LAND USE AND TRAFFIC IMPACT STUDY

INTERSTATE 81-EXIT 12

FINAL REPORT

PREPARED FOR:

Central Cumberland County Task Force

Tri-County Regional Planning Commission

Capital Region Economic Development Corporation

PREPARED BY:

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LAND USE AND TRAFFIC IMPACT STUDY
INTERSTATE 81 – EXIT 12

1.0 Introduction

In 1998, the Central Cumberland County Task Force recognized a high level of development pressure emerging in the I-81 Exit 12 region. As a result the Task Force decided that joint municipal planing was necessary. This report documents the findings of the planning effort that evaluated the interrelationship between land use and transportation in the Exit 12 study area and developed recommendations for development in the study area. Figure 1 shows the prominent features of the Exit 12 study area.

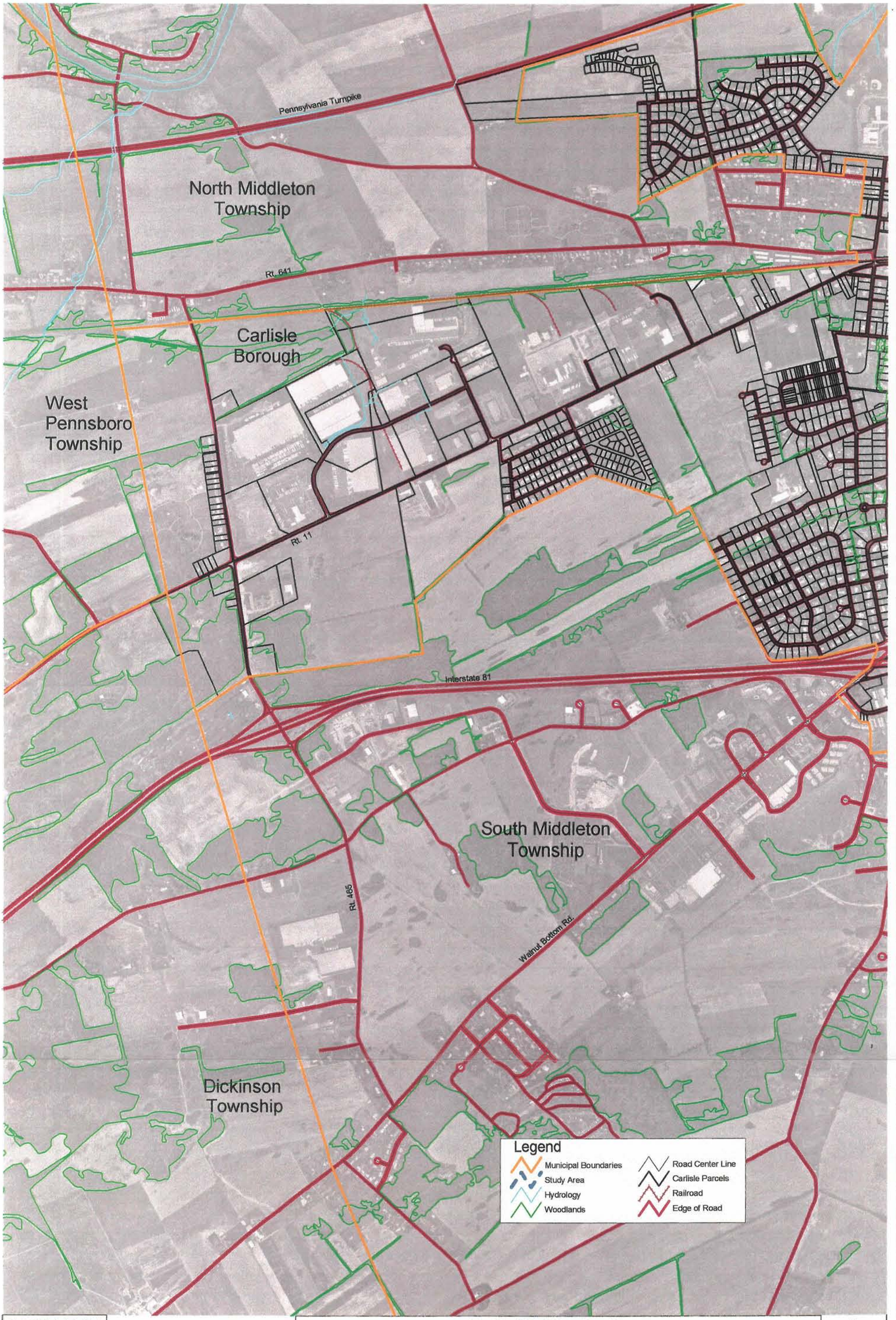
1.1 Study Goals/Objectives

The study goals/objectives are as follows:

- **Create** a desirable future land use pattern for the Exit 12 study area.
- **Prepare** zoning recommendations to evaluate warehousing and distribution activities around the Exit 12 interchange.
- **Inventory** current traffic data and project and analyze future traffic growth using established Institute of Traffic Engineers (ITE) methods within the study area based on development scenarios and potential impacts from current and future development.
- **Establish** transportation system design and improvement recommendations for the transportation network (e.g., roads, bridges, signalization, exit improvements, etc.) to safely and effectively serve the anticipated land uses and development within the study area.

2.0 Study Purpose

The purpose of the Exit 12 Land Use and Traffic Impact Study is to plan for a sensible balance between land use and transportation. To be effective, the study must formulate a plan that accommodates growth, mitigates development impacts, and



Data: Provided by Cumberland County Orthophotography (Spring 1998)

Prepared for CREDC and the Central Cumberland Task Force

Date: December 20, 1999

0 500 1000 1500 Feet

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Exit 12 Study Area
Figure #1

N W E S

helps to secure funding for needed improvements. Each of the study goals is discussed further in the following sections:

2.1.1 Accommodate Growth

The strategic geographic location, transportation system, and available land resources have all made the Exit 12 area a magnet for development. Industrial, light industrial, commercial, and office land uses have all developed in this area as a result of these and other factors. As development occurs, the host municipality's benefit from increased tax revenues, employment, and availability of goods and services. Therefore, the land use and transportation plan that results from this study **must** accommodate "smart" growth in order to help balance land use in the individual municipalities. The challenge to accommodating growth is to do so in a manner that is concurrent with infrastructure needs and preserves the quality of life for the surrounding community.

2.1.2 Mitigate Impacts

As the Exit 12 study area develops, the benefits of such development must be accompanied by a thorough assessment of the resulting impacts. The transportation system, the surrounding community, and the environment are all subject to the adverse impacts of development. The land use and transportation plan resulting from this study must simultaneously consider land use, transportation, and quality of life issues and their relationship with one another.

2.1.3 Secure Funding

Plans that lack the required financial support rarely make the transition from paper to project. This requires an innovative financing strategy that spreads the costs of land use and transportation improvements across the beneficiaries. Federal, state, and local funding sources as well as partnership opportunities warrant consideration in the financial plan.

3.0 Definition 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 requirements - 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 - a theoretical future point when all of the buildable land in the Exit 12 study area is developed. 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.

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.

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 on sale 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 often offensive 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 cemeteries. 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 calculated by comparing the volume of traffic against the capacity of the roadway. An intersection's level of service is calculated by the time of total control delay per vehicle at that 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 offensive 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.

Truck service plazas – a service facility specifically for freight trucks. Such facilities include abundant parking, numerous fueling stations, maintenance, and other services specifically geared toward the trucking industry.

Transportation analysis zone (TAZ) - a delineated area in which trip generation and distribution will be further analyzed.

Vacant land - this land use type includes lands that are not presently in use, such as wooded areas, unimproved areas not used for agriculture or recreation, and improved areas or buildings that are not occupied.

Warehousing / distribution center – a break in bulk point for freight movement characterized by large storage buildings with convenient access to transportation facilities. In the Exit 12 study

area these centers should include large, attractive buildings that include abundant open space and landscaping that does not alter the quality of life of surrounding neighborhoods.

4.0 Methodology

The recommended land use scenario represents the culmination of a process of evaluating the impacts of numerous scenario iterations of land use and transportation interactions. For each iteration, certain types of land uses were selected for inclusion in the study area. Zoning restrictions were then developed to guide how the identified land uses would physically occupy a tract of land. Finally, trip generation estimates and the associated transportation improvements necessitated by the suggested land use and zoning scenario were identified.

"If we want to predict the future, we must create it."
-Bob Livingston, Chairman, CCTF

4.1 20-Year Planning Horizon

For the purpose of this study, we have assumed a twenty-year planning horizon for the purpose of projecting background traffic and development. Many assumptions have been used in planning for this 20-year window of time. We have documented these assumptions throughout the study process, however the rate of development and traffic growth could be faster or slower depending on many factors including the economy, population growth and development patterns and the regional traffic congestion.

4.2 Land Use Assessment Methodology

We performed a land use survey within the study area during the week of July 5, 1999. The land use survey was performed using field reconnaissance to verify land use information portrayed on digital orthographic mapping available for the study area. The land use information was then digitized onto the digital base map using Geographic Information Systems (GIS) software. The quantification of land use data was performed using the GIS software. An existing land use map was produced to graphically portray the existing land use conditions within the study area.

4.3 Zoning Assessment Methodology

Information on existing zoning districts within the study area was derived from a review of existing zoning ordinances from the five municipalities in the study area. The review of the zoning district regulations focused on use (permitted, conditional and special exceptions) and area and bulk requirements. The zoning districts were digitized onto the digital base map using GIS. A zoning map was produced to graphically portray current zoning conditions within the study area.

4.4 *Transportation System Assessment Methodology*

Traffic forecasts within the Exit 12 study area were developed from two sources:

1. Background traffic
2. Study area development traffic

Background traffic consists of the trips made in the study area roadways that have origins and destinations outside of the study area. Future year forecast background traffic was estimated by applying a growth factor to the turning movement count data collected within the corridor. An annual growth rate of 1.2% was used to forecast background traffic.

Study area development traffic was determined by generating trips from the forecast land use in the study area. All trip generation was developed based on ITE Trip Generation Manual procedure with the exception of the trip generation rates for warehousing. Trip generation for warehousing was developed based on average rates used in traffic impact assessments approved within the study area. Figure 2 shows the ITE data used to forecast trips for study area land uses.

Figure 2: ITE data for study area land uses.

ITE Code	Land Use	Time	Unit of Measurement	% Vehicles Enter	% Vehicles Exit
130	Industrial Park	AM	Acres	83%	17%
		PM	Acres	21%	79%
150	Warehousing[1]	AM	Square feet	78%	22%
		PM	Square feet	26%	74%
210	Single-Family Detached	AM	# units	25%	75%
		PM	# units	64%	36%
230	Residential Condo/ Townhouse	AM	# units	17%	83%
		PM	# units	67%	33%
710	General Office Building	AM	Square feet	88%	12%
		PM	Square feet	17%	83%
750	Office Park	AM	Square feet	92%	8%
		PM	Square feet	15%	85%
820	Shopping Center	AM	Square feet	61%	39%
		PM	Square feet	48%	52%
845	Gasoline Station w/ Market	AM	# of pumps	50%	50%
		PM	# of pumps	50%	50%

These development specific trips were then distributed onto the study area roadway network based on predicted travel patterns and observed turning movements in the study area.

[1] Trip generation rates were based in part on Excel Logistics Preliminary Traffic Impact Assessment and Allen Distribution Preliminary Traffic Impact Study.

Figure 3 lists the assumptions that were employed for trip distribution:

Figure 3: Trip distribution assumptions

Roadway / Intersection	AM Enter	AM Exit	PM Enter	PM Exit
I-81 North/Walnut Bottom East[1]	60%	60%	60%	60%
PA 641East/US 11 North[2]	5%	5%	5%	5%
PA 641 West	5%	5%	5%	5%
US 11 South	5%	5%	5%	5%
I-81 South	20%	20%	20%	20%
Walnut Bottom West	5%	5%	5%	5%
Total	100%	100%	100%	100%

1. Traffic South of Alexander Spring Road will access northbound I-81 via eastbound Walnut Bottom Road and Exit 13. All other traffic will access northbound I-81 at Exit 12.
2. Traffic north of US 11 will use eastbound PA 641 while traffic south of US 11 will use northbound US 11.

Finally, the study area development traffic for each land use configuration was added to the background traffic to determine the total forecast traffic volumes on roadways under each land use configuration.

Picture 1 Allen Distribution

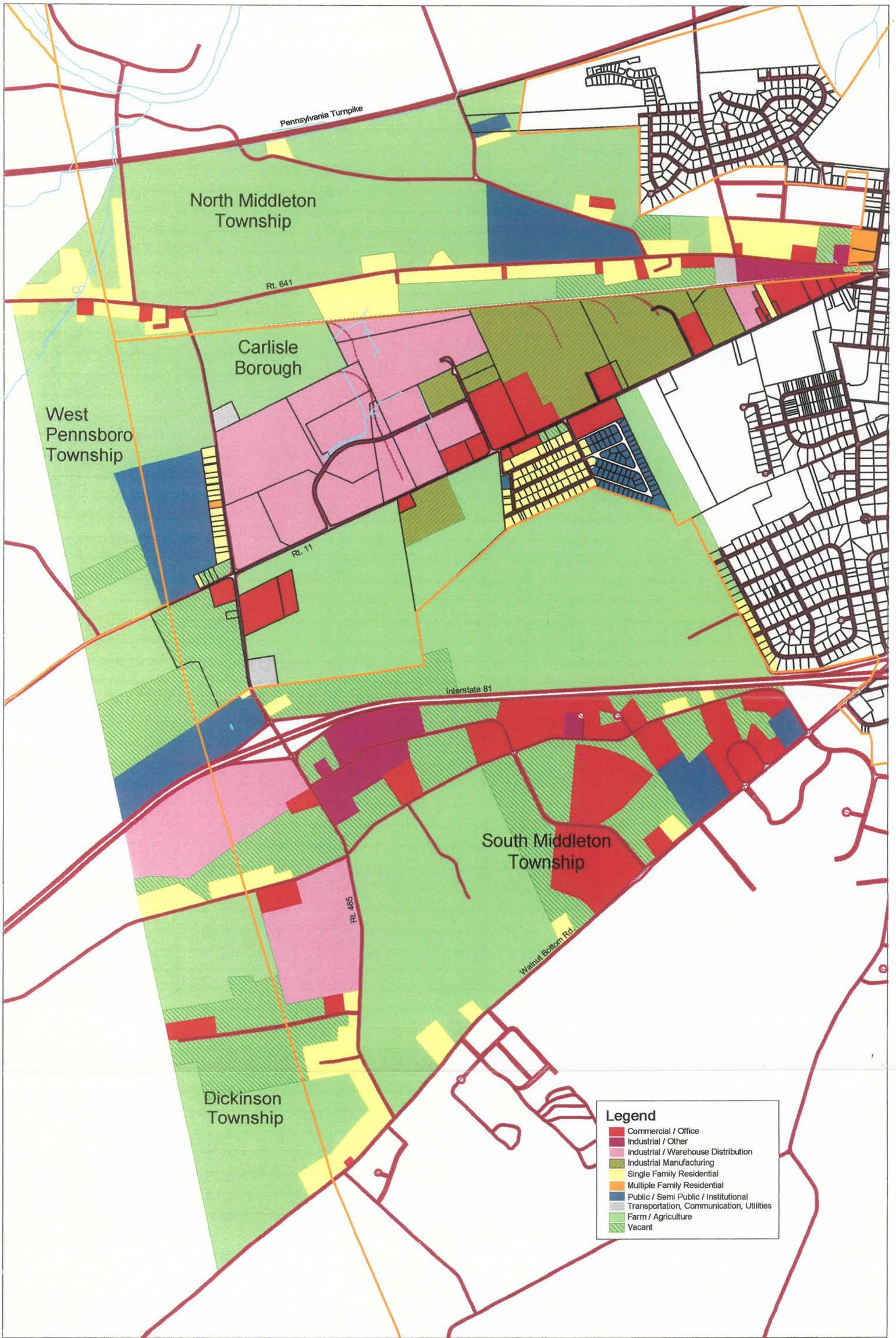
5.0 Existing Conditions in the Exit 12 Study Area

A review of the existing land use and transportation conditions in the Exit 12 study area provides a baseline against which future development and the associated impacts can be compared. The existing land use and transportation conditions are discussed in the following sections.

5.1 Existing Land Use

The identification, quantification and mapping of existing land use is an integral component of the land use/transportation planning process. The existing land use data serves to identify current development patterns, identify undeveloped or underdeveloped lands available for future development, and serve as a base condition for building future land use scenarios.

The Exit 12 study area encompasses nearly 2750 acres of land and includes ten different land use categories. Undeveloped land, either vacant or in agriculture, comprises 62% of the land area. Agriculture constitutes 48% of the undeveloped land in the study area and can be found in the northern, central, and southern portions of the study area. The vacant land parcels are clustered around the Exit 12 interchange and in the southeastern part of the study area. Figure 4 shows the existing land use in the study area.



Data: Provided by Cumberland County Orthophotography (Spring 1998)

Prepared for CREDC and the Central Cumberland Task Force

Date: December 20, 1999

0 500 1000 1500 Feet

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Existing Land Use Conditions (1999)

Figure #4

N W E S

Industrial and industrial-warehousing/distribution are the primary developed land uses in the study area. The industrial land uses are located along the Route 11 corridor and just south of the Exit 12 interchange on Allen Road. Residential, commercial/retail and office, and public/semi-public land uses constitute the remaining land uses in the study area. A breakdown of acreage totals by land use type within the study area is presented in Figure 5 below:

Figure 5: Existing (1999) land use acreage totals

Land Use	Acreage	Percent of Total
Industrial –Warehousing-Distribution	286.6	10.45%
Industrial – Manufacturing	112.1	4.09%
Industrial – Other	42.8	1.56%
Commercial/Retail	128.8	4.69%
Office	24.4	.89%
Multi-Family Housing	4.5	.16%
Single-Family Housing	178.9	6.52%
Transportation/Communication/Utilities	8.8	.32%
Public/Semi-Public	149.8	5.46%
Right-of-Way	101.8	3.71%
Subtotal – Developed Land	**1038.4**	**37.86%**
Agriculture	1326.2	48.35%
Vacant	378.4	13.80%
Subtotal – Undeveloped Land	**1704.6**	**62.14%**
Total	**2743.1**	**100**

The land use data provided above indicates that the Exit 12 study area has a high development potential. The combination of available land and prime location make this area very attractive to developers.

5.2 Existing Zoning

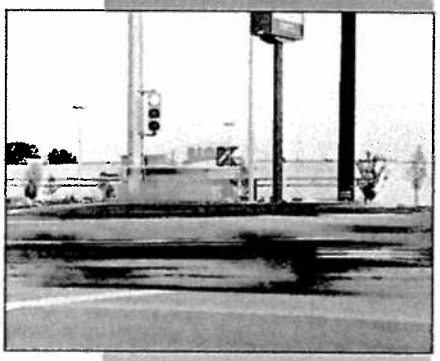
The Exit 12 study area includes about 20 different zoning districts that fall under the control of five different municipalities. While many of the districts permit the same basic uses, restrictions on how the parcel may be developed differ significantly from municipality to municipality.

Light industrial and general industrial zones predominate in the study area. The light industrial districts are found adjacent to I-81 and 465 south of Route 11 in Dickinson and South Middleton Townships. The general industrial parcels, many of which have already been developed, are found north of Route 11 in Carlisle Borough and North Middleton Township. Commercial office districts in South Middleton and Dickinson Township comprise the

other major zones in the study area. The majority of the commercial office parcels border Walnut Bottom Road in the southern part of the study area. Coordination and consistency between the various zoning districts across municipal boundaries presents a major challenge in this study. Figure 6 summarizes the existing zoning districts in the study area.

5.3 Existing Transportation System

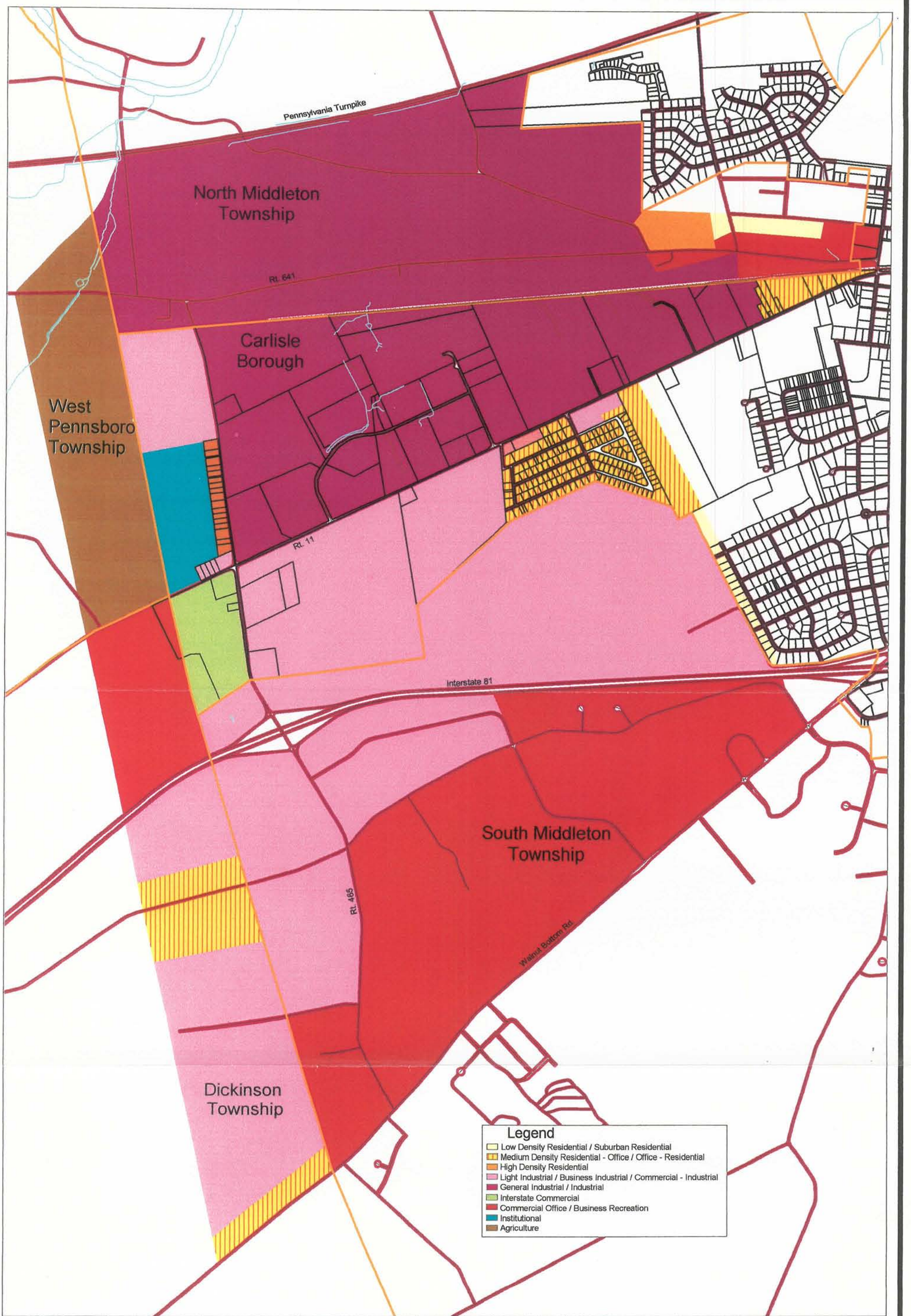
The Exit 12 study area is comprised of five major transportation facilities that include Walnut Bottom Road, Route 465 (Allen Road), Interstate 81, U.S. Route 11, and PA Route 641. Route 11 and Route 465 service the major existing industrial warehousing operations in the region. Walnut Bottom Road services residential, commercial and office land uses in the southern part of the study area. The land adjacent to PA 641 includes residential land uses but remains largely undeveloped. Increased development in the area will likely warrant the alteration of these facilities or the construction of new capacity.



Picture 2 Big box retail southwest of the study area

The study area includes six major intersections with operating efficiencies that impact circulation. Increased development or changes in land use generate more traffic that in turn hampers these intersections to service travel demand. A brief description of the study area intersections is listed below:

1. **Allen Road (PA 465) @ Newville Road (PA 641):** Unsignalized "T" intersection with stop control on northbound Allen Road approach, Single lane approaches on all legs.
2. **Allen Road (PA 465) @ Ritner Highway (US 11):** Signalized intersection with westbound protected/permitted left turn phasing. Single shared through/right turn lane and exclusive left turn lane on all approaches.
3. **Allen Road (PA 465) @ I-81 Southbound Ramps:** Unsignalized intersection with one-way westbound approach stop controlled, Single lane approaches with southbound channelized right turn lane.
4. **Allen Road (PA 465) @ I-81 Northbound Ramps:** Unsignalized intersection with one-way eastbound approach stop controlled, Single lane approaches with northbound channelized right turn lane.
5. **Allen Road (PA 465) @ Alexander Spring Road:** Unsignalized intersection with eastbound and westbound Alexander Spring Road approaches stop controlled, Single lane approaches on all legs.
6. **Allen Road (PA 465) @ Walnut Bottom Road unsignalized intersection:** Unsignalized "T" intersection with stop control on southbound Allen Road approach, Single lane approaches on all legs.



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Date: December 20, 1999

0 500 1000 1500 Feet

Gannett Fleming

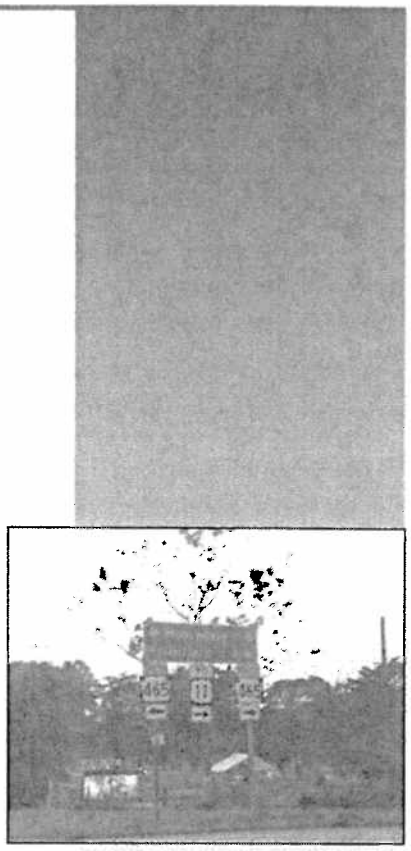
Existing Zoning (1999)
Figure #6

N W E S

Peak period traffic counts were conducted at these intersections to assess baseline traffic conditions. These conditions will serve as a base upon which traffic attributable to new development will be added. The percentage of truck traffic was a key component of the traffic counts, as transportation improvements in the study area must sufficiently service the needs of these larger, heavier vehicles. The percentage of trucks counted at the study area intersections is listed below.

1. Allen Road (PA 465) @ Newville Road (PA 641): 5.8%
2. Allen Road (PA 465) @ Ritner Highway (US 11): 9.9%
3. Allen Road (PA 465) @ I-81 Southbound Ramps: 34.4%
4. Allen Road (PA 465) @ I-81 Northbound Ramps: 43.4%
5. Allen Road (PA 465) @ Alexander Spring Road: 8.8%
6. Allen Road (PA 465) @ Walnut Bottom Road unsignalized intersection: 5.5%

In addition to the traffic counts, the operational performance of the intersections located on study area roadways were determined for existing traffic conditions and future year forecast traffic conditions using the procedures outlined in the Highway Capacity Manual.



Picture 3 Transportation options at Exit 12

The Highway Capacity Manual models determine operational performance at signalized and unsignalized intersections by using the physical characteristics (number and width of lanes on all approaches), the control characteristics (which approaches are STOP controlled or the signal timing), and traffic characteristics (number of vehicles and percentage of trucks) to determine the average delay per vehicle caused by the traffic control device at the intersection over a particular time period.

The average control delay per vehicle is equated to a Level of Service (LOS) letter grade (A through F). LOS of A represents the most desirable conditions of no or negligible delay while LOS F represents intolerable delay. It is not necessarily desirable to have facilities operating at LOS A because the level of investment required to bring a facility to this operational level would be extremely high. New facilities should be designed to operate at LOS C or better while existing facilities should operate at LOS D or better. Figure 7 shows the values of average delay per vehicle, which have been defined as the threshold values for LOS:

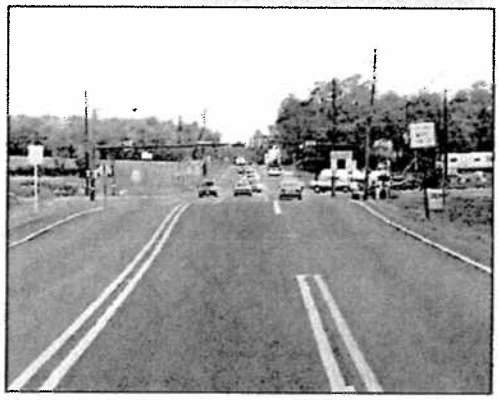
Figure 7: Definition of level of service rating.

Level of Service	Signalized Intersections seconds of control delay per vehicle	Unsignalized Intersections seconds of control delay per vehicle
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>10 and ≤25

Level of Service	Signalized Intersections seconds of control delay per vehicle	Unsignalized Intersections seconds of control delay per vehicle
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

The threshold values for LOS at an unsignalized intersection are lower than those at a signalized intersection because of the nature of the delay associated with the two types of control. On a STOP controlled approach, the motorist must actively search for acceptable gaps in the opposing traffic stream before proceeding while the motorist stopped at a signal may passively wait for the signal to turn green. There is also an expectation that an intersection with a signal will serve more traffic and have higher delays.

At a signalized intersection, LOS is determined for each individual group of movements that share lanes (i.e. the eastbound left turns in an exclusive lane or the northbound through/right turn movements in a single lane), for each approach (i.e. eastbound approach or westbound approach), and for the intersection as a whole. At a two-way STOP controlled intersection, LOS is calculated for the side street approaches and the main street left turning movement. LOS is not calculated for the intersection as a whole because the main street through movement experiences no delay caused by the traffic control devices and would lead to low average intersection delays even when the side-street approaches experience unacceptable delays. Figure 8 shows what the various level of service ratings may look like on a highway.



Picture 4 Signalized intersection at PA465 and Route 11

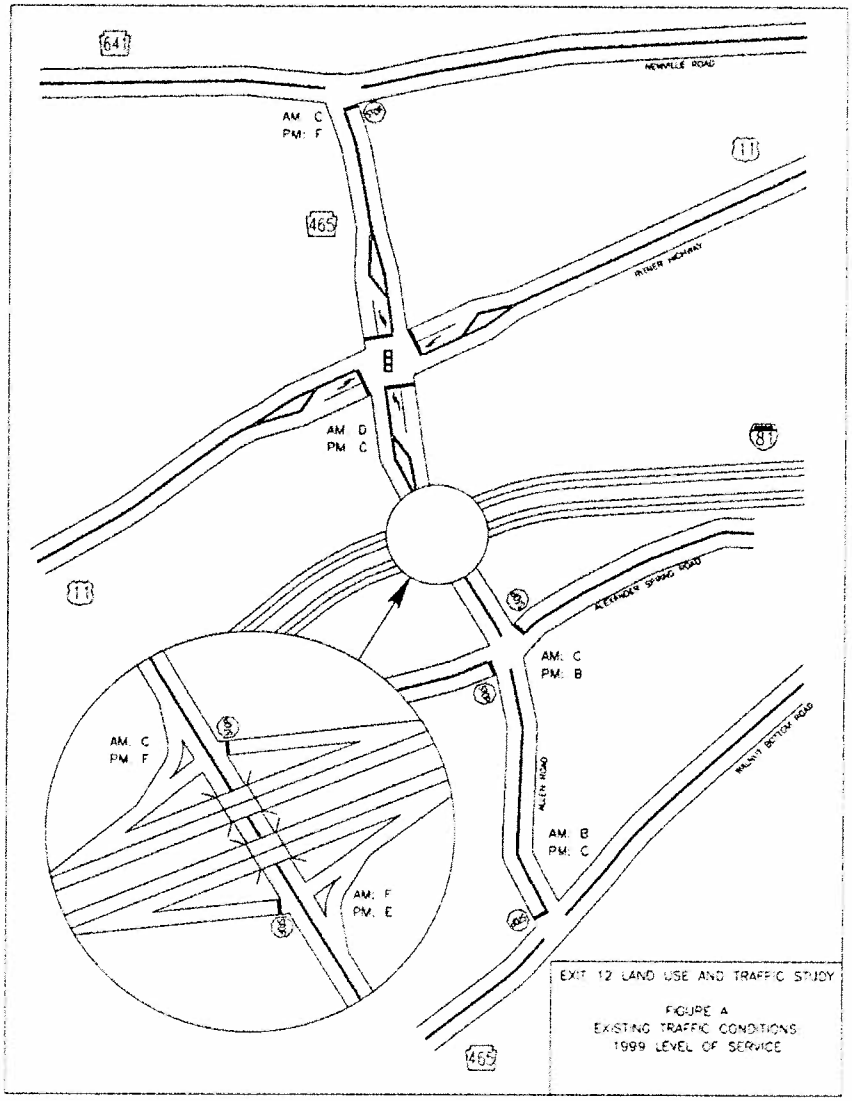
The existing traffic data provided a base upon which projected traffic conditions could be extrapolated. A 2.4% annual growth rate factor was applied to the 1999 traffic data to project traffic growth throughout the development horizon of 2019. The 2.4% growth factor is a number generally accepted and used by PennDOT for traffic growth estimation purposes. The 2.4% factor is also consistent with Tri-County Regional Planning Commission's regional travel demand forecast model that estimated a 2.3% growth factor for the region. Figures 9 and 10 show the existing and projected traffic conditions for the major study area intersections.

Figure 9: Existing and projected traffic conditions for intersections in the Exit 12 study area.

Intersection	1999 Existing		2019 Projected	
	AM Peak	PM Peak	AM Peak	PM Peak
1. Allen Road @ Newville Road (PA 641)	NB: C	NB: **F**	NB: **F**	NB: **F**

Intersection	1999 Existing		2019 Projected	
	AM Peak	PM Peak	AM Peak	PM Peak
2. Allen Road @ Ritner Highway (US 11)	D	C	**F**	**F**
3. Allen Road @ I-81 SB Ramps	Ramp: C	Ramp: **F**	Ramp: **F**	Ramp: **F**
4. Allen Road @ I-81 NB Ramps	Ramp: **F**	Ramp: **E**	Ramp: **F**	Ramp: **F**
5. Allen Road @ Alexander Spring Road	EB: C	EB: B	EB: D	EB: D
6. Allen Road @ Walnut Bottom Road	SB: B	SB: C	SB: **E**	SB: **F**

Figure 10: Existing intersections and traffic conditions in the Exit 12 study area



The transportation data presented for the study area indicates that the Exit 12 study area represents a major travel corridor for

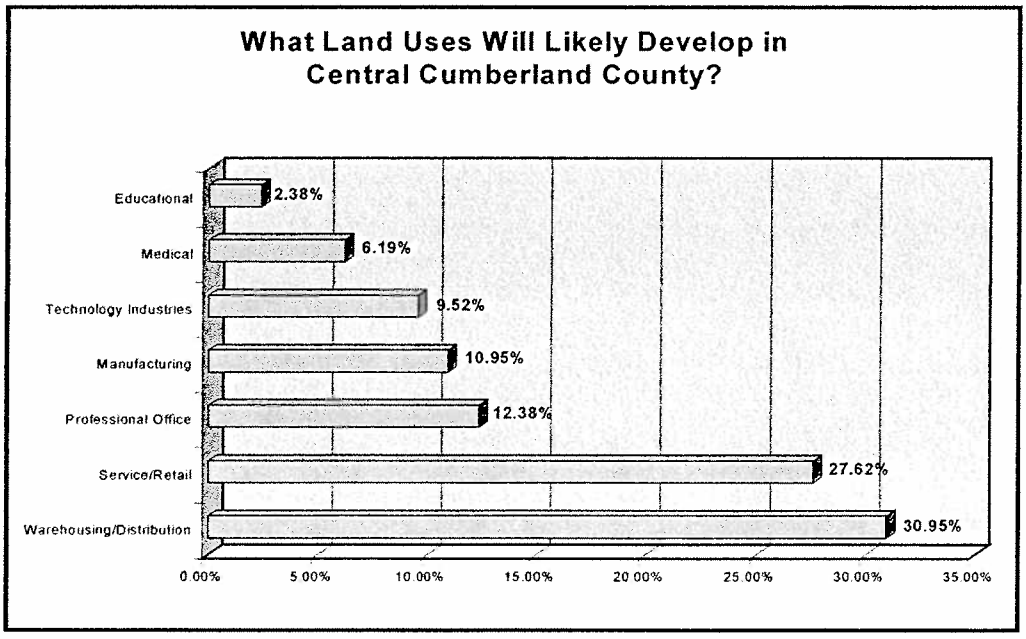
commuters, businesses, and industry. The transportation facilities in the area carry large volumes of traffic during peak periods that often induce failing conditions at some intersections. Without a sound land use and transportation plan, new development in the area will generate more traffic that will degrade the efficiency of the transportation system to a state of near gridlock.

6.0 Public Involvement

Following the existing conditions assessment, a public involvement session was conducted to ascertain the public's vision for the Exit 12 study area. Each landowner in the Exit 12 study area received a personal letter inviting them to the public meeting. Over 350 residents attended the meeting that included presentations on the existing and projected study area conditions. A survey was distributed to the meeting attendees that asked residents about the types of land uses they would like to see develop and the land uses that they felt would realistically develop.

The residents believed that warehousing and distribution centers were the most likely land uses to develop in the study area. Concerns were expressed over the traffic congestion, noise, and visual blight created by such land uses. Figure 11 summarizes the input received on what land uses are most likely to develop in the Exit 12 study area.

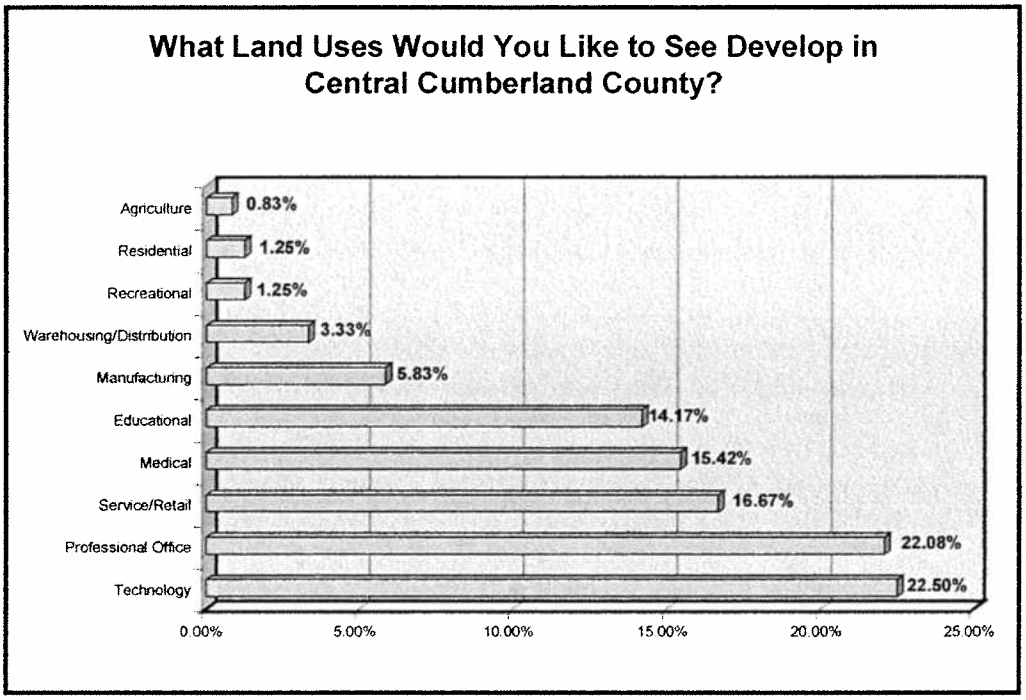
Figure 11: Land uses that will likely develop in the Exit 12 study area



The residents' vision for the study area conflicted sharply with what they believed would realistically develop. Technology and office were the two land uses preferred by the residents of the

study area. The following graph summarizes the input received on the land uses preferred by the residents of the study area.

Figure 12: Preferred land uses in the Exit 12 study area.



A final element of the survey asked residents to assess the traffic conditions in the study area. Ninety-seven percent of the survey participants rated the traffic conditions in the study area as congested or very congested.

Three main realizations resulted from the public involvement session:

1. Residents recognize the attractiveness of the Exit 12 study area as a hub for the trucking industry. As such they believe the area will most likely develop as warehousing and distribution centers.
2. Residents would like to see a variety of land uses in the Exit 12 study area, particularly more office and technology uses. This desire is in conflict with their perception of what will realistically develop.
3. Residents believe the traffic conditions in the Exit 12 study area are congested and likely to worsen with the development of more transportation intensive land uses. A plan that balances land use and transportation is required.

The public involvement session served as a guidance tool for the succeeding study process. The desire of the public for a variety of land uses in the study area and an improved transportation system were two factors that were strongly considered in each of the development scenarios.

7.0 Preliminary Development Scenarios Considered

Three transportation and land use scenarios were developed for this study. Each scenario included:

- Land use recommendations,
- Zoning requirements, and
- Transportation impacts/improvements.

The scenarios examined as part of this study included the full buildout, the alternative buildout scenario, and the final land scenario. The buildout and alternative buildout scenarios each had major barriers that eliminated them from further consideration for implementation. Summaries of the buildout scenarios and the accompanying land use, zoning, and transportation impacts are included below.

"Quality of life issues warrant consideration in the land use and transportation planning process."
-Resident of Exit 12

7.1 Iteration #1 Full-Buildout Scenario

The full buildout scenario assumes that all undeveloped land in the study area will be developed according to the use and density standards set forth in the respective zoning ordinance. Figure 13 shows the elements of the full buildout scenario.

The process for determining the full buildout scenario is outlined below.

(1) Undeveloped land was identified based on a review of the existing land use map. It was assumed that developed land will not be redeveloped to a more intensive use. Using GIS, lands that are already developed were blocked out.

(2) Current zoning for the undeveloped lands was identified through GIS by overlaying the zoning districts on the undeveloped land map.

(3) Undeveloped lands were then grouped based on location and assigned "traffic analysis zone" (TAZ) numbers. Areas were calculated for each TAZ.

(4) Adjustment factors were then applied to the TAZs to account for land set aside for internal roads and infrastructure and for other potential sensitive environmental features not identified on readily available mapping sources.

(5) Area and bulk, and use requirements were then applied to the TAZs based on densities allowed under current zoning. Residential development was quantified using units per acre, while nonresidential development was quantified in terms of gross square footage.

(6) Traffic impacts were determined for each land use using techniques outlined in the *ITE Trip Generation Manual.*

Data: Provided by Cumberland County Orthophotography (Spring 1998)

Prepared for CREDC and the Central Cumberland Task Force

Date: December 20, 1999

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Gannett Fleming

Current Zoning of Vacant Undeveloped Land (Full Buildout Scenario) - Figure #13

N W E S

7.1.1 Land Use

If the undeveloped parcels within the study area were to develop based on current zoning over 40 million square feet of nonresidential development could occur. Of that 40 million square feet of building area, over 16 million square feet could develop as office space, about 13 million square feet could develop as light industrial/warehousing space, approximately 10 million square feet could develop as heavy industrial space, and 1 million square feet could develop as commercial/retail space. In addition, approximately 200 townhouses and 60 single-family dwelling units could be developed within the study area. Figure 14 summarizes the land use development included in the buildout scenario.

Figure 14: Full buildout scenario land uses

Land Use	Acres	Dwelling Units	Gross Building Area in Square Feet
Industrial	363		9.959 million
Light Industrial (Warehouse/ Distribution)	729		13.100 million
Office	351		16.758 million
Commercial Retail	73		1.006 million
Townhouses	28	199	
Single Family Dwelling Units	126	61	
Total	1670	260	40.23 million

7.1.2 Transportation

The full build-out scenario required major expansions to the Allen Road corridor, the Newville Road (PA 641) corridor, the Ritner Highway (US 11) corridor and the interchange of Allen Road with Interstate 81. To accommodate the level of development in this scenario, an unreasonable amount of investment in the roadway system would be required.

Costs for the improvements necessitated by the buildout scenario could range anywhere from $80 million to $100 million depending upon the I-81 improvement required. Further, these improvements would create only temporary improvements in the performance of the transportation system. Even with the immense capital investment required by the buildout scenario, numerous intersections in the study area would be operating at a level of service of E and F in the year 2019. Without the investment, traffic congestion would prevent full development from occurring. Figure 15 outlines the transportation improvements and estimated costs[2] associated with the buildout scenario. Figure 16 shows the

[2] The costs are estimations inclusive of construction and 10% engineering. They are not meant to be final numbers.

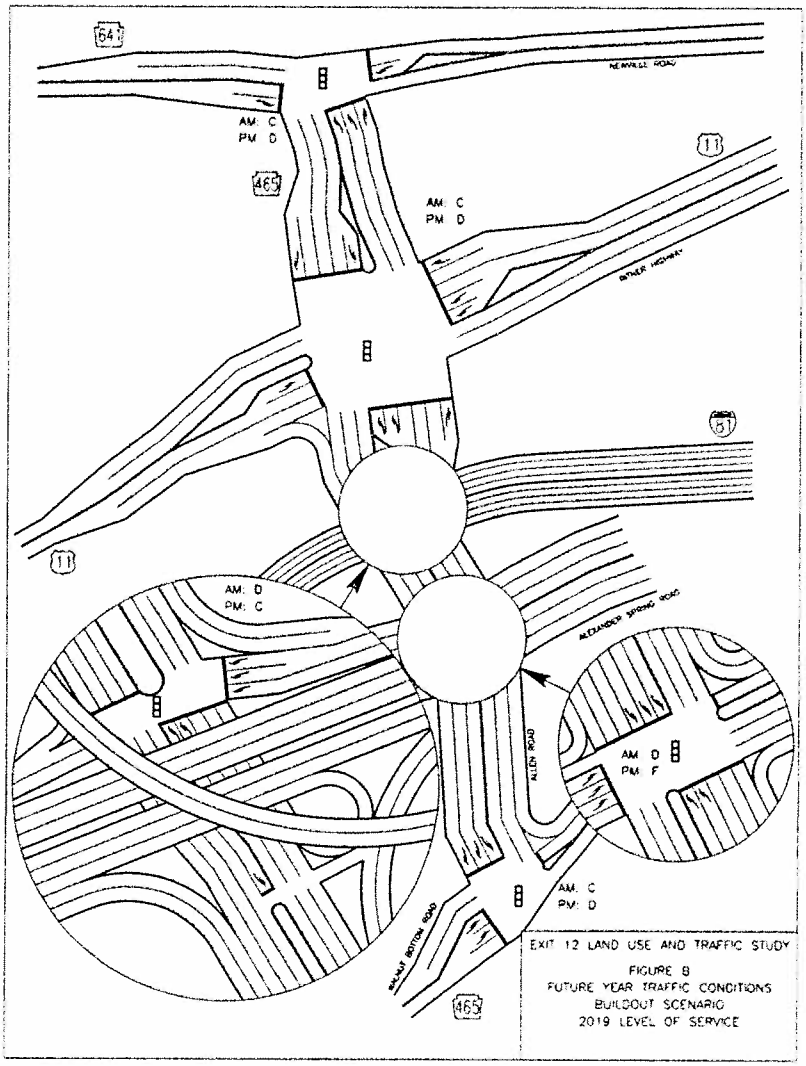
transportation improvements necessitated by the buildout scenario.

Figure 15: Full buildout scenario transportation improvements and costs.

Roadway	Improvement
PA 641	Widen to 4 lanes
PA 641 intersection with PA 465	Add a westbound left turn lane
	Add an eastbound right turn lane
	Install a traffic signal
	Add a receiving lane for the northbound dual left turn lanes on westbound PA 641
PA 465 (PA 641 to US11)	Add three lanes between Walnut Bottom Road and PA 641
US 11	Add two lanes from 1,000 feet west of PA 465 to the east out of the study area
US 11 intersection with PA 465	Add west bound and northbound left and right turn lanes
	Add eastbound (freeflow) and southbound right turn lanes
I-81 southbound ramps at PA 465	Reconstruct I-81 overpass of PA 465 to allow 132 feet of horizontal clearance
	Southbound PA 465 to northbound I-81 2 lane flyover ramp
	Add two I-81 southbound off ramp freeflow right turn lanes
	Add two additional left turn lanes to the I-81 off ramp
	Add two northbound left turn lanes
	Add an additional southbound through lane
	Reconstruct southbound freeflow right turn lane
	Add a lane to the I-81 on ramp
	Install a traffic signal
I-81 Northbound Ramps at PA 465	Add a loop ramp from northbound I-81 to northbound PA 465
	Add two freeflow right turn lanes from northbound I-81 to southbound PA 465
	Reconstruct existing northbound Allen Road to northbound I-81 freeflow right turn lane and add one lane
	Add a southbound left turn lane
Alexander Spring Road intersection with PA 465	Add two westbound free flow right turn lanes
	Add three eastbound left turn lanes
	Add three southbound left turn lanes and a free-flow right turn lane
	Add two northbound left turn lanes and a freeflow right turn lane
	Install a traffic signal

Roadway	Improvement
Walnut Bottom Road intersection with PA 465	Add a westbound freeflow right turn lane
	Add two eastbound left turn lanes
	Add a receiving lane for the southbound dual right turn lanes on westbound Walnut Bottom Road to the west of PA 465
	Install a traffic signal
Estimated Costs of Improvements	$80 - $100 million dependant upon improvements made to I-81

Figure 16: Transportation improvements in the full buildout scenario.



7.2 *Iteration #2 Alternative Buildout Scenario*

The process for developing a so-called "alternative buildout land use scenario" was less rigid and more subjective than the process described above that established the Buildout scenario.

The development of the Alternative Buildout Land Use Scenario involved a variety of inputs and numerous iterations, evolving over the course of several months.

The first input involved the identification of development in the "pipeline"; that is those development projects which are currently in the approval process such as the Excel Logistics development in South Middleton Township and Carlisle Borough. Information on proposed building sizes were gathered for known pipeline development projects in the study area.

A second source of input involved input from the general public and public officials. A public meeting was held on July 28, 1999. Public input was received in a question/comment period and from a questionnaire survey form. A similar questionnaire survey form was distributed to local officials in the area. Responses from these surveys were summarized, reviewed, and taken into consideration for development of the alternative buildout land use scenario.

"The Exit 12 area requires a variety of land uses that can be adequately supported by the transportation system."
-Vic Stabile, Member, CCTF

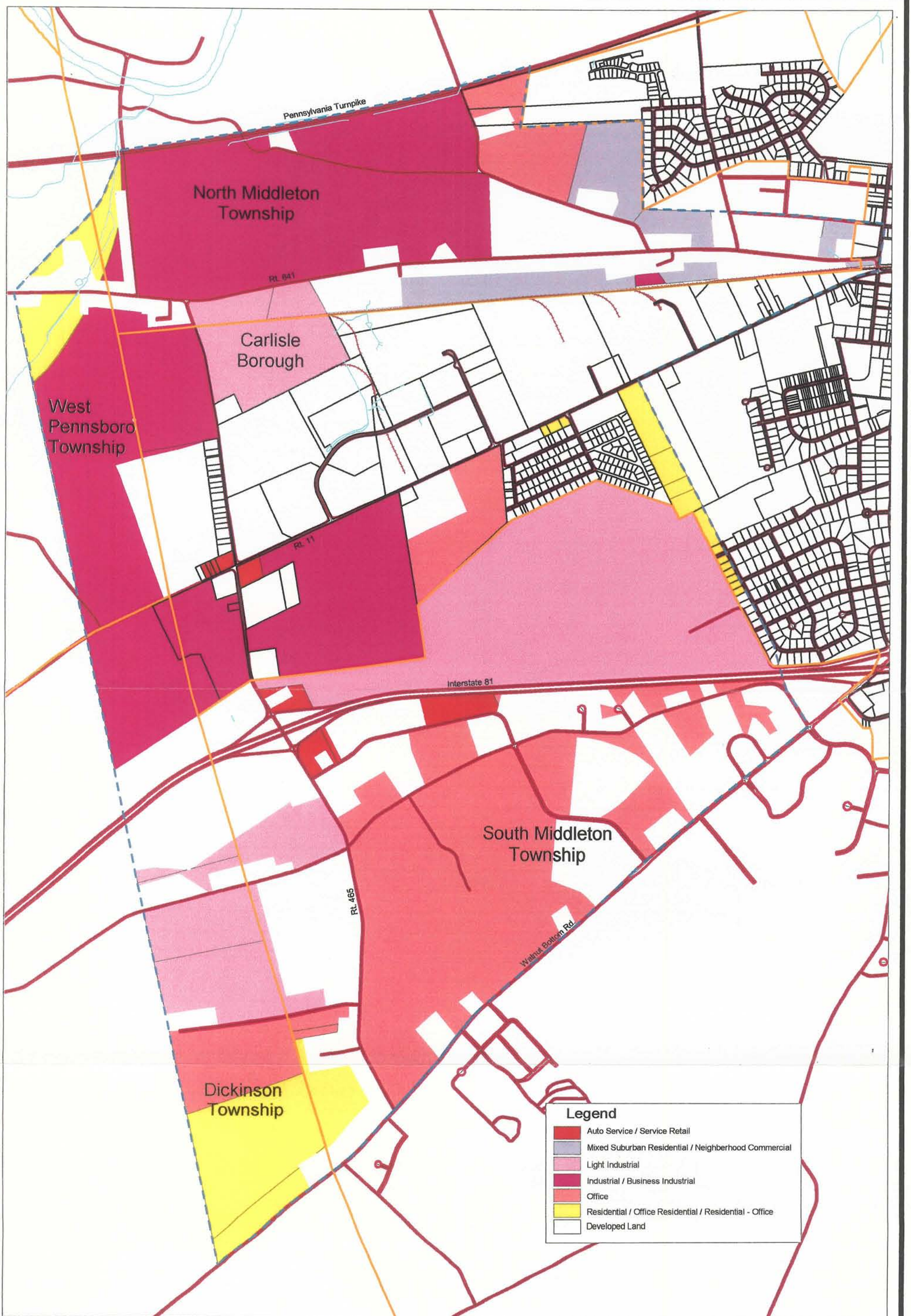
Recent office, industrial, light industrial and commercial developments were researched and factored into the development of the alternative buildout land use scenario. Data on area development trends was primarily provided by CREDC. These trends were summarized and incorporated into the alternative buildout land use scenario.

Professional planning judgement from Gannett Fleming staff, and extensive knowledge of local conditions gleamed from a sub Committee of the Central Cumberland County Task Force were also used as inputs in the development of the alternative buildout land use scenario.

Once all the inputs were gathered, reviewed and processed, an initial alternative buildout land use scenario was established. Traffic projections were then made based on this initial scenario. The results of the traffic analysis for this scenario revealed some major roadway/intersection capacity deficiencies. Therefore a variety of iteration of land use scenarios were developed and tested before a final version that balanced land use and transportation in the area was selected. Figure 17 shows the components of the alternative buildout scenario.

7.2.1 Land Use

The alternative buildout land use scenario involved developing and testing numerous iterations of future development scenarios. The initial scenarios involved changes in the types of land uses planned for the area. In particular, commercial and office land uses were included in the study area in lieu of warehousing distribution centers. Residential uses were suggested at the northwest, southwest, and eastern parts of the study area. Despite the attempts to include more amenable land



Data: Provided by Cumberland County Orthophotography (Spring 1998)

Prepared for CREDC and the Central Cumberland Task Force

Date: December 20, 1999

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Alternative Buildout Scenario

Figure #17

N W E S

uses in the study area plan, traffic generated from the suggested uses still resulted in unacceptable levels of infrastructure investment.

Next, development intensities were lessened to try to better balance land use and transportation. Light industrial districts and office districts were targeted for intensity reduction as these two uses produced the generated the highest levels of traffic. The gross building area permissible for industrial land uses was scaled back to 40%-50% of the lot area, where appropriate. This change decreased the legally permissible physical size of on site structures that in turn decreased the traffic generated by the site. While the lessening of development intensities had some positive impact, it still resulted in adverse impacts on the transportation system. The following table summarizes the land uses included in the alternative buildout scenario.

Figure 18: Alternative buildout scenario land uses.

Land Use	Acres	Dwelling Units	Gross Building Area in Square Feet
Industrial	560		9.672 million
Light Industrial (Warehouse/ Distribution)	472		7.395 million
Office	470		22.170 million
Commercial Retail	57		1.111 million
Townhouses	105	842	
Single Family Dwelling Units	5	16	
Total	1669	858	40.348 million

It became evident that altering the types of uses and intensities of those uses would not produce the sensible balance of land use and transportation that this study was striving to achieve. The desired balance could not come to fruition if all undeveloped lands in the study area were to be developed in the next twenty years. Therefore, several parcels were taken out of development and identified for use as open space, agriculture or for development at a later date (Phase II), beyond the twenty-year planning horizon being studied. These changes ultimately resulted in the recommended scenario.

7.2.2 Transportation

The alternative buildout land use scenario required similar improvements to the study area transportation system as the full-buildout scenario. Despite attempts to decrease the intensity of development and to change land use types, an unreasonable amount of investment in the roadway system would be required to support the constrained build-out scenario. The table below lists the specific improvements and their estimated costs[3] of the

[3] Costs include 10% engineering and construction

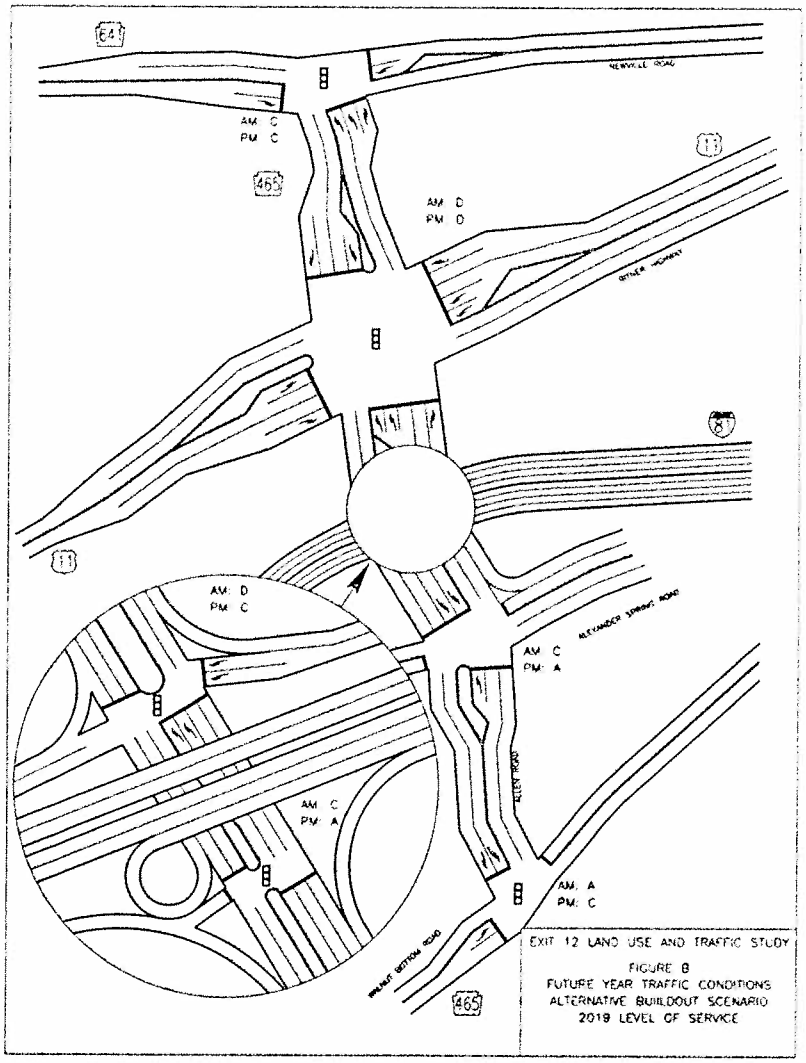
alternative buildout scenario. Figures 19 and 20 show the improvements necessitated by the alternative buildout scenario.

Figure 19: Transportation improvements and costs necessitated by the alternative buildout scenario.

Roadway	Improvement
PA 641 intersection with PA 465	Add a westbound left turn lane
	Add an eastbound right turn lane
	Add a northbound right turn lane
	Install a traffic signal
	Add a receiving lane for the northbound dual left turn lanes on westbound PA 641 to the west of PA 465
PA 465 (PA 641 to US11)	Add two lanes between Walnut Bottom Road and PA 641
US 11	Add two lanes from 1,000 feet west of PA 465 to the east out of the study area
US 11 intersection with PA 465	Add west bound and northbound left and right turn lanes
	Add eastbound and southbound right turn lanes
I-81 southbound ramps at PA 465	Reconstruct I-81 overpass of PA 465 to allow 108 feet of horizontal clearance
	Add an I-81 southbound off ramp freeflow right turn lane
	Add an additional left turn lane to the I-81 off ramp
	Add two northbound left turn lanes
	Add an additional southbound through lane
	Reconstruct southbound freeflow right turn lane
	Add a lane to the I-81 on ramp
	Install a traffic signal
I-81 Northbound Ramps at PA 465	Add a loop ramp from southbound PA 465 to northbound I-81
	Add a freeflow right turn lane from northbound I-81 to southbound PA 465
	Reconstruct existing northbound Allen Road to northbound I-81 freeflow right turn lane
	Add an additional northbound through lane
	Install a traffic signal
Alexander Spring Road intersection with PA 465	Add a westbound free flow right turn lane
	Add two southbound left turn lanes
	Add a northbound left turn lane
	Install a traffic signal
Walnut Bottom Road intersection with PA 465	Add an eastbound left turn lane
	Add two eastbound left turn lanes
	Install a traffic signal
Estimated Costs of Improvements[4]	$80 - $120 million dependant upon improvements made to I-81

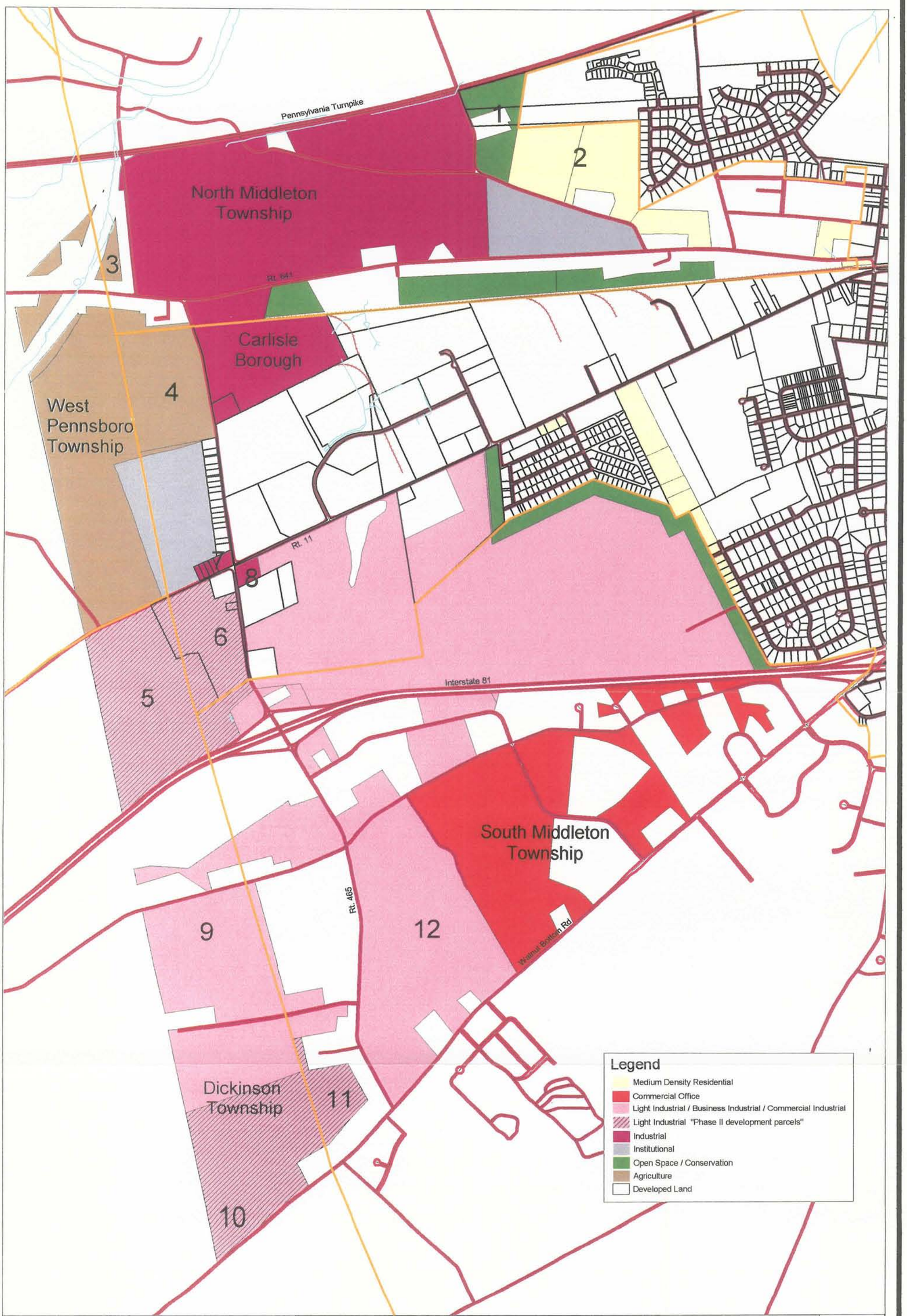
[4] Costs include 10% engineering and construction

Figure 20: Alternative buildout scenario transportation improvements.



8.0 Iteration #3 Recommended Scenario

The recommended scenario combines the concepts of providing attractive land uses, managing the intensity of use, and making certain parcels of land unavailable for development over the next 20 years. In doing so, the recommended scenario creates a publicly supported land use and transportation plan that meets the municipalities' economic development and transportation needs. Figure 21 shows the components of the recommended land use scenario. The specific land use, zoning, and transportation recommendations accompanying the recommended scenario are discussed in more detail below.



Data: Provided by Cumberland County Orthophotography (Spring 1998)

Prepared for CREDC and the Central Cumberland Task Force

Date: December 20, 1999

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Gannett Fleming

Recommended Land Use Scenario

Figure #21

N W E S

8.1 Recommended Scenario Land Use Recommendations

The alternative buildout scenario demonstrated the need for certain parcels of land in the study area to be taken out of development or to be developed as non-transportation intensive land uses such as agriculture or open space. The recommended scenario meets the land use and transportation demands of the municipalities and the public. The scenario involves a mix of land uses including light industrial/warehousing/distribution, industrial, commercial/office, commercial/retail, residential, institutional, agricultural and open space. The uses have been situated in the most sensible locations to minimize transportation investment and community impact. Also, the development of these land uses has been restricted in a manner that decreases their transportation demand and enhances community aesthetics. Each of the land uses found in the study area is discussed below. Figure 22 summarizes the land uses included in the recommended land use scenario.

Figure 22: Recommended land use scenario

Land Use	Acres	Dwelling Units	Gross Building Area in Square Feet
Industrial	433		6.937 million
Light Industrial / Business Industrial / Commercial Industrial	800		10.752 million
Commercial Office	161		6.251 million
Commercial Retail	5		.083 million
Townhouses	88	299	
Single Family Dwelling Units	10	34	
Total	1497	333	24.023 million

8.1.1 Light Industrial Uses

The light industrial land uses in the study area have been concentrated along the Route 465 corridor. Easy access to Route 465 allows for a convenient connection to I-81 for the heavy truck traffic associated with light industrial uses. By funneling the truck traffic onto PA 465 impacts to additional transportation facilities and the surrounding communities are avoided.

Two parcels of land zoned for light industrial use have been earmarked as "phase II" development parcels, meaning that development should be delayed until the rest of the study area develops. Insufficient roadway access, current conflicts with existing land uses, and the lack of sewer and water resources are the primary reasons these parcels should not be immediately developed.

While not warmly received by the public, industrial/warehousing/distribution uses in the greater Harrisburg

area are in high demand. Properly accommodating such uses, as is accomplished by concentrating development around PA 465, provides municipalities with economic development opportunities without sacrificing the quality of life of surrounding communities. Recommended uses in the light industrial district include:

- Warehousing, wholesaling, storing, and distribution facilities.
- Research, engineering, or other high-tech industries.

8.1.2 Commercial Office Uses

The public involvement session proved that the residents of the Exit 12 study area would like to see a mix of land uses. In particular, residents would welcome commercial, office, and technology land uses into their community. The recommended land use scenario addresses these concerns by providing for commercial and office land uses in the study area.

The purpose of the commercial office is to provide an opportunity for mixed commercial and office development in an attractive setting that is separated from industrial and light industrial centers. Recommended uses in this district include:

- Professional offices
- Retail businesses
- Business services
- Personal services
- Repair services
- Day care centers (both child and adult)
- Medical offices / services.

Picture 5 Sprint: existing commercial office use

The commercial office land uses have been concentrated in the southeast corner of the study area between Walnut Bottom Road and I-81. This area is adjacent to a similar type of development that has already occurred to the east. Therefore, providing commercial office uses in this area makes for a sensible continuation of an existing pattern. Opportunities exist for infill of office uses westward toward PA 465.

Transportation conditions in the study area are improved by placing the commercial office in the southeast part of the study area as well. This location provides the commuter traffic typically associated with commercial office land uses with convenient access to Exit 13 of I-81 to the east. Commuter traffic is removed from the identified PA 465 corridor that will carry a significant portion of the study area's truck traffic and potential conflicts and congestion are decreased. The physical separation of the light industrial and commercial office land uses also makes the area more attractive to high tech offices.

8.1.3 Industrial Uses

The major industrial land uses in the study area occur in the northernmost part of the study area. Much like light industrial uses, the industrial uses have been centered around PA 465 for convenient access to I-81 and to minimize impacts on other area roadways. The parcels are proposed to be industrial and manufacturing developments. The size of the parcels provide an opportunity to create a mixed-use manufacturing industrial center with an internal road network that connects directly with PA 465. Recommended uses in the industrial district include:

- Manufacturing facilities
- Food processing, packaging, storage, or wholesaling facilities

We have recommended that the residential area along PA 641 in North Middleton Township be retained as residential and that the lands to the immediate south be retained as open space or agricultural until those individual properties can be acquired and the area be developed as industrial in blocks. Many of the homes along PA 641 are in good condition. The residential and open space/conservation area should be consolidated before developing. We are not recommending changing the zoning designation for the area along PA 641 because that area currently is zoned for industrial use and will likely develop as such in the future.

"The regional problems of the Exit 12 study area require intermunicipal solutions."
David Miner, PennDOT

8.1.4 Open Space / Conservation

Open space in the study area is important for two reasons. First, open space decreases the need for transportation improvements in the study area as no traffic is generated from this type of use. Secondly, open space can provide needed buffers between conflicting types of land uses such as residential and industrial. In protecting communities from degradation, open space also provides the residents of those communities with recreational opportunities.

The purpose of the open space / conservation zone is to protect tracts of land with value to the natural or social environments. For purposes of this study, the open space / conservation zone is used in the northern part of the study area to create a buffer between industrial uses and residential neighborhoods. Based on the size and location of the parcels included in this zone, the following are recommended uses:

- Agriculture
- Natural areas / wildlife refuges
- Public and non-profit parks

Future changes in the land use in this area may lead to the elimination of this zone in lieu of a developed use. However,

given the current abundance of residential land use, the open space / conservation zone is vital to maintaining a high quality of life for the surrounding neighborhoods.

8.1.5 Residential Uses

The existing land uses and development trends in the Exit 12 study area do not appear compatible with extensive residential development. Residential development should take place in the northeastern and eastern parts of the study area. These areas are compatible uses with bordering residential developments in Carlisle Borough. Open space preservation and buffering from surrounding uses are key components to protecting the quality of life for these neighborhoods.

Recommended residential uses include:

- Low density single family dwellings (detached and semi-detached)
- Moderate density single family dwellings (detached and semi-detached)
- Single family townhouses.

8.1.6 Commercial Uses

The purpose of the commercial district is to provide for commercial activities for highway traffic and commercial activities that are not suited for the downtown area or in shopping malls. This zone is intended to provide services for those that work and travel in the Exit 12 study area. The following uses are recommended for the zone:

- Retail sales of goods or services
- Convenience stores
- Restaurants (includes fast food)

Aside from the recommended uses, these parcels of land should not be developed as truck stops or truck terminals, whose specific purpose is to fuel, wash, maintain, or otherwise serve trucks. Such uses draw trucks that otherwise have no trip purpose in the study area and as a result place an unneeded strain on area roads. Trucks have been adequately accommodated at exits north and south of the study area and as such require no special accommodation at Exit 12.

Commercial uses should be centered on the intersection of US 11 and PA 465 as recent developments have already done. While the commercial district provides variety to the land uses in the study area, the primary purpose of the area is to provide for industrial, light industrial, and office uses.

Picture 6 Truck traffic on US Route 11

8.1.7 *Institutional Uses*

The two cemeteries in the study area are zoned as institutional uses and should be preserved as such.

8.1.8 *Agricultural Uses*

The purpose of the agriculture zone is to preserve the agricultural soils and rural character of the study area. Recommended land uses for the agriculture district include:

- Agriculture related uses as set forth in the definitions of terms.
- Public or semi-private recreation areas when not operated for profit.

The land parcels north of US 11 should be maintained as agriculture. By doing so, a potential land use conflict between agriculturally zoned land in West Pennsboro Twp. and light industrial zoned land in Carlisle is eliminated. The parcels are one working farm spread over two municipalities and should be maintained as a homogeneous land use. Also, the existing land use to the west and lack of infrastructure on this parcel make it inappropriate for immediate development. Increased development pressure and expansion of infrastructure into the area may make this land attractive for development in the future.

"The Central Cumberland County Task Force has demonstrated the benefits of proactive, cooperative planning."
-Nancy Besch, Cumberland County Commissioner

8.2 Recommended Scenario Zoning Recommendations

Each municipality should review its zoning map and its zoning ordinance, looking closely at the use and bulk requirements in those zoning districts. Each municipality should also be familiar with the requirements of abutting zoning districts from adjacent municipalities. The following changes are proposed and should be carefully considered by each municipality.

8.2.1 *All Municipalities*

- The municipalities in the study area should amend the area and bulk requirements of their zoning ordinances to be consistent for each type of land use. The recommended area and bulk requirements for each land use are as follows:
  - **Office uses** - maximum allowable gross building area at 35% of buildable lot area
  - **Light industrial uses** - maximum allowable gross building area at 40% of buildable lot area; require landscaping of the development site that obligates developers to plant a number of trees for square foot of light industrial space that is developed.
  - **Industrial uses** - maximum allowable gross building area at 40 percent of buildable lot area

- **Commercial retail uses** - maximum allowable gross building area at 50 percent of buildable lot area

- Municipalities should uniformly amend their zoning ordinances to limit the number of pumps allowed at fueling stations to 8. Large numbers of pumps attract traffic that would otherwise not enter the study area. One of the objectives of this recommendation is to reduce the chance of a truck service plaza from locating in the Exit 12 study area.
- Municipalities should funnel new growth into locations currently served by water and sewer. Zoning ordinances should require developers to provide for such infrastructure where appropriate.
- Municipalities should uniformly require developers to landscape developed lands. A formula based system that requires that a certain number of trees be planted for every acre or square foot of land developed would be appropriate. This change would address the public's desire for quality of life preservation and increase the attractiveness of the study area as a whole.

In addition to the general zoning recommendations that have applicability to all municipalities in the study area, the respective municipalities should consider the following zoning recommendations. The rationale for each zoning change is included in italics.

Picture 7 Carlisle Livestock Market off Alexander Spring Road

8.2.2 Carlisle Borough

- Modify zoning map to create a small commercial district (either C3 General Commercial or C4 Neighborhood Commercial) concentrated at the Route 11 PA 465 intersection (parcels 6 and 7 on figure 21)
  - *Rationale: Commercial development should be centered at intersections and close to the Exit 12 interchange to avoid strip development and access management problems.*
- Modify zoning for lands west of PA 465 and north of cemetery from light industrial (I2) to agricultural (parcel 3 on Figure 21)
  - *Rationale: The land west of the study area is largely undeveloped and is maintained as agriculture. Developing this land as light industrial would be inconsistent with the surrounding development patterns.*
- Modify zoning map for lands just north of the Interstate 81 interchange from interstate commercial to light industrial (parcel 5 on Figure 21).
  - *Rationale: Commercial development should be clustered around interchanges, not in a linear arrangement along PA*

465 that promotes strip development and excessive highway access.

8.2.3 Dickinson Township

- Modify zoning map for lands along its boundary with South Middleton north of Walnut Bottom Road from a mix of Business-Recreation, Business-Industrial and Medium Density Residential-Office to Business-Industrial (parcels 8 and 9 on Figure 21).
  - *Rationale: Continued residential development in this area would conflict with the expanding light industrial uses in the area.*
- Modify zoning map for lands north of Interstate 81 from Business-Recreation to Business-Industrial (parcel 4 on Figure 21).
  - *Rationale: As infrastructure becomes available and surrounding land uses develop as light industrial, this parcel should be developed as business-industrial. The surrounding land use patterns are not compatible with residential or extensive commercial development.*
- Provide buffers to the industrial land for the residential developments in the southwestern part of the study area (parcel 9 on Figure 21 is currently developed as residential).
  - *Rationale: Not a zoning change, providing buffers protects the quality of life of existing residential neighborhoods.*

8.2.4 North Middleton Township

- Maintain lands along railroad right-of-way as Conservation.
  - *Rationale: Not a zoning change, these lands should remain undeveloped as long as the residential uses exist. Once the residential lands can be acquired, the land should be developed as zoned (industrial).*
- Modify zoning map for lands east of McClures Gap Road and south of the Turnpike from Industrial to Conservation (parcel 1 on Figure 21).
  - *Rationale: The residential neighborhoods to the east warrant buffering from the industrial zoned land to the west.*
- Modify zoning map for lands on the north side of Dyarman Road and east of McClures Gap Road from Industrial to medium or high-density residential (parcel 2 on Figure 21).
  - *Rationale: Residential land uses predominate to the east, a trend that should be continued in association with buffering from the industrial lands to the west.*

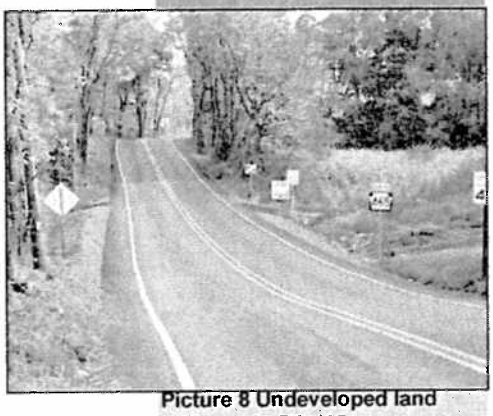
"Transportation and land use need to be considered as an individual unit, not as separate entities."
-Jim Szymborski, Tri-County Regional Planning Commission

8.2.5 South Middleton Township

- Modify zoning map for lands along PA 465 south of Alexander Spring Road from Commercial Office to Commercial Industrial (parcels 10 and 11 on Figure 21).
  - *Rationale: Light industrial uses should be concentrated along PA 465 to prevent truck traffic from entering surrounding neighborhoods.*
- Provide buffers to the residential neighborhoods in Carlisle Borough that surround the light industrial district in the center of the study area.
  - *Rationale: Not a zoning change, residential neighborhoods in the study area warrant protection from the impacts of industrial and light industrial land uses.*

8.2.6 West Pennsboro Township

- No changes are proposed.



Picture 8 Undeveloped land adjacent to PA 465

8.2.7 Consistency of Zoning Recommendations with County Comprehensive Plan

Cumberland County's 1990 Comprehensive Plan includes future land use considerations that provide guidelines for how the land in the area should develop. The plan advocates locating industrial and light industrial uses in those areas currently experiencing development that have adequate transportation facilities. The Recommended Scenario is consistent with the plan, as industrial and light industrial uses have been clustered around the immediate Exit 12 interchange with traffic being funneled onto PA 465.

Protecting residential areas from the impacts of industrial and light industrial development is another component of the County Comprehensive Plan. The Recommended Scenario maintains consistency with this provision as buffers between residential and industrial uses have been incorporated to the plan.

The Recommended Scenario is also consistent with the County Comprehensive Plan in protecting agricultural land. West Pennsboro's tracts of land in the northwestern part of the study area were recommended to be maintained as agriculture, consistent with the County Comprehensive Plan.

A point of inconsistency between the two plans involves the parcels of land south of Interstate 81. The County Comprehensive Plan envisions this area as being a mix of agriculture and residential. Current develop trends have negated the County's plan as commercial office and light industrial land uses have developed in the area. The Recommended Scenario suggests the continuation of this trend with special focus on providing adequate transportation. This inconsistency is likely due

to a Comprehensive Plan that has been outdated by rapid development.

8.3 Recommended Scenario Transportation Recommendations

The transportation improvements necessitated by the preferred land use scenario include improvements to the all the major roads in the study area including PA 641, US 11, PA 465, Walnut Bottom Road, and the I-81 interchange. Unlike the previous iterations these improvements maintain a "D" level of service for the region and carry a manageable price tag. Figures 23 summarizes the transportation improvements in the study area, the cost, and the efficiency in terms of level of service increases[5].

Figure 23: Recommended scenario transportation improvements and costs.

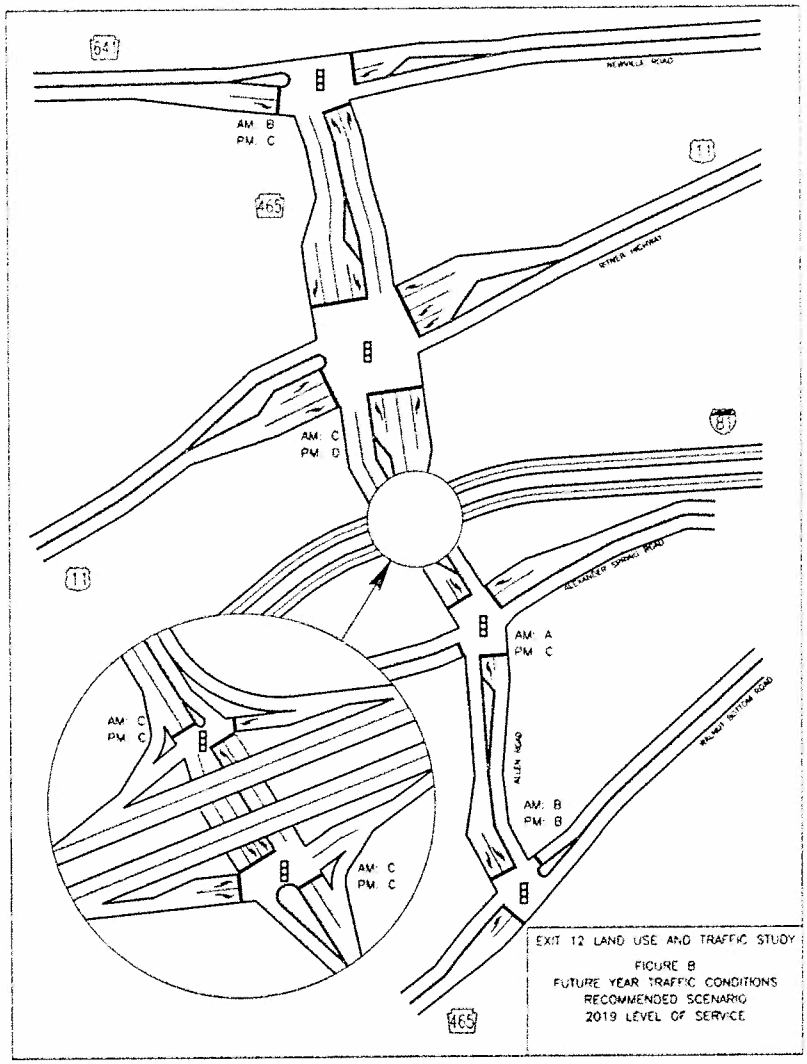
Intersection	Improvement	Cost ($million)	2020 Do Nothing LOS AM (PM)	2020 New LOS AM(PM)
N/A	Add two lanes to Allen Road between I-81 and PA 641	5.6	N/A	N/A
PA 641 and PA 465	Add a westbound turn lane	.27	F (F)	B (C)
	Add an eastbound turn lane			
	Install a traffic signal			
US 11 and PA 465	Add a westbound left and right turn lane	.47	F(F)	C (D)
	Add an eastbound right turn lane			
	Add a southbound right turn lane			
	Add a northbound right turn lane			
I-81 and PA 465	Reconstruct I-81 structures over PA 465 to allow 84 feet of horizontal clearance (36 feet northbound, 48 feet southbound)	2.0	N/A	N/A
I-81 Southbound Ramps and PA 465	Add an I-81 southbound off-ramp free-flow right turn lane	.40	F (F)	C (C)
	Add a northbound left turn lane			

[5] These costs represent 10% engineering and construction costs. They should not be considered final estimates.

Intersection	Improvement	Cost ($million)	2020 Do Nothing LOS AM (PM)	2020 New LOS AM(PM)
	Reconstruct southbound free-flow right turn lane			
	Install a traffic signal			
I-81 Northbound Ramps at PA 465	Add an I-81 northbound off-ramp left turn lane	.40	F (F)	C (C)
	Add two southbound left turn lanes			
	Add one northbound through lane			
	Reconstruct northbound free-flow right turn lane			
	Install a traffic signal			
Alexander Spring Road at PA 465	Add a westbound right turn lane	.25	D (D)	A (C)
	Add a southbound left turn lane			
	Add a northbound left turn lane			
	Install a traffic signal			
Walnut Bottom Road at PA 465	Add a southbound right turn lane	.20	E (F)	B (B)
	Install a traffic signal			
N/A	Allen Road reconstruction with full width lanes and shoulders between I-81 and Walnut Bottom Road	2.5	N/A	N/A
Total Estimated Costs		12.0		

These improvements are estimated to cost approximately $12 million, inclusive of 10% engineering and construction only. The improvements and the resulting peak period LOS are shown on Figure 24 shows the necessary transportation improvements of the recommended scenario.

Figure 24: Recommended scenario transportation improvements.



Traffic was generated for the constrained growth alternative with additional parcels, identified as phase 2 development, included. With these trips added to the improved highway network, two locations experienced a decline in LOS: PM peak at Ritner Highway and Allen Road where LOS dropped from "D" to "E" and PM peak at I-81 northbound ramps and Allen Road where LOS dropped from "C" to "D." The forecast operating conditions at the I-81 northbound ramp intersection with Allen Road do not warrant further improvements. The intersection of Ritner Highway and Allen Road will require the addition of a second left turn lane on the northbound Allen Road approach for the intersection to operate at an acceptable LOS. This additional left turn lane will require the construction of an additional lane on westbound Ritner Highway to the west of the intersection.

9.0 Project Financing

This section presents several financing/funding options that the Central Cumberland Task Force may want to consider to fund some or all of the transportation improvements that are recommended in this document. There is a wide range of methods that can be used to finance the proposed improvements including:

- Transportation Partnership District (i.e. special assessments
- Tax Increment Financing
- State Infrastructure Bank
- Twelve year plan and program
- Developer funded improvements
- Transportation Impact Fees

Each option is explained below

9.1 Transportation Partnership District

A transportation partnership provides for a special assessment on land and development to pay for off site transportation improvements. The special assessment must be approved by those who own at least 50% of the assessed land value in order to approve the formation of the district. A district can be used to pay for part or all of the costs associated with a project. To make a district successful, the majority of the landowners in a proposed district need to see direct transportation benefits.

Picture 9 Pennsylvania Turnpike

9.2 Tax Increment Financing (TIF)

The concept of tax increment financing is to use the difference in taxes generated from a property as vacant land to the taxes generated from that same property once developed to pay for improvements made in that region. Tax increment financing requires that all of the taxing agencies or authorities commit to earmarking the additional tax revenue for a set period of time to pay for the agreed upon improvements.

9.3 State Infrastructure Bank (SIB)

The state infrastructure bank allows an agency to borrow funds to pay for approved infrastructure improvements. In Pennsylvania, low interest loans are issued at ½ the current prime-lending rate as determined by the Federal Reserve. A complete financing plan must be presented when applying for funds. Collateral and ability to repay must also be presented. PennDOT oversees this program.

9.4 Twelve Year Plan and Program

For the state owned and maintained roads in the study area, the Central Cumberland Task Force can present to the Harrisburg Area Transportation Study to advance the proposed projects currently on the 12 year plan and move the project up to the TIP with Federal and State project funding. The land use/transportation focus and public-private and municipal cooperation factors make this an attractive project for the 12-year plan. Currently the Exit 12 interchange is on the 12-year plan at $13.2 million for construction, right of way and engineering in the 2003 to 2006.

Despite its municipal ownership, the stretch of Allen Road south of Interstate 81 has a urban collector functional classification. Such a classification makes the road eligible for Federal transportation funding as any roadway with a designation of collector or greater may have improvements funded with Federal money. Effective leveraging of state and Federal funds could provide transportation improvements to PA 465 at low or no cost to the affected municipalities.

9.5 Developer funded improvements

New developments in the Exit 12 area will impose traffic impacts on the road system. As part of the PennDOT's Highway occupancy permit process, the developers must meet the Department's requirements for improvements in order to maintain roadway levels of service and safety must be met. Many of the improvements in the study area such as turning lanes and signalization may fall under the HOP permit process. In addition, the municipalities in the study area have the ability to negotiate with developers for on site improvements related to their development. It is not unusual to exact these improvements from the developer through negotiations.

9.6 Traffic Impact Fees

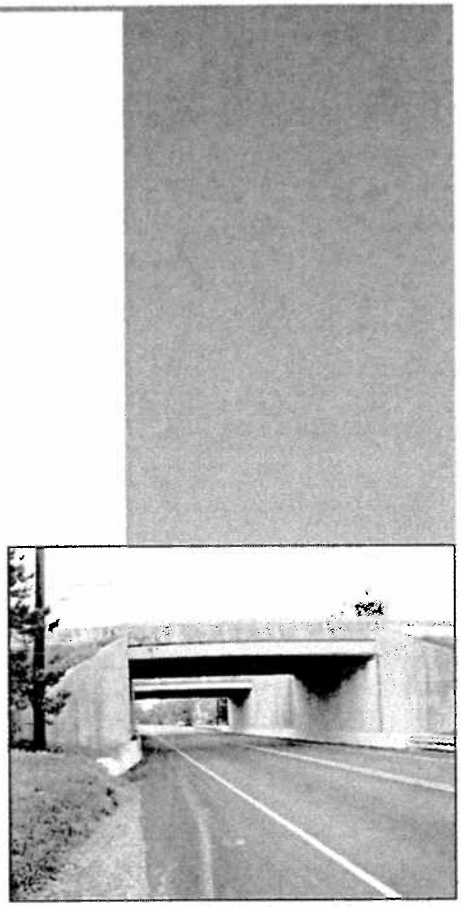
Impact fees can be used to capture the costs that development can levy on the transportation system and the surrounding community. To implement an impact fee ordinance in Pennsylvania, the municipality (ies) must conduct a detailed existing traffic conditions study to form a basis for assessing new impacts to development. Traffic impact fees are useful but are somewhat complex to implement in Pennsylvania.

9.7 Recommended Approach

The funding mechanisms discussed above are some of the major methods that can be used to fund transportation improvements. One important issue needs to be addressed before discussing how to fund the recommended plan. That issue is roadway ownership. State and Federal funds can be used to

pay for improvements to PA 641, U.S. 11, I-81 and PA 465 from I-81 to PA 641, however PA 465 from I-81 to Walnut Bottom Road is owned by South Middleton Township and is not eligible for state or federal funds in a normal straight funding scenario.

To find funding for the project we have developed a recommended approach that entails partnering with PennDOT, the county and the Department of Community and Economic Development. We recommend that the CCTF consider the following as a preferred funding method for the projects in the study area. We envision a Transportation Partnership District to be established by the CCTF, who will act as the umbrella mechanism under which other options can be incorporated as well. We propose that the special assessment be used to pay for the local share of the overall project up to 20% of the project cost.



Picture 10 Interstate 81 bridge over PA 465

10.0 Regional Planning/Policy Recommendations

The preceding land use and transportation recommendations require additional policies to insure their successful implementation and long term viability. Without consideration of the following policy recommendations, the problems of the Exit 12 study area will likely persist.

10.1 Joint Comprehensive Planning and Zoning

The five municipalities in the Exit 12 study area have their own comprehensive plans and zoning ordinances. Each respective planning tool addresses the study area in a different manner. The comprehensive plans include different visions for the area. While one municipality envisions preservation of agricultural lands a neighboring municipality may be planning for an industrial park on the adjacent property. As a result, the study area remains void of a unified, long-range plan.

Similarly, the zoning ordinances for the Exit 12 study area fail to establish complimentary land uses across municipal boundaries. Conflicting land uses can lead to community disruptions and impacts upon quality of life.

A joint comprehensive plan and zoning ordinance would allow the municipalities in the study area to plan for the region as a whole rather than in the existing disjointed fashion. The municipalities would meet and cooperatively develop a vision for the study area that ignored municipal boundaries. The vision would then be expanded into a joint comprehensive plan. The joint comprehensive plan would be the foundation upon which the joint zoning ordinance would be built. The municipalities could create a zoning ordinance that provides the legal framework to implement the vision outlined in the joint comprehensive plan. A joint comprehensive plan and zoning ordinance should be

considered in association with a regional tax base sharing program.

10.2 Regional Tax Base Sharing

Development has both positive and negative effects in the respective host municipality. While this report has focused primarily upon mitigating the negative impacts of development, the positive impacts of development provide the impetus for municipalities to develop the land within their boundaries.

The taxes generated from a developed parcel of land help to fund a variety of activities that have inherent value to the community such as schools and roadway improvements. Therefore, the unwanted consequences of development such as traffic congestion and light pollution are often overshadowed by the benefits derived from generating tax revenue.

The preferred land use scenario presented above asserts that several of the municipalities in the study area should not develop certain parcels of land. By leaving certain parcels of land out of development, improvements to the transportation system are decreased and disturbances to the surrounding communities are kept to a minimum. However, those municipalities that forego development opportunities to decrease traffic impacts bestow the potential tax revenue generated from those sites.

Therefore, a regional tax base sharing system should accompany the land use and transportation improvements in the Exit 12 study area. Under such a system, a formula would be established that divides the tax revenue generated from a parcel of land among the municipalities involved in the tax sharing agreement. The formula would consider the amount of land each municipality has available for development in the region and the potential impacts from the development of those parcels.

A regional tax base sharing system requires extensive communication and cooperation between the participating municipalities. Cumberland County should take the lead role in initiating and coordinating this effort. The role of dividing tax revenue needs to be mediated by a third party entity that does not have a direct interest in the division of funds but rather, has a general interest in the vitality of the participating municipalities and the study area as a whole. By taking the lead role, Cumberland County can ensure that the tax base sharing program can be established in a impartial manner that decreases tension between the participating municipalities and results in an effective, useful financing tool.

10.3 Consistency with State and Local Policies

Land use and transportation decisions made in the Exit 12 study area should strive to be consistent with state and local

policies. Proactive policies such as those listed below will guide future planning efforts throughout the state.

- ***21st Century Environment Report*** – The *21st Century Report* sets Pennsylvania's future environmental objectives. Sustainable development and planning that links land use and transportation are key components of the report.
- ***PennPlan*** – PennDOT's long range plan, PennPlan advocates strong integration of land use and transportation planning. Likewise, the plan promotes regionalism and quality of life issues.
- ***MPC Reform Efforts*** – Currently several bills exist in the House and Senate that propose revisions the *Municipalities Planning Code*. Concurrency and sound land use planning are major focus areas of these bills.

11.0 Conclusion

The Exit 12 Study participants should take pride in what they have begun. Pennsylvania local government has much strength, but has also gained a somewhat deserved reputation for fragmentation and lack of planning. The work to date accomplished by the Committee shows that Pennsylvania communities can cooperate and effectively plan for their desired futures. It should be known that this project held the interest of state agencies, in part, because of its bold objective of inter-municipal planning and problem solving. It was also a significant project in that it is one of the first in the Commonwealth to meaningfully link transportation and land use.

Clearly, the Exit 12 area is a magnet for growth, and growth is generally a good thing. But when growth goes unchecked or unmanaged, it can undermine the very factors that initially attracted development—transportation system performance (access and mobility) and quality of life. The following conclusions provide context for what has been accomplished and the associated future impact or direction.

- **Municipal Cooperation** – that five municipalities covering the Exit 12 area cooperated to plan and set priorities means that future development can be coherent. The prospect of a hodge-podge development pattern in this area would have been untenable, yet that is a common situation in growth areas. Municipal cooperation also brings with it the power of numbers—this local government coalition, for example, can be a force in the regional and statewide context—such as pursuing grants for infrastructure and other purposes. The taxpayers of these respective communities can also take pride in their leadership for taking this common sense approach that

not only represents good stewardship and planning, but also offers efficiency and economy of scale.

- **Consistent Planning Tools** – Pennsylvania policy makers are now engaging in the most serious dialogue in decades regarding municipal planning and growth. Much of that dialogue stems from the need for planning tools to effectively plan for growth. It is being increasingly recognized that such planning is neither conservative nor liberal, but smart. The five Exit 12 communities now have an emerging planning process for transportation and land use that is consistent and effective. So many communities make development decisions in isolation from their neighboring locales without regard to impact. In some cases, the costs of that are limited, but when one considers the type, scale, and scope of developments that the Exit 12 area is attracting, consistency is clearly necessary to deal with large-scale developments with ripple effects on the community. Consistent planning tools will foster a constructive dialogue, not only among these five communities, but also among the developers who must work with them to advance projects that provide jobs but also to ensure the land use and transportation infrastructure necessary to support that growth over the long term.
- **Land Use Coordinated With Transportation** - It may be hard to believe, but the understanding and appreciation of the transportation-land use interaction is only recently finding its way to the general public and policy makers for that matter. Unfortunately, it took a significant amount of sprawl development and its adverse impacts before this conundrum was seen as a real issue. The opportunity before the Exit 12 communities is to link land use and transportation strategies—in doing so each element becomes stronger and more effective for the community. It is also safe to assume that in the future transportation funding will increasingly be linked to performing certain sensible planning approaches like tying land use and transportation. That is already being seen in directives from the FTA issued on September 23. Nationally, transportation professionals have come to see that land use does have a pronounced effect on transportation. Tools like access management are gaining much greater attention for their potential in providing needed access, but at the same time endeavoring to maintain high levels of mobility.
- **Unified Regional Planning** – the Exit 12 planning process also links well with efforts to improve planning on a regional scale. Regional planning does not mean regional control—but rather a sensible approach to considering long term regional needs and priorities and to work with communities to make that happen. Federal policy in TEA-21 emphasizes the importance of regional planning. As such, certain priorities are established at a regional level including County

Comprehensive Plans, Regional Growth Plans, and Transportation Long-Range Plans and Transportation Improvement Programs (TIPs). Using the latter as an example, we believe that Exit 12 transportation planning activity would get significant consideration at a regional level because of its strong sub-regional approach to inter-municipal issue management and land use/transportation priority setting.

- **Public-Private Partnerships** – Lastly, but in no way least, the best planning is that which is carried out in a partnership among public and private partners. Most PA communities want to grow, provide a strong job base, and retain young people. To do that requires investment on the part of the private sector. That investment must be matched with a responsible and responsive planning system that values growth, but that also values community performance at all levels. Exit 12 communities have set the stage for long term growth in ways that accommodate new employers while attaining long term strong performance from its infrastructure.

"Together we make a difference."

-Quote from December meeting of the Central Cumberland County Task Force