation. Twenty-four hour automatic traffic counts and peak hour turning movement counts were conducted at key locations throughout the study area. The automatic traffic counts were conducted with tubes that count cars as they roll over the counter. The turning movement counts were taken manually where observed turning movements for the peak hour were counted and recorded.

Table 6 shows the locations as part of the study's traffic counting program and associated volumes for each.

Table 6:Study Area Roadways: Base 24-hour Traffic Volumes

Count Location	Volume
PA 641 east of Fairview Street	9,056
PA 74 east of Fairview Street	9,720
Fairview Street south of Lisburn Road	6,744
Petersburg Road south of PA 74	3,420
Valley Street	1,438
Fairfield Street	2,612
Mayapple Drive	1,140

Table 7 below outlines peak hour volume for each major intersection in the Exit 48 and 49 study area.

Table 7: Peak Hour Volume by Major Intersection

Intersection	Peak Hour Volume			
	AM	Mid-Day	PM	Saturday
PA 641 & PA 74	1,341	1,745	2,030	1,710
PA 641 & Fairview	1,306	969	1,544	1,114
PA 74 & Fairview	1,104	722	1,455	1,055
Forge Rd & Mayapple	484	514	739	697
Forge Rd & PA 74	1,116	950	1,470	1,365
PA 74 & Otto Ave	807	1,001	1,246	1,386

4.3.2 Existing and Projected Traffic Conditions

Existing traffic conditions were summarized directly from the Tri-County Regional Planning Commission's travel demand model 2000 base year. The model was updated in 2004 using 2000 census data.

The TCRPC travel demand model also includes 2030 base traffic projections. These forecasted traffic volumes reflect several assumptions about future population and employment growth in the region and the impact this growth is expected to have on the area highway network. The assumptions for this growth area a result of TCRPC's review of local and county comprehensive plans and other land use data.

The network is assumed to include committed projects such as those from the regional Transportation Improvement Program (TIP). The result of the expected traffic in 2030 on this network results in the estimated impact on the system in the future. These base year numbers (2002) and 2030 base forecast traffic volumes are shown below in Figure 4.

Figure 4: Current (2002) and 2030 Base Traffic Volumes

	Existing Daily Volume (2002)			2030 Forecast Base Conditions		
Segment	WB/SB	EB/NB	*Total*	WB/SB	EB/NB	*Total*
Trindle Btwn. Fairfield St. and Petersburg Rd.	6,082	6,299	***12,381***	7,159	6,976	***14,135***
Trindle Btwn. Fairfield and Interchange Connector/I-81 Interchange	8,469	8,439	***16,908***	12,247	11,349	***23,596***
Trindle East of I-81 Interchange	8,627	7,261	***15,888***	12,322	10,775	***23,097***
York Rd. Btwn. Fairfield St. and Petersburg Rd.	6,363	6,577	***12,940***	7,214	7,783	***14,997***
Fairfield St. Btwn. Trindle and York Rd.	2,387	2,139	***4,526***	5,087	4,373	***9,460***
Exit 48 and Exit 49 West Connector Rd.	N/A	N/A	-	N/A	N/A	-
York Rd. East of Forge Rd.	4,417	4,890	***9,307***	7,820	8,687	***16,507***
Forge Rd. South of York Rd.	2,960	3,045	***6,005***	3,873	3,852	***7,725***
York Rd. Btwn. Fairfield and Interchange Connector/I-81 Interchange	7,701	8,162	***15,863***	10,943	12,227	***23,170***
Petersburg Rd. Btwn. Trindle and York Rd.	254	420	***674***	551	790	***1,341***
Exit 48 and Exit 49 East Connector Rd.	N/A	N/A	-	N/A	N/A	-
Army Herritage Dr. North of Trindle	5,357	4,497	***9,854***	7,112	6,771	***13,883***
Fairview St. Btwn. Trindle and York Rd.	129	174	***303***	502	858	***1,360***

Source: TCRPC travel demand model; Gannett Fleming

Baseline information from the TCRPC travel demand model indicates that moderate growth in traffic volumes will occur between now and 2030 on the roadways indicated in the previous table. Growth is most prominent on the roadways directly adjacent to the interchanges representing an

annual rate of increase of approximately 1.5 percent. The roadways most impacted by increasing volumes in the Exit 48 and 49 area are PA 641 and PA 74 with direct connection to I-81.

Traffic growth is expected to continue across the highway network. By connecting Trindle and York Road, Fairfield Street is expected to have the greatest growth rate of the roadways analyzed in the Exit 48 and 49 area under baseline conditions. Fairview Street and Petersburg Road also function in the same way and are forecast to experience significant growth rates, as shown in Table 8.

Table 8: Traffic Growth Percent Change, 2002-2030 Base Year

Segment	Percent Change 2002-2030 Base
Trindle btw Fairfield St & Petersburg Rd	14
Trindle btw Fairfield and I-81	40
Trindle east of I-81	45
York btw Fairfield St and Petersburg Rd	16
Fairfield St btw Trindle Rd and York Rd	109
York Rd east of Forge Rd	77
Forge Rd south of York Rd	29
York Rd btw Fairfield and I-81	46
Petersburg Rd btw Trindle Rd and York Rd	99
Army Heritage Dr north of Allen St	41
Fairview St btw Allen St and York Rd	349

Source: TCRPC travel demand model

4.3.3 Intersection Analysis

The study team analyzed six intersections for turning movements and volumes during the morning (6-9AM), mid-day (11AM to 2PM), and evening (3PM to 6PM) peak hours, as well as on Saturday between 11 and 2. In addition, some basic information about the physical layout of the intersections was compiled, as well as a Level of Service (LOS) analysis.

York Road (PA 74) and High Street (PA 641)

- **Physical Description** – This intersection is signalized with a 35 MPH speed limit for all approaches. There is street lighting with only minimal bike/ped facilities. There is no parking on the roadways. East bound traffic on High Street has exclusive through and right-turn lanes, with a "free right" turn, while west bound traffic has a left/through lane and an exclusive through lane. North bound traffic on York Road has a left/right turn lane.

- **Traffic Volumes and Turning Movement Counts** – Total volumes for each of the count periods ranged from a low of approximately 3,400 vehicles during the AM counts to a high of more than 5,700 during PM counts. Saturday volumes were approximately 4,900 vehicles. High Street carries between 80 and 85 percent of the total volume at this

intersection regardless of the time of day, with close to half of the total approaching the intersection on High Street from the west (Carlisle). Trucks account for approximately 3 percent during morning and mid-day hours and less than one percent during the evening and Saturday counts. More than half of the vehicles on High Street that approach the intersection from the west (Carlisle) travel straight through the intersection regardless of the count period.

- **Five Year Crash History & Level of Service** – There have been 44 crashes with no fatalities at the intersection between 1997 and 2001 (most recent data available). At the present time, the intersection operates at LOS B for all peak hours.

PA 641 and Army Heritage Drive/Fairview Drive

- **Physical Description** – This intersection is signalized with 35 MPH speed limits on PA 641. The intersection is lit with only minimal bicycle/pedestrian facilities and no parking. Traffic on east and west bound PA 641 has left and through right lanes. Army Heritage Drive and Fairview Drive both have single lane approaches.

- **Traffic Volumes and Turning Movement Counts** – Total volumes for the intersection ranged from a low of 2,850 during mid-day counts to a high of 4,186 during evening counts. Saturday volumes were just over 3,000. PA 641 handles between 65 and 67 percent of the total volume through this intersection. During the AM hours, about 28 percent of the total approaches the intersection from Fairview Drive, while in the evening approximately 20 percent approach from Army Heritage Drive. Trucks accounted for approximately 6 to 7 percent of the total volume during the morning and mid-day hours; about 2 percent during the evening, and less than 1 percent on Saturday.

- **Five-year Crash History and LOS** – PennDOT has recorded 12 crashes at this intersection between 1997 and 2001, with no fatalities. The intersection currently operates at LOS C during all count periods.

Fairview Drive and PA 74

- **Physical Description** – This intersection is signalized and lit. Speed limits are different for each approach – 35 MPH on Fairview from the south and 25 MPH from the north and 40 MPH on York Road from the east and 50 MPH from the west. There are single lanes on all approaches with minimal bicycle/pedestrian facilities and no parking.

- **Traffic Volumes and Turning Movement Counts** – Total volumes at this intersection ranged from a low of 2,660 during the morning hours and over 3,800 during the evenings. York Road handled the bulk of the traffic through this intersection – between 70 and 75 percent – mornings, mid-day and Saturday. Even during the evening hours about 66 percent of the total is on York Road, while Fairview Drive from the north handles about 27 percent during this time period (compared to 11 percent in the AM and 20 percent at mid-day and Saturdays). Trucks accounted for 3 to 4 percent of the

total during the morning and mid-day counts and about 1 percent during the evening and Saturday Counts.

- **Five-year Crash History and LOS** – Between 1997 and 2001, there were 26 crashes at the intersection, all of which were prior to the installation of the signal. The intersection operates at LOS B for all but the PM peak hour, when it operates at LOS C.

Forge Road and Mayapple Drive/Overfield Road

- **Physical Description** – There are stop signs on Mayapple and Overfield Roads. The speed limit is 35 MPH on Forge Road and 25 MPH on both Mayapple and Overfield Roads. The intersection is not lit and there is no parking. There are minimal bicycle/pedestrian facilities. All approaches have single lanes only.

- **Traffic Volumes and Turning Movement Counts** – Total volumes at this intersection range from just over 1,100 during AM counts and over 1,900 during evening and Saturday counts. Forge Road handles most of the traffic – just over 90 percent during all counting periods. During the evening counts, approximately 54 percent of the intersection traffic is coming from the north. Truck traffic accounts for almost 4 percent of the total during the morning and mid-day counts and one percent or less during the evening and Saturday counts.

- **Five-year Crash History and LOS** – PennDOT has recorded one crash at the intersection in 1997. There was a fatality. During the morning and mid-day peaks the intersection operates at LOS B. It operates at LOS C during PM and Saturday peaks.

Forge Road and PA 74

- **Physical Description** – This three-way intersection is controlled by a stop sign on Forge Road and is lit. The approach on Forge is single lane with a 35 MPH speed limit. PA 74 has dual lanes, with through/right and left through with a 40 MPH speed limit. There are minimal bicycle/pedestrian facilities and no parking.

- **Traffic Volumes and Turning Movement Counts** – Total volumes at this intersection for the three-hour counts ranged from 2,500 during the morning to just over 4,000 during the evening. Saturday volumes were over 3,800 vehicles. The vast majority of the total volumes for each count period approach the intersection on PA 74 from the west. Of these vehicles, 42 to 44 percent turn right onto Forge Road during each count period, except the AM, when only 30 percent did. Between 93 and 97 percent of the vehicles that approached the intersection on Forge Road turned left onto PA 74. Trucks accounted for 3 – 4 percent of the total during AM and mid-day counts, and one percent or less for PM and Saturday.

- **Five-year Crash History and LOS** – PennDOT has recorded 7 crashes with no fatalities at this intersection between 1997 and 2001. Currently, the intersection operates

at LOS F during each peak hour except mid-day, when it operates at LOS C. Peak hour and four-hour volumes warrant a traffic signal at this intersection.

PA 74 (York Road) and Otto Avenue (T-656)

- **Physical Description** - This three way intersection is lit and has a stop sign on Otto Avenue. The speed limit on York Road is 35 MPH and is 25 MPH on Otto. There are single lane approaches on both York and Otto. There is no parking and bike/ped facilities are minimal.

- **Traffic Volumes and Turning Movement Counts** – Less than 45 vehicles used the Otto Road approach to this intersection. Total volumes ranged from just over 1,900 in the morning to almost 3,800 on Saturday. Between 96 and 99 percent of vehicles on York Road travel straight through the intersection. Trucks accounted for 3 – 4 percent of the total traffic during morning and mid-day counts, and one percent or less for evening and Saturday counts.

- **Five-year Crash History and LOS** – Between 1997 and 2001, PennDOT recorded 11 crashes with no fatalities. Currently the intersection operates at LOS B during AM and Mid-day peaks and LOS C during PM and Saturday peaks.

4.3.4 Traffic Safety Audit

The study team conducted a safety audit of the study area's primary roadways, including US 11 and Walnut Bottom Road. The following points were noted as part of this audit:

PA 641/Trindle Road

- Two separate crest curves could pose sight distance limitations. A longer vertical curve providing additional sight distance may be preferable.
- Guiderail with improper end treatments were noted in directional side of traffic.
- Non-breakaway utility poles exist in close proximity to the roadway.
- Faded pavement markings exist between Lowe's and McDonald's on PA 641. Faded pavement markings lowers visibility, particularly in rainy or dark conditions.
- Pedestrian crossing pushbutton is difficult to access due to its placement above a drainage inlet.

PA 74/York Road:

- Consideration should be given to consolidate access by defining driveways through the use of curbing.
- There are inconsistencies between the lane use markings and receiving lanes through the intersection with Fairfield Street.

4.4 Economic Assessment

ECONOMIC ASSESSMENT HIGHLIGHTS

- **Construction on selected land developments within the Exit 48 and 49 study area will create approximately 2,000 temporary jobs at an average annual wage of $41,000.**
- **The economic assessment model shows that the construction will create approximately 640 indirect and 690 induced jobs.**
- **New construction in the area is estimated to create 3,500 permanent new jobs, with average annual earnings of $34,000.**

The study team conducted an economic impact assessment to measure the effects of several land development projects on Cumberland County's economy. There are various types of uses associated with proposed land developments in the greater Exits 48 and 49 area, including retail, warehousing, and residential development.

Components of the initial Exits 48 and 49 development program included the following:

- **Carlisle Crossing**: approximately 353,320 square feet of retail shops and food service businesses.
- The 2.5 million square-foot **Keystone Warehouse** facility.
- **Carlisle Commons**: neighborhood of approximately 86 new single family homes.

The construction and operation of the planned warehouse and new retail and foodservice businesses will create direct, indirect and induced effects. An economic assessment model called IMPLAN was used to measure these effects. The results - expressed as number of jobs created - are presented in the following tables. It is important to note that the jobs resulting from construction are *temporary*, and will last only until construction is complete. The jobs created from the operation of the new businesses will be *permanent* (assuming the business continues to operate). It should be noted that the IMPLAN model does not report jobs in full time equivalents (FTE). In other words, the number of jobs in the accompanying tables *includes both part-time and full-time jobs.*

The results of the economic impact assessments include an estimation of the number of new permanent jobs that will be created by each development component at the interchanges, as well as the compensation associated with those jobs that will be introduced into the local economy.

In addition to the permanent jobs created, each development project will also create temporary jobs during its construction phase. The assessment estimates the number of construction jobs created and related compensation. Construction costs were estimated for each component of the proposed land developments. Average construction costs from the Cumberland County Planning Commission's 2003 Annual Report were used for the residential components. An estimated price per square foot from a local developer was used for the warehouse and retail components.

The assessment also identifies the "ripple effects" of the new economic activity related to increased inter-industry spending, as well as increased household spending as a result of the new job creations.

A conceptual design for the Carlisle Crossing plaza was produced prior to the analysis. The conceptual design includes six large retail stores of the proportions shown in Table 9 below. No decisions had been made, at the time of analysis, as to what businesses would occupy the retail stores. Therefore, the project team studied plazas in the local area that contain stores with similar square footage as those listed in the conceptual design. Based on these similar square footage stores, the team selected likely tenants.

Table 9: Carlisle Crossing: Conceptual Tenants for Economic Analysis

Store Type	Economic Sector	Square Footage
Grocery Store	Food and Beverage Store	45,000 sq ft
Liquor Store	Food and Beverage Store	1,400 sq ft
Pharmacy	Health & Personal Care Store	10,500 sq ft
Apparel Store	Clothing & Clothing Accessories Store	10,350 sq ft
Sports Shop	Sporting goods, hobby, book, music	3,000 sq ft
Craft Store	Sporting goods, hobby, book, music	12,000 sq ft
Department Store 1	General merchandise store	86,000 sq ft
Department Store 2	General merchandise store	126,500 sq ft
Office Supply Store	Miscellaneous	24,080 sq ft
Card Store	Miscellaneous	9,000 sq ft
Movie Rental	Video and disc rental	3,500 sq ft
Fast Food - Sub Shop	Food Services & Drinking Places	1,400 sq ft
Pizza shop	Food Services & Drinking Places	1,500 sq ft
Hair salon	Personal Care Services	1,100 sq ft

Data on 2001 retail sales per square foot, by store type, was collected from the International Council of Shopping Centers (ICSC). This data was combined with the assumed retail mix to produce an estimate of total sales at the future plaza.

While the assumed retail mix was created as a "best guess" about the type of stores that will be present, the actual mix may vary from the assumptions. However, the assumed mix should be a reasonable proxy for the actual mix that will occur. The total sales estimate (using the assumed mix) was approximately 16% higher than an estimate that multiplied the total square footage. In spite of this difference, the project team chose to use the assumed mix sales estimate for analysis, as it represents a more specific picture of what will likely occur in comparison to the average estimate.

In similar studies, warehouses have been estimated to create approximately one job per 1,000 sq. ft. of space (MIG[3], Inc. 2004). Therefore, the study team assumed the Keystone facility would support approximately 2,500 permanent jobs.

Because the analysis measured job creation and spending at the new retail plazas, the study team decided not to additionally measure household spending for the Carlisle Commons neighborhood, in order to avoid the possibility of double-counting. The decision not to count household spending was made in accordance with guidance from MIG, Inc. Table 10 below shows the total construction jobs expected to be created by various land developments.

Table 10: Temporary Direct Jobs Created, by Economic Sector

Development Component	Total Construction Jobs
Carlisle Crossing (retail development)	335
Keystone Warehouse	1,085
Carlisle Commons (Residential Development)	580
TOTAL	2,000

Source: IMPLAN assessment

The model shows that the construction at Exits 48 and 49 will create approximately 2,000 temporary construction jobs. According to the model, a construction worker in Cumberland County earns, on average, approximately $41,070 per year.

As shown in Table 11, the model also shows that the construction will create approximately 638 indirect and 690 induced jobs. Because the indirect and induced employment from the construction encompasses so many economic sectors, the model only reports average employee compensation, not earnings, for indirect and induced jobs. Employee compensation differs from earnings in that it includes benefits such as health and life insurance, retirement payments, and non-cash compensation. Therefore, employee compensation will be significantly higher than a worker's actual earnings. For the indirect and induced employment resulting from construction, average employee compensation will be $29,062 and $25,509 respectively.

[3] Minnesota Implan Group

Table 11: Multiplier Effects, Construction

Development Component	No. of Temporary Jobs		
	Indirect	Induced	TOTAL
Carlisle Crossing (retail development)	126	120	246
Keystone Warehouse	237	353	590
Carlisle Commons	275	217	492
TOTAL	638	690	1328

Source: IMPLAN assessment

Table 12 below shows that the development at Exits 48/49 would directly result in the creation of approximately 3,541 permanent jobs (including full- and part-time positions). The majority of these jobs will be in the warehousing and retail sectors. On average, workers at these jobs will earn approximately $34,230, as shown in Table 13 below. However, average earnings vary significantly between economic sectors. For example, workers at the 935 retail jobs will only earn $19,760 on average. Average employee compensation from the indirect and induced employment will be $27,006 and $25,468, respectively.

Table 12: Permanent Jobs Created, by Economic Sector

Development Component	Number of Jobs by Economic Sector						
	Retail Trade	Real Estate Rental/Leasing	Accommodation & Food Services	Other Services	Other Federal Gov't Enterprises	Warehousing & Storage	TOTAL
Carlisle Crossing	935	48	37	9	12	- -	1,041
Keystone Warehouse	- -	- -	- -	- -	- -	2,500	2,500
TOTAL							3,541

Source: IMPLAN assessment

Table 13: Exit 48 & 49, Average Earnings, Direct Employment

Economic Sector	Average Earnings Per Worker (2004 Dollars)
Retail Trade	$ 19,760
Real Estate/Rental/Leasing	$ 8,100
Accommodation & Food Services	$ 17,110
Other Services	$ 16,780
Other Federal Gov't Enterprises	$ 59,210

Economic Sector	Average Earnings Per Worker (2004 Dollars)
Warehousing & Storage	$ 40,340
ALL SECTORS	$ 34,230

Source: IMPLAN assessment

4.4.1 Overview

The model results indicate substantial job creation, but this must be put into careful context. The model shows simply the level of employment required to sustain the new development. It does not consider the new development's impact on existing businesses. In other words, the model assumes that all the spending at the interchange development is *new* spending, as opposed to *transferred* spending from elsewhere in the region. For the new warehouse, this is likely an accurate assumption. The warehouse probably represents new growth in light industry for the region, and will not take business away from warehouses already in existence. However, a substantial portion of the retail spending may represent a transfer from other shopping areas within or outside Cumberland County.

For example, some of the spending at the new Carlisle Crossing may result from consumers shifting their purchases from the Silver Spring Commons or the new Wal-Mart in Shippensburg. Consumers may also shift their purchases from downtown areas, smaller retailers and local banks to the new retail development in Carlisle Crossing, as shown in a 2001 University of Wisconsin study.

From Cumberland County's perspective, shifting spending from shopping plazas outside the County to shopping plazas inside the County is a positive impact in that it provides tax revenue and prevents leakages. To wit, any payments made to goods and services imported from outside the County which do not in turn re-spend the dollars within the County.

The County should be indifferent, however, to spending transferred from one area of the county to another, as it does not represent new growth. Further, spending transferred from surrounding counties to Cumberland may represent job growth within Cumberland County, but job loss in surrounding counties. Cumberland County residents may be employed in these surrounding counties, so transferred spending may merely represent job transfer for these residents.

Therefore, the number of jobs created in the model results represents a **maximum**. The reality is that the number of *new* jobs is likely lower.

5.0 Public Involvement

PUBLIC INVOLVEMENT HIGHLIGHTS

- **Improving safety and reducing congestion are two top public concerns for the area.**
- **Public perception is that the dramatic growth the area has experienced over the past several years is expected to continue.**
- **The public believes that commercial retail activities are the most likely to develop in the study area; however, the most desired future development includes commercial retail, agricultural, or no development at all.**
- **The study steering committee hosted public meetings at the Lamberton Middle School on May 26, 2004 and again at the South Middleton Township building on April 18, 2005.**

5.1 Public Involvement 1

This section summarizes the results from the study's first public meeting, which was held on May 26, 2004 at the Lamberton Middle School in Carlisle.

The Cumberland County Planning Commission held the open house to introduce the study to the general public. The public's input on the existing and future land uses and transportation system issues affecting the Exit 48 and 49 study area was received.

All landowners in the study area received a personalized meeting invitation. A meeting advertisement was also placed in the local newspaper and was announced on a local television station.

The consultant team made two presentations at the open house. Before and after the presentations, meeting attendees were joined in informal groups at work stations in the school lobby area to discuss their ideas, concerns and opinions regarding the existing and future development issues. The planning team facilitated and recorded comments at the work stations. An exit survey was also distributed to capture meeting attendee comments on study issues. Public input was subsequently used to develop study recommendations. Exit survey results are summarized below. A sample of the survey instrument can be found in the report appendix.

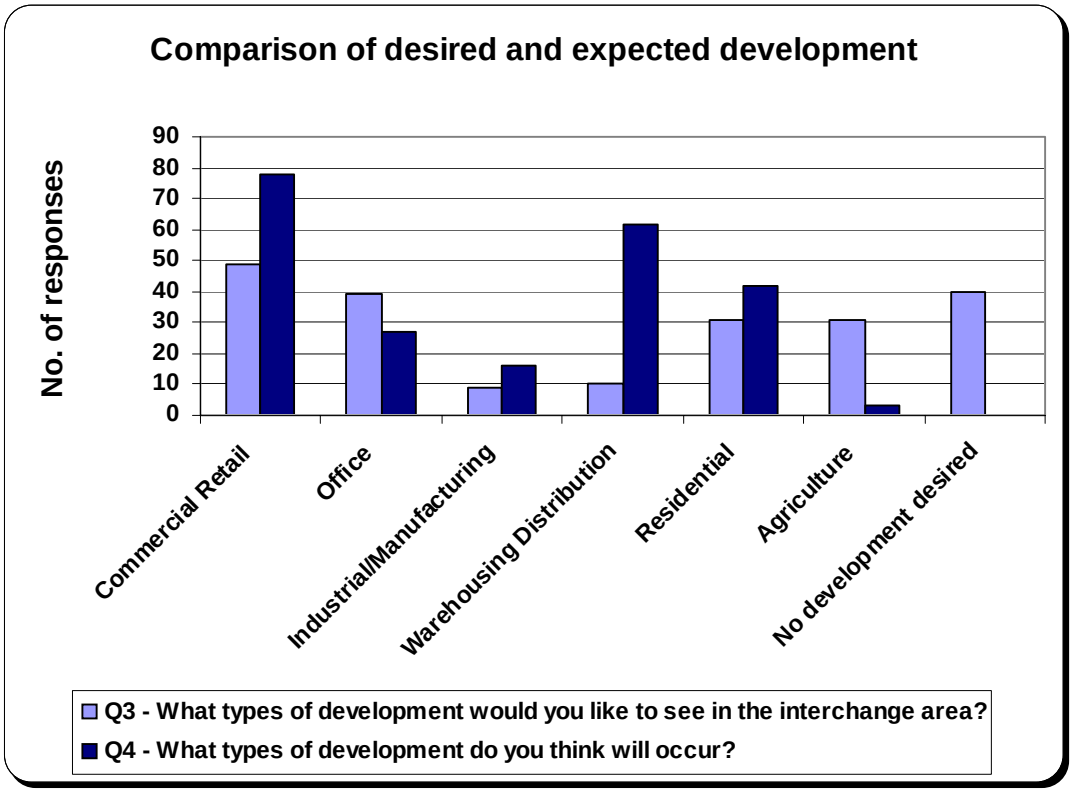
5.1.1 Exit Survey Results

The survey provided a good representation of the study area residents and land owners. All three municipalities in the study area were equally represented in the survey results.

When asked to express preferences for future land use by development type for the study area, participants' responses were mixed. Commercial retail ranked as the highest development preference, with no new development ranked second. Warehousing distribution and industrial ranked as the least desirable.

In contrast, when survey participants were asked what type of development they *think* will occur in the greater Exit 48 and 49 study area, a majority identified commercial retail as the primary development type.

Figure 5; Comparison of Desired vs. Expected Development



Source: Exit 48 & 49 Public Meeting #1, May 26, 2004

5.1.2 Work Station Summary

The following highlights common themes expressed at the public meeting:

Congestion

- Congestion is a problem at several study area locations, including:
  - York and Forge Roads
  - York and High Street (the "Point")
  - York and Fairview Street.

Traffic

- Fairview Street is being used as a connector road.
- Passing zones on Trindle Road are a concern, particularly with the many points of access.
- There are too many points of access along York Road to justify the posted 50mph speed limit.

- Public desire for a traffic signal at the intersection of York and Petersburg Roads was frequently expressed.
- Increasing truck traffic volumes are a concern, particularly along York Road.

Land Use

- Rural preservation is important; there is a concern with the perceived erosion of South Middleton Township's rural character.

"The area is preserved from undesirable development from the way the interchanges are currently [configured]."

- There is a concern with improving Exits 48 and 49 to full interchanges as it relates to area's attractiveness to more warehousing uses in the study area.
- Preserving farmland is South Middleton Township's top priority. It is a priority with the state and county as well. Developing the study area is contrary to local government priorities.
- Interchange area quality of life issues include:
    - Improving safety
    - Discouraging the practice of "cut through traffic" on local streets
    - Reducing traffic noise
    - Planning for the future performance of the interchange.

Enforcement

- Posted speed limits on such roads as York and Forge are commonly ignored.

Sight Distances

- Sight distance at York and Mayapple is a concern.

5.1.3 P.I. #1 Summary

The study area participants are to be commended for their outstanding participation and wealth of good ideas and community spirit. The overall direction of these findings is positive:

1. The study area is experiencing growth with associated problems and challenges.
2. The study area participants, however, are prepared to face these challenges and recognized the need for a more proactive, planned approach to development.
3. What participants want in the study area and what they believe will happen are different. This illustrates that residents do not believe they have a say in community planning.
4. That approach can be achieved by going forward in this planning process and beyond to:
    a. Properly balance the goals of development and quality of life preservation
    b. Address traffic and safety problems

c. Focus development in certain areas that better mesh with available infrastructure and that conflict less with residential areas and other protected land uses (e.g., open space).

d. Opportunities for innovation abound—including more cooperative efforts with developers and others for funding regional-scale transportation improvements in generally supporting the emerging vision.

e. Continue to build on the great public spirit in completing and implementing the study recommendations.

5.2 Public Involvement 2

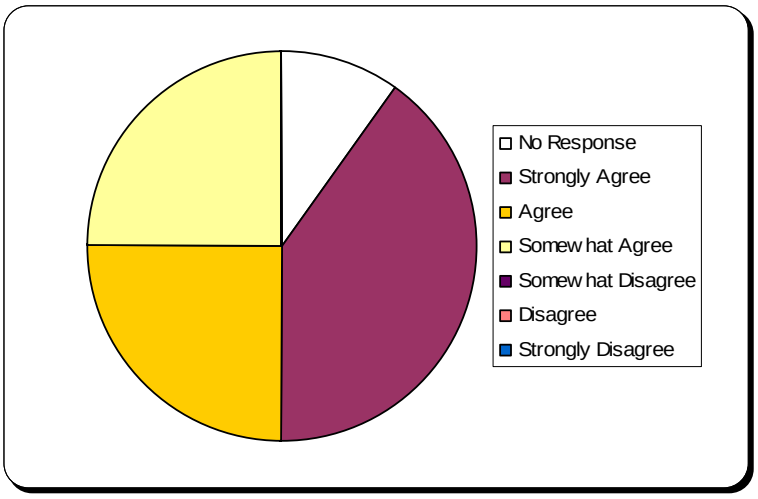
The study steering committee held a second open house on April 18, 2005. South Middleton Township hosted the meeting, which followed the same format as the previous open house, with doors opening at 5:00 and formal presentations at 5:30 and 7:30 PM. As before, the session included the use of an exit survey. There were approximately two dozen public participants. A copy of the slide presentation, as well as the exit survey instrument is included in the report appendix.

While the first survey focused on general conditions and public preferences, the survey for the second public meeting focused on specific items that could assist the study area in shaping its future. It solicited public perspectives on topics related to zoning, ordinances, priorities, and other specific questions regarding future development and land use controls. Results from the 20 surveys that were submitted are presented below; the complete results can be found in the appendix.

Draft recommendations registering some degree of agreement (percent saying either strongly agree/ agree/ somewhat agree) include:

- 90% - Rezone Spring Garden Street parcel from Light Industrial to Village
- 85% - rezone parcel south of Lisburn Road to Neighborhood
- 85% - Monitor rail crossing safety along Army Heritage Drive
- 80% - Advance safety-related projects
- 75% - Rezone along York Road to High Density Residential
- 70% - Relocate Westminster Drive and signalize
- 60% - Construct a connector road between Exits 48 and 49

Figure 6: Rezone Spring Garden Street parcel



Although 20 surveys do not represent a large public sampling, the above results are generally indicative of high levels of support for the recommended improvements.

Recommendations registering the highest percentage of those saying "Strongly Agree":

- 55% - Relocate Westminster Drive and signalize
- 50% - Rezone parcel south of Lisburn Road to Neighborhood
- 50% - Discourage extension of water and sewer service further east along Trindle Road

The only draft study recommendation registering any "Strong Disagreement" at all was the construction of the connector road, with 3 votes, or 15 percent.

6.0 Development of Recommendations

Community development changes can have significant transportation impacts. To evaluate land use development options for the study area, the study team examined different potential development program options to determine the relative varied impacts on the roadway network. This testing allows decision makers to understand the consequences of zoning decisions and their resultant impact on the highway network.

The study team identified the study area parcels that were "in play" and the respective zoning district information regulating each. From this information, the team developed a "worst case scenario", in which each property would be developed to its fullest potential as allowed by the local zoning ordinance.

6.1.1 Evaluating Trip Generation

Based on the results of steering committee meetings and public involvement, the study team evaluated the impact of differing land uses as they related to trip generation. As part of the evaluation, the study team organized the study area into 8 Traffic Analysis Zones, or TAZs for modeling and evaluating study area traffic patterns.

According to the current land use and zoning regulations in the study area, a total of 4,447 residential dwelling units could potentially be built. A total of 2.2 million leasable square feet of warehouse space is also expected to be developed. Most significantly, a total of 2.5 million leasable square feet of commercial retail development is proposed. The evening peak hour traffic volumes for future years 2020 and 2030 were generated and analyzed.[4]

Table 14 shows the results on total trip generation if existing undeveloped parcels would be permitted to develop to the maximum densities allowed under current zoning ordinances.

[4] It should be noted that due to the preliminary nature of the developments and trip generation rate limitations (i.e., trip generation rates are only available for certain units such as leasable square footage in the case of commercial developments and not for total building area) the sizes of the commercial developments were adjusted from maximum building square footage to leasable square footage. This was done by reducing the maximum building square footage by 33 percent for commercial buildings and by ten percent for the industrial and warehouse developments.

In addition, the trip generation presented in Table 1 assumes that 15 percent of the trips generated will be internal trips or trips that will have an origin and destination within the TAZ. This can be conservatively assumed because of the interaction that will exist between the different land uses included in the study area. Therefore, the trip generation was reduced by 15 percent to account for internal trips.

Table 14: Trip Generation from Proposed Developments[5]

TAZ #	Trip Generation Information			New Trips Generated			
	Type	#	Units	Daily Total	PM Peak		
					Total	In	Out
1	SF Detached	317	UNITS	2,578	171	101	272
2	SF Detached	1,166	UNITS	9,484	631	370	1,001
	SF Semi-Detached	295	UNITS	2,400	160	94	254
3	SF Detached	65	UNITS	528	35	21	56
	Warehouse	2,250	SQ FT	9,486	225	645	870
4	Industrial	1,503	SQ FT	8,904	150	1,102	1,252
	SF Semi-Detached	956	UNITS	7,776	517	304	821
5	Commercial Retail	238	SQ FT	8,950	241	306	547
6	Commercial	1,130	SQ FT	41,260	1,730	1,874	3,604
	SF Semi-Detached	365	UNITS	2,970	197	116	313
	SF Semi-Detached	1,061	UNITS	8,630	574	337	911
7	SF Detached	108	UNITS	878	58	34	92
	Commercial Retail	1,153	SQ FT	43,442	1,169	1,488	2,657
8	SF Semi-Detached	40	UNITS	326	22	13	35
	SF Detached	74	UNITS	602	40	24	64
		TOTAL TRIPS		148,214	5,920	6,829	12,749

The projected change in trip generation is a function of specific land use. Total trip generation numbers represent estimated volumes distributed over the study area highway network. All traffic changes were assumed to occur over 25 years, the assumed period for development to occur. Based in part on the results shown in Table 14 above, the study team was able to develop policy and ordinance-related recommendations that would lessen travel demand in the study area.

6.1.2 Evaluating Trip Distribution

As discussed earlier, the study team used the Tri-County Regional Planning Commission's regional travel demand model (TDM) in estimating the distribution of future trips. Cumberland County (including the Exit 48 and 49 study area) is included within the geographic limits of this analysis tool. The TDM gives planners the ability to perform "what if" analyses, showing the diversion of future traffic based on proposed transportation improvements. Given this capability and through discussions with study steering committee members and public meeting output, the team tested five area transportation improvement alternatives with the TCRPC TDM:

[5] Each land use is assigned a trip generation rate which is the number of trips a particular land use produces and attracts per one specific unit of measure. For example, for every single family dwelling unit, there is an average of 9.57 trips generated per day. These rates are established by the Institute of Transportation Engineers (ITE) and were used to develop trip tables which represent the changes in land use and the corresponding changes in traffic generation.

1. A Connector Road, linking the southbound off-ramp of Exit 49 with the southbound on-ramp of Exit 48
2. In addition to the proposed improvement described above, this second alternative includes another connector road to the east of I-81, connecting York and Trindle Roads between Fairview Street and Middlesex Road.
3. Full interchange at Exit 48
4. Full interchange at Exit 49
5. Full interchange at both Exit 48 and 49.

As an evaluation tool, the TDM gives planners and decision-makers a general sense of the relative impact and magnitude of traffic diversion as a result of recommended improvements. The impact analyses of all five improvement scenarios are described below.

Alternative 1 - Connector Road

This first alternative is envisioned as a connector road linking the south-bound off-ramp of Exit 49 with the south-bound on-ramp of Exit 48. Traffic volumes for Alternative 1 and the 2030 base condition are shown in Table 15, below.

Table 15: Daily Traffic Volumes: 2030 Base vs. 2030 Alternative 1 (Connector Road)

Segment	Existing Daily Volume			2030 Daily Forecast Base		
	WB/SB	EB/NB	Total	WB/SB	EB/NB	Total
Trindle btw Fairfield and Petersburg Rd	7,159	6,976	14,135	6,928	6,496	13,424
Trindle btw Fairfield & I-81	12,247	11,349	23,596	6,928	6,541	13,469
Trindle east of I-81	12,322	10,775	23,097	12,898	10,911	23,809
York Rd btw Fairfield & Petersburg	7,214	7,783	14,997	7,713	8,308	16,021
Fairfield btw Trindle & York	5,087	4,373	9,460	35	45	80
Connector Road	N/A	N/A	- -	6,388	6,183	12,571
York Rd east of Forge Rd	7,820	8,687	16,507	7,745	8,664	16,409
Forge Rd south of York Rd	3,873	3,852	7,725	3,935	3,949	7,884
York btw Fairfield & I-81	10,943	12,227	23,170	7,713	8,263	15,976
Carlton Ave btw Trindle & York	551	790	1,341	437	768	1,205
Army Heritage Dr north of Trindle	7,112	6,771	13,883	7,056	6,631	13,687
Fairview St btw Trindle & York Rds	502	858	1,360	461	690	1,151

Source: TCRPC TDM; Gannett Fleming

The Alternative 1 connection between interchanges would significantly reduce traffic volumes along Trindle and York Road just to the west of the proposed connector. This connector is expected to accommodate approximately 12,500 vehicles daily. In 2030 the improvement would be expected to decrease traffic along Trindle Road from its baseline 2030 traffic of 23,600 vehicles by 43 percent to 13,500, and along York Road by 31 percent. Fairfield Street is also expected to experience significantly reduced traffic volumes as a result of vehicles using the new parallel route. Other segments are forecast to have little change.

Table 16 below shows the change in traffic volumes of Alternative 1 compared to baseline 2030 forecasts under existing conditions for each analysis roadway segment.

Table 16: Percent Change: Existing (2002) and 2030 base vs. 2030 Alt. 1

Segment	Percent Change 2002 vs. 2030 Alt 1	Percent Change 2030 Base vs. 2030 Alt. 1
Trindle btw Fairfield & Petersburg	8	(5)
Trindle btw Fairfield & I-81	(20)	(43)
Trindle east of I-81	50	3
York Rd btw Fairfield & Petersburg	24	7
Fairfield St btw Trindle & York	(98)	(99)
York Rd east of Forge Rd	76	(1)
Forge Rd south of York Rd	31	2
York RD btw Fairfield & I-81	1	(31)
Carlton Ave btw Trindle & York	79	(10)
Army Heritage Dr north of Trindle	39	(1)
Fairview St btw Trindle & York Rd	280	(15)

Source: TCRPC TDM; Gannett Fleming

The changes in traffic patterns would alleviate congestion to a large degree within the localized area but not significantly throughout the area analyzed. This is typical as a result of the local nature of the alternative improvements.

Alternative 2 - Connector Pair

This alternative would have a 2-lane road between Trindle Road and York Road directly connecting the southbound off-ramp at Exit 49 with the southbound on-ramp at Exit 48 (just as in Alternative 1). In addition, this alternative includes another connector road to the east of I-81, connecting York and Trindle Roads between Fairview Street and Middlesex Road. Daily traffic volumes for Alternative 1A and the 2030 Base condition are shown in Table 17, below.

Table 17: Daily Traffic Volumes: 2030 Base vs. 2030 Alternative 2 (Connector Road Pair)

	Existing Daily Volume			2030 Daily Forecast Base Conditions		
Segment	WB/SB	EB/NB	Total	WB/SB	EB/NB	Total
Trindle btw Fairfield and Petersburg Rd	7,159	6,976	14,135	6,827	6,271	13,098
Trindle btw Fairfield & I-81	12,247	11,349	23,596	6,827	6,271	13,098
Trindle east of I-81	12,322	10,775	23,097	12,975	11,103	24,078

	Existing Daily Volume			2030 Daily Forecast Base Conditions		
Segment	WB/SB	EB/NB	Total	WB/SB	EB/NB	Total
York Rd btw Fairfield & Petersburg	7,214	7,783	14,997	7,755	8,666	16,421
Fairfield btw Trindle & York	5,087	4,373	9,460	29	31	60
Connector Road	N/A	N/A	- -	8,909	6,692	15,601
York Rd east of Forge Rd	7,820	8,687	16,507	7,491	8,364	15,855
Forge Rd south of York Rd	3,873	3,852	7,725	3,942	3,968	7,910
York btw Fairfield & I-81	10,943	12,227	23,170	7,755	8,666	16,421
Carlton Ave btw Trindle & York	551	790	1,341	421	749	1,170
East Connector Road	N/A	N/A	- -	1,945	1,454	3,399
Army Heritage Dr north of Trindle	7,112	6,771	13,883	7,112	6,598	13,710
Fairview St btw Trindle & York Rds	502	858	1,360	257	489	746

Source: TCRPC TDM; Gannett Fleming

Similar to Alternative 1, Alternative 2 is expected to reduce traffic volumes along the same roadways (Trindle, York, Fairfield) to the west of the I-81 Exit 48 and 49 interchanges compared to the 2030 base. This Alternative 2 traffic reduction is expected to be nearly identical to that of Alternative 1 in this location.

To the east of the interchange, the additional connector road is expected to accommodate approximately 3,400 vehicles daily, resulting in additional decreases on Fairview Street between Trindle and York Road. Although decreasing volumes by nearly half, this accounts for a total of only 600 daily vehicles.

Table 18 shows the change in traffic volumes of Alternative 2 compared to the 2030 Base conditions for each analysis roadway segment.

Table 18: Percent Change: Existing (2002) and 2030 Base vs. 2030 Alt. 2

Segment	Percent Change Existing (2002) vs. 2030 Alt. 2	Percent Change 2030 Base vs. 2030 Alt. 2
Trindle Rd btw Fairfield & Petersburg Rd	6	(7)
Trindle Rd btw Fairfield & I-81	(23)	(44)
Trindle Rd east of I-81	52	4
York Rd btw Fairfield & Petersburg Rd	27	9
Fairfield btw Trindle & York	(99)	(99)
York Rd east of Forge Rd	70	(4)

Segment	Percent Change Existing (2002) vs. 2030 Alt. 2	Percent Change 2030 Base vs. 2030 Alt. 2
Forge Rd south of York Rd	32	2
York Rd btw Fairfield & I-81	4	(29)
Carlton Ave btw Trindle & York	74	(13)
Army Heritage Dr north of Allen St	39	(1)
Fairview St btw Allen & York	146	(45)

Source: TCRPC TDM; Gannett Fleming

Alternative 3 - Full Interchange at Exit 48

The third alternative would have a full interchange at Exit 48, where access is currently provided by a southbound on-ramp to I-81 and the northbound exit ramp to York Rd. There would be no change to the Exit 49 interchange. Table 19 below provides more detail on changes in traffic volumes among selected study area roadway segments.

Table 19: Daily Traffic Volumes: 2030 Base vs. 2030 Alt. 3

	2030 Forecast Base Conditions			2030 Forecast - Alternative 3 Exit 48 Full Interchange		
Segment	WB/SB	EB/NB	Total	WB/SB	EB/NB	Total
Trindle btw Fairfield & Petersburg	7,159	6,976	14,135	7,091	6,778	13,869
Trindle btw Fairfield & I-81	12,247	11,349	23,596	12,184	11,141	23,325
Trindle east of I-81	12,322	10,775	23,097	12,224	10,478	22,972
York btw Fairfield & Petersburg	7,214	7,783	14,997	7,285	8,030	15,315
Fairfield btw Trindle & York	5,087	4,373	9,460	5,093	4,363	9,456
E48/49 west connector road	NA	NA	- -	NA	NA	- -
York Rd east of Forge Rd	7,820	8,687	16,507	7,901	8,724	16,625
Forge Rd south of York Rd	3,873	3,852	7,725	3,900	3,972	7,872
York btw Fairfield & I-81	10,943	12,227	23,170	11,018	12,493	23,511
Carlton Ave btw Trindle & York	551	790	1,341	553	836	1,389
E48/49 west conn	NA	NA	- -	NA	NA	- -
Army Heritage Dr north of Trindle	7,112	6,771	13,883	7,078	6,753	13,831
Fairview St btw Trindle & York	502	858	1,360	501	786	1,287

Source: TCRPC TDM; Gannett Fleming

This alternative would be expected to have a minimal impact (for the better or the worse) on the roadway system compared to the 2030 base forecast.

The table below shows the change in traffic of Alternative 3 compared to the current conditions and the 2030 forecasts under existing conditions for each analysis roadway segment.

Table 20: Percent Change: Existing (2002) and 2030 Base vs. 2030 Alt. 3

Segment	Percent Change Existing (2002) vs. 2030 Alt. 3	Percent Change 2030 Base vs. 2030 Alt. 3
Trindle Rd btw Fairfield & Petersburg Rd	12	(2)
Trindle Rd btw Fairfield & I-81	38	(1)
Trindle Rd east of I-81	45	(1)
York Rd btw Fairfield & Petersburg Rd	18	2
Fairfield btw Trindle & York	109	0
York Rd east of Forge Rd	79	1
Forge Rd south of York Rd	31	2
York Rd btw Fairfield & I-81	48	1
Carlton Ave btw Trindle & York	106	4
Army Heritage Dr north of Allen St	40	0
Fairview St btw Allen & York	325	(5)

Source: TCRPC TDM; Gannett Fleming

The development of a full interchange at Exit 48 would be expected to have no greater impact in 2030 than no improvement at all.

Alternative 4 - Full Interchange at Exit 49

Alternative 4 would have a full interchange at Exit 49, where access is currently provided by a southbound exit ramp to Trindle Road and the northbound on-ramp to I-81. There would be not be any changes to the Exit 48 interchange.

Table 21: Daily Traffic Volumes: 2030 Base vs. 2030 Alt. 4

	2030 Forecast Base Conditions			2030 Forecast - Alternative 4 Exit 49 Full Interchange		
Segment	**WB/SB**	**EB/NB**	**Total**	**WB/SB**	**EB/NB**	**Total**
Trindle btw Fairfield & Petersburg	7,159	6,976	14,135	7,297	7,620	14,917
Trindle btw Fairfield & I-81	12,247	11,349	23,596	7,747	7,995	15,742
Trindle east of I-81	12,322	10,775	23,097	13,252	11,991	25,243
York btw Fairfield & Petersburg	7,214	7,783	14,997	7,358	7,899	15,257
Fairfield btw Trindle & York	5,087	4,373	9,460	450	375	825
E48/49 west connector road	NA	NA	- -	NA	NA	- -
York Rd east of Forge Rd	7,820	8,687	16,507	8,042	8,455	16,497
Forge Rd south of York Rd	3,873	3,852	7,725	3,969	3,986	7,955
York btw Fairfield & I-81	10,943	12,227	23,170	6,908	7,525	14,433
Carlton Ave btw Trindle & York	551	790	1,341	428	669	1,097
E48/49 west conn	NA	NA	- -	NA	NA	- -
Army Heritage Dr north of Trindle	7,112	6,771	13,883	7,030	6,541	13,571
Fairview St btw Trindle & York	502	858	1,360	443	600	1,043

Source: TCRPC TDM; Gannett Fleming

While Alternative 3 had no real effect on the local transportation system, a full interchange at Exit 49 would have a fairly significant one. This alternative is expected to have the most effect on Trindle Road (with which the full interchange would connect) but depending on which side of I-81 these changes vary. Trindle Road to the West of I-81 would be expected to see a decrease of almost 8,000 vehicles daily over the 2030 base forecast. Trindle to the east of the new interchange would experience an increase of over 2,000 vehicles above the base. Conversely, traffic would be reduced on York Road between I-81 and Carlisle and relatively unchanged to the east of I-81.

The telling sign that vehicles would use alternative routes is the decrease in volumes on Fairfield Street. Within the travel demand model this road acts as a connector between the two interchanges. The significant decrease in volumes as a result of the improvement shows the shifting of traffic from Exit 48 to Exit 49. The changes in volumes on Trindle Road point toward traffic being attracted to development to the east in South Middleton and Middlesex Townships.

The table below shows the change in traffic of Alternative 4 compared to the current conditions and the 2030 forecasts under existing conditions for each analysis roadway segment.

Table 22: Percent Change: Existing (2002) and 2030 Base vs. 2030 Alt. 4

Segment	Percent Change Existing (2002) vs. 2030 Alt. 4	Percent Change 2030 Base vs. 2030 Alt. 4
Trindle Rd btw Fairfield & Petersburg Rd	20	6
Trindle Rd btw Fairfield & I-81	(7)	(33)
Trindle Rd east of I-81	59	9
York Rd btw Fairfield & Petersburg Rd	18	2
Fairfield btw Trindle & York	(82)	(91)
York Rd east of Forge Rd	77	0
Forge Rd south of York Rd	32	3
York Rd btw Fairfield & I-81	(9)	(38)
Carlton Ave btw Trindle & York	63	(18)
Army Heritage Dr north of Allen St	38	(2)
Fairview St btw Allen & York	244	(23)

Source: TCRPC TDM; Gannett Fleming

The development of a full interchange at Exit 49 would have a fairly significant impact on the local area road network and improvements should be carefully planned for the change in area traffic distribution.

Alternative 5 - Full Interchanges at Exits 48 & 49

Alternative 5 would provide a full interchange at both Exit 48 and Exit 49, where both currently function as half interchanges.

Table 23: Daily Traffic Volumes: 2030 Base vs. 2030 Alt. 5

	2030 Forecast Base Conditions			2030 Forecast - Alternative 5 Exit 48 & 49 Full Interchanges		
Segment	WB/SB	EB/NB	Total	WB/SB	EB/NB	Total
Trindle btw Fairfield & Petersburg	7,159	6,976	14,135	7,246	7,229	14,475
Trindle btw Fairfield & I-81	12,247	11,349	23,596	7,246	7,272	14,518
Trindle east of I-81	12,322	10,775	23,097	13,261	12,059	25,320
York btw Fairfield & Petersburg	7,214	7,783	14,997	7,425	8,134	15,559
Fairfield btw Trindle & York	5,087	4,373	9,460	33	43	76
E48/49 west	NA	NA	- -	NA	NA	- -

	2030 Forecast Base Conditions			2030 Forecast - Alternative 5 Exit 48 & 49 Full Interchanges		
Segment	WB/SB	EB/NB	Total	WB/SB	EB/NB	Total
connector road						
York Rd east of Forge Rd	7,820	8,687	16,507	8,110	8,504	16,614
Forge Rd south of York Rd	3,873	3,852	7,725	4,013	4,024	8,037
York btw Fairfield & I-81	10,943	12,227	23,170	7,425	8,090	15,515
Carlton Ave btw Trindle & York	551	790	1,341	425	600	1,025
E48/49 west conn	NA	NA	- -	NA	NA	- -
Army Heritage Dr north of Trindle	7,112	6,771	13,883	7,112	6,771	13,883
Fairview St btw Trindle & York	502	858	1,360	502	858	1,360

Source: TCRPC TDM; Gannett Fleming

The result of this analysis is similar to that of Alternative 4 and further reinforces the conclusion that a full interchange at Exit 48 would make little difference in the travel patterns within this area. This alternative is also expected to have the most effect on Trindle Road where the segment to the west of I-81 would be expected to see a decrease of almost 9,000 vehicles daily over the 2030 base forecast, and to the east would experience an increase of over 2,000 vehicles above the base. Traffic would also be reduced on York Road between I-81 and Carlisle by over 7,500 vehicles.

Significant decreases on Fairfield Street and Petersburg Road also occur as a result of this improvement. The table below shows the change in traffic of Alternative 5 compared to the current conditions and the 2030 forecasts under existing conditions for each analysis roadway segment.

Table 24: Percent Change: Existing (2002) and 2030 Base vs. 2030 Alt. 5

Segment	Percent Change Existing (2002) vs. 2030 Alt. 5	Percent Change 2030 Base vs. 2030 Alt. 5
Trindle Rd btw Fairfield & Petersburg Rd	17	2
Trindle Rd btw Fairfield & I-81	(14)	(38)
Trindle Rd east of I-81	59	10
York Rd btw Fairfield & Petersburg Rd	20	4
Fairfield btw Trindle & York Rd	(98)	(99)
York Rd east of Forge Rd	79	1
Forge Rd south of York Rd	34	4
York Rd btw Fairfield & I-81	(2)	(33)

Segment	Percent Change Existing (2002) vs. 2030 Alt. 5	Percent Change 2030 Base vs. 2030 Alt. 5
Carlton Ave btw Trindle & York Rd	52	(24)
Army Heritage Dr north of Allen St	41	0
Fairview St btw Allen & York Rd	349	0

Source: TCRPC TDM; Gannett Fleming

As in Alternative 4, the development of a full interchange at Exit 48 and Exit 49 would have a fairly significant impact on the local area road network and improvements should be carefully planned for the change in area traffic distribution.

Alternative Analysis Summary

Table 25 and the points below summarize the results of the modeling analysis among the 5 alternatives examined.

1. Improvements in the connection between Exits 48 and 49 (Alternative 1) would likely produce the greatest benefits to the Exit 48 and 49 local area transportation system.
2. Alternative 2 would have very similar results as Alternative 1 with additional benefits in reducing traffic on Fairview Street between Trindle and York Roads.
3. The development of a full interchange at Exit 48 (Alternative 3) would not produce significant traffic shifts on area roadways. However, a full interchange at Exit 49 (Alternative 4) is expected to yield some local traffic reductions in the Carlisle area but more traffic to the east of I-81. Alternative 5 is expected to have similar results to Alternative 4.

Table 25: Percent Change: 2030 Base vs. 2030 Alternatives (1 through 5) for Exits 48 and 49

Segment	Percent Change				
	2030 Base vs. 2030 Alt. 1	2030 Base vs. 2030 Alt. 2	2030 Base vs. 2030 Alt. 3	2030 Base vs. 2030 Alt. 4	2030 Base vs. 2030 Alt. 5
	CONNECTOR	CONNECTOR PAIR	FULL INT. EXIT 48	FULL INT. EXIT 49	FULL INT. EXIT 48 & 49
Trindle Rd btw Fairfield & Petersburg	(5)	(7)	(2)	6	2
Trindle Rd btw Fairfield & I-81	(43)	(44)	(1)	(33)	(38)
Trindle Rd east of I-81	3	4	(1)	9	10
York Rd btw Fairfield & Petersburg	7	9	2	2	4
Fairfield St btw Trindle & York	(99)	(99)	0	(91)	(99)
Exit 48 & 49 west Connector Rd	N/A	N/A	N/A	N/A	N/A
York Rd east of Forge Rd	(1)	(4)	1	0	1
Forge Rd south of York Rd	2	2	2	3	4
York Rd btw Fairfield & I-81	(31)	(29)	1	(38)	(33)
Carlton Ave btw York & Trindle	(10)	(13)	4	(18)	(24)
Exit 48 & 49 east Connector Rd	N/A	N/A	N/A	N/A	N/A
Army Heritage Dr north of Trindle Rd	(1)	(1)	0	(2)	0
Fairview St btw Allen & York Rd	(15)	(45)	(5)	(23)	0

Source: TCRPC TDM; Gannett Fleming

7.0 Choices for our Future

A plan is only as strong as its public support and ultimate implementation. As a matter of good public policy and economic common sense, "getting it done" needs to be paired with "doing it right." The development of an action plan constitutes a proactive, strategic approach to moving from the planning and design stages to implementation and construction (as applicable).

As important challenges and decisions are faced in the months and years ahead, the action plan should be the frame of reference to which the borough, surrounding townships and County's elected officials and planning officials can refer in implementing new policies and programming transportation projects. The purpose of the action plan is to provide the framework for many of the decisions that will need to be made along the way. The action plan also provides the basis for tracking progress over time.

In developing interchange area recommendations, the following broad opportunities and challenges were considered:

- The lack of direct access between the two interchanges,
- The need to plan and prepare for additional development in the area,
- The need to protect the area's natural resources,
- The need to protect transportation investments,
- I-81's division of the study area, and
- The study area's development pattern varies from rural/agricultural to the east of I-81, with a town/suburban character to the west of the interstate.

Land Use and Zoning Recommendations

RECOMMENDATION #1: **South Middleton Township should rezone the 86-acre parcel on Spring Garden Street from Light Industrial to Village**. This zoning district is intended to "preserve the quality and character of existing community environment; provide for the filling-in of land within built up areas by permitting a mix of compatible uses; encourage stability and preservation of existing residential communities and community values; allow flexibility in planning and promote compatible land uses in established neighborhoods". (SMT Zoning Ordinance, Article X). This type of development is more consistent with existing development patterns in both Carlisle Borough and South Middleton Township.

Full compliance with the Township's Traffic Impact Study, access management, and buffer requirements is essential, particularly along I-81. Improved access to the property via the cul-de-sac at Giant Lane or through to Petersburg Road (or both) will be necessary to distribute the potential traffic that would be generated. One concept would include constructing a street on an existing township-owned right-of-way between the intersection of Pine Street and Petersburg Road to a new signalized intersection on York Road. In supporting this concept, the township should consider amending its official map to include this potential future improvement. Carlisle Borough and South Middleton Township will need to work together to determine the most effective solutions. In addition, the Township should insist that the physical design of any future development is compatible with the surrounding area.

An additional area of coordination involves the issue of broader access between the property and I-81. As such, this recommendation should be implemented in tandem with a new access connection created in the Exit 48 and 49 interchange study area to prevent traffic destined for I-81 northbound from traversing the Carlisle Mall property.

Even if a connector road linking Exit 48 and 49 is eventually built, additional access through Giant Lane would be needed to allow residential development.

BASIS:

Phase 1 Data /Public Involvement -

- The property is currently limited by a lack of adequate roadway access to support industrial uses. In addition, industrial uses are not compatible with existing development.
- Results of the public involvement exit survey indicate that commercial retail, office and residential uses were preferred over industrial, manufacturing, or warehousing.

Table 26: Trip Generation Comparison

Development Type		Trips Generated
Current Allowable Use	Light Industrial (1,124,000 sq ft)	8,300
	Commercial (1,124,000 sq ft)	48,157
Recommended Allowable Use	Village 300,000 sq ft commercial	12,872
	194 Townhomes	1,127

Source: ITE Trip Generation Manual; Gannett Fleming

Economic Impact Assessment (IMPLAN)[6] For assumed mix of development based on provisions of existing zoning: 194 town houses and approximately 300,000 sq ft general commercial.

[6] The results of the assessment include an estimation of the number of new permanent jobs, as well as the compensation associated with those jobs that will be introduced into the local economy. It also estimates the number of temporary construction jobs created and related compensation. The model assumes that all spending is *new* spending, as opposed to *transferred* spending from elsewhere in the region. Therefore, the number of jobs created in the model results represents a **maximum**. The reality is that the number of *new* jobs is likely lower.

Construction (Temporary)	Operations (Permanent)
445 Construction Jobs (Direct) Average earnings per worker $41,000.00	617 Direct Jobs 90% in General Merchandise Stores Avg earnings per worker $20,000.00
194 Indirect Jobs (e.g., maintenance; wholesale trade, architectural/engineering) Average compensation $30,445.00*	68 Indirect Jobs (e.g. commercial printing, employment services, management of companies) Avg compensation $36,331.00
165 Induced Jobs Average compensation $29,337.00	97 Induced Jobs Avg. compensation $31,599.00

* Average employee compensation includes benefits such as health and life insurance, retirement payments, and non-cash compensation; therefore, it is higher than actual earnings.

Community Impact – 2004 Budget figures from South Middleton Township and the School District were used in running *Penn State University's Economic Impact Model: Costs and Revenues of Residential Development* to estimate the impact of the assumed 194 new town houses. The results are summarized here and more fully documented in the Appendices. It should be noted that Township officials felt that the projected new revenues from the model was higher than expected, thus indicating that the township would likely experience a negative impact. The net fiscal impact would therefore be even greater.

Category		Value
School District		
1. Total New Revenues	$	404,273
2. Total New Costs	$	680,204
3. Net Positive Impact on School District	$	(275,931)
Township		
4. Total New Revenues	$	224,783
5. Total New Costs	$	114,353
6. Net Positive Impact on Township	$	110,430
7. Net Fiscal Positive Impact from the Development	**$**	**(165,501)**

RECOMMENDATION #2: Ideally, **South Middleton Township should modify its existing Commercial zoning designation along York Road**. The Township must give very careful consideration to any proposals for the zone. Low impact businesses, particularly those that would service the existing and future residential areas adjacent to the zone would be most appropriate. Full compliance with the Township's Traffic Impact Study, access management, and buffer requirements is essential. In addition, the Township should insist that the physical design of the development is also compatible with the surrounding area. Pedestrian access from the high density zone to the north should be encouraged as part of any new development plans.

BASIS:

Phase 1/Public Involvement

- Many residents would prefer to have a more residential orientation and character along the PA 74 corridor, while keeping commercial activity focused on PA 641. However, given the potential for new residential development adjacent to the zone, as well as to the south, some **small scale commercial development** that would provide personal services locally *may* allow for improved distribution of traffic.
- Results from the public involvement survey also indicated that some commercial development would be welcome.
- This area should serve as a transition zone from existing agriculture/conservation areas to the east to the growing commercial area to the west.
- Access management is a concern: "There are too many points of access along York Road to accommodate the posted speed limit."

Trip Generation

- The Commercial zone, if fully developed, could allow for approximately 340,000 square feet of general commercial uses, which would generate approximately 15,000 trips per day. Careful review of each proposed development will be necessary to ensure that actual trips are minimized and that access is carefully managed. The chart to the right provides an example of a small strip center. The ITE manual indicates that this center would generate approximately 2,200 trips per day.

Type of Store	Gross Floor Area (sq ft)
Video Rental	3,500
Hair Salon	1,200
Pizza Place	1,500
Pharmacy	11,000
Mailboxes, etc.	1,000
Total Gross Floor Area	18,200

Source: LMS Commercial Real Estate Online

- For comparison, a 2,000 sq. ft. drive-thru, fast food restaurant can generate up to 900 trips per day.

- For comparison purposes, if the zone were developed as High Density residential, approximately 117 new town houses could be built, which would generate approximately 734 trips per day.

Economic Impact Assessment (IMPLAN) for the small shopping center described above.

Construction (Temporary)	Operations (Permanent)
17 Construction Jobs (Direct) Average earnings per worker $41,000	174 Direct Jobs Average earnings per worker $20,140
7 Indirect Jobs Average compensation $28,912*	15 Indirect Jobs Avg compensation $29,520
6 Induced Jobs Average compensation $28,117	26 Induced Jobs Avg. compensation $26,866

* Average employee compensation includes benefits such as health and life insurance, retirement payments, and non-cash compensation; therefore, it is higher than actual earnings

Community Impact

Results from the *Penn State University's Economic Impact Model: Costs and Revenues of Residential Development* for 117 new town houses are summarized below.

Category		Value
School District		
1. Total New Revenues	$	243,814
2. Total New Costs	$	410,226
3. Net Positive Impact on School District	$	(166,412)
Township		
4. Total New Revenues	$	135,565
5. Total New Costs	$	68,965
6. Net Positive Impact on Township	$	66,599
7. Net Fiscal Positive Impact from the Development	**$**	**(99,813)**

RECOMMENDATION #3: South Middletown Township should rezone the existing Light Industrial parcel between the Carlisle Crossings development and Fairview Street.

BASIS:

- The area in question was not incorporated into the Carlisle Crossing commercial land development. Given the access available via Wood Lane (and surrounding residential properties), the township should consider rezoning the area as part of its Village zoning district.

RECOMMENDATION #4: **The South Middleton Township Municipal Authority should not extend sewer and water infrastructure any further into the agriculture/conservation zones east of the interchange unless there are specific health and safety concerns that would necessitate such an extension**. At the present time, sewer is available south of Trindle Road (PA 641) from the Borough to east of Fairview Street. In addition, if and when public utilities become available in the vicinity of Trindle Road and Army Heritage Drive, the Middlesex Township Municipal Authority should not extend public utilities along frontage of lands in existing agricultural use on Trindle Road east of the existing Fetrow Acres residential development.

BASIS:

Phase 1/Public Involvement

- Preserves open space and agricultural lands while discouraging high density development.
- Many residents would prefer to see no development in the area.
- This recommendation is consistent with the County and Middlesex Township's Future Land Use Maps.

RECOMMENDATION #5 - Middlesex Township and South Middleton Township should maintain the current extent and maintain or reduce allowable development densities in their Residential Farm and Agriculture/Conservation zoning districts within the study area. In addition, Middlesex Township should consider the development of a more effective agriculture/conservation zoning district to better protect their most productive farmland, much of which is located within the study area in the Residential Farm District.

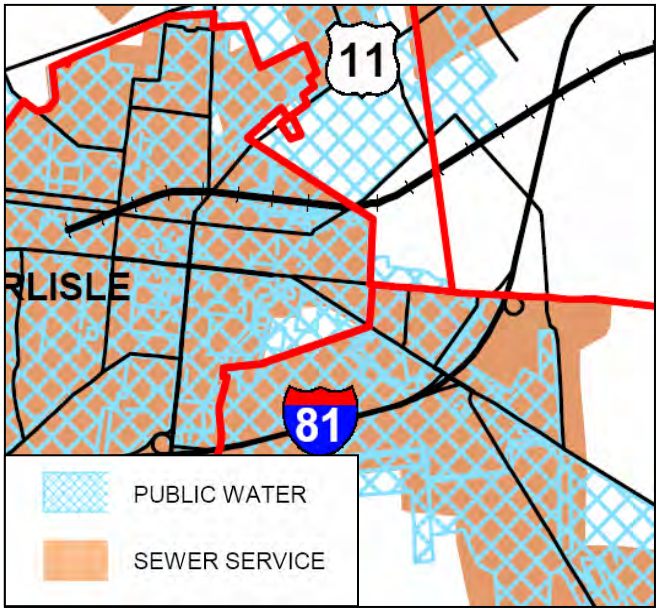
BASIS:

Phase 1/Public Involvement

- Demonstrates a commitment by the Townships to public preference for maintaining the area's rural character while still allowing for some growth.

Trip Generation:

- If the areas are developed as residential as per each municipal zoning ordinance, a total of approximately 455 homes could be built, equating to approximately 4,100 trips per day.



Existing Sewer and Water Service
(Source: Cumberland County Comprehensive Plan)

Transportation Recommendations

RECOMMENDATION #1: **Construct a connector road linking the south bound off-ramp of I-81's Exit 49 with the south-bound on-ramp of Exit 48**. Estimated planning-level engineering costs (including preliminary engineering and construction) for this improvement are approximately $84,000,000. This estimate includes associated lane additions to I-81, PA 74, PA 641, the on- and off-ramps to I-81, four new traffic signals and a 2,000 foot long soundwall. (The cost of constructing the connector road in isolation is $2.57 million.[7])

ALTERNATIVE COMPARISON: Five traffic alternatives were evaluated in comparing trip distribution: 1) a connector road, directly linking Exit 48 and Exit 49, 1a) a connector pair, including a second link east of Fairview Street, 2) a full interchange at Exit 48, 3) a full interchange at Exit 49, and 4) full interchanges at both Exit 48 and Exit 49. Highlights are shown in the table below.

Table 27: Alternative Comparison

Alternatives	Planning-level Cost	Features	Benefits/Comments
1. Connector Road	$84,200,000	A two-lane connector road providing a direct link between E48 and E49.	Produces the greatest traffic reduction on surrounding local roadways.
1a. Connector Pair	$84,200,000 *assumes second roadway would be built with private funds*	Alternative 1, plus a privately-built N/S connector east of Fairview Street between Trindle and York Roads.	Same results as Alternative 1, with even greater reductions in volumes on Fairview Street.
2. Full E48 Interchange	$99,615,000	Completes Exit 48 and adds a fourth lane* to I-81 a mile in each direction.	Does not produce significant shifts in traffic on area roadways.
3. Full E49 Interchange	$92,693,000	Completes Exit 49 and adds a fourth lane to I-81 a mile in each direction.	Similar to #2, with greater reductions on Fairfield and Fairview Streets.
4. Full E48 & E49 Interchange	$101,027,000	Completes each interchange and adds a fourth lane to I-81 a mile in each direction.	Similar results in traffic distribution as Alternative 3.

[7] The estimate includes a 200' turning lane and traffic signal on the connector at both of its ends. It includes costs for construction, engineering, right-of-way, inspection, and utilities. However, it assumes no widening to PA 74, PA 641 or I-81 and no improvements to any of the ramps, intersections, or structures at Exits 48 and 49.

* A third lane on I-81 is already assumed, as per the region's 2030 LRTP

ALTERNATIVE TRIP DISTRIBUTION: Traffic impacts on other local roads vary by location and alternative. Table 28 below shows the change in traffic from the current conditions and among each alternative.

Table 28: Trip Distribution by Alternative

	Segment	Percent Change 2030 Base vs. 2030 Alt 1	Percent Change 2030 Base vs. 2030 Alt 1A	Percent Change 2030 Base vs. 2030 Alt 2	Percent Change 2030 Base vs. 2030 Alt 3	Percent Change 2030 Base vs. 2030 Alt 4
1	Trindle Btwn. Fairfield St. and Petersburg Rd.	-5%	-7%	-2%	6%	2%
2	Trindle Btwn. Fairfield and Interchange Connector/I-81 Interchange	-43%	-44%	-1%	-33%	-38%
3	Trindle East of I-81 Interchange	3%	4%	-1%	9%	10%
4	York Rd. Btwn. Fairfield St. and Petersburg Rd.	7%	9%	2%	2%	4%
5	Fairfield St. Btwn. Trindle and York Rd.	-99%	-99%	0%	-91%	-99%
6	Exit 48 and Exit 49 West Connector Rd.	N/A	N/A	N/A	N/A	N/A
7	York Rd. East of Forge Rd.	-1%	-4%	1%	0%	1%
8	Forge Rd. South of York Rd.	2%	2%	2%	3%	4%
9	York Rd. Btwn. Fairfield and Interchange Connector/I-81 Interchange	-31%	-29%	1%	-38%	-33%
10	Petersburg Rd. Btwn. Trindle and York Rd.	-10%	-13%	4%	-18%	-24%
11	Exit 48 and Exit 49 East Connector Rd.	N/A	N/A	N/A	N/A	N/A
12	Army Herritage Dr. North of Allen St	-1%	-1%	0%	-2%	0%
13	Fairview St. Btwn. Allen St. and York Rd.	-15%	-45%	-5%	-23%	0%

BASIS:

- During the May 2004 public meeting at Lamberton Middle School, the public raised several issues and concerns including:
  - The elimination of cut-through traffic, particularly on Fairview and Fairfield Streets
  - Noise (particularly engine retarder noise after the posted speed limit on I-81 was lowered to 55 mph)
  - Air quality
  - Accessibility and mobility
  - Safety
  - Light pollution
  - Farmland preservation, and
  - General concerns over a perceived decrease in quality of life over time.
  - Residents who live or work outside the immediate area and business owners will be most concerned with seeing access to I-81 improved to simplify their trips. Regional motorists traveling along I-81 who exit for food or gas will desire a design that has a standard, easy-to-use configuration.

- Funding for preliminary engineering of Exits 48 and 49 is included in the region's TIP. In conjunction with increasing traffic volumes, a wide range of preliminary alternatives will need to be developed and evaluated. Design simplicity and function, ramp geometry, adequate weaving distances, intersection capacity and level-of-service, impact minimization, cost control, and utilization of existing PennDOT right-of-way reserved for future ramps will be just some of the issues to consider.

- Alternative 1 (Connector Option) would provide an alternative route for traffic attempting to access I-81 northbound without negotiating local roads.

- An understanding of current traffic issues and how planned development would redistribute traffic for various alternatives is key to designing a successful solution for this project. With the half-interchanges, traffic moving between destinations east of Carlisle and I-81 often cuts through on Fairview Street or Fairfield Street. Recent development along York and Forge Roads have increased the volume of cut-through traffic. Traffic data along Fairview Street between York Road and Trindle Road from 1998 to 2004 shows an increase of nearly 8 percent per year, which is significantly greater than generalized traffic growth in the area.

- The opening of the Army Heritage Museum will further increase traffic on existing roadways as will planned development such as the Carlisle Crossing Commercial Retail Development, the Keystone Property Trust (dubbed *Monster Warehouse* by local opponents), and other developments along York and Trindle Roads. As traffic volumes increase, intersections and roadways in the study area will increasingly exhibit operational constraints. Potential interchange modifications will need to consider the redistribution of traffic and the relationship between future traffic, infrastructure development, and land use. Changes to the interchanges will likely have an impact on other intersections beyond the interchange areas.

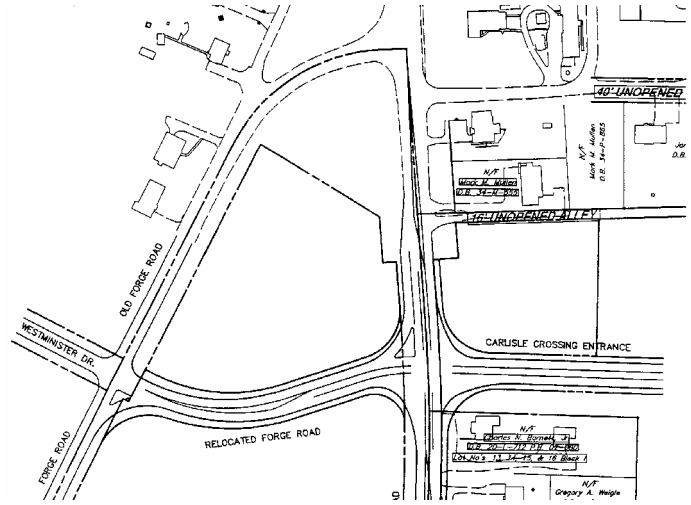
- Preliminary engineering for Exit 48 and 49 should consider the access issues related to the Spring Garden Street property and attempts at improving its accessibility by way of a possible connector from the intersection of Pine Street at Petersburg Road to a new signalized intersection at York Road.

RECOMMENDATION #2: **Complete the transportation improvements associated with the Carlisle Crossing Development** – primarily the relocation of Westminster Drive extension and the signalization of its intersection with PA 74.

BASIS:

- Signalizing the intersection of Forge and York Roads was a recommendation in the Roadway Safety Audit of April 2004.
- Additional residential growth to the south, coupled with the 9,000 daily trips generated by Carlisle Crossing make the implementation of this recommendation essential.
- Realignment of the roadway will address safety concerns at the existing location. This point was frequently raised by the public during the May 2004 meeting.
- The developer of Carlisle Crossing is willing to contribute some funding for the realignment and signalization of the new intersection.

Figure 7: Schematic of Roadway Relocation



RECOMMENDATION #3: Based on an annual increase of 1.5%, Army Heritage Drive and Fairview Street are expected to operate at acceptable levels of service through 2030 based on existing capacity. (Fairview Street has a current AADT of 6750.) However, **PennDOT, South Middleton Township and Middlesex Township should continue to monitor the operation of both roadways as properties continue to develop within the study area**.

Along Army Heritage Drive, particular attention will need to be paid to the intersections with Claremont Road and Trindle Road, the at-grade rail crossing, and the condition of the cartway and shoulders given the likelihood of an increase in bus/tourist traffic destined for the new museum. With regard to the public at-grade rail crossing, the township should coordinate with the Harrisburg MPO in having the crossing be considered for placement on its line item for rail grade crossing safety projects. Such an action would typically follow an inspection by the PUC to determine what modifications (if any) would be needed for the crossing. (An inventory of existing conditions of the crossing must be made and a formal action by the PUC made before any candidate projects would be considered by the MPO for placement on the TIP.) The crossing (#517695U) already appears on the Federal Railroad Administration's listing of inventoried crossings. Updates to the inventory would need to be made as conditions change.

As the undeveloped properties immediately east of Fairview Street develop, sidewalks should be constructed for improved pedestrian accommodation in the area.

BASIS:

- According to the traffic analysis, significant increases in traffic volumes are forecasted at Fairview Street's intersections with both Trindle and York Roads between now and 2030.
- Improvements would help remove traffic from York Road west of I-81.
- Army Heritage Drive will likely be the main collector route to the planned museum. In addition, new residential development to the north of the study area may begin to use the road as a primary route to any new commercial development such as the proposed Carlisle Crossings Regional Shopping Center.

RECOMMENDATION #4: Address the deficiencies noted in the project Traffic Safety Audit of PA 641 and PA 74:

PA 641/Trindle Road

- Two separate crest curves could pose sight distance limitations. A longer vertical curve providing additional sight distance may be preferable.
- Guiderail with improper end treatments were noted in directional side of traffic.
- Non-breakaway utility poles exist in close proximity to the roadway.
- Faded pavement markings exist between Lowe's and McDonald's on PA 641. Faded pavement markings lowers visibility, particularly in rainy or dark conditions.
- Pedestrian crossing pushbutton is difficult to access due to its placement above a drainage inlet.

PA 74/York Road:

- Consideration should be given to consolidate access through the definition of driveways through the use of curbing.
- There are inconsistencies between the lane use markings and receiving lanes through the intersection with Fairfield Street.
- PennDOT's annual Betterment Program is developed using public and legislative input, as well as the Department's Pavement Management System. The study area municipalities should work with PennDOT District 8-0 and the County Maintenance Manager to include these recommended improvements as part of a coordinated maintenance program.

Other

- Although not specifically noted in the study safety audit, the issue of "lost" truckers was raised by study area residents as a concern. According to area residents, truckers commonly exit I-81 at the wrong location due to poor directions and inadequate signage on I-81. Improved signage could possibly mitigate this issue.
- Speeding is a safety concern on both PA 74 and PA 641as additional development has increased the number of driveways and "decision points" for motorists. PennDOT should periodically evaluate driving speeds along these roadways. As the area further develops, the Pennsylvania State Police should increase enforcement to improve safety and compliance with the posted speed limit.

8.0 Appendices

- Mapping
- Exit Survey (Instruments/Results)

Appendix A
Study Mapping

- Base Map
- Undeveloped Parcels with Existing Zoning
- Land Use Recommendations
- Transportation Recommendations

Interstate 81Exits 48 & 49
Base Map

Legend

- Railroads
- Roads
- Municipal Boundaries

Map Notes:

The base mapping consists of aerial photography flown in April 2003 provided by PAMAP

The mapping was compiled in Pennsylvania State Plane South coordinate system with units in feet and a horizontal datum of NAD 83. Parcel boundaries were provided by Cumberland County, and Zoning information was provided by the individual municipalities.

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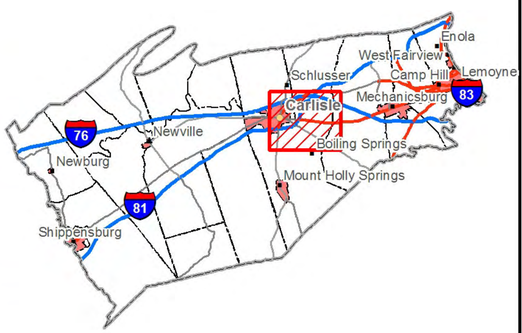

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September 2005

Interstate 81 Exits 48 & 49
Undeveloped Parcels with Existing Zoning

Legend

- Railroads
- Planned Projects
- Developed Parcels
- Municipal Boundaries

Carlisle Borough Zoning

- Commercial
- Agriculture

Middlesex Township Zoning

- Industrial - Light
- Residential - Town
- Residential - Farm

South Middleton Township Zoning

- Residential High Density
- Residential Medium Density
- Commercial
- Agriculture
- Industrial - Light
- Village

- Traffic Analysis Zones (TAZ)

Map Notes:

The base mapping consists of aerial photography flown in April 2003 provided by PAMAP

The mapping was compiled in Pennsylvania State Plane South coordinate system with units in feet and a horizontal datum of NAD 83. Parcel boundaries were provided by Cumberland County, and Zoning information was provided by the individual municipalities.

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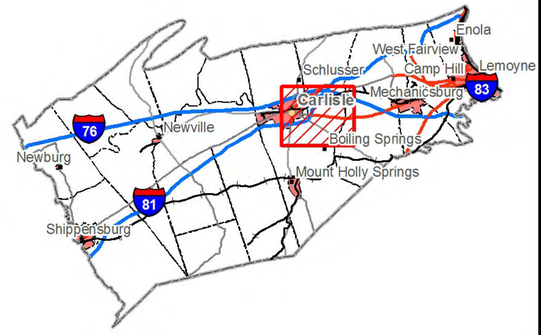

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September 2005

Interstate 81 Exits 48 & 49 Land Use Recommendations

Legend

- Railroads
- Planned Projects
- Developed Parcels
- Municipal Boundaries

Carlisle Borough Zoning

- Commercial
- Agriculture

Middlesex Township Zoning

- Industrial - Light
- Residential - Town
- Residential - Farm

South Middleton Township Zoning

- Residential High Density
- Residential Medium Density
- Commercial
- Agriculture
- Industrial - Light
- Village

- Traffic Analysis Zones (TAZ)
- Land Use Recommendations

Map Notes:

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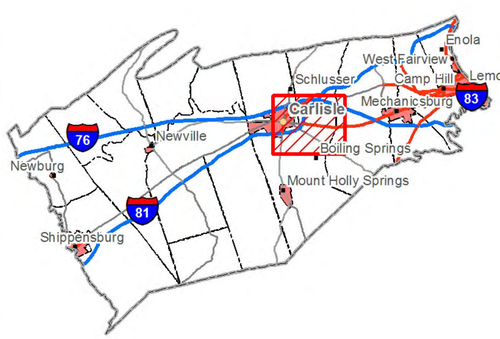
The mapping was compiled in Pennsylvania State Plane South coordinate system with units in feet and a horizontal datum of NAD 83. Parcel boundaries were provided by Cumberland County, and Zoning information was provided by the individual municipalities.

0 0.25 0.5 1 Miles



Prepared By:

Gannett Fleming

207 Senate Avenue, Camp Hill, PA 17011

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September 2005

Interstate 81 Exits 48 & 49 Transportation Recommendations

Legend

- Railroads
- Proposed Roads
- Planned Projects
- Municipal Boundaries
- Developed Parcels

Carlisle Borough Zoning

- Commercial
- Agriculture

Middlesex Township Zoning

- Industrial - Light
- Residential - Town
- Residential - Farm

South Middleton Township Zoning

- Residential High Density
- Residential Medium Density
- Commercial
- Agriculture
- Industrial - Light
- Village

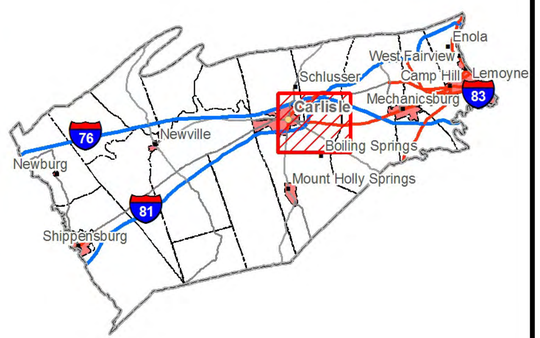
- Traffic Analysis Zones (TAZ)
- Transportation Recommendations

Map Notes:

The base mapping consists of aerial photography flown in April 2003 provided by PAMAP

The mapping was compiled in Pennsylvania State Plane South coordinate system with units in feet and a horizontal datum of NAD 83. Parcel boundaries were provided by Cumberland County, and Zoning information was provided by the individual municipalities.

0 0.25 0.5 1 Miles



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Septemeber 2005

NORTH MIDDLETON

MIDDLESEX

CARLISLE

SOUTH MIDDLETON

1. CONSTRUCT CONNECTOR ROAD

2. RELOCATE WESTMINSTER DRIVE & SIGNALIZE

3. MONITOR RR CROSSING SAFETY

4. ADVANCE SAFETY PROJECTS
- Improve faded pavement markings on PA 641
- Replace deficient guiderail end treatments
- Consolidate access on PA 74 through curbing

TR-1

TR-2

TR-3

TR-3

Claremont Road

Norfolk Southern Railroad

Army Heritage Drive

South Middlesex Road

E High Street

Trindle Road

York Road

Spring Garden Street

Petersburg Road

Forge Road

Lisburn Road

76

11

81

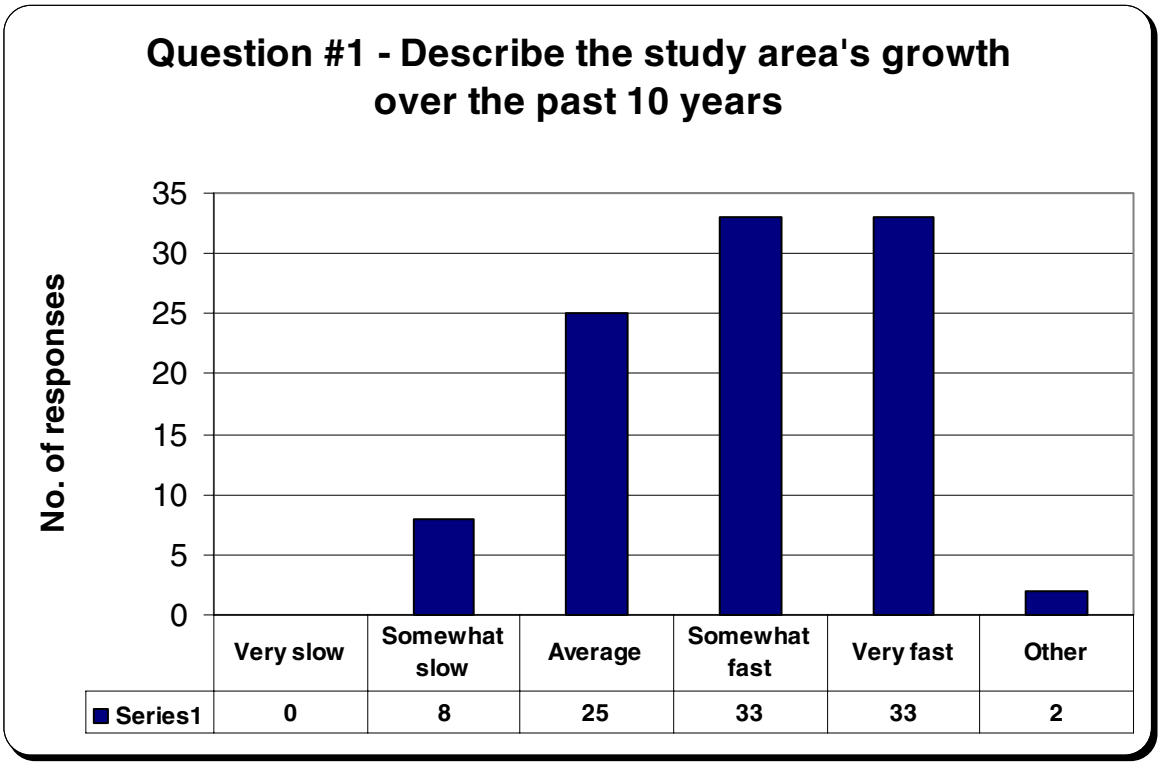
641

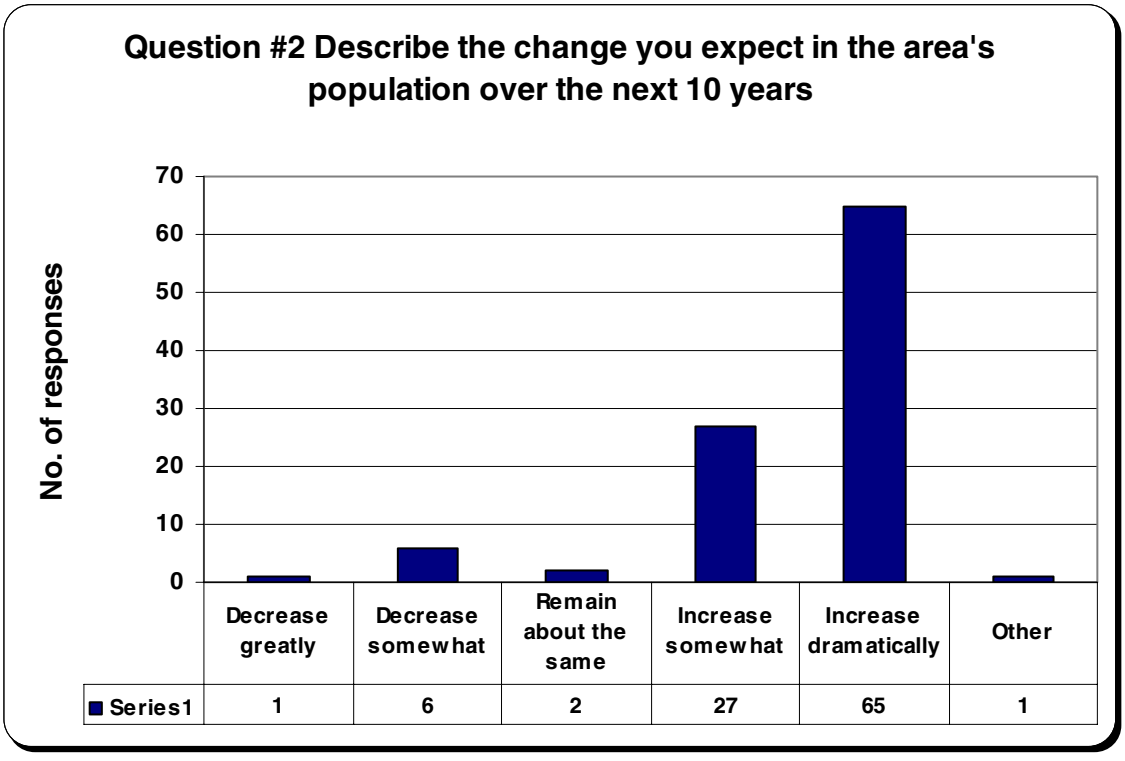
74

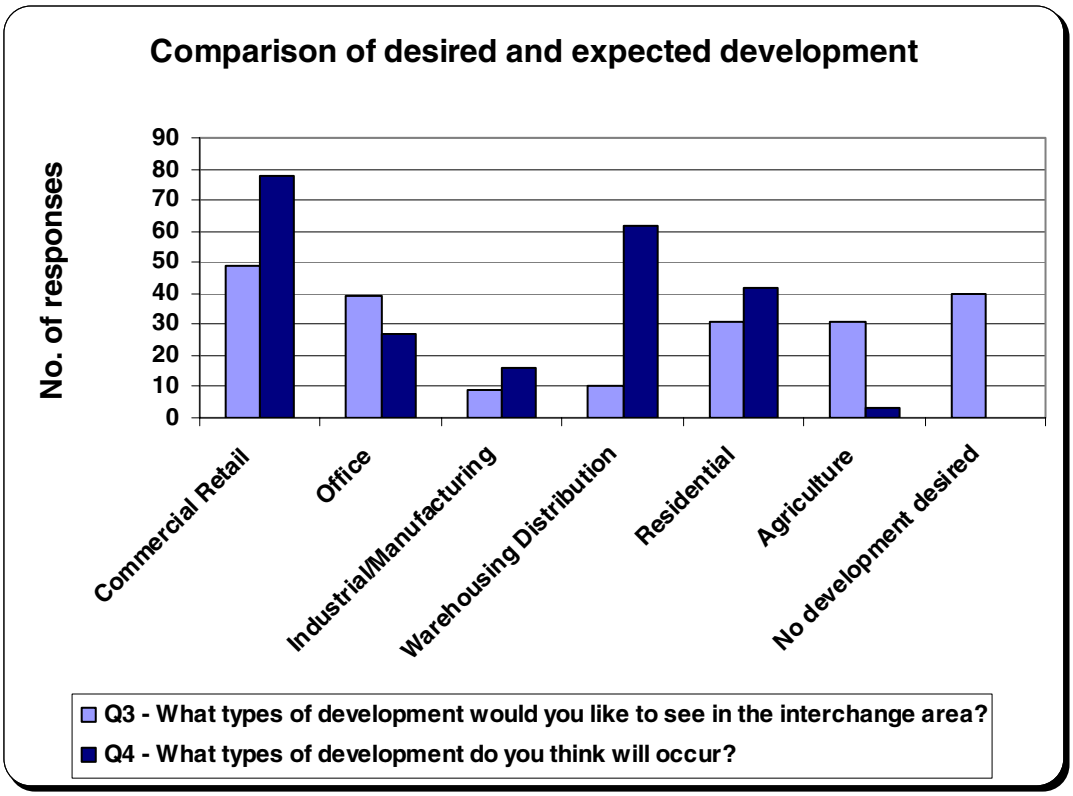
Appendix B
Public Meeting Survey

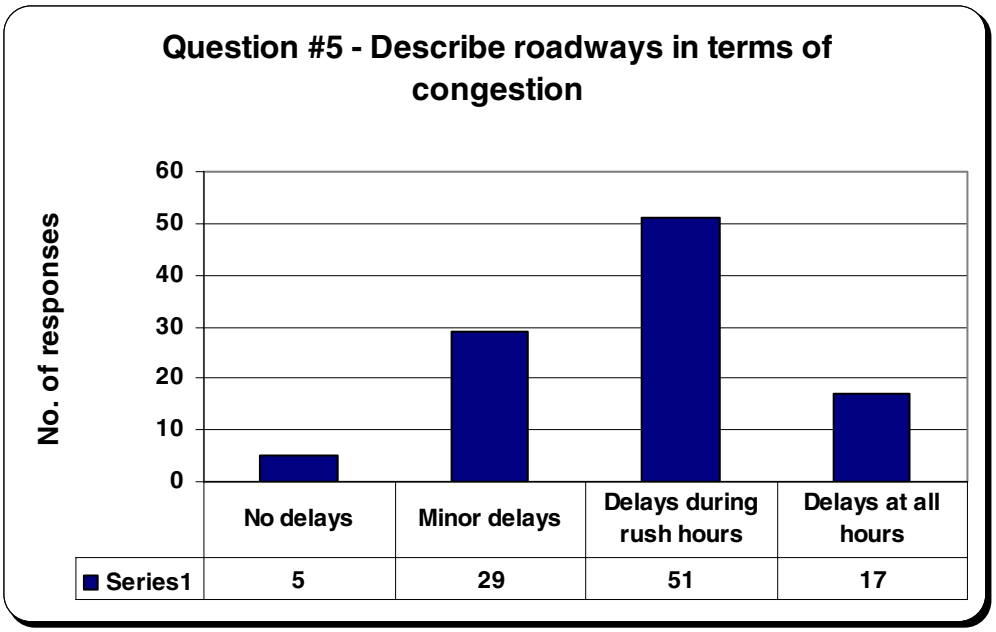
- Instrument
- Results

Exits 48 & 49 – York Road and High Street
Public Open House #1 - Exit Survey Summary
May 2004


Question #1 - Describe the study area's growth over the past 10 years
No. of responses
35
30
25
20
15
10
5
0
Very slow
Somewhat slow
Average
Somewhat fast
Very fast
Other
Series1
0
8
25
33
33
2


Question #2 Describe the change you expect in the area's population over the next 10 years
No. of responses
70
60
50
40
30
20
10
0
Decrease greatly
Decrease somewhat
Remain about the same
Increase somewhat
Increase dramatically
Other
Series1
1
6
2
27
65
1

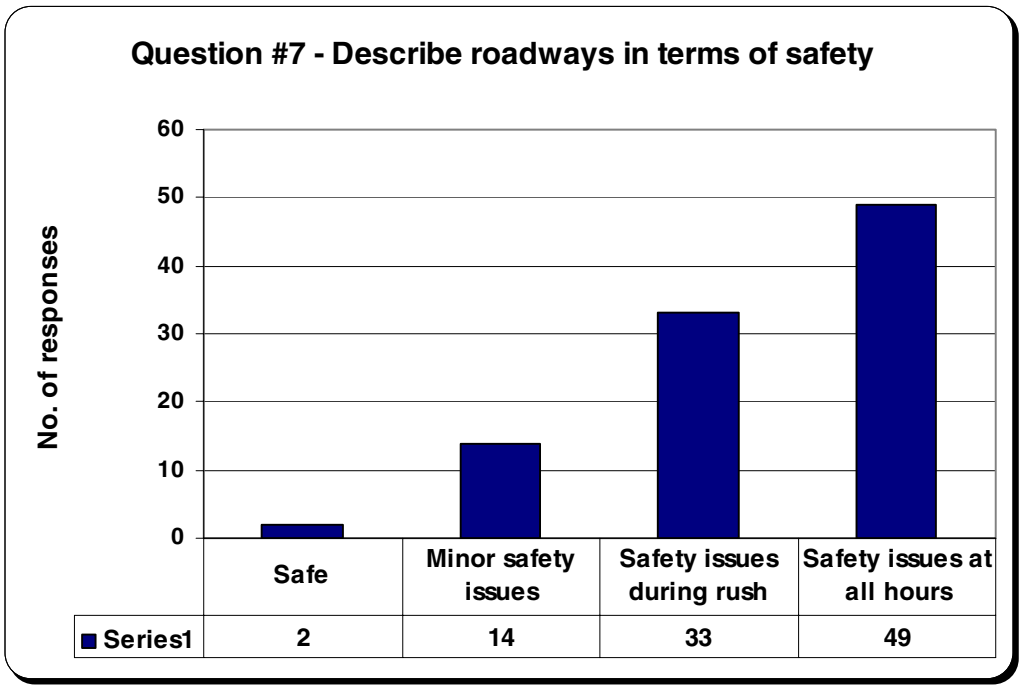

Comparison of desired and expected development
No. of responses
90
80
70
60
50
40
30
20
10
0
Commercial Retail
Office
Industrial/Manufacturing
Warehousing Distribution
Residential
Agriculture
No development desired
Q3 - What types of development would you like to see in the interchange area?
Q4 - What types of development do you think will occur?



Q# 6 – List any specific locations in the study area where traffic congestion is currently a problem.

- Currently acceptable; not adequate for keystone or Carlisle Crossing
- Forge Road & 74 (York Rd)
- Rte 34 North/South Int.
- York Rd from Giant Lane to Forge
- Left from York to Fairview/ Left from Forge to York
- Traffic on York has increased significantly; hard to pullout onto York at various times of day
- Forge/ 74; Fairview/Forge
- Valley Rd/74
- York/Fairview; Forge/York; Exit ramps at York and Trindle
- The point; Forge/York; Fairview/York; exit ramp to York
- Petersburg to York; valley to York and Trindle; Forge to York
- Petersburg to York; Forge to York
- York/Fairview; Forge/York; Exit ramps at York
- all of York into Carlisle from SMT; York/Forge; York and Fairview; 81 off ramp at Trindle and York
- congestion on Fairview between York & Trindle; truck traffic prohibited but not enforced
- Fairview/Trindle
- Forge/York
- Petersburg/York;Giant Lane/York
- Trindle/Fairview
- York/Forge; York/Fairview
- York/Forge; York/Fairview; York/Fairfield
- York/Petersburg
- Forge/York
- Major problems on 81 itself…
- Forge/York; Fairfield/York
- Petersburg/York
- Forge/York; Fairfield/York; Trindle to HighSt
- Forge/York
- York/Fairview
- getting on at York and merging

- York/Fairview; York/Forge
- York/Forge; York/Fairview; York/Fairfield
- York/Forge
- York/Fairview; York/Forge
- York/Forge; need better way to n on 81 from 74 and to get off 81 to 74
- Fairfield to S on York
- York/Fairview; York/Forge; Fairview/Trindle; York and farmer's mkt; all along Trindle and Fairview
- rte 11; Forge rd; Fairview rd
- York/Forge; 81/641; 641/York
- York/Fairview no left turn lane or signal
- Petersburg/York
- Forge/York; point; 74 from Fairview to the point
- turning left out of any side street west of 81 onto York south
- from exit 48 and 49 to the point
- York from exit to point; especially during car shows
- turn from residential area to 74 S to 81; Forge/York
- 81 & HighStreet
- York/Forge
- Fairfield and Trindle; Fairfield and York
- the point; Trindle and interchange; exit ramp to York
- side streets meeting Trindle and York
- Forge rd; Petersburg; Trindle and York in and out of Carlisle
- Mayapple/York; Mayapple/Forge; traffic density of 81, notwithstanding reduced speed
- concerns are of truck traffic increases
- HighStreet at spring garden
- 81- Ext 48
- Fairview street; York and Forge
- Fairview between York and Trindle; Forge/York/81
- Higher truck traffic in HighStreet exchange
- Exit 49; valley street; getty station to mall
- 74 and Petersburg rd
- Forge/York; Petersburg/York; the point
- 48&49
- York/Fairview
- York/Fairview; entrance ramp to 81 SB
- entering 81 during rush hours
- truck traffic is a concern along 641; Highway can't accommodate increase
- York Rd
- York rd-heavy traffic during rush hours; very difficult to exit from little john restaurant onto York
- Trindle/Fairfield; 74 Fairfield; Trindle/claremont
- exiting traffic from 81 turns around in driveway; residential roads used to connect York and Trindle
- getting on Trindle and York from streets in the development
- Kenwood Ave -trouble getting onto Trindle and York roads
- Forge and Fairfield
- York/Forge
- York rd; Petersburg rd; Forge rd; Highst
- York/Petersburg; York/Forge; the point
- Petersburg/York; Fairfield/York
- York wood lane
- Fairview and Trindle



Q# 8 - List any specific locations in the study area where safety is currently a problem.

- Anywhere w/ large trucks
- York/ Forge; Fairview/74 turning east
- Get on ramp off rte 34 to 81N
- York Rd from 641 to Forge
- York/ Forge; I-81 speed and volume; left from ramp to York
- York/Forge; York at farmers market
- 81 at York - ramps
- Left from Forge to York
- York/Forge; York at farmers market
- see #6;
- Lowe's lot to York; York/Forge; exit ramp to York
- See #6; also ramps @ 34
- 34 onto 81N; Petersburg to York
- reduce speed limit on York
- reduce speed limit on York; it's like a raceway near Mayapple
- Fairview being used as connnector but is narrow w/sharp turns causing safety concerns
- 1400-1480 Trindle is passing zone through multiple driveways
- Fairfield and York
- Forge/York; Fairview/Forge & Petersburg; Petersburg/York
- Exit 48 NB
- Exit 48 NB
- Trindle/Fairview
- Fairfield and York; 81S ramp & York; Forge Rd
- need light at York and Petersburg
- 81 in Carlisle area
- left from Fairfield to York
- Petersburg rd
- Fairfield to York
- 81 interchanges all deficient

- Mayapple-York sight distance; 81NB ramp at 48
- 81 at ramps; several York intersections
- 81 need guard rails between n & s lanes
- York/Forge; need better way to n on 81 from 74 and to get off 81 to 74
- Fairview street - children at play; Forge and York
- York/Forge
- exit ramps at York and Trindle; Fairview has too much traffic
- Cross traffic exiting York and Trindle; Fairfield at market house
- any off street coming into York
- Drivers not slowing down once off the interstate
- Too many to name
- from exit 48 and 49 to the point
- Study area has an issue of speeders - no one wants to do the speed limit
- turn from residential area to 74 S to 81; Forge/York
- Cars and trucks trying to get off during the times when 81 is shut down
- 81 exits
- 81; 11; Trindle; York
- Farmer's market
- Fairfield and Trindle; Fairfield and York
- side streets meeting Trindle and York
- all roads entering 74, esp. Forge and Petersburg; need signals
- Mayapple/York; Mayapple/Forge; traffic density of 81, notwithstanding reduced speed
- Middlesex speed trap on Trindle at paradise dr; 74 /Fairview; ex 49 onto Trindle east; York and Trindle
- HighStreet below east and spring garden st
- Fairview street; Mayapple drive
- left to York from Mayapple; hill on York restricts visibility
- From exit 49 to lowe's first light
- Petersburg/York; 74/Fairfield/Trindle; Forge/74
- At both interchanges, people don't know how to get on when they get off
- 81 from the river to Plainfield
- streets to Trindle and York without lights
- York and giant lane
- Trindle and Fairfield
- Fairview/York; Forge/York; 81NB at York
- from Forge rd onto York
- Forge/York; all streets in Carlisle manor entering York or Trindle, esp when there are activities in Carlisle or at the fairground
- Forge rd; exit 48
- Exits 47, 48, 49
- 81 NB & SB between 47 & 50
- 81
- Exit 49

Summary of Additional Comments

- Development will happen, we need to guide/manage; commercial/industrial need to be concentrated and separated from residential/schools/commuter routes; Route 11 is what you get w/out planning and controls; SMT needs two commercial zones: Walnut Bottom and Trindle; York is a residential commuter road and should limit truck activities
- Warehouses between York and Trindle would be a disaster. I'm afraid that making exits 48 & 49 one 2- way interchange would greatly accelerate development
- Poster speed limits on roads like Forge Road are ignored; I'm a bicyclist and it's hard to avoid roads that are dangerous to ride on. The increased traffic is causing the area to lose its appeal. I'm very concerned with the trend for agriculture to leave the township (South Middleton).
- New full interchange will allow for faster responses for auto accidents.
- Don't want to see industrial – warehouses; would like to see Barrier Walls
- Do not want to see this interchange develop as the Middlesex interchange related to excessive truck traffic both at interchange and on existing feeder roads; should not develop industry/warehousing.
- The truck traffic is increasing, as is the general traffic on all roads – York, High, and Trindle. Used as a short-cut and now to access the newly developed commercial property at the Point.
- Too much large truck traffic on York Rd.; it is used as a short cut from Rt. 15 to I-81.
- Rt. 81 needs to be 6 land with tractor trailers restricted to outside lane (right lane); on and off ramps need to be lengthened – need to stop building warehouses – either exit 48 or 49 should be made both an on and off exit both north and south bound.
- We do not need any more trucks and warehouses. Need traffic lights at Petersburg onto York; Since Lowe's opened and traffic lights were installed on High St. it has made the traffic so much worse on York Rd. People drive York now to avoid the lights.
- Too many entry points onto York Rd to allow 50 MPH speed limit; less heavy truck traffic on York Rd; Full interchange at 81 and Trindle Rd.
- There are too many entry ways onto and off York Rd to support 45 to 55 MPH; less warehousing; think about growth plan; make interchange at 81 and Trindle Rd. full interchange; less residential on Trindle at Fairview than York; Fewer trucks/tractor trailers.
- Looking to the future – both 48 & 49 should be full interchanges.
- Yes we must look to the future – not stop progress. This is a need; we need improvements to grow.
- Traffic noise has increased dramatically – What can be done?

- Atrocious noise from I-81…so loud I cannot step outside my house and use a cell phone; The small island between York and Trindle Road east of Lowe's has become an area "trapped by traffic" – traffic which will only increase in quantity… therefore, personal vested interests aside, I believe the area between York and Trindle Road within South Middleton Township (east of Lowe's) should be re-zoned for commercial use…that might upset many homeowners, but reason tells me that an area surrounded by commercial use along with the need for more of the same should be re-zoned for commercial use. The views expressed here come from a resident who has lived in SMT for 32 years.
- Good luck!
- For many reasons property owners I know would not like any changes made to these interchanges. We are saved from undesirable development (industrial and through traffic from other areas by the way these interchanges are currently. Thanks!
- Need full interchange at 48.
- I do NOT want a four-way interchange at either exit 48 or 49. Commercial and industrial growth in that area has been slowed because of the split interchange. Money should be spent on improving entrance and exit ramps at the exits between 44 and 48.
- I don't see how expanding exits 48 & 49 will improve the quality of life for residents. Expanding either interchange would spur additional growth and it its out of control now. Preserving farmland is South Middleton's #1 priority. It is also a high priority with the state and county. Developing this area is contrary to local gov't priorities.
- Please, please no more warehouses!
- Too many colors/not enough difference on the land use map – difficult to tell the difference. I would like to see the rural/suburban character of the area maintained! Because development seems to be inevitable (and desired by the municipalities), I would at least like to see a push to keep that development compatible with current land uses and consideration of secondary infrastructure improvements in conjunction with the development.
- Rt. 81 speeds are excessive, too many vehicles driving too fast; excessive noise from concrete paving – no noise barriers for residents.
- Since the speed limit was dropped to 55 mph the engine retarder noise has increased between exits 48 & 49 greatly.
- No more warehoused needed or wanted around Carlisle. They have already destroyed the country and quality of life on the other two ends of town.
- NOISE, NOISE, NOISE – Light pollution from business; road dirt.
- Trindle cannot handle any more traffic! The poor folks who live along it or have to cross it cross or get onto it in a very dangerous manner already. Above all, truck traffic needs to be forbidden on Fairview to Trindle or York. There are warehouses in the area very underused already that are truck warehouses. Ther is absolutely no need for any such thing in South Middleton.

- Trucks, trucks, and more trucks; we cannot support the truck traffic we have now let alone the increases that are proposed. No more warehouses. Just say no to warehouses.
- A complete interchange at Exit 49 would support industrial growth in the zoned area along Trindle Rd. and tourist traffic to the Army Heritage Center. The "connector roads" between York and Trindle proposed by developers won't really do that. We need stronger planning at the County level, especially where growth near township boundaries; RE: Q2 – The issue may not be population growth so much as growth of traffic; lots of vehicles move through this area independent of population growth; RE: Q3 – The Army Heritage Center doesn't fit any of these categories by it should be built and supported with an adequate transportation system.
- I-81 is a hazard – way too many trucks; interjecting more warehouses into this area will worsen the condition – Regional planning is essential!
- This study will change dramatically depending on proposed warehouses and commercial retail!
- Preservation of the residential areas…the quality of water, sewerage, and noise.
- I have frequently questioned if speed bumps or rumble strips for York Rd. should be put in; while these additional entrance/exit ramps are being considered, better marking in regard to road signs should be done immediately. If I were a stranger coming into the area I would find present signs very lacking.
- This questionnaire doesn't seem specific or complete enough for the planners to really see what people think!
- The more traffic – the more noise and speeders. We don't need any new land uses – we need more control over speeders on both York and Trindle Roads. If new uses go in effect – put in either speed bumps or traffic lights.
- In my opinion, the interchanges should remain the same. Any "improvements" will only cause more traffic congestion in the areas. In fact, you should consider eliminating one of the interchanges. As it is now, if there is an accident on I-81 they close down the exits so no one gets off. There are entirely too many exits in the Carlisle area already. More would only increase traffic and building up of the area.
- Close the interchanges 48, 49; impose a ten-year moratorium.
- Too many shopping malls and truck terminals now!
- Noise and air!
- I hope we are done with warehouses. Encourage other commercial businesses such as offices and small stores and restaurants; make full exits at #48 and/or 49.
- Only exit 49 needs to be expanded.
- Consider service roads parallel to I-81 to link route 74 to Trindle Rd. with traffic signals at each end.
- Land use/transportation must protect wellheads to protect water supply. Consider the wealth of fishing streams and the "commercial" services needed to service a

high-end clientele. Middlesex/Route 11 is a nightmare. If heavy industrial development is permitted, our residential quality of life is at risk.

- The government needs to start thinking farther ahead and stop spending tax money like it is someone else's and they have a limitless supply of it. I do not think the expansion of the interchanges would provide nearly the return on investment unless we bring in significant businesses (trucking) that can be taxed to pay for it. Especially since most residents do not want the warehouses or trucks; send future notices in a red envelope; I mean how many letters did you send out? How many people came? 1% ? 2%?; Noise barriers MUST be a serious consideration.
- If industrial warehouses go in, who will pay for additional stoplights, improve roads (esp. York, Trindle, and Forge)? We will need a police department; consider our water supply; additional truck traffic causes health and safety issues – air, noise, and light pollution; respiratory problems from diesel fuel.
- The zoning of the Otto farm as "industrial" is inappropriate vis-à-vis quality of life and safety in the adjacent residential areas; making exit 49 a full interchange would only marginally address this issue; it would do nothing to address heavy truck traffic to/from I-71 and US 15.
- (Safety) Speeds east and west and volume; full exits at 48 & 49; center turn lane from 81 on Trindle Rd. to new existing turn lane past mall; township should change these properties on Trindle and York to commercial and residential.
- Relocation of full access to Exit 48 or 49 will dramatically increase traffic on perp. Roads to Trindle or Rt 74. What will be done for this extra traffic load? (Residential areas).
- When the roads will be constr. 49 all commercial; best for full interchange.
- Sound barriers are needed now! Exit 48 & 49.
- The connector road (proposed) between the projected warehouse site on the Ott Farm, to York Rd. across from Mayapple Dr. should not be approved.
- Additional landscaping, such as sound walls, additional trees in medians on I-81.
- We need to look ahead and make the right move today for the future.
- Please improve safety with the best engineering at the lowest cost.
- If the area "Carlisle Manor" is to become a complete commercial area, those elected officials changing it should let the people know as soon as possible. We wanted to make changes; however, these will be put on hold pending information.
- You have not aske about safety if either exit (48-49) is complete. Traffic then will be horrendous, especially at exit 49. Advocate of completing 49 insist that Lowe's and the museum need its completion. Lowe's is completed with no problems; traffic at the museum has been grossly overstated; completion of 49 is not needed!
- We do not need another exit ramp between 47 and 48.
- We do not need any exits at 48!
- We need a full interchange north and southbound at exit 49 ASAP!

Exit 48 & 49 York and High Streets
Public Open House Survey

Cumberland County, in partnership with Carlisle Borough, South Middleton Township, North Middleton Township, Middlesex Township, PENNDOT, and the Department of Community and Economic Development (DCED) is conducting a study to plan for the future of the area around Exits 48 & 49 – York and High Street. There is a map attached to this survey that shows the study area.

Your input is the crucial part of this study. Your elected officials want to know how you want your community to develop. The survey only takes a few minutes. Please return your responses in the box provided. Thank you!

1. In your opinion, which of the following best describes the study area's growth and development over the past 10 years? (see map)

a. Very slow
b. Somewhat slow
c. Average
d. Somewhat fast
e. Very fast
f. Other _____

2. Looking forward, which of the following best describes the change you expect in the study area's population over the next 10 years? (see map)

a. Decrease greatly
b. Decrease somewhat
c. Remain about the same
d. Increase somewhat
e. Increase dramatically
f. Other _____

3. What types of development would you like to see occur in the interchange area? (Circle all that apply)

a. Commercial Retail (Shopping, Restaurants, etc.)
b. Office
c. Industrial/Manufacturing
d. Warehousing Distribution
e. Residential
f. Agriculture
g. No development desired

4. What types of development do you think will occur? (Circle all that apply)

a. Commercial Retail (Shopping, Restaurants, etc.)
b. Office
c. Industrial/Manufacturing
d. Warehousing Distribution
e. Residential
f. Agriculture

(Over)

5. How would you describe roadways around Exits 48 & 49 in terms of traffic congestion:

a. No delays
b. Minor delays
c. Delays during rush hours
d. Delays at all hours of the day

6. List any specific locations in the study area where traffic congestion is currently a problem.

_____

_____

_____

7. How would you describe the study area roadways in terms of safety?

a. Safe
b. Minor safety issues
c. Safety issues during rush hours
d. Safety issues at all hours of the day

8. List any specific locations in the study area where safety is currently a problem.

_____

_____

_____

Additional Comments: _____

_____

_____

_____

_____

_____

Thank you for your time and input into this study process!

Exits 48 & 49 - York Road and High Street
Public Open House #2 - Exit Survey Summary
April 18, 2005

Summary of Open Ended Comments

- We do not need any more “high” density
- The best long range solution is to close all exits between 44 and 52, forcing local municipalities to provide proper infrastructure
- Air quality needs to be addressed
- Relocate signage at Forge Road and York Road, provide a signal and cross bars at rail crossings, and make the advancements of projects a necessity
- Improve I-81 signage
- Strong support on an Exit 49 full interchange
- Full interchange Exit 49
- Construct a four way interchange at Exit 49; connector road will negatively impact the housing developments between Carlisle and I-81
- Full interchange at Exit 48 & 49 due to cost effectiveness; however, if this option is not available the fall back should be a full interchange at Exit 49
- Provisions for sewer and water are a significant issue and the best way to keep these requirements at a minimum is to put land in agriculture security and limit water and sewer expansion
- No full interchange at Exit 48
- Excellent job
- Concern about development encroaching on property

Interstate 81 Integrated Land Use and Transportation Study

Public Open House # 2 - Exit Survey

Please circle ONE number that best represents your level of support for each of the following recommendations. In the final column, please identify the three recommendations from each category that you believe should receive priority status for implementation and number them 1 through 3. Please refer to the display maps for additional information.

LAND USE RECOMMENDATIONS

	Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	Priority
1. Rezone Spring Garden Street parcel from light industrial to village.	1	2	3	4	5	6	
2. Rezone along York Road to high density residential.	1	2	3	4	5	6	
3. Rezone parcel south of Lisburn Road to neighborhood.	1	2	3	4	5	6	
4. Limit water/sewer service extensions.	1	2	3	4	5	6	

TRANSPORTATION RECOMMENDATIONS

	Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree	Priority
1. Construct connector road between Exits 48 & 49.	1	2	3	4	5	6	
2. Relocate Westminster Drive and signalize.	1	2	3	4	5	6	
3. Monitor rail crossing safety.	1	2	3	4	5	6	
4. Advance safety projects.	1	2	3	4	5	6	

Which municipality do you live in? _____

Additional comments: _____

_____