

COMPREHENSIVE PLAN

FOR

ANTRIM AND GREENCASTLE

The document was prepared and drafted by a cooperative agreement between Antrim Township, Greencastle Borough, the Greencastle-Antrim School District and the Center for Local and State Government at Shippensburg University.

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Robert Whitmore.

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I. PROLOGUE

The comprehensive planning process involves an assessment of what is and what ought to be. This comprehensive plan includes an in-depth analysis of the natural resources including:

- soils
- bedrock geology
- surface topography
- wetlands
- agricultural land

Additionally, the plan examines the human resource base to include:

- land use
- population
- housing
- transportation
- community facilities
- financial resources

A comprehensive plan is a 'big plan' in the words of Daniel H. Burnham, one of the founders of the American Planning movement. He said in a 1910 speech that a comprehensive plan

"aims high in hope and work, remembering (that) a logical diagram, once recorded, will be a living thing".

A comprehensive plan, in spite of its visionary tendencies, must display a practical and reasonable balance between conservation and preservation on one hand and the individual's right to a reasonable return from their land. The Comprehensive Plan for Antrim Township and Greencastle Borough assumes that each viewpoint is a legitimate entity in the community. Without conservation, development becomes

shabby and inferior. Without development, individual freedoms are stifled with callous and calculated forethought.

The following plan for Antrim-Greencastle attempts to not only inventory what is, but also to look beyond the present to the year 2005 or 2010. As such, the plan is not merely a crystal ball with the fingerprints of planning genies etched on it. Rather it is more like a pair of red and green 3-D glasses, allowing the viewer to see what others may not see, allowing the wearer to see the world in a new and different way.

II. COMMUNITY DEVELOPMENT OBJECTIVES

The following objectives are formulated with the intention of balancing conservation and anticipated future growth in the Antrim - Greencastle community. The balancing will hopefully maintain the unique small town rural flavor of the community while assuring a positive outlook for growth. The community development goals are as follows:

a) That future residential, commercial and industrial development concentrate in an orderly way in areas accessible to public sewer and central water.

b) That the impact of new traffic become a major consideration in site approval for new development.

c) That the street and highway networks provide efficient circulation through and around the existing commercial centers of the community.

d) That provisions are made for a safe and reliable water supply for the current and anticipated populations.

e) That community facility planning become coordinated between the two communities in order to more efficiently serve the needs of an anticipated economically diversified population.

f) That future planning decisions take into consideration the increasing attractiveness of the region for commercial and residential development spreading outward from the metropolitan areas of Washington and Baltimore.

g) That the community develop and maintain a land management data base to help in a coordinated governmental approach to land regulation and development in the area.

h) That the community manage open space and agricultural land with the intention of preserving these essential ingredients that produce the rural nature of the area.

i) That future housing development meets the varied needs, preferences and incomes of the existing and future residents of the community.

j) That the resident population have access to the full range of needed goods and services existing both in the commercial nodes and outlying commercial establishments.

k) That implementation strategies such as zoning and subdivision regulations insure that future growth occurs in area where the positive features of the development far outweigh the negative features.

III. COMMUNITY FACILITIES

See Plate 1- Community Facilities and Transportation Map

The Community Facilities section of a comprehensive plan examines the existing public infrastructure. Included in the community facilities section are the following:

- A. educational resources
- B. fire and police services
- C. public sewer services
- D. public water services
- E. local recreation services
- F. local library services
- G. solid waste
- H. recycling facilities

A. Educational Resources

The Borough of Greencastle and Antrim Township have combined their educational function under the auspices of the Greencastle - Antrim School District Authority. The district has about 2139 students (1990) in grades K-12. There are three elementary schools (K-5) with an enrollment of 978. The Middle School (6-8), and the Senior High School (9-12) building each have approximately 462 and approximately 680 students respectively (1990). There are 269 full and part-time employees and the operating budget in 1990, was \$10.5 million.

School capacity is a factor affecting the development approval process. A large residential development may increase the population of a local school. Based on 1991 estimates, the existing capacity of the five school buildings is as follows:

- 1) South Antrim -67%
- 2) Shady Grove - 67%
- 3) Greencastle-Antrim Elementary -80%
- 4) Greencastle-Antrim Middle -60%
- 5) Greencastle-Antrim High School - 85%

The school district annually makes estimates of the

kindergarten class six years hence from the recorded live births of the current year in Franklin County. The State of Pennsylvania also makes an estimate using the same data. Live birth estimates do not factor in the number of pre-school children who are born outside the county and move into the county before beginning kindergarten. The ratio of live births to actual kindergarten enrollment for the period 1979 to 1991 has a range from .74 to 1.02. The last two school years (1990-91 and 1991-92) had a live/actual ratio of .93 and 1.02. The grade level enrollment projections from 1990 to 1995 expressed as a percent change are presented below:

- 1) K to 5 +13.9%
- 2) 6 to 8 +13.3%
- 3) 9 to 12 -6.8%

Vocational education is met by the Franklin County Area Vocational Technical School located approximately eight miles north of Greencastle Borough in Guilford Township along US Route 11. In 1990, 79 students or approximately 17% of the senior high students were enrolled in the vocational education programs.

The unused existing capacity of the five schools in the Greencastle-Antrim School district appears to be adequate for the next fifteen years. The K to 5 subgroup has the largest projected increase but even that increase is less than the unused existing capacity in the three elementary schools, the two middle schools and the high school. The above conclusion is based on the assumption that a major immigration of young families does not occur during the next fifteen years.

B. Fire and Police Services

Primary fire services for the two municipalities are provided by Rescue Hose Company No. 1 which is an all volunteer, non-profit organization. With about 88 active members, Rescue Hose provides fire-fighting and emergency medical services to borough and township residents. Advanced Life Support services are provided by the Waynesboro Area Advanced Life Support Unit located in Waynesboro and the Chambersburg Area Advanced Life Support Unit located in Chambersburg. Hospital facilities are also located in Chambersburg, Waynesboro and Washington County, Maryland.

Greencastle Borough provides twenty-four hour a day law enforcement services for its residents. As of 1990, the Greencastle Police Department has one full time chief and two full time patrol officers along with five part-time temporary officers. Pennsylvania State Police stationed in Chambersburg, provide law enforcement services for residents of Antrim Township.

During the next fifteen to twenty years, the outward spreading effects of urbanization and its accompanying societal problems will impact the area. Urban related crime will most likely increase along the I-81 corridor. A Greencastle/Antrim regional police force may represent an appropriate future response to an anticipated increase in local criminal activity.

C. Public Sewer Services

Both municipalities maintain a separate public sewer system. The Borough of Greencastle's plant began operation in 1958, with a design capacity of 400,000 gallons per day (gpd). An upgrade to 800,000 gpd was completed in July, 1990. An average daily volume of the Greencastle system is 300,000 gpd which gives the system an excess capacity of 500,000 gpd. The average residential unit consumes 152.6 gpd.

Antrim Township has an average daily flow of 291,000 gpd. The average residential unit consumes 130 gpd. The actual design capacity of the system is 700,000 gpd. Reserve capacity in Antrim Township is approximately 409,000 gpd which includes the Waste Management Landfill reservation.

Both sewage treatment plants are located on the Conococheague Creek (see Plate 1 Community Facilities and Transportation Map). The two plants perform both primary and secondary treatment and do not treat heavy metals. Because of the close proximity of the two municipalities, an agreement was established in 1990. Antrim Township provides sanitary sewage service to some of their citizenry through a utilization of Greencastle Borough's excess sewage capacity.

The Waste Management Landfill located north of Upton, (Montgomery Township) has plans to treat leachate in the Antrim Township Plant. The landfill will consume about 50,000 gpd of excess sewer capacity once connected to the Antrim system.

Excess sewer capacity is one measure of a community's potential for growth. Few units in both communities are

metered and therefore the vast majority of users pay a flat rate. An estimate of the potential for growth in both communities is obtainable by dividing excess capacity by average usage. Greencastle has a potential to increase its capacity by approximately 3200 equivalent dwelling units (edu). Antrim has a potential to increase its capacity by approximately 3146 edu.

Excess sewer capacity is a mixed blessing for a municipality. On the positive side the capacity appears to satisfy the projected growth in housing (Table IV-2). However, certain non-residential activities such as meat and food processors along with waste processors might be attracted to areas with excess sewer capacity. Recent federal Clean Water legislation may mandate that many industrial activities reduce their point discharge of toxic substances into surface streams and use municipal sewer facilities. As a consequence, some industrial activities may have to leave certain urban locations where excess capacities are not found and move to areas where excess capacities are found.

If either municipality would consider a future sewer facility upgrade or major interceptor expansion, then they would have to compete for limited funds with much larger metropolitan areas. Federal construction funding for sewer lines and plant expansion is currently biased to communities with a population in excess of 500,000 people. Limited sewer upgrade funds for small communities are available from the U.S. Farm and Home Administration (FmHA). Funds are also available from the Pennsylvania revolving loan funds (SRLF).

Future planning in both communities needs to cau-

tiously and wisely allocate excess sewer capacity so that a mixture of land uses is achieved and one type of land use does not dominate. An upgrade of sewer facilities does not appear fiscally practical in the near future. An expansion of sewer lines into areas not currently sewered is more likely but the procedure and location of the lines demands careful scrutiny. Conclusion #2 in Chapter XI addresses the issue more fully.

D. Public Water Service

The Greencastle Area Water Authority was established in 1977 to serve the Borough and selected areas of Antrim Township. The Authority uses three surface water supplies: Moss Spring, Ebberts Spring and Eshelman-Spangler Spring. The three locations are shown on the Community Facilities Map. Eshelman-Spangler Spring is the main reservoir. Two of its main springs are located on a 75 acre farm owned by the Authority. Eshelman-Spangler Springs has a capacity of 13 million gallons per day (mgd) with a supplemental well of 300 gallons per minute (gpm). Moss Spring has a ground level holding tank of 500,000 gallons and Ebberts Spring has a 20,000 gallon holding tank.

In 1990 the Greencastle Water Authority served approximately 3950 people utilizing 1469 taps. About 83% of the taps are located in the Borough with the remaining 17% in Antrim Township. Ninety percent of the taps are residential, nine percent are commercial and only one percent are industrial or institutional taps. The operating cost / revenue rate is about 0.76. Many improvements in the system

are planned during the first half of the decade of the nineties. One of the major improvements includes nitrate removal, a problem related in part to nutrient runoff from agricultural fields in the carbonate area near the three springs. Lincoln Utilities, a Public Utilities Commission approved private water company, is located in the southern portion of Antrim Township. It serves customers in the Hykes Road area and at the time of this publication, no specific data was available.

Antrim Township is unique in that public sewer is provided to many of its residents while a much smaller number of its residents use municipal water. Many of Antrim's residents live on carbonate terrain and rely on groundwater for drinking water. Groundwater contamination normally occurs from several different sources but one major source in the local area is nutrient runoff from agricultural operations. Individual water treatment systems can be encouraged by the municipality. A planned expansion of the existing water systems, particularly along the major growth corridors is another long range alternative. Conclusion #2 in Chapter XI addresses the topic in more detail.

E. Local Recreational Services

Neither Antrim Township nor the Borough of Greencastle directly owns or manages major recreation facilities. Most of the facilities which do exist, are privately owned and managed by public-nonprofit associations. The following list details the local recreational facilities and their respective owners: (See Plate 1 Community Facilities and Transportation Map)

- 1.) Jerome R. King - Greencastle, (pool, tennis courts, picnic pavilions, ball fields) Managed by Jerome R. King Playground Association.
- 2.) Enoch Brown Park - Antrim, (4 acres, picnic pavilions, historic monument) Owned and Managed by Antrim Township.
- 3.) Ball Fields managed by the Ruritans in State Line, Kauffman Station, and Shady Grove.
- 4.) Greencastle Sportsman's Association (fishing, archery, picnicking, rifle and pistol shooting).
- 5.) Martin's Mill Bridge Association (covered bridge preservation).

Many state parks are located within easy driving distance. Cowans Gap, Caledonia, Buchanan Valley and Pine Grove Furnace are all located within one hour's driving time of the municipalities.

Recreational facilities appear to be adequate for the current period. If significant immigration would occur, then an expansion of public recreational services may be demanded. Future recreational development may include: community swimming pool, multi-use community park and a community activities building.

F. Local Library Services

The Lilian S. Besore Memorial Library, located in the Borough of Greencastle provides public library facilities to the region. Built in 1963, with off-street parking, the library has 35,000 volumes within a building of 5,000 square feet. During a summer 1990 expansion, 1,800 square feet was added to the structure. It now has a larger first floor and an unfinished basement. The library is part of the Franklin County Library System and the State of Pennsylvania Library system.

G. Solid Waste Management

A major regional landfill is located in the western portion of Antrim Township near the village of Upton, in Montgomery Township. The landfill is owned and operated by Waste Management Inc. Additional expansions of the landfill over the next few years may occur in the direction of Antrim Township. In 1990, Pennsylvania's Department of Environmental Resources (PADER) permitted Waste Management to accept up to a maximum of 1250 tons per day with an average daily volume of 1000 tons. Antrim Township employs two licensed landfill inspectors as specified under Pennsylvania Act 101 of 1988. The same act authorizes a benefit fee of \$1.00 per ton of weighted solid waste, be paid to the host municipality. Since the landfill is in two townships, the fee is apportioned based on the percentage of permitted area within each municipality. When expansion occurs, then it is likely that more of the benefit fee will be received by Antrim Township. As of 1991 about 34% of the permitted area of the Waste Management Landfill was located in Antrim Township. Greencastle Borough and Antrim Township are both participants in the Franklin County Solid Waste Management Plan.

In the future, Antrim Township may be viewed as a desirable community for future waste disposal facilities. The Township possesses some of the following advantages

- a) Within a two to three hours shipping time from the Baltimore, Washington and Philadelphia metropolitan areas;
- b) Within a twenty mile radius of major north-south and east west interstate highways;

- c) Abundant and relatively low cost land;
- d) Excess sewer capacity.

Future planning in the Township needs to carefully control the existing waste disposal facility. Every means to legally restrict additional expansion of the landfill should be utilized. Furthermore, planning in the Township needs to develop a strategy to prohibit new facilities from locating in the area.

H. Recycling Facilities

Neither Antrim Township nor the Borough of Greencastle is mandated by Pennsylvania Act 101 to develop a community re-cycling plan until July, 1993. However, both municipalities, in cooperation with three other jurisdictions, have formed a coalition for regional recycling. The coalition will share costs for containers and makes recycling information available for their residents by July, 1992.

IV. DEMOGRAPHICS, HOUSING AND LABOR

PART A. - DEMOGRAPHICS

Antrim Township in 1990 had 10,071 residents and Greencastle Borough had about 3595 residents. Antrim Township increased its population from the previous decade by 7.9% which is about one-quarter of the growth it had in the previous three decades. The 7.9% population growth rate for Antrim Township was the lowest growth rate since the decade of 1940 (Table IV-1).

Compared to certain contiguous municipalities in Franklin County, Antrim's population change was noticeably lower. Hamilton, Guilford, and Washington Townships all had a relative population change from 1980 to 1990 at least one and half times to two times larger than Antrim Township. Montgomery, Quincy, Peters and St. Thomas Townships had relative population change significantly lower than Antrim.

In spite of its low relative growth rate, Antrim Township, during the decade of the 1980s, achieved its largest population. The population base has consistently increased since 1940 to the present level of more than ten-thousand residents (Figure IV-1).

Greencastle Borough had a negative rate of population change during the decade of the 1980s. Greencastle steadily increased its population every decade from the 1940s through the 1970s (Figure IV-1). During the previous decade, Greencastle Borough lost 84 residents from its largest population base achieved during the decade of the 1970s (Table

IV-1). Greencastle's population decline for the period 1980-1990 is similar to two other Franklin County boroughs, Orrstown and Waynesboro. Chambersburg, Mercersburg and Shippensburg experienced a positive population growth during the same period.

Population density or people per square mile, increased in Antrim Township by 7.4% and decreased by 2.2% in Greencastle Borough (Table IV-1). The large population density of Greencastle is normal for boroughs in Pennsylvania which traditionally have limited area with large populations. The positive percentage increase in population density for Antrim Township is about one-third as large as the surrounding townships (Table IV-1). Two higher density townships, Guilford and Hamilton Townships, adjoin Antrim Township on its northern border. The bulk of Hamilton's and Guilford's population is located in the northern portions of the township closest to the Chambersburg urban area.

TOTAL PERSONS

1940 - 1990

Total Persons
(Thousands)

17

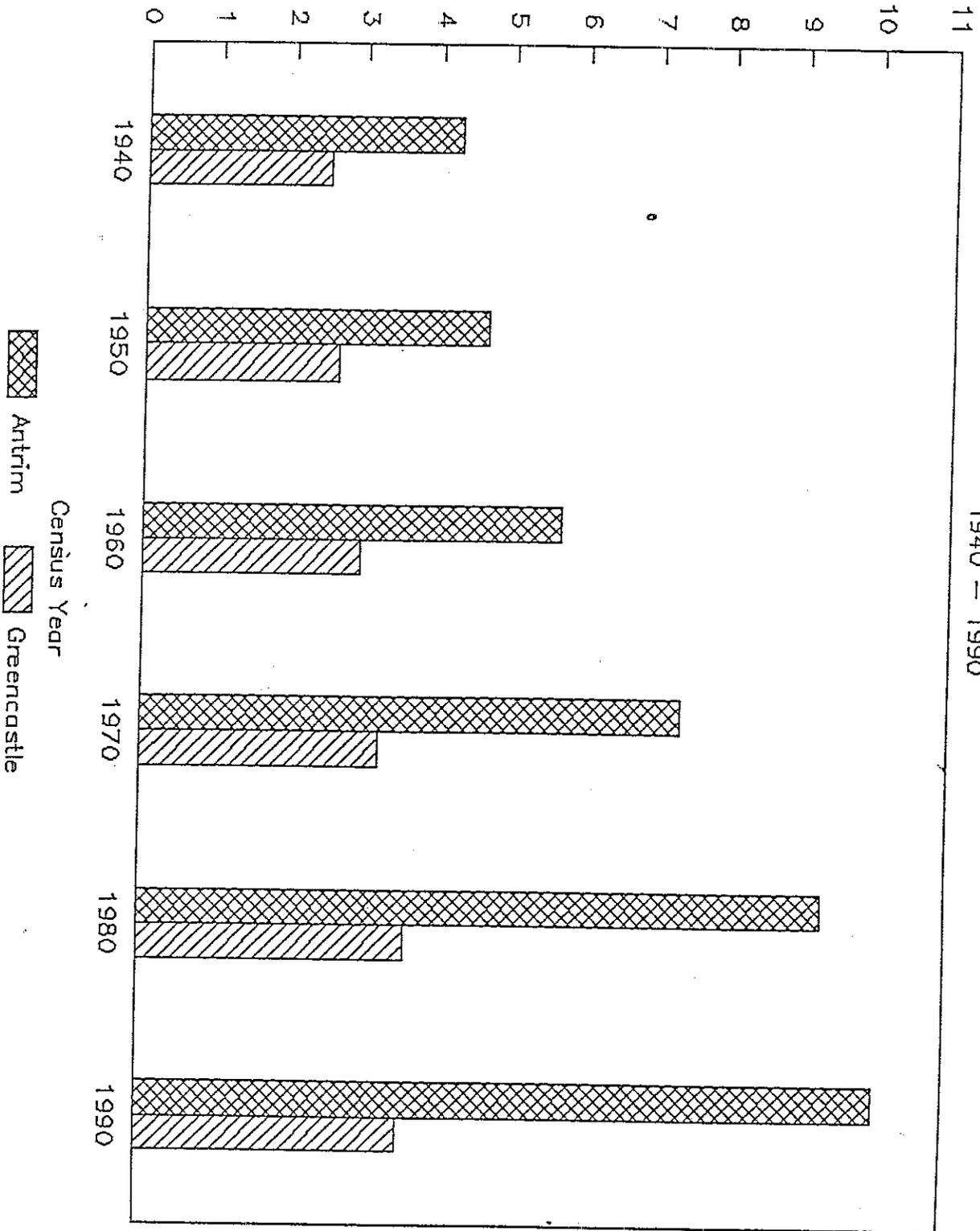


Figure IV - 1 TOTAL PERSONS.

**TABLE IV-1
POPULATION CHARACTERISTICS**

**Antrim Greencastle Contiguous¹
Township Borough Municipalities**

Total Population			
1980	9356	3679	5954
1990	10071	3595	7252
Percent Change	+7.9	-2.2	+21.8
Percent Change Population			
1940-1950	9.4	5.9	NA
1950-1960	22.2	12.2	NA
1960-1970	28.7	10.2	NA
1970-1980	26.4	11.7	NA
Population Density (sq. mile)			
1980	134.0	3065.8	132.1
1990	144.2	2995.8	161.0
Percent Change	+7.4	-2.2	+21.9
Mean Per capita Income (\$)			
1980	6643	8038	6447
Income/Family(\$)			
1980	20756	20368	19156
Families Below Poverty			
1980	2.0%	6.8%	6.4%

Source: 1980 PA. Population and Per Capita Income Estimates;
1980,1990 General Population and Housing
Characteristics;

¹ Values for contiguous municipalities are determined by calculating the average from the following townships which are abutting the study area: St. Thomas, Quincy, Hamilton, Montgomery, Peters, Guilford and Washington

PART B. - HOUSING AND INCOME

Antrim Township and Greencastle Borough both increased their housing stock for the period 1980 to 1990 (Table IV-2, Figure IV-2-A). However, the increases were lower than the average of the nearby municipalities. Based on the 1990 census, owner occupied dwellings increased more in Antrim Township than in Greencastle Borough (Figure IV-2-B). The Antrim Township increase exceeded the average for nearby locations by a significant fifty percent. Antrim Township increased its housing stock primarily by the growth of owner occupied dwellings (Figure IV-2-B).

Housing values are interpreted with a degree of caution. Interpretations should be made only for the same time period. Housing values less than \$20,000 in 1980 and values less than \$50,000 in 1990 indicate the lower end of the housing market. Antrim Township has fewer low income units than Greencastle Borough and together both municipalities have more units in the higher end of the market than surrounding locations.

Housing density or people per household has decreased since 1980 (Table IV-2). Household size is also decreasing. More and more houses in the study area are occupied by fewer people. The decrease in household density in Antrim Township was one and half times larger than similar values for nearby locations. Recreational and educational resources may need reallocation in the future due to these trends.

One conclusion from the data is that average family size is larger in Antrim than in Greencastle. However, income per family and per capita income is slightly higher in

TABLE IV-2

HOUSING CHARACTERISTICS

	Antrim Township	Greencastle Borough	Contiguous ² Municipalities
Total Housing			
1980	3050	1528	2294
1990	3652	1614	2875
% of Change	19.7	5.6	25.3
Owner Occupied %			
1980	78.3	57.9	76.9
1990	82.5	59.2	79.6
% Of Change	5.3	2.2	3.5
Housing Value			
1980 < \$20,000	4.4	4.8	6.2
1990 < \$50,000	7.3	8.4	12.4
Housing Value			
1980 > \$50,000	22.5	19.3	21.2
1990 > \$100,000	11.3	11.9	10.2
Median Housing			
1980 Value	\$45,000	\$44,500	\$41,366
1990 Value	\$75,000	\$77,800	\$70,633
Housing Density (Persons/HH)			
1980	3.17	2.52	2.96
1990	2.88	2.30	2.73
% Of Change	-9.1	-8.7	-7.7
Future Housing Demand			
2000	3877	1700	
% change -1990	+6.1%	+5.3%	
2010	4345	1760	
% change-1990	+18.9%	+9.0%	

²Values for contiguous municipalities are determined by calculating the average from the following townships which are abutting the study area: St. Thomas, Quincy, Hamilton, Montgomery, Peters, Guilford and Washington

1990 HOUSING UNITS

Total, Owner, and Occupied

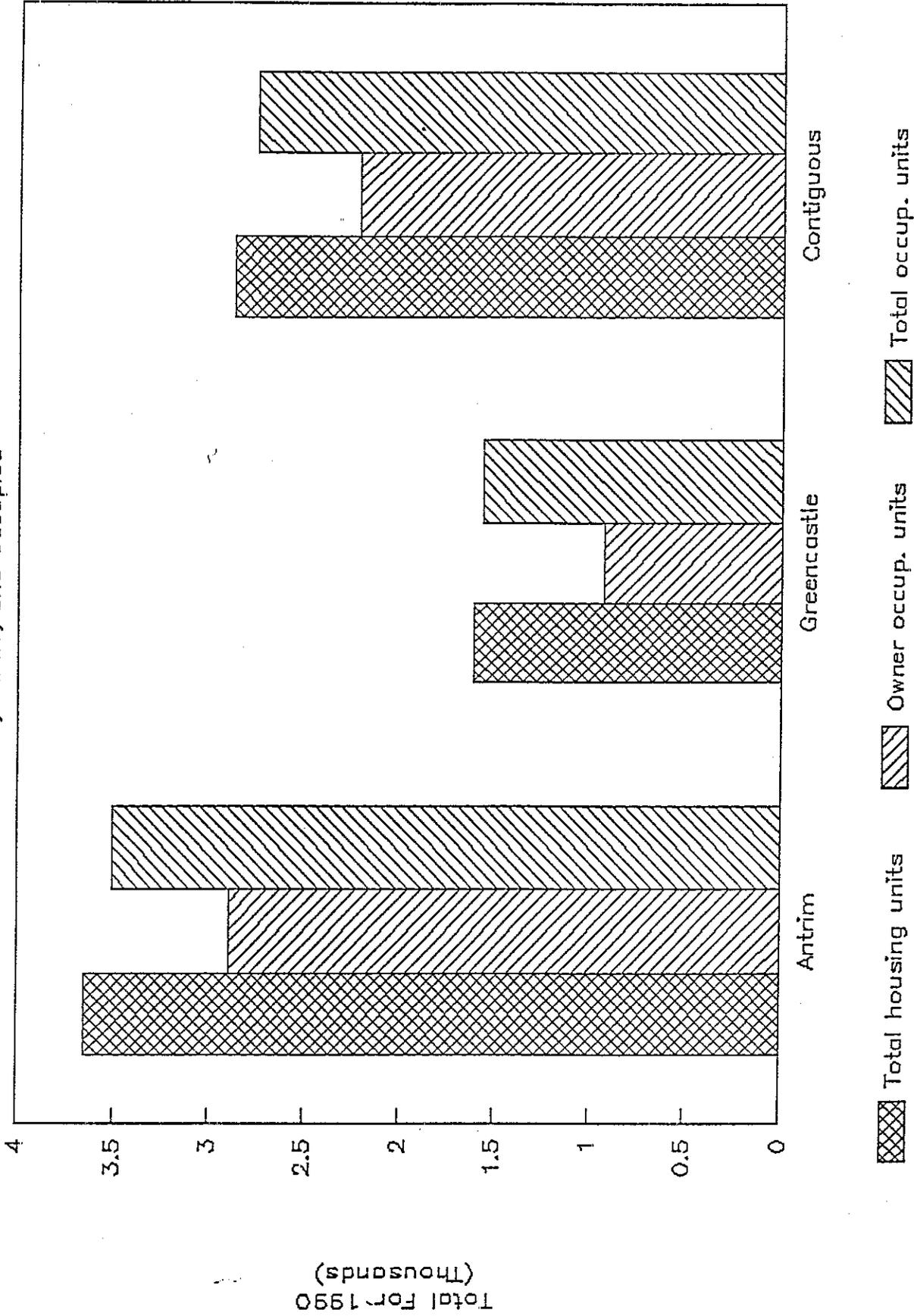


Figure IV-2A. 1990 Housing Units.

1990 OWNER OCCUPIED HOUSING

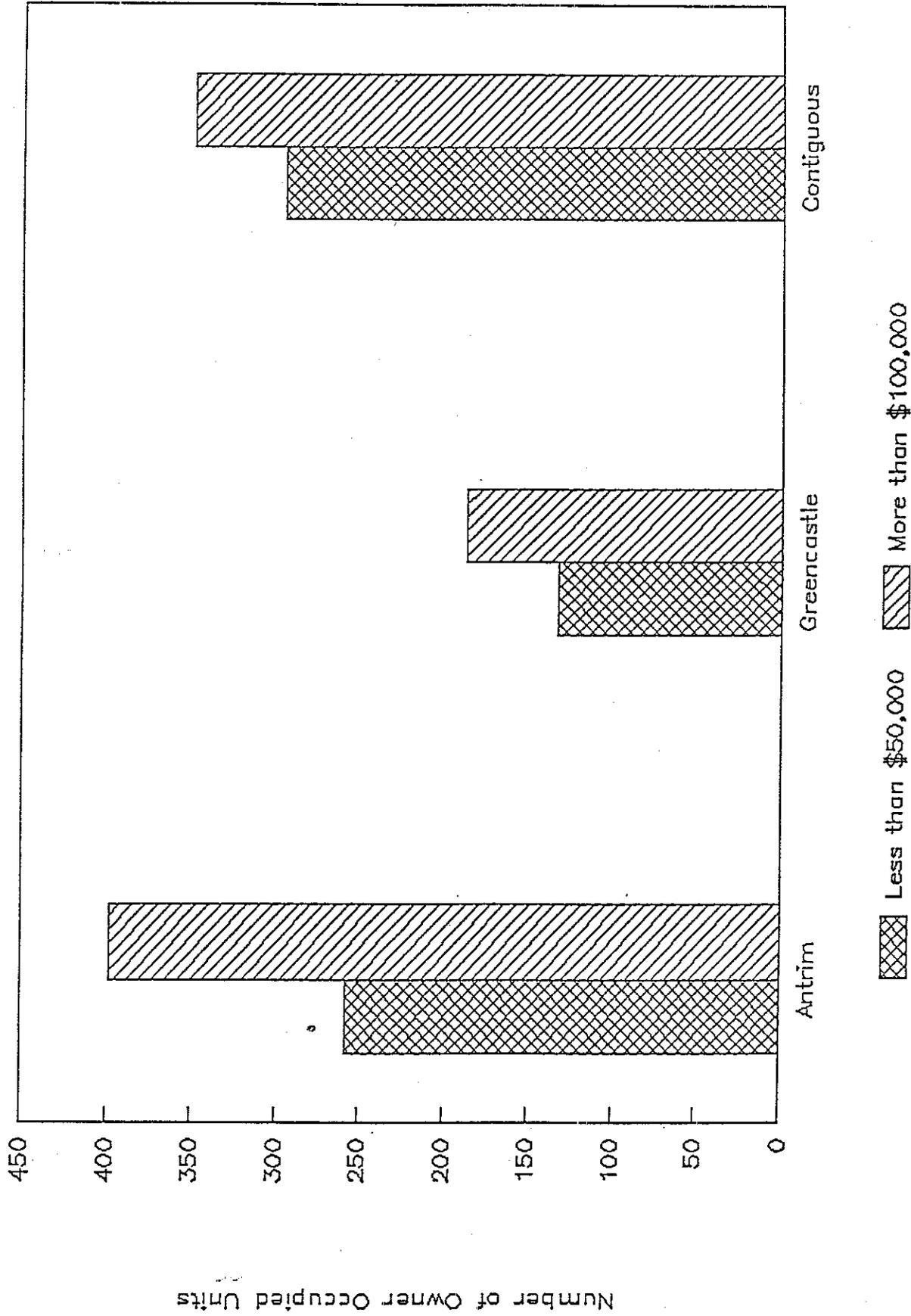


Figure IV-2B. 1990 Owner Occupied Housing.

HOUSING DENSITY

1990 Persons Per Household

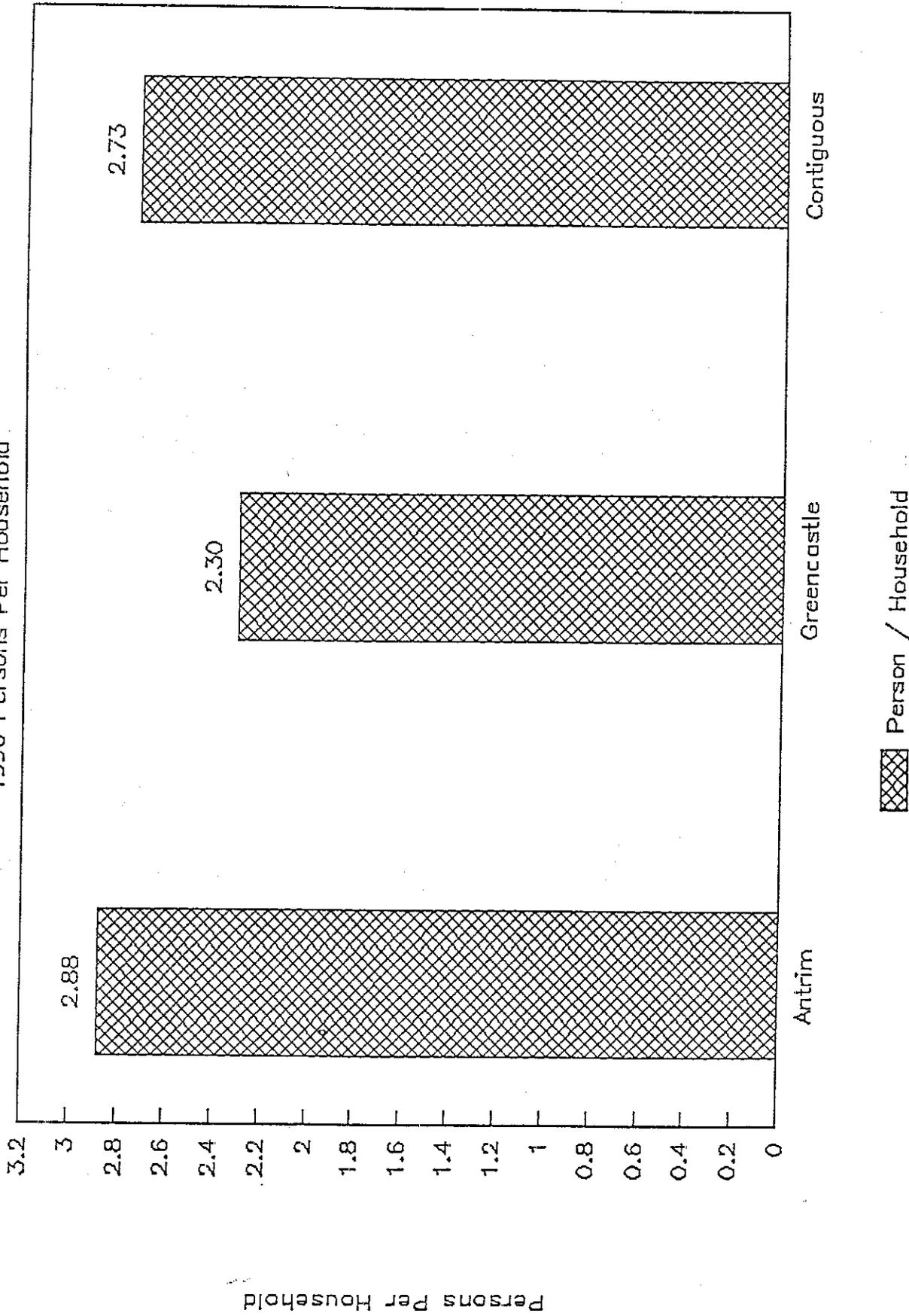


Figure IV-2C. Housing Density!

Greencastle. Income per family is about equal (Figure IV-3A). Antrim Township in 1990 has an average of 3.43 people per family while Greencastle Borough has 3.3 people per family. About 29% of Antrim's total population is classified as a family while 30.0% of Greencastle's total population is classified as family.³

Future housing demand is calculated by referencing Table IV-2 and Table IV-5. Using the average projected population for the decades 2000 and 2010 and dividing it by the 1990 housing density for each municipality, yields projected new housing units of 3877 (2000) and 4345(2010) for Antrim Township. Similar projected values for Greencastle Borough are 1700 (2000) and 1760 (2010) units. Based on the above assumptions and using 1990 as the base year, Antrim Township will need to increase its housing stock by 6.1% by the next decade and by 18.9% by the decade of 2010. Greencastle Borough will have to increase its housing stock by 5.3% by the year 2000 and 9.0% by the year 2010.

The General Planning Map (Plate 10) defines areas of future land development. If all future residential development were to occur within Class I areas, then there appears to be adequate land within Antrim Township to meet the anticipated growth in housing units. In the Borough, the anticipated growth would have to occur by increasing lot density where developable land is not available.

³ A family consists of a household and one other person who is related by blood or adoption.

1987 PER CAPITA INCOME

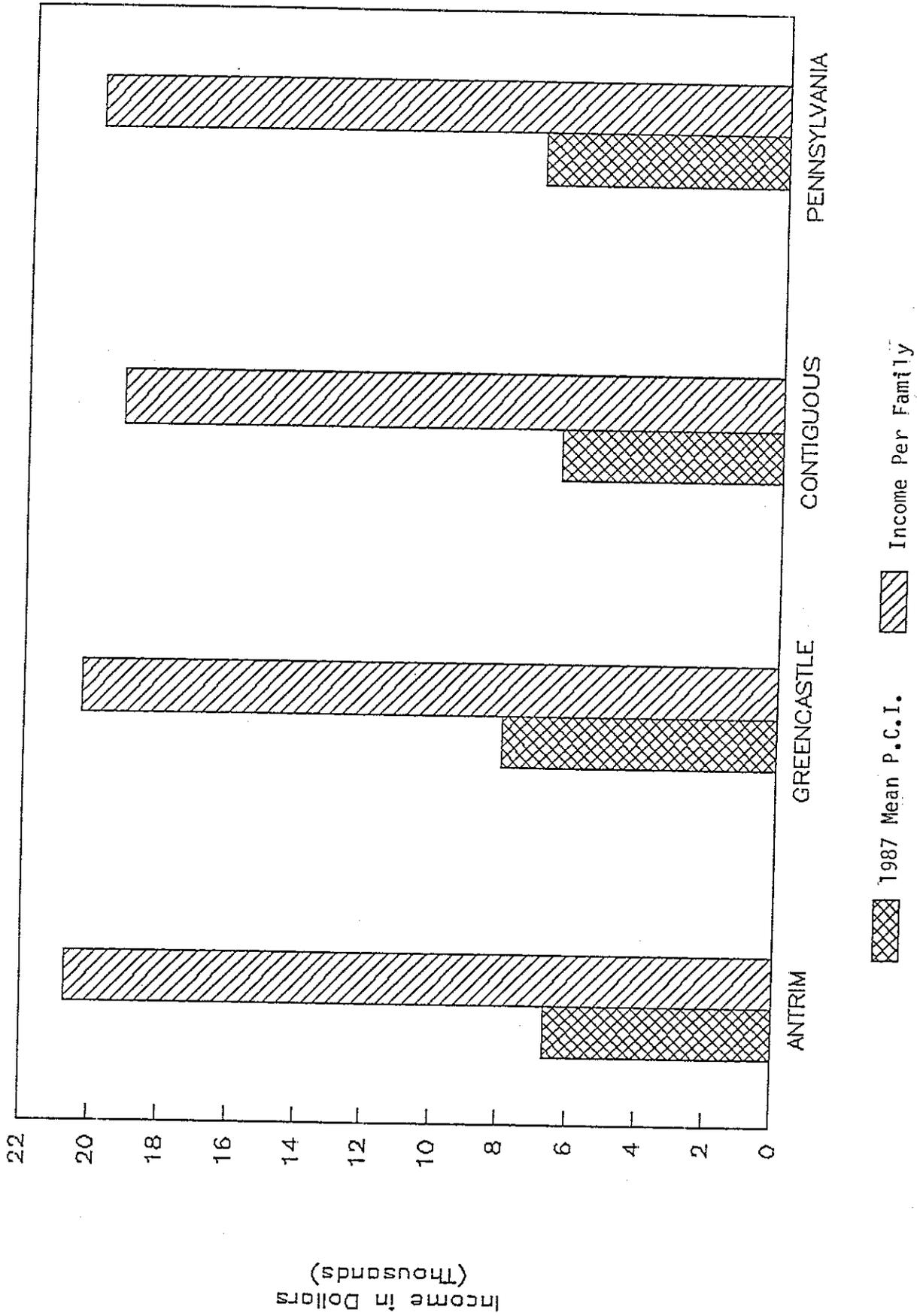


Figure IV-3A. 1987 Per Capita Income

Income in Dollars
(Thousands)

PART C. - LABOR FORCE

Antrim Township and Greencastle Borough have a similar labor force composition (Table IV-3). Both municipalities are slightly lower than the surrounding municipalities in service oriented employment but significantly higher than the surrounding municipalities in manufacturing employment. Retail and wholesale employment is also slightly larger in the study area than in the surrounding areas.

When a community possess a relatively large amount of its labor force in manufacturing, they normally have higher incomes since incomes in manufacturing normally exceed incomes in the retail and service sectors. On the negative side, manufacturing employment tends to fluctuate, often based on international or national market conditions. Service and some types of retail oriented activities tend to be more immune to short term market perturbations.

Tables IV-4a, b and c, list the major industrial employers in the Greencastle and Waynesboro area. The largest employer in the region is Grove Worldwide with approximately 2000 to 3000 employees followed then by four other firms employing 600-800 employees. Most of the other employers are small with an average labor force of 111 employees per establishment in Waynesboro and 75 per establishment in Greencastle.

The relatively large proportion of the total labor force employed by the five largest firms presents a degree of economic vulnerability for the region. A major cutback in employment in one firm would impact the local area. However, the laborshed for the large employers goes well

beyond the boundaries of the Township and the Borough. Unemployment rates in Franklin County have traditionally been in the range of 4.6% to 6.3%. The low rate of unemployment in Franklin County has placed it in the upper quartile of counties in Pennsylvania since 1988.

TABLE IV-3

LABOR FORCE CHARACTERISTICS
1980

Antrim
Township

Greencastle
Borough Contiguous
 Municipalities

Service (%) Labor Force	9.4	9.5	10.4
Retail-Wholesale (%) Labor Force	16.5	17.1	13.0
Manufacturing (%) Labor Force	40.3	41.7	34.3

INDUSTRIAL EMPLOYERS IN WAYNESBORO, PA

Table IV-4a

Employers:	# of Employees
Frick Co.	822
Regenency Thermographics of PA	800
Litton Industrial Automation Systems	695
Teledyne Landis Oster	350
Amp. Inc.	135
Connie Sportswear	131
Elite Personalized Creations	100
Homes by Keystone	97
SPI Fire Apparatus	63
Beck Manufacturing Inc.	50
Benju Corp.	50
Wayne Tool Co.	42
Record Herald Publishing Co.	38
Bonded Applicators	30
TRI Fab Inc.	31
Waynesboro Pipr. Products	14
Sesco Electrical Systems	16
Mull Machine Shop	10
Antietam Dairy	9
Waynesboro Ice and Cold Storage	8
Window Stor and More	8
American Analytical Testing	6
The Colorworks	6
Mohn's Lumber Mill	5
South Potomac Lumber	5
Ray Eyler Paving	4
Leos Candy Factory	3
Waynesboro Marble and Granite Works	3
Ernest Whitney Pressure Pro.	3
A. E. Sollenberger	3
Investment Casting	3
Allison's Harness Manufacturing	2

Average = 111 for area

Data Based January, 1990 Estimates

INDUSTRIAL EMPLOYERS IN GREENCASTLE-ANTRIM AREA

Table IV-4b

Employer:	# of Employees
Corning Glass Works	620
Jerr-Dan Corp.	215
Foremost Industries	169
Anvil Products Inc.	159
Baer Packing Corp.	156
Lucchino Industries Co.	55
Precision Manufacturing and Engineering	54
Strait Manufacturing and Welding	40
Mitchell Machine Shop	37
Contech Construction Products	35
Eshland Enterprises Inc.	33
Appalachian Lamb Co.	27
Graphics Universal	24
Castle Machine Shop	20
Danco Products	20
Better Foods Foundation	15
Greencastle Metal Works	10
Echo Pilot	9
Pen-Mar Wood Works	6
Craig's Concrete	6
Panel Structures Inc.	6
Bock Oil	3
Investment Casting	3

Average = 75 for Area

INDUSTRIAL EMPLOYERS IN SHADY GROVE
AND MARION AREAS

Table IV-4c

Employers in Shady Grove	# of Employees
Grove Worldwide	2,000 - 3,000
Shady Grove Planning Mill	8

Employers in Marion	# of Employees
Williard Agricultural Service	9
Statler Body Works	5
Ira Leshner and Son Inc.	3
Village Printing	1

PART D. - POPULATION PROJECTIONS

Small area population projections are often very tenuous in nature since it considers only gross changes in population. Population change arises from changes in either net natural increase or net migration. Small area projections sometimes are impacted by the migration component more than the natural increase component.

Three population projection models are used and produce varying results (Table IV-5). The linear model assumes constant average change and data came from the period 1940 to 1980. The linear model assumes that the rate of change in the past decades will continue into the future. The exponential model assumes that growth continues relentlessly and a population gets bigger and bigger. The ratio model assumes that the population growth in the Greencastle and Antrim area is part of a larger growth pattern in the surrounding Franklin County area.

Population projections at the local level provide a broad picture of possible future scenarios for the community. Each scenario provides different implications. However Antrim has land for expansion which is lacking in Greencastle. Provided that long term economic downturns do not occur, then Antrim Township can absorb a larger population in the next two decades. The projection for Greencastle signals a far more restrained growth particularly after the year 2000.

The fundamental issue which continually arises in light of population growth is the provision of public services. Both communities currently have the

POPULATION PROJECTIONS 2000, 2010

Table IV-5

	Greencastle Absolute	Boro % Change	Antrim Absolute	Township % Change
1990 Actual Census Bureau Count	3595	-2.2%	10071	7.98%
Linear Projection				
2000	3843	6.8%	11229	11.4%
2010	4088	6.4%	12387	10.3%
Exponential Projection				
2000	3867	7.5%	11974	18.8%
2010	4088	7.6%	14237	15.8%
Ratio*				
2000	4028	12.0%	10297	2.2%
2010	3900	-3.0%	10924	5.7%
Average of Three				
2000	3912	8.8%	11166	10.8%
2010	4049	3.5%	12516	12.0%

*Used weighting of decade with larger weights going to more recent changes

capability to provide needed public services such as central water, sewer, police and recreation through the next decade. Beyond a certain threshold, however, in order to provide the needed services, some form of public service expansion may be needed.

V. TRANSPORTATION

The transportation section is subdivided into the following sections:

- A. Intersection Survey
- B. Transportation Management Issues
- C. Transportation Partnership

PART A. INTERSECTION SURVEYS

A-1 GENERAL OVERVIEW OF INTERSECTION SURVEY

The purposes of the intersection survey are⁴:

A. To determine overall movement patterns within the municipalities and to develop base line data for future surveys.

B. To assess movement problems at principle intersections which have been noted as congested by both communities.

The intersection survey section is subdivided into rural nonsignalized and urban signalized intersections. Nine major intersections were selected by the local officials and traffic flow data was collected on a mid-week day in July, 1990, for two A.M. peak periods, two P.M. peak periods and two non-peak periods. A sample period was 15 minutes in length, and counts included volumes in both directions.

Tables V-1 and V-3 show the percent of total vehicles per hour⁵ on the prime routes. The secondary routes for both

⁴An intersection study is a sample investigation of traffic movement at an intersection over a period of time.

⁵Vehicles per hour is the sum of all vehicles entering the intersection in both directions. The percentages represent the portion of the total vehicles per hour (VPH) moving through the

peak and non-peak volumes represent an average of the A.M. and P.M. sample values. Table V-1 devotes itself to non-signalized intersection, while Table V-3 concentrates on signalized intersections. It should be emphasized that the detailed traffic data is most useful for developing a baseline for future traffic decisions.

Level of service is a measure of traffic flow effectiveness. It is a qualitative measure of operational conditions within a traffic stream (Highway Capacity Manual, 1985, p. 1-3). Tables V-2 and V-4 summarize the major levels of service for rural two lane and urban signalized intersections. The level of service was qualitatively determined from the Highway Research Manual criteria in order to facilitate roadway intersection conjunction. A more detailed traffic analysis of the intersections could define more precise levels of service.

The following example will provide the reader with an understanding of the traffic data contained in Tables V-1 and V-3. The intersection of Kaufman Road and Route 11 is chosen for the example and Route 11 had an estimated total of 783 vehicles per hour (VPH) in both directions in the peak period and 500 VPH in the non-peak period (Column 8 of Table V-1).

intersection or turning. Since there are different totals the percentages will not equal 100%

Table V-1

RURAL TWO-LANE NON-SIGNALIZED INTERSECTIONS

Location

Percent of Total VPH

Location	Primary)	Through		Turns		Differences		Volumes both direction primary	Level of Service primary VPH/2800
		->S (->E)	->N (->W)	from primary	to primary	through (N-S)	turns from/to		
Kauffman Route 11	P NP	32.9 34.8	37.6 26.6	49.7 68.4	87.1 80.5	4.7 8.2	37.4 12.1	783 500	.27-B .17-A
Rabbit Route 16	P NP	94.1 88.2	97.6 94.6	2.9 4.1	95.0 77.7	3.5 6.4	92.1 73.6	2212 900	.79-D .32-B
Hykes Route 11	P NP	82.4 78.3	84.8 86.1	16.5 17.8	100 100	2.4 2.8	83.5 82.2	2296 602	.82-D .21-B
Hollowell Route 16	P NP	87.0 94.9	90.8 94.5	5.0 5.2	100 100	3.8 0.4	95.0 94.8	3488 1066	>1.0 -E .38-C
Hollowell Leitersbg	P NP	57.1 40.0	45.0 76.9	50.0 22.4	12.7 27.7	12.1 36.9	37.3 5.3	442 74	.15-A .02-A
res Wausport	P NP	.78 .92	.80 .70	20.8 13.8	75.6 87.7	2.0 22.0	54.8 73.9	562 148	.20-B .05-A

P = Peak
NP = Non-Peak

Source: Authors, 1990

TABLE V-2

TWO-LANE HIGHWAY SEGMENTS

LEVEL OF SERVICE (LOS)

Major Characteristics

LOS	Flow	Average Spd.	Passing demand Passing capacity	Driver delay
A	420 pcph	= 60 mph	< 1.0	< 30%
B	750 pcph	<= 55 mph	<=1.0	< 45%
C	1200 pcph	< 52 mph	>=1.0	< 60%
D	1800 pcph	<= 50 mph	very difficult	< 75%
E	2800 pcph	< 50 mph (25 mph)	impossible	< 75%

pcph = Per car per hour

Source: Highway Capacity Manual
 Transportation Research Board
 1985, pp. 8-5 - 8-6

TABLE V-3

URBAN TWO-LANE SIGNALIZED INTERSECTIONS

Location (Primary)		Percent of total VPH through turns				differences	
		->S (->E)	->N (->W)	from primary	to primary	through	turns
Baltimore (PA-16)	P	46.3	49.6	52.1	45.7	3.3	6.4
Antrim W. (US-11)	NP	46.1	48.2	51.7	50.6	2.1	1.1
Washington	P	95.0	89.6	7.5	63.0	5.4	55.5
Baltimore	NP	88.2	88.6	11.5	69.9	0.4	58.4
Carlisle	P	85.5	83.1	10.9	59.2	2.4	48.3
Baltimore	NP	82.0	76.8	20.8	67.2	5.2	46.4

Source: authors, 1990

TABLE V-4

SIGNALIZED INTERSECTION

LEVEL OF SERVICE (LOS)

LOS	Stop Delay per vehicle (seconds per vehicle)	Progression of Vehicle
A	< 5.0	Favorable
B	5.1-15	Good
C	15.1-25.0	Fair
D	25-40.0	Congestion
E	40.1-60.0	Poor
F	>60.1	Oversaturation

Source: Highway Capacity Manual
Transportation Research Board
1985, pp. 9-4 - 9-5

Approximately 32.9% of the VPH (Column 2) came from the South while 37.6% of the VPH came from the north. Thus 70.5% (37.6% + 32.9%) of the VPH in the peak period passed through the intersection and 29.5% of the total VPH came from either side of Kauffman Road. 49.7% (column 4) of all turns at the intersection came from Route 11 with the remainder (100%-49.7%) of all turns coming from Kauffman Road. 87.1% (column 5) of all traffic on Kauffman Road turned onto Route 11 and 12.9% (100%- 87.1%) passed through the intersection. Column 6 and Column 7 indicate the differences between the north-south and turn movements. Thus 4.7% (37.6% - 32.9) represents the difference between traffic coming from the north onto Route 11 and traffic coming from the south. About 37.4% of all turns came from the primary and turns to the primary. Large values in the difference columns signify more of an unbalanced flow and the most meaningful comparisons are the ones between the peak and non-peak. Therefore, a difference of 25.3% (37.4% - 12.1%) signifies that turning movement at the Kauffman - Route 11 intersection is heavily influenced by the work trip.

A-2. ANALYSIS OF RURAL TWO-LANE NON SIGNALIZED INTERSECTIONS

A. Kauffman and Route 11

Traffic movements at this intersection indicate a sizable turning volume to and from Route 11. Residences either side of Route 11 and accessible from Kaufman Road help to account for the sizeable turning volume. Peak and non-peak differences are not very pronounced on Route 11, particularly in the southward direction. Peak and non-peak differences are also not as noticeable in turning movement. This consistency may be due to the large number of residences nearby. Overall, the intersection in peak hours reflects a small bias for northward movement on Route 11 to Chambersburg. Traffic volumes to capacity values (2800 VPH) indicate a level of service of "B" for peak hours and "A" for non-peak times (Table V-2). No major recommendations are made regarding this intersection.

B. Rabbit Road and Route 16

This intersection reflects a pronounced imbalance in flow with few vehicles turning onto Rabbit Road, and most traveling through. Turning volumes from Route 16 to Rabbit Road vary little from peak to non-peak periods. Traffic volumes to capacity ratios for Route 16 indicate an unsatisfactory level of service during peak hours (Table V-2).

On Rabbit Road, roadway width and the overall peak volume of 88 vehicles per hour indicates how a rural local road often functions as a rural collector. A future roadway

modification to Rabbit Road may be needed to accommodate increased flow.

C. Hykes and Route 11

Route 11 and Hykes Road south of Greencastle carries a larger peak volume of traffic than does Route 11 north of Greencastle (Table V-1). The level of service on Route 11 on the peak hour is one of the lowest (Table V-2). Possibly employment opportunities in Hagerstown are more numerous than employment opportunities in the Chambersburg area. Turns from Route 11 to Hykes Road have a consistent flow with small peak to non-peak variation.

Residential development in this part of the township has greatly impacted the Hykes Road traffic volume. In the future increased residential development will only serve to further aggravate the situation. Turning from Route 11 to Hykes is an adventure, particularly during the peak period. The primary route driven must stop in the traveling lane in order to complete the turn. One recommendation is the installation of turning lanes particularly on the northbound part of Route 11 at the Hykes Road intersection.

D. Hollowell Church and Route 16

Route 16 has the highest peak hour flow of the six rural intersections and the poorest peak hour level of service of all roads studied. Most of the peak hour flow is moving eastward. Turns to Hollowell Church Road are proportionally equal to non-peak hour turns. Peak hour totals for the turns to Hollowell Church are around 100 VPH. Turning

lanes installed on Route 16 in both directions, would allow through traffic to continue without delay.

E. Hollowell Church and Leitersburg Pike

This section of the Township is closest to the Maryland border, it has some of the lowest hourly totals for peak and non-peak periods. Most of the movement on both rural collectors is balanced or straight through. The peak hour factor increase is one of the largest of the six intersections. The installation of a larger shoulder would allow through traffic to continue unimpeded by the left turning traffic.

F. Hykes and Williamsport Pike

The intersection has a low absolute volume flow, but a highly unbalanced flow. Williamsport Pike is a rural collector serving the small rural settlements in Southern Franklin County and Northern Washington County. Most traffic is straight through with only an occasional turn to Hykes Road. However in the future, as residential development expands parallel to Hykes Road, increased turning movement can be expected. Future road planning may consider shoulder enlargement to accommodate turning traffic.

A-3. ANALYSIS OF SIGNALIZED URBAN INTERSECTIONS

The following signalized intersections in the Borough of Greencastle are also studied similarly to the rural non-signalized intersections.

- A. Baltimore and Antrim Way
- B. Baltimore and Carlisle Street⁶
- C. Baltimore and Washington

A. Baltimore and Antrim Way

Baltimore Street (PA Route 16) and Antrim Way (US Route 11), have a balanced flow both north and south and also in the turning movement. In both peak and non-peak periods, about 25% of all vehicles entering the intersection turn with approximately one-half of all turns occurring against approaching traffic (Table V-3). Stop delays⁷ for non-peak periods are low, but delays for opposing approach turns are high. In some cases, during non-peak periods, turns are only completed once the opposing approach traffic is stopped for a red light during peak hour.

B. Carlisle and Baltimore

The intersection of Carlisle and Baltimore reflects an unbalanced flow. Most of the traffic passes through the intersection on Baltimore. Stop delays for non-peak periods are highest for traffic from South Carlisle crossing Balti-

⁶ The intersection of Carlisle and Baltimore is not technically signalized, but given its orientation and location, it was considered with the other two signalized intersections

⁷ Stop delays are defined as the time in seconds a vehicle takes to enter and leave the intersection during a green light.

more and continuing on North Carlisle. Most traffic movement from South Carlisle is evenly divided between left turns, right turns and straight through for both peak and non-peak periods. Given the volume of traffic on Carlisle (peak 1418 VPH, non-peak 312 VPH), it is recommended that a traffic signal be installed.

C. Washington and Baltimore

Washington and Baltimore reflects a more unbalanced flow than the Baltimore-Carlisle intersection. Most of the turning movement occurs from Washington to Baltimore. Stopped delays are tolerable for non-peak periods, and through peak movement is acceptable (Table V-4).

PART B. TRANSPORTATION MANAGEMENT ISSUES

INTRODUCTION

The purpose of this section is to detail some solutions to the traffic congestion problem that exists primarily along the corridors of US Route 11 (Antrim Way) and State Route 16 (Baltimore Street). It is assumed that congestion is never eliminated but municipalities need to make attempts at relieving it. Since a comprehensive plan is visionary, then it should elaborate what could be done to solve traffic congestion. The following solutions examine specific traffic management improvements. Engineering solutions are often short lived, whereas traffic management solutions, since they affect more directly people's mobility, normally have increased longevity. However, before solutions are proposed, a summary of the local traffic congestion situation is presented.

SUMMARY OF TRAFFIC CONGESTION ISSUES IN THE AREA

The following generalizations are based on quantitative data and field observations made over different times, different days and different seasons of the year.

Generalization #1. - The highest traffic demand is work based and weekday peak periods have the largest daily volumes.

Generalization #2. - Most traffic on the two major corridors is passing through with a destination of the work place or home.

Generalization #3 - Employment centers and residential centers are decentralized in their location with the result that trip length is comparatively large, and trip mode is the automobile.

Generalization #4 - Future residential and commercial development in both Greencastle Borough and Antrim Township should focus on undeveloped areas within close proximity to Route 11 and Route 16 and existing water and sewer lines.

ENGINEERING SOLUTIONS TO REDUCE TRAFFIC CONGESTION

The following are short term traffic solutions that may improve movement in the study area. They are presented here because of their close relationship to the traffic data and are not repeated in the conclusions section.

A. Channelization of traffic to allow left turn lanes would be most effective at the following intersections:

- a. Hykes Road and Route 11
- b. Hollowell Church and Route 16
- c. Kauffman Road and Route 11
- d. Rabbit Road and Route 16

B. Public use of under-utilized rear parking areas could be encouraged in the Borough of Greencastle. Periodic review of the zoning ordinance in Greencastle Borough should also be done to address the issue of the lack of parking.

C. Maximization of pedestrian mobility and safety on Baltimore Street by installation of larger crosswalk markings, yellow caution lights and signs warning pedestrian crossing priority are needed.

D. Extension of sidewalks along Baltimore Street eastward beyond the I-81 overpass to include new commercial development in Antrim Township is needed.

E. Installation of bike lanes (5-6 feet) along both sides of PA 16 eastward from I-81 would be effective.

F. Establishment of maximum parking time requirements along Baltimore Street is needed during the hours of 8 AM to 6 PM, Monday through Saturday.

G. Construction of parallel feeder roads for new large commercial establishments along Route 16 would reduce short trip entry onto Route 16 in Antrim Township.

H. Construction of a connector road between Exits 2 and 3 of I-81, parallel and east of I-81 would relieve some traffic congestion on Route 11.

I. Incorporation of appropriate road signs along I-81 to encourage truck traffic wishing to go west on PA route 16 to use either exit 2 or exit 4. Reducing through truck traffic along Baltimore Street (Route 16) will enhance the overall quality of life and increase the economic viability of the Greencastle core area.

PART C. TRANSPORTATION PARTNERSHIP

Establishment of a transportation partnership is a long term strategy to improve traffic flow in the Greencastle Antrim area. A partnership is a public-private coalition built upon the following assumptions:

- 1) Public sector controls impact facility siting and movement along roads.

- 2) Private sector (employers and developers) impact individual travel decisions such as work hours, parking availability and individual expectations.

The State of Pennsylvania through the Transportation Partnership Act (1985, 53 p.s. 1621 et. seq.) encourages municipalities to organize to deal with traffic congestion problems. The 1985 Act allows the formation of Transportation Development Districts, (TDD). A TDD can then comprehensively approach traffic management in the local area. The Act encourages private sector's participation both for physical improvements and traffic management.

If a TDD were developed along the Route 16 - Route 11 corridors, then the following management strategies could be employed:

- 1) special assessment districts for road widening, signal installation and sidewalk construction along the corridor;

- 2) preferential assessment for some types of non-residential development that has lower trip generation rates such as professional offices;

- 3) formulation of traffic congestion plans for pro-

posed development along Routes 16 and 11;

4) density bonuses and accelerated permit review for new developments that encourage non-auto types of travel;

5) establishment of municipal impact fees as authorized by Act 209 to public facility improvements along major corridors.

Transportation Development Districts (TDD) recognize that a private-public coalition is needed to manage and plan traffic movements in an area of limited public resources. Comprehensive planning during the next ten years will recognize this fact.

VI. FINANCIAL RESOURCES

Identification of the key financial resource is a necessary part of the information gathering process for community planning. It is not the intention of this section to perform a detailed analysis of the financial worth of the two municipalities. It is the intention of this section to identify those financial factors which have impacted community planning. In order to assess the future one must observe the general trends. Table VI-1 and Figure VI-1 contain a detailing of the most important financial factors for both Greencastle and Antrim Township. Franklin County is used as a comparison.

During the past decade, the percentage change in total revenue for Antrim Township was +218.2% and +70.5% for Greencastle Borough. The total expenditures during the same period increased by 73.1% in Antrim and 5.5% in Greencastle. Revenue and expenditures per capita increased in both municipalities but the percentage change in per capita revenue in Antrim exceeded the percentage change in per capita revenue in Greencastle by three times. The percentage change in per capita expenditures in Greencastle was one-third higher than per capita change in revenue.

Real estate tax increases are one indicator of the latent growth potential in a community. During the decade of the 1980's, Antrim Township increased its real estate tax

Table VI-1

FINANCIAL RESOURCES

	Antrim Township	Greencastle Borough	Franklin County
Total Revenue			
1981	629,072	594,108	13,160,158
1989	2,002,789	1,013,665	15,389,168
% Of Change	+218.2	+70.5	+16.9
Total Expenditure			
1981	529,739	916,477	10,823,917
1989	916,477	967,680	16,138,928
% Of Change	+73.16	+5.5	+49.0
Taxes as % Revenue			
1981	51%	46%	26.8%
1989	43%	41%	23.4%
% Of Change	-15.6	-10.8	-12.6
Revenue Per Capita			
1981	67.45	161.49	115.82
1989	204.16	259.25	135.43
% Of Change	+202.6	+60.5	+16.9
Expenditures Per Capita			
1981	56.80	136.29	95.26
1989	93.42	247.49	142.3
% Of Change	+64.4	+81.5	+49.0
Real Estate Taxes			
1981	43,502	153,365	3,299,374
1989	199,813	199,969	3,251,250
% Of Change	+359.30	+30.3	-1.4
Market Value Real Estate (\$1000)			
1981	123,570	35,675	1,198,697
1989	199,813	199,969	3,173,033
% Of Change	+ 61.7	+460.5	+259.0
Assessed Value To Market Value			
1981	18.1	23.0	19.9
1989	8.9	8.9	9.09
% Of Change	-50.5%	-61.3%	-54.3

Source: Local Government Financial Statistics
1981, 1982, 1983, 1984, 1985, 1986 1987, 1988, 1989
PA. Dept. of Community Affairs

1981 And 1989

REVENUE FROM TOTAL TAXES COLLECTED

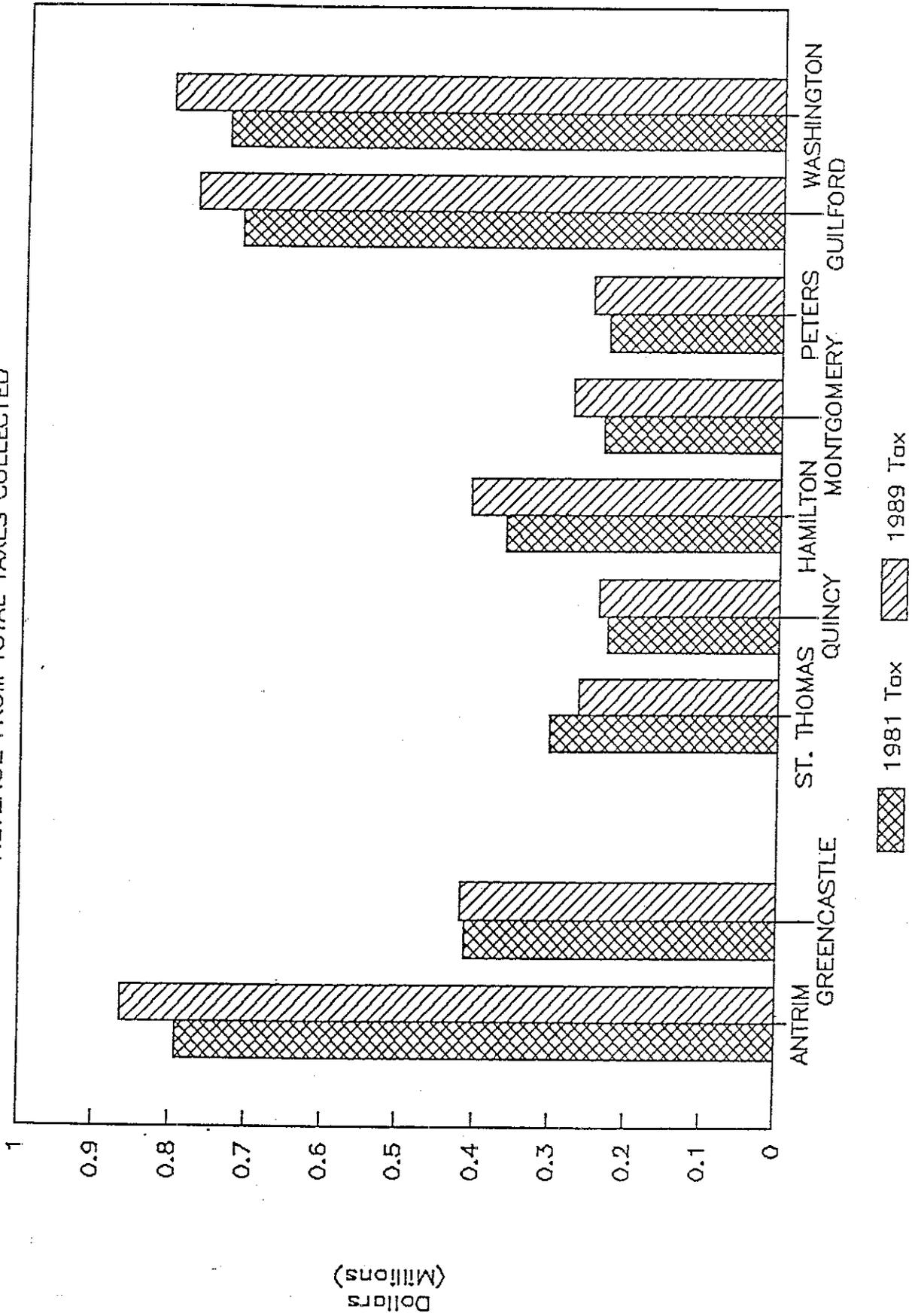


Figure VI-1. 1981 and 1989 Revenue From Total Taxes

revenue by over 350% while Greencastle Borough increased its real estate tax revenue by 30% for the same period.

The market value of the real estate increased more than 400% in Greencastle Borough compared to a 61.7% increase in Antrim. The ratio of assessed valuation to market value for the period 1981-1989 decreased by more than 50% in Antrim compared to a 61% decline in Greencastle.

The current revenue and expenditure picture for both municipalities show that 1989 revenue for both municipalities is significantly higher than surrounding communities (Figure VI-2). The higher expenditures for Greencastle are partly explainable by the police based expenditures (Figure VI-3) Revenue from the total taxes collected for Antrim is similar to other adjoining townships in Franklin County (Figure VI-4). Real property transfer tax in Antrim is similar to Guilford and Washington Townships (Figure VI-5).

State highway funding for the years 1988-1989 for Antrim also reflects a pattern common to other municipalities in Franklin County (Figure VI-6). Most municipalities are receiving less funding for road maintenance activities.

Antrim and Greencastle belong in two different financial classes. In Antrim Township, revenues are increasing at a faster rate than expenditures. Real estate taxes represent a growth source of revenue and should increasingly be looked upon as a source of revenue for Antrim Township. However, national economic fluctuations could make this revenue source less than reliable. Real estate revenue is less positive for Greencastle as a growing source of revenue. Property reassessment is a county responsibility which

would financially benefit a municipality like Greencastle. The finite amount of undeveloped land in the Borough will inhibit future increases in market value assessment.

Both municipalities need to adjust to the possibility of reduced financial growth during the decade of the 90s. Additional sources of revenue will be needed in order to provide needed public services. Higher user fees for public services such as sewer and water along with impact fees within selected areas are new sources of municipal revenue. Periodically both municipalities should review their fee schedules for building permits and zoning variances in order to verify that the incurred costs are covered.

1989 PER CAPITA REVENUE AND EXPENDITURES

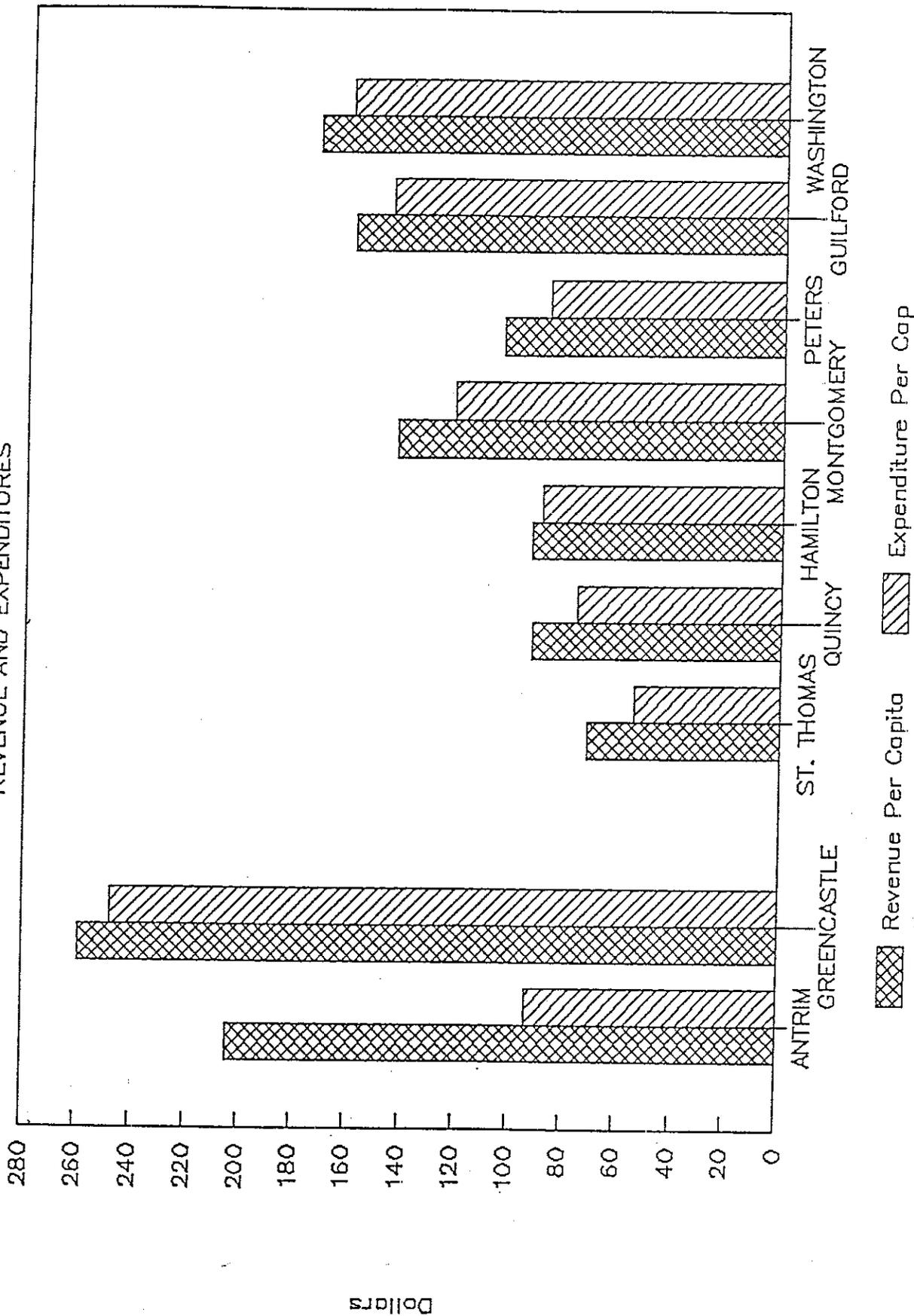


Figure VI-2. 1989 Per Capita Revenue and Expenditures.

1 9 8 9

TOTAL EXPENDITURES

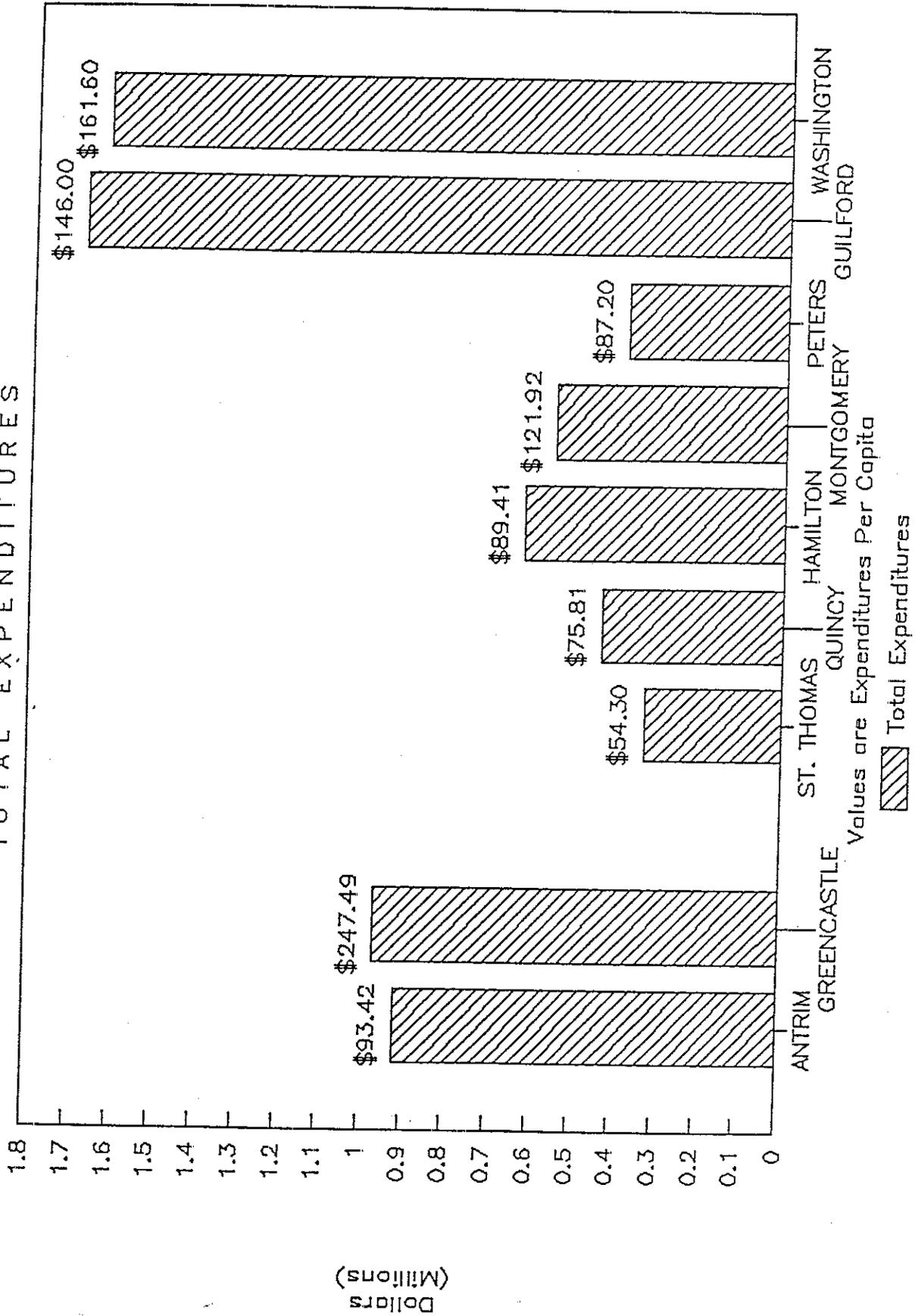


Figure VI-3. 1989 Total Expenditures.

1 9 8 9

TOTAL REVENUE

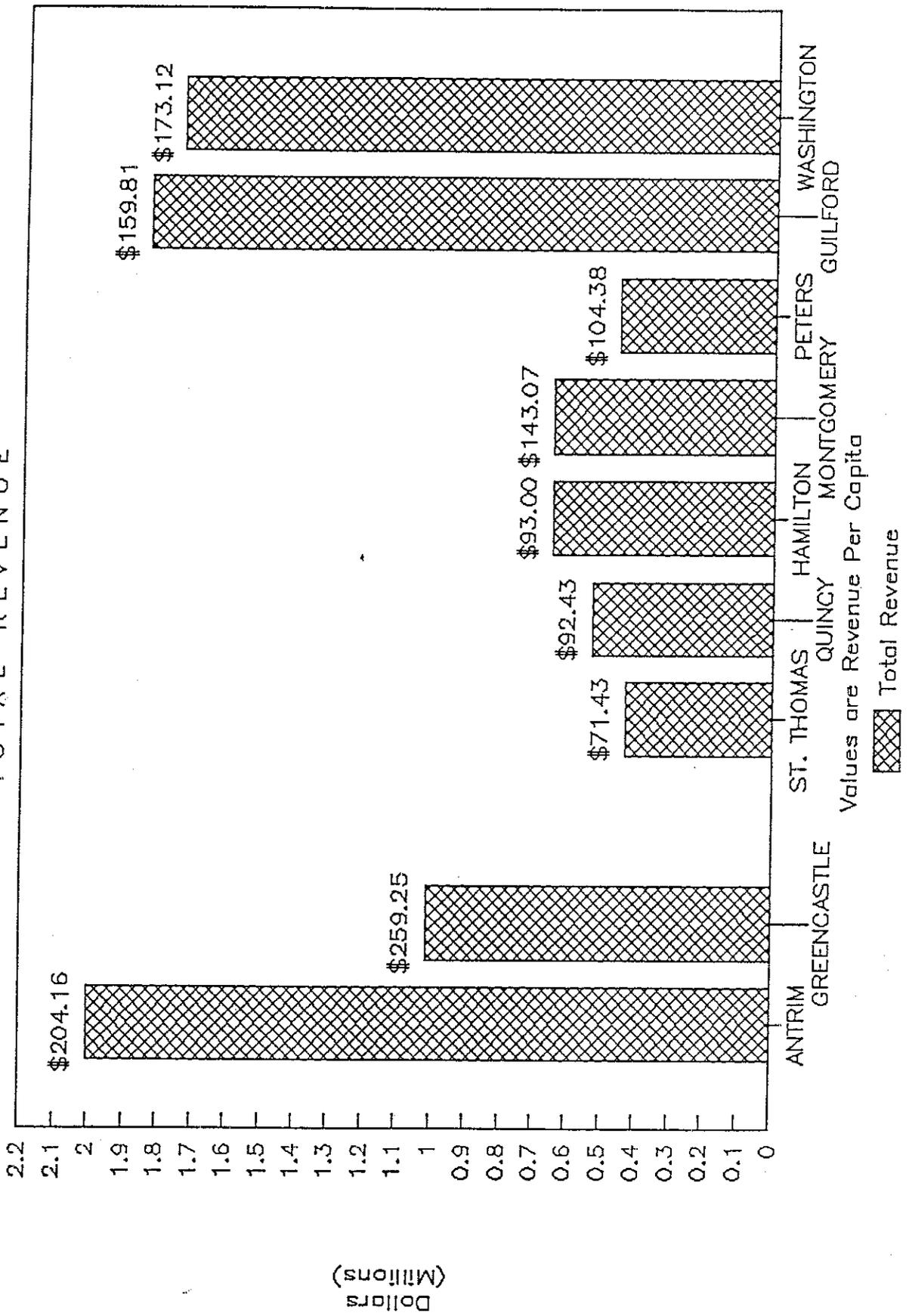
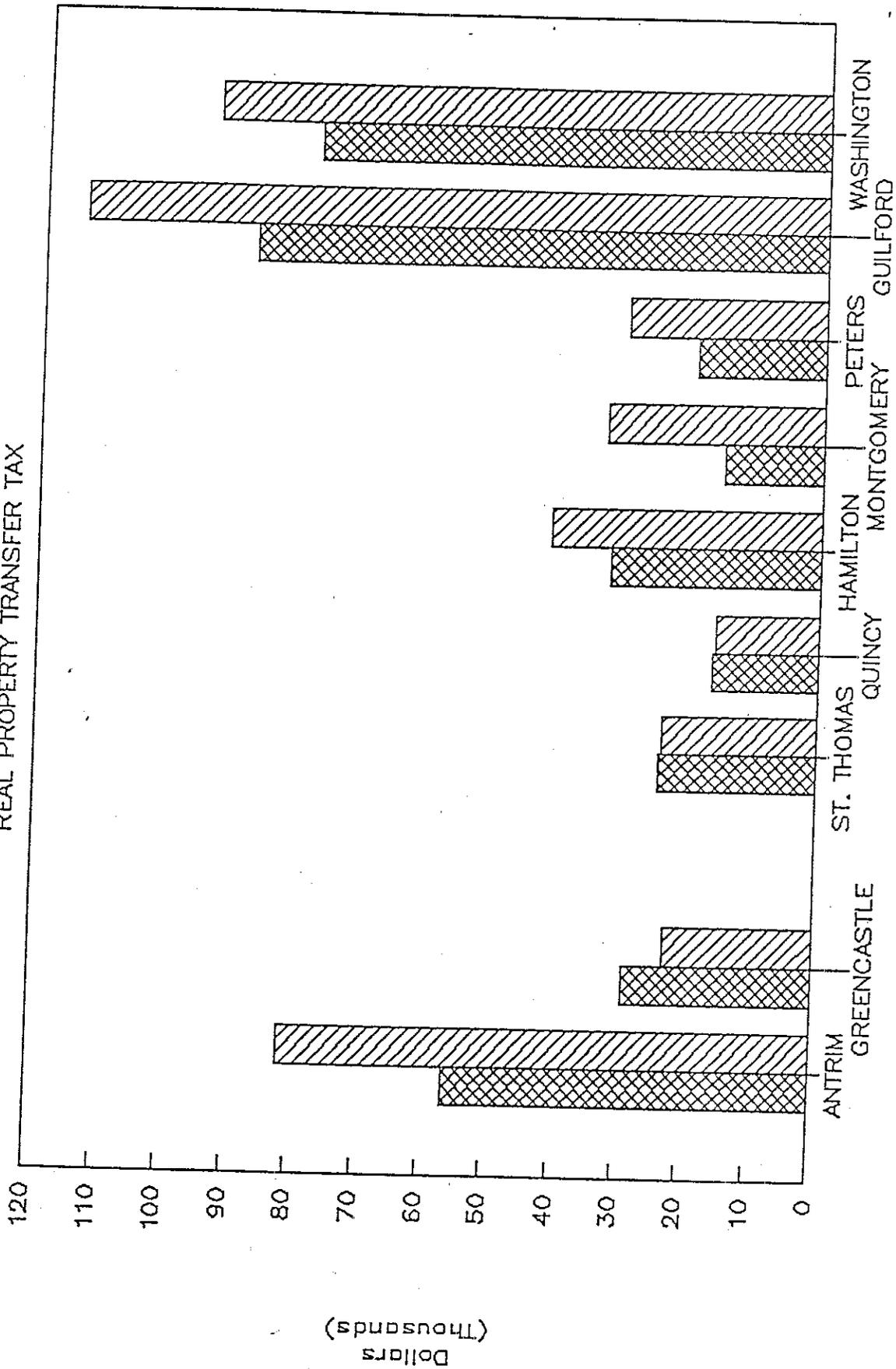


Figure VI-4. 1989 Total Revenue.

1 9 8 8 9

REAL PROPERTY TRANSFER TAX



1988 Property Tax 1989 Property Tax

Figure VI-5. 1989 Real Property Transfer Tax.

1988 And 1989

STATE HIGHWAY FUNDING FOR COMMUNITIES

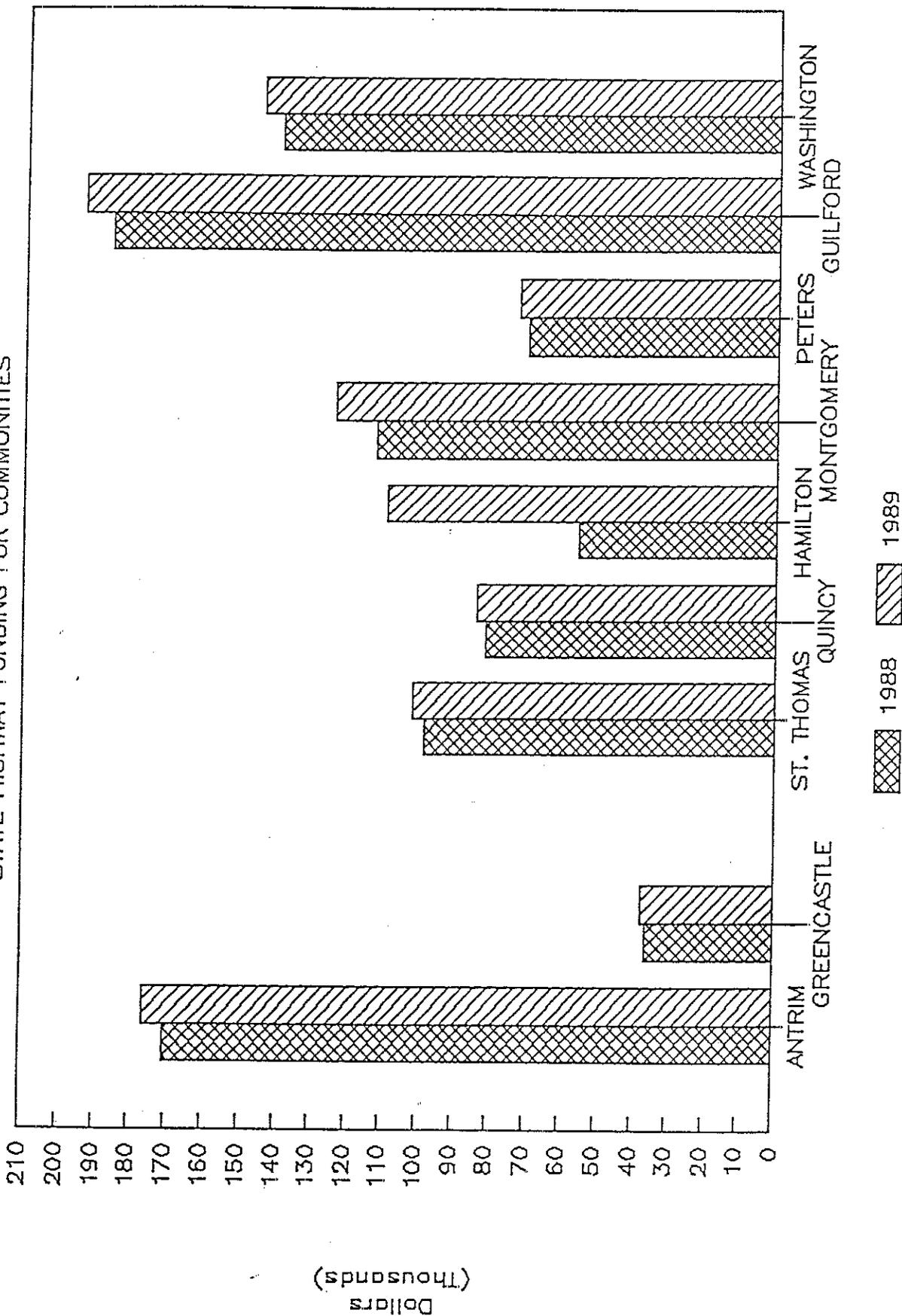


Figure VI-6. State Highway Funding for Communities.

VII. ZONING

See Plate 2 - Zoning

Zoning for the two municipalities provides some control over unwanted land use development. The purpose of this section is to provide an analysis of the zoning map for Antrim Township and Greencastle Borough. The permitted uses within each of the zoning districts depicted on the zoning map are detailed. The analysis evaluates the overall effectiveness of the zoning ordinance. Refer to Plate 2 -Zoning for a cartographic display.

Part A: ANTRIM TOWNSHIP

Antrim Township has seven districts defined within its ordinance. They are:

- a) Residential - Low density -R-1
- b) Residential - Medium density - R-2
- c) Agricultural Residential District- AR
- d) Community Commercial District -CC
- e) Highway Commercial - HC
- f) Industrial District- I
- g) Flood Hazard - FH

Permitted uses within the Agricultural Residential district are detached and semi-detached houses up to three per acre. Other non-residential uses permitted within the zone include: agricultural activities, extraction activities, landfills, recreation and campgrounds. Minimum lot sizes range from 12500 to 25000 square feet depending on water and sewer availability.

The Low Density Residential and the Medium Density residential districts differ in their minimum lot sizes and also in the density of residential structures. Two family detached houses and townhouses are the structures permitted in the R-2 while the R-1 permits only single

family detached and semi-detached structures. Each district permits similar non-residential activities. Minimum lot sizes vary from 30000 square feet in the R-1 with on-lot water and sewer to 7,500 square feet in the R-2 with central water and sewer.

The Community Commercial classification permits not only single family and high density residential (garden apartments), but also planned residential developments. Retail and personal businesses are also permitted uses in this zone.

The Highway Commercial classification permits most of the uses in the Medium Density residential and in the Community Commercial. Automobile related activities are also permitted in this zone.

The Industrial District classification permits normal manufacturing activities and storage oriented activities such as lumber yards. Warehousing activities and truck terminals are permitted in both the Industrial and the Highway Commercial District.

The Flood Hazard zone is actually an overlay zone which places more stringent regulations on structures located within the 100 year flood elevation. Hospitals, nursing homes and jails are prohibited outright and other uses are only permitted if structural modifications are made.

Mobile homes and customary home occupations are two activities that are difficult to plan effectively. Mobile homes or manufactured homes are permitted in the AR, R-1 and R-2 zones. Customary home occupations are permitted as accessory uses within a single dwelling.

Part B: GREENCASTLE BOROUGH

See Plate 2 Zoning

The Borough has seven defined districts and they are as follows:

- a) Residential - R1
- b) General Residential (R2)
- c) Residential-Mobile Home (RM)
- d) Community Commercial (CC)
- e) Community Commercial (CC-II)
- f) Highway Commercial (HC)
- g) Industrial (I)

The two residential districts are fundamentally similar to one another in terms of the permitted uses. The General Residential district allows a higher intensity of residential structures and smaller lot sizes than the Residential district. Membership clubs and outdoor recreation facilities along with eleemosynary institutions are special exceptions in the General Residential district.

The Community Commercial and Highway Commercial classifications are similar to each other. There is no minimum lot size nor off street parking requirement in the Community Commercial since it has a focus around the older commercial core of Greencastle. Residential uses are permitted in both districts. A minimum lot width of 80 feet and lot depth of 150 feet along with off-street parking separate the Highway Commercial District from the Community Commercial district.

The Industrial classification permits manufacturing assembling and other related handling activities. Single family detached homes are permitted as a special exception.

The Residential - Mobile Home districts allow both single family detached and semi-detached units, townhouses, garden apartments and individual mobile homes. A mobile home park is a special exception.

PART C: GENERAL CONCLUSION

A primary goal of a comprehensive plan is the development of a road map for the evaluation of a community's zoning ordinance. It is beyond the immediate scope of the document to specifically comment on the number of needed zoning classifications or the degree of specificity of each zoning classification.

One overriding conclusion is derived from an analysis of the zoning map (Plate 2) and the General Planning Map (Plate 10). It is assumed that both communities want to maintain in the future the essential quality of life and sense of community present currently. Then any future zoning map should judiciously allocate the best developable land (Class I and Class II) in such a way that public health, public morals and public safety is given at least equal weight with individual land rights.

VIII: ENVIRONMENTAL ANALYSIS OF FLOODPRONE AREAS, SINKHOLES, WETLANDS, AND DRAINAGE

Part A: BEDROCK

Bedrock geology is one of those unique environmental factors which plays a crucial role in the economic utilization of the land. The eastern three-fourths of the study area is underlain by faulted and fractured carbonate rock, specifically limestone and dolomite formations. The western one-fourth of the study area is underlain by the Martinsburg shale formation. The two contrasting rock types have caused different relief features, soils, surface water and subsurface water patterns. Carbonate and shale bedrock have also determined the agricultural productivity of the land.

Carbonate terrain is characterized as rolling land with gentle slopes overlain with deep and very fertile soils. Carbonate bedrock also contains abundant subsurface drainage channels interspersed with sinkholes and solution cavities (See Sinkhole Section below). Shale terrain is characterized by steeper slopes and shallow soil. Shale soils, due to their reduced profiles, are more prone to dryness when precipitation does occur. Surface runoff is also larger on shale soils than on carbonate soils. Additional interrelationships between bedrock and the physical environment are discussed in the sections that follow.

PART B: FLOODPRONE AREAS

See Plate 3 - Environmental Conditions: Floodprone Areas and Sinkholes Map.

The flood hazard areas are mapped from information provided by the National Flood Insurance Program. Hazard areas are delimited by the Federal Insurance Administration as locations adjacent to the streams which have the highest probability of inundation.

The most extensive flood hazard area consists of a swath averaging 1000 feet in width along the Conococheague Creek. A similar swath averaging 200-300 feet wide exists along the Muddy Run and Rush Run tributaries. Overall the vast majority of the 2171 acres designated as flood hazard in the study area are located on the broad floodplain of the Conococheague Creek.

An additional 136 acres are designated as a flood hazard area in the eastern portion of the study area. The eastern area consists of swaths averaging 300 feet wide paralleling Marsh Run and its smaller tributaries. Non-agricultural use of flood hazard areas is limited to low intensity, non-structural uses.

PART C: SINKHOLES

See Plate 3 - Environmental Conditions: Floodprone Areas and Sinkholes Map.

Sinkholes are vertical solution cavities in limestone bedrock which occur at or near the surface as opposed to more horizontal underground caverns. Quite often, sinkholes are buried beneath a soil mantle and are therefore visible only as surface depressions. Closed depressions within the study area have been identified and mapped by the Pennsylvania Department of Environmental Resources, Bureau of Topographic and Geologic Survey, using existing literature, updated aerial photography and extensive field investigation.

A total of 848 sinkholes, mostly closed depressions, are identified within the study area. Overall, sinkholes are widely distributed across the carbonate terrain with several noticeable areas of clustering in areas of easily weathered limestone formations north and east of Interstate 81.

Sinkholes often collapse or cave-in, thereby causing overlying surface structures such as roads and buildings to subside. Sinkholes are open channels to the groundwater. Groundwater in areas of sinkholes can quickly become contaminated from surface applications of manures, fertilizers, hazardous waste spills or other biochemical materials.

PART D: WETLANDS

See Plate 4 - Environmental Conditions: Wetland Map

Wetlands occur when the soil is classified as hydric meaning that it is seasonally or annually saturated with water. The presence of hydric soils fosters the growth of water tolerant plants called hydrophytic vegetation. Wetlands are normally identified by the United States Geological Survey on its seven and half minute topographic maps. The National Wildlife Inventory Maps also has identified wetlands utilizing large scale color infrared photography.

Wetlands are important for local governments. They provide a setting for outdoor recreation, reduce surface runoff and flooding, improve water quality, and recharge the groundwater. Wetlands also help to maintain the intrinsic beauty of the community.

Wetland regulations in the 1990s have entered a period of stringent permitting requirements. The Pennsylvania Department of Environmental Resources (PADER) is charged with the state wide enforcement of wetland regulations. Activities involving any of the following require a PADER permit.

- a) discharges as part of channel construction;
- b) construction of dams, dikes or levees;
- c) filling to construct any structure requiring rock, sand or soil;
- d) filling for recreational, industrial, commercial or residential uses;
- e) riprap, groins or other devices to protect adjacent property. (Adapted from PADER
Environmental Planning Information Series Report # 7)

The legal basis of PADER regulations, Chapter 105 Dam Safety and Encroachment Act and Section 404 of the Federal Clean Water Act do not preempt local regulations. Local governments have the prerogative to disapprove a project even if PADER approves it. Additional local authority for wetland preservation is found in the Municipal Planning Code (MPC) as amended 1988. The MPC identifies wetland protection as a legitimate purpose of zoning.

The most extensive area of wetlands is found in the shale portion or the western one-fourth of the study area. Some of these wetlands are riverine wetlands associated with the Conococheague Creek or Muddy Run Creek. Other wetlands occur upland from the streams in a more forested environment. The increased subsurface drainage so characteristic of carbonate rock reduces the number of wetlands in the area east of Greencastle Borough.

Wetlands unquestionably need protection. Plate 4 identifies the most important wetlands in the region. Future preservation of wetlands necessitates that close cooperation is established between local governments, the agricultural community and the development community. The Franklin County Soil Conservation Service can provide technical advice on wetland delineation and regulation. Alternative uses for wetlands other than agriculture may include natural preserves or community recreation areas.

PART E: SURFACE DRAINAGE

See Plate 5 - Environmental Conditions: Drainage Map

Surface and subsurface drainage are interrelated and factors that influence one oftentimes impact the other. The following section identifies factors which affect drainage in the study area.

The study area is divided into two drainage basins. The larger one, the Conococheague Creek Basin drains all of the northern and most of the central and western part of the area. The basin covers approximately 80 percent (37151 acres) of the total area. The Conococheague Creek and its major tributaries, Muddy Run and Rush Run are principle drainage lines. The greatest stream density, that is, the largest number of stream channels per square mile, is found in the western one-third of this basin on the shale terrain. Shale bedrock has a slower water infiltration with an accompanying larger runoff. Carbonate rock has the opposite characteristics.

A small section in the southeast, about 18 percent (8000 acres) of the study area, is part of the Antietam Creek drainage basin and is drained by the Marsh Run tributary. There are few surface streams in this area since subsurface infiltration is more rapid through the limestone solution cavities. The drainage divide which separates surface flow between the Conococheague and Antietam Creek Basins closely follows Ridge Road and Hades Church Road.

PART F. SUBSURFACE DRAINAGE

See Plate 5 - Environmental Conditions: Drainage Map.

By definition, groundwater is subsurface water which moves under hydrostatic pressure through crevices and pores in the bedrock. Where the crevices and pores are small, as in shale bedrock, groundwater movement is very slow. Where crevices are larger, as in carbonate bedrock, groundwater flow is much faster.

Groundwater flow in the study area is divided similarly to surface water along the general trace of Ridge Road and Hades Church Road. East of the divide, groundwater moves, toward the south east. West of the divide, the gross movement of groundwater is westward toward the Conococheague Creek. However, west of the Conococheague Creek, groundwater movement, in general moves easterly in the direction of the Conococheague Creek.

Fracture traces influence the quantity and volume of groundwater. Linear features such as fracture traces or faults represent weak structure zones along which groundwater tends to collect and move. A total of 91 fracture traces are mapped ranging in length from 1200 feet to 8000 feet. About ten major fault lines are mapped with lengths exceeding 25,000 feet. The faults generally trend in a northeast-southwest direction.

Wells located on fracture traces and faults may yield larger quantities of groundwater but may also contain water of questionable quality. Sediment and surface pollution

easily enters the groundwater through these conduits. The drainage map shows the approximate locations of the fracture traces and faults. Professionals using aerial photography augmented with field identification can more accurately locate these fractures on the ground.

PART G. LAND USE

See Plate 6 Land Use Map

The map illustrates the overall distribution of major land uses. In rural areas, the use of the land often corresponds with the predominant land cover. For example the appearance of forests, cultivated crops and pastures corresponds with the actual use on the land. In more urban areas, there are normally differences between uses and the actual cover types.

The land use map was initially constructed by photo-interpretation of color infrared aerial photography. The scale of the air photographs was one inch equals about one-third of a mile. The area was photographed in April 1988 and May 1989 and a small portion around State Line came from October 1987. Extensive field work verified and updated the interpretation.

Nine classes were functionally defined. The difference between residential and residential-multiple family depends on the structural density. Institutional land uses include public buildings, churches, school and community facilities. Commercial uses include fast food restaurants, car dealerships and other type of consumer oriented establishments. Industrial land uses include firms which produce a product

such as Foremost Industries. Commercial-industrial undifferentiated land uses are represented by activities which combine features of industry but are fundamentally oriented to the consumer. The Food Lion Warehouse represents an example of this class. When the tree cover was dense then the area was interpreted as a forest. The area was then classified within the agriculture - vacant land class.

The existing pattern of land uses in the study area is not completely random. The present pattern represents both market conditions, infrastructure assets and past decisions of the elected officials. In order not to build upon mistakes made in the past, it is recommended that future implementation strategies consider the existing zoning as a basis for the future. Any future use of land is modifiable by the reality of the infrastructure and the existing environmental limitations of the land.

IX. ENVIRONMENTAL INTERPRETATIONS

PART A: SOIL SUITABILITY FOR SEPTIC EFFLUENT

See Plate 7 - Soil Septic Suitability Map

Septic effluent is related to the conditions of the soil and the structural integrity of the disposal system. A soil survey is a professional means of assessing broad area suitability of the soil to discharge the effluent.

The soil survey report, as published by the U.S. Department of Agriculture, Soil Conservation Service (SCS), provides scientific information on the nature and properties of soil and land resources. In addition, the SCS interprets and evaluates soil types for specific applications. On-site analysis is always beneficial. However, Soil Survey Reports are a legally recognized document and should be used in macro level site plans and effluent evaluations.

Dozens of soil types within the study area are interpreted for suitability for septic effluent. Factors such as soil depth, drainage, slope, sinkholes, change the overall suitability of the soil to discharge effluent. The soils are then rated overall as having slight, moderate, or severe limitations for effluent.

By far, the most extensive or continuous extent of land rated with severe limitations is located on the shale terrain in the western one-fourth of the study area. These soils are either poorly drained, too shallow or they are located on steep slopes. Noticeable exceptions to this generalization are upland shale soils that tend to be deep, well drained and gently sloping such as the Bedington Series which is rated as having only slight limitations.

A large part of the eastern three-fourths of the study area is located on the carbonate terrain which is rated by the SCS as having moderate limitations. In many eastern areas the soils are well drained and deep, and the local relief is level to gently sloping. The Hagerstown Soil Series is an example of one soil type in this area and it also is rated with moderate limitations. A few carbonate areas are rated as having only slight limitation since the soils are deep and well drained and the slopes are level. Septic effluent is potentially a problem in areas like Kauffman Station where existing sewer facilities currently do not extend. Many of the tanks are antiquated and some of the lots are under sized based on current Pennsylvania Department of Environmental Resource standards.

The Soil Septic Suitability Map illustrates the general effectiveness of the soil for septic operations. Certain areas do not have suitable soil for on-lot systems. A future infrastructure priority should be the development of public sewer lines in areas with continuing and reoccurring septic problems. A sewer lateral extension to an existing sewage treatment facility may be prohibitive. In such a case, a pocket sewage treatment plant in the affected area may become more practical. The Soil Septic Suitability map does not take the place of on-site testing which is needed to make a more specific evaluation of a site specific suitability.

PART B: SOIL SUITABILITY FOR AGRICULTURE

See Plate 8 - Prime Agricultural Land Map.

Prime agricultural land is described as land having few limitations that restrict their agricultural use. Moderate conservation practices are needed to consistently achieve high yields. Major limitations still exist on prime soil and examples of the limitations may be erosion, wetness, surface drainage, draughtyness, shallowness, and stoniness.

The most extensive and continuous tracts of prime agricultural land occur on the carbonate terrain in the eastern three-fourths of the township. Not only is this soil deep, well drained and only gently sloping, but it also retains moisture and nutrients. Areas classified as prime agricultural land in the shale terrain occur as somewhat narrow 500 to 1000 feet swaths which follow the ridge lines. Prime agricultural shale soils are deep and well drained with gentle slopes. However, shale prime soils do not possess the natural fertility or have the moisture holding capacity of the soils on the carbonate terrain.

Competition for land classified as prime agricultural is pronounced. Many of the qualities that make the land valuable for agricultural purposes such as level to gently sloping, deep and well drained soil, also make it desirable for most other non-agricultural uses. It is not practical nor is it feasible for Antrim Township to attempt to preserve all of its prime farmland. The vastness of prime farmland would greatly inhibit any future growth of the Township. Small tracts of of prime farmland within 500 feet

of existing water and sewer lines are difficult to maintain as agricultural land. Large tracts of prime farmland located beyond the 500 foot buffer line from water and sewer need maximum public protection. Conversion of large tracts of prime farmland to non-farm uses requires careful public scrutiny in order to maintain the resource for future residents.

X. ENVIRONMENTAL PROVISIONS-UTILITIES

See Plate 9 - Utility Service Areas

The existing sanitary sewer lines and water distribution lines were located and mapped. Then a 500 foot buffer zone was determined for each of the two systems. The result is a map which shows all land within 500 feet of an existing system.

The total acreage of the study area is about 44,480 acres. Of that total, 12.1% or 5422 acres is located within 500 feet of an existing sanitary sewer line. Most of the built-up portions along State Route 16 and US Route 11, including Greencastle and State Line, are defined within the buffer. The buffer zone also extends southwest of Greencastle along the Williamsport Pike with connections to Worleytown and Coseytown. An east-west line traverses along Hykes Road connecting the Worleytown area with the State Line system.

The existing water system is limited principally to the Greencastle area. A short 1.5 mile line connects the system to the reservoir which is located in Antrim Township. Another 1.25 mile line extends southward of Greencastle Borough along Route 11 near the Corning Plant. The total acreage within the study area that lies within 500 feet of an existing water line is 1566 acres or 3.5% of the area.

XI. CONCLUSIONS AND RECOMMENDATIONS

PART A: INTRODUCTION AND CONCLUSIONS

A comprehensive plan is a 'big plan' in the words of Daniel Burnham. Big is also defined as large in size and in many cases, a comprehensive plan is a voluminous document. Big may also mean broad in context. A comprehensive plan brings together many diverse aspects of the natural and human environment within a community. A comprehensive plan attempts to define visionary pathways for the community for the next twenty or so years.

This chapter is subdivided into four sections. Section one contains eight general planning conclusions derived from an analysis of the human and natural environments in the Antrim and Greencastle region. Section two includes recommendations based on the best land to develop in the next twenty years. Section three provides a schedule of short term activities and section four analyzes the current document in relationship to the surrounding area.

The conclusions represent an evaluation of the Antrim and Greencastle area based on the current data and scientific observation by an outsider. An outsider is like a satellite which observes and evaluates from a distance. Satellite images of the earth's surface provide unrivaled perspectives on the land and water features which then can be compared with the local perspective. An outsider's perspective provides images which may or may not coincide with the local area or the insider's perspective. The insider's perspectives are often based on specific knowl-

The Board noted that clustering developments along particular traffic corridors is being accomplished through zoning. Transfer of development rights, purchase and lease back of undeveloped land, and tiered utility rates were discussed.

When discussing Capital Improvements the Board agreed that working cooperatively with the Borough could benefit both of us. For example, the Township can benefit from certain Borough recreational facilities and the Borough could benefit if the Township provided snow plowing services to them.

Zoning, impact fees, and tapping fees were reviewed and the Board agrees that we are current on these topics.

The Board agreed that a capital improvement program outlining infrastructure improvements for the long term future of the Township should be completed.

A map and statistics about the Township should be included in the Comprehensive Plan.

Supervisor Byers felt the Board should consider obtaining and straightening Milnor Road because if the area is developed it will create various safety concerns as it is today.

Cooperative efforts with the Borough should include stormwater management, water, sewer, zoning, recreation, and police.

The Board discussed having a "committee" that would consist of members of the Borough and School District to review subdivision plans when they have an impact on traffic.

The meeting adjourned at 9:22 p.m.

Respectfully submitted,



Teresa D. Schnoor
Administrator

edge gathered from daily interaction with a portion of the community.

Both perspectives have merit in their own way. Neither is more right or more wrong than the other. It is the job of the elected and appointed municipal officials to determine which perspective has the most benefits for the local community over the next twenty or so years. Once a conclusion is adopted, then the elected officials must soon develop and fund an implementation strategy to more effectively carry out the approved conclusions.

CONCLUSION #1 PUBLIC - PRIVATE COOPERATIVE AGREEMENTS

(Long Term Strategy)

Public investment in infrastructure (roads, sewer lines, water lines and sidewalks) spurs the growth of the community and increases property taxes. Greencastle Borough and Antrim Township have entered a period of reduced federal and state funding for infrastructure development and maintenance. In order to maintain a continuing climate of economic growth, public - private cooperative agreements are needed. These partnership agreements particularly along the corridors of Routes 11 and 16, could achieve the following ends:

- a) roadway widening
- b) water and sewer line extension
- c) sidewalk construction
- d) parallel feeder road development
- e) recreational development

Local governments need to consider the establishment of public-private agreements based on the existing state enabling legislation.

CONCLUSION #2 CLUSTERING OF DEVELOPMENT ALONG SELECTED
CORRIDORS

(Long Range Strategy)

Antrim and Greencastle have well defined primary and secondary growth corridors. Routes 11 and 16 are the primary growth corridors and the Williamsport Pike, Leitersburg Pike and the Williamson Road are secondary growth corridors. Interstate 81 is intentionally not defined as a growth corridor since development is limited to areas of entrance and exit which is either Route 11 or Route 16. It is recommended that the bulk of future water and sewer line improvements be concentrated along a 500 foot buffer either side of the primary growth corridors and along a 300 foot buffer either side of the secondary growth corridors. In addition, special priority for water and sewer line extension should be given to areas like Kauffman Station, where the septic tanks are antiquated and some are malfunctioning. Some of the primary drinking wells in this area have high levels of nitrates.

Future expansion of sewer and water lines should consider the implication of the area wide growth it spawns. Sewer and water line expansion affects the land values and the environmental quality within a local area. Sewer and water line expansion can also engender land use conflicts.

Sewer and water line expansion must begin as a joint project between the developer and the local community. Maps such as the Land Use, Prime Agriculture, Utilities and Septic Suitability provided in this document are designed to permit a case by case evaluation of where sewer and water

lines should expand. Ideally, expansion should occur within the Class I and Class II areas indicated on the Plate 10 map. Practically however, sewer and water lines have been constructed along the path of least resistance. Paths of least resistance are normally determined by the using the shortest distance between two points. Clustering of future activities in and around areas of current activities is one viable method of reducing the straight line distance mentality and replacing it with the area-wide approach.

Additionally, higher zoning densities and clustering of commercial and residential activities should occur along the primary corridors of Routes 11 and 16. The increased traffic can be effectively handled by a series of parallel roads to Route 11 and Route 16 which would intersect the primary road every half-mile. A feeder road east of Interstate 81, connecting Route 16 to Exit 2 of Interstate 81 is also suggested as a congestion reliever. A feeder road is required by the density increase proposed for the Route 16 area. Higher zoning densities and more mixed commercial-residential developments along the primary corridors of Routes 11 and 16 would free prime agricultural land beyond the 500 foot build zone from development pressure. Antrim Township has vast acreage on the carbonate rock classified as prime agricultural land. It is impossible to prevent development on all prime agricultural soils but it is possible to limit future commercial and residential development to areas served by existing water and sewer lines. Concentrating future development along the primary and secondary growth corridors will save the vast acreage of

prime agricultural land while maintaining the integrity of private property.

CONCLUSION #3 TRANSFER OF DEVELOPMENT POTENTIAL

(Short Term Strategy)

Private property is a right well protected by the Constitution and the American legal system. However private ownership of land may run counter to the public good. The end result is either costly litigation to define the ownership or the assumed dominance of one sector over the other.

The comprehensive plan has defined many areas as containing unique or special value to the public sector. For example wetland fringe areas, sinkholes, flood fringe areas, and freshwater springs require some form of local preservation in order to function as natural systems for all the residents of the area. Many of these areas are privately owned. The development potential associated with these unique natural systems can be transferred to other areas which are less valuable to the public good. The concept is called transfer of development rights or development potential and it is legally recognized in the updated version of the Pennsylvania Municipal Planning Code.

Transfer of development rights provides a 'win-win' strategy for both the private and the public sector. The private landowner is allowed to realize a basic property right to sell land to the highest bidder and the public can protect environmentally sensitive areas without outright purchase. Local government must establish an adminis-

trative system to define and allocate the transferred development potential.

CONCLUSION #4 PUBLIC PURCHASE AND LEASE BACK OF UNDEVELOPED LAND

(Long Term Strategy)

Local governments historically have avoided direct purchase of undeveloped land in order to influence the character of development in the community. For most communities the municipal budgets are too tight and the long term purchases could tie up needed operating funds and never produce a return for the local government. Local governments can purchase certain tracts of prime undeveloped land and then lease the land back to the private sector for development. Local government then places legal restrictions on the leased land controlling such aspects as structure siting, building density, use or function, paved and unpaved areas and vegetative buffers. Selective purchase and then leasing of prime undeveloped land allows local governments to influence the overall character of commercial, industrial and even high density residential developments without making major monetary outlays. The lease backed land remains on the tax rolls thus doubling the benefits to the local government. Selective purchasing and then leasing could be considered along certain tracts of undeveloped land along the Route 16 area east of Interstate 81. If the local government did not want to extend its borrowing capacity to purchase prime undeveloped land, then the establishment of an authority to purchase and lease the land, can be considered.

CONCLUSION #5 TIERED UTILITY RATE STRUCTURE

(Short Term Strategy)

Utility rate structures are sometimes unfair to established users because utility rates paid by them are often top heavy with capital improvements expenditures. Newer users may pay proportionally less for capital improvements. One solution is to more equally transfer the burden of capital improvements for public utilities for all users is to use a multiple tier rate structure. However, under Pennsylvania Utility Commission regulations, only operating authorities have the power to develop a tiered rate structure. In Greencastle Borough water and sewer rates could be structured so that all residents pay a certain proportion for system maintenance and another proportion for capital improvements. A customer's bill would clearly show the various proportions. Additionally metering of commercial establishments should be mandatory in order to more accurately charge customers.

CONCLUSION #6 CAPITAL IMPROVEMENTS PLANNING

(Long Term Strategy)

A capital improvement plan attempts to match long term infrastructure development with the anticipated growth of the local population. The local governments of Greencastle and Antrim need to develop a capital improvements plan. The plan would specify the type of public improvement, where the public improvement will be made and when it will be constructed. Armed with a capital improvements plan, local decision makers could review and decide a new development's impact on the existing and anticipated water and sewer facilities.

CONCLUSION #7 ZONING

Zoning is one implementation tool to carry out a comprehensive plan. An effective zoning ordinance is flexible to change but also has sufficient regulatory power to achieve the desired objective. The following concepts are proposed by the new comprehensive plan. Specific ordinance wording related to these changes is beyond the scope of this study.

a) Periodically evaluate the zoning ordinance and the subdivision ordinance every three to five years. An update checks for: internal consistency within the ordinances; amount of land in each zoning category; viability of the fee schedules; and external consistency with the adopted comprehensive plan. (Short Term Strategy)

b) Review of site plans for any rezoning request of vacant land. The review may possibly reduce or mitigate potential conflicts with adjacent properties. (Short Term Strategy)

c) Zoning overlays are sets of restrictive uses or height limitations imposed in a certain area because of the unique nature or special circumstances. Overlay zones could effectively protect areas of mutual public concern such as wetlands, sink holes, and fracture traces. (Short Term Strategy)

d) The pedestrian, formerly vanished from the heavily traveled core area is making a return. The zoning ordinance needs to reflect the increasing popularity of pedestrian amenities such as sidewalks, bike paths, and community walking areas. (Long Term Strategy)

e) Zoning border conflicts frustrate the effectiveness of area wide regulation of land uses. Antrim Township borders only two townships with municipal zoning: Quincy and Washington Townships. The vast majority of land at the mutual borders is zoned as agriculture. Commercially zoned land coincides along Routes 16. Each municipality should make every effort to make their zoning borders coincide in terms of permitted uses and restrictions. Where zoning coincidence is not practical, then mandatory vegetative buffers to reduce noise and visual impacts should become an alternative. (Long Term Strategy)

f) Prime agricultural land is an invaluable resource for a community. The large percentage of prime land in Antrim Township creates many challenges to the local government. Large lot zoning in unsewered areas is one method to preserve prime agricultural farmland. In addition, the local governments can support state programs for agricultural preservation districts. (Long Term Strategy)

CONCLUSION #8 IMPACT FEES AND TAPPING FEES
(Short Term Strategy)

The property tax is no longer a sufficient mechanism for municipal capital improvements. Developers increasingly are responsible for not only on-site impacts but also a 'pro-rata' share of off-site costs attributable to their development.

Antrim Township and Greencastle Borough are now legally allowed to enact and collect impact fees (Act 209 of 1990). The Act enables a municipality to collect impact fees from developers for off-site road improvements within specifically defined service areas. In the case of contiguous municipalities such as Greencastle and Antrim, two abutting service areas along Route 16 could effectively coordinate road improvements.

The use of tapping fees for municipal sewer and water services is closely related to the impact fee issue. Act 203 of 1990 defines the components of tapping fees which may be charged for the authority's water and sewer services. Tapping fees should be fully utilized as a source of revenue. Careful scrutiny of Act 203 and periodic updates will allow the authority to judiciously utilize the fees as a sustaining source of revenue.

PART B: BEST DEVELOPABLE LAND

See Plate 10 - General Planning Map

The General Planning Map can assist the local officials in making land use related decisions. The map cartographically portrays a ranking of land based on its overall worth for future development. The ideal growth strategy for the municipalities is to encourage future development on those tracts of land ranked as the best. In addition, the municipalities should discourage development on the least desirous vacant land.

The general planning map was derived using the following environmental criteria:

- a) preserve as much as possible large areas of contiguous or non-fragmented prime agricultural land (Prime Agricultural Map);
- b) avoid areas that are subjected to flooding (Floodplain Map);
- c) avoid areas of dense sinkhole concentration (Sinkhole Map);
- d) recognize the location of large wetlands (Wetland Map);

The overall assumption utilized in the general planning map is that any future large scale development should be directed to areas already having utilities. Furthermore, the best land for future development in the township and the borough is vacant land within the 500 foot buffer of both water and sewers. Vacant tracts within a 500 foot buffer strip of municipal sewers are less likely to have groundwater contamination than areas serviced only by public water. Five classes of developable vacant land are depicted on the General Planning Map. The areas are ranked from best potential (Class I) to poorest potential (Class V).

**CLASS I - VACANT AREAS WITHIN 500 FEET OF WATER
AND SEWER**

About 1342 acres, primarily the area next to Greencastle Borough, has both water and sewer facilities. The land has the highest potential for development because of the safe drinking water and the low possibility of groundwater contamination afforded by the public sewers.

CLASS II - VACANT AREAS WITHIN 500 FEET OF SEWER

About 4292 acres have a sewer system within 500 feet. The major concentration of the land consists of narrow areas radiating east, west south and southwest from the Borough of Greencastle. Other areas are found in the villages of State Line, Shady Grove, Worleytown and Coseytown and in the general Hykes Road area. Since public water is not available, developers of the vacant land would have to provide some method of purifying the drinking water.

**CLASS III - VACANT AREAS WITHIN 500 FEET OF PUBLIC
WATER**

A small area of 282 acres is contained within this class. Most of the area consists of a narrow swath extending east of the Borough of Greencastle into Antrim Township. Another area is found south of the Borough. Developers of vacant land in this area would have to utilize alternate septic systems such as sand mounds.

**CLASS IV - DEVELOPABLE SHALE LAND BEYOND 500 FEET OF
WATER AND SEWER**

Approximately 4860 acres are contained within this class and it is concentrated within the western portions of the Township. Some prime agricultural land is included in this class but the land is somewhat fragmented or clumped in narrow swaths. Developers need to exercise careful planning to reduce the erodability of the soil. Many wetlands are scattered throughout the area.

**CLASS V - DEVELOPABLE LIMESTONE LAND BEYOND 500 FEET OF
WATER AND SEWER**

About 2940 acres are found within this class which is located in the central and eastern portions of the study area. The land is classified as least recommended for development because of the following reasons:

- a) high susceptibility of groundwater contamination in limestone areas;
- b) high probability of hidden sinkholes not yet detected;
- c) high natural fertility, high productivity and lower erodability of limestone soil particularly when compared to shale soil, except in areas of outcrops.

The General Planning Map functions as a cartographic model to assist the local decision makers in the management of land uses. It is not intended to cover specific plots of land but deals with larger areas and it portrays future developable land.

PART C: SCHEDULE FOR FUTURE ACTIVITIES

The following schedule is proposed as a tentative list of needed activities which should occur after the comprehensive plan is formally adopted by the elected officials. The list is proposed in order to maximize the effectiveness of the comprehensive planning process.

a) Develop and adopt an impact fee ordinance. The process may involve: establishing a committee; defining service areas; performing sufficiency analysis and developing a capital improvement program.

b) Revise the current zoning ordinance in light of the adopted comprehensive plan. The process may involve: redefining community development objectives; evaluating permitted uses and conditional uses; incorporating siting criteria, transfer of development applications and pedestrian concepts in the districting schemes; defining overlay districts for environmentally sensitive areas; and minimizing zoning border conflicts.

c) Revise the current subdivision land development ordinance in light of the adopted comprehensive plan. The process may involve incorporation of vegetative buffers, cooperative agreements and implementation of clustering incentives.

d) Develop a capital improvements program to more effectively plan and to develop priorities for major infrastructure improvements over an extended period of time.

e) Establish an ongoing schedule of internal review of municipal planning ordinances and fees.

PART D: A POSTSCRIPT ON THE JOINT COMPREHENSIVE PLAN

A comprehensive plan is a visionary document designed to propose and establish policies for future land management. Antrim Township and Greencastle Borough are not isolated islands. They are localities reacting to larger development trends. Many of the implementation strategies proposed in the joint plan are visionary and are not currently utilized by adjoining municipalities. Four contiguous municipalities: St. Thomas, Hamilton, Guilford and Montgomery Townships do not have enacted zoning (Table XI-1). Washington and Quincy Townships do have zoning. Most contiguous municipalities to Antrim Township, with the exception of Washington Township, have not taken the preferred method of formulating an implementation strategy after the adoption of a comprehensive plan.

Franklin County has a comprehensive plan adopted in 1977 but has not developed an implementation strategy. The Franklin County plan sets forth some implied objectives which coincide with many of the suggested implementation strategies in the Antrim-Greencastle Plan (Table XI-2). The lack of update of the Franklin County plan prevents a better correspondence.

Some of the long range strategies proposed in the conclusions sections are not currently practiced in the contiguous municipalities. This fact should not diminish the value of the strategies. A comprehensive plan is a proposal type of document. An adopted comprehensive plan is only the first step in the long and involved process of developing a viable and sustainable implementation strategy.

TABLE XI-1

PLANNING INSTRUMENTS IN CONTIGUOUS MUNICIPALITIES

CONTIGUOUS MUNICIPALITY	COMPREHENSIVE PLAN	ZONING ORDINANCE	SUBDIVISION ORDINANCE
St. Thomas	1980	NO	1990
Guilford	1978	NO	1988
Quincy	NO	1983	1983
Washington	1986	1988	1990
Hamilton	NO	NO	1965
Montgomery	1974	NO	1991

Source: authors, 1992

TABLE XI-2

CORRESPONDENCE OF PROPOSED STRATEGIES
WITH FRANKLIN COUNTY COMPREHENSIVE PLAN

ANTRIM GREENCASTLE PLAN STRATEGY	FRANKLIN COUNTY COMPREHENSIVE PLAN
CLUSTERING	Reduce piecemeal and haphazard development WORK ELEMENT 204
PUBLIC PURCHASE- LEASE	Encourage municipal purc- hase of open space WORK ELEMENT 205
CAPITAL IMPROVEMENT PLANNING	Encourage capital improve- ment and budgeting WORK ELEMENT 207
ZONING STRATEGY A UPDATE ZONING ORDINANCE	Provide sufficient land use diversity WORK ELEMENT 207
ZONING STRATEGY F PRESERVE PRIME AGRICUL- TURAL LAND	Preserve agricultural land WORK ELEMENT 204

Source: Franklin County Comprehensive Plan, 1977

An adopted and visionary comprehensive plan provides new solutions. Without an awareness of new solutions, old problems continue to persist.

FRANKLIN COUNTY, PENNSYLVANIA

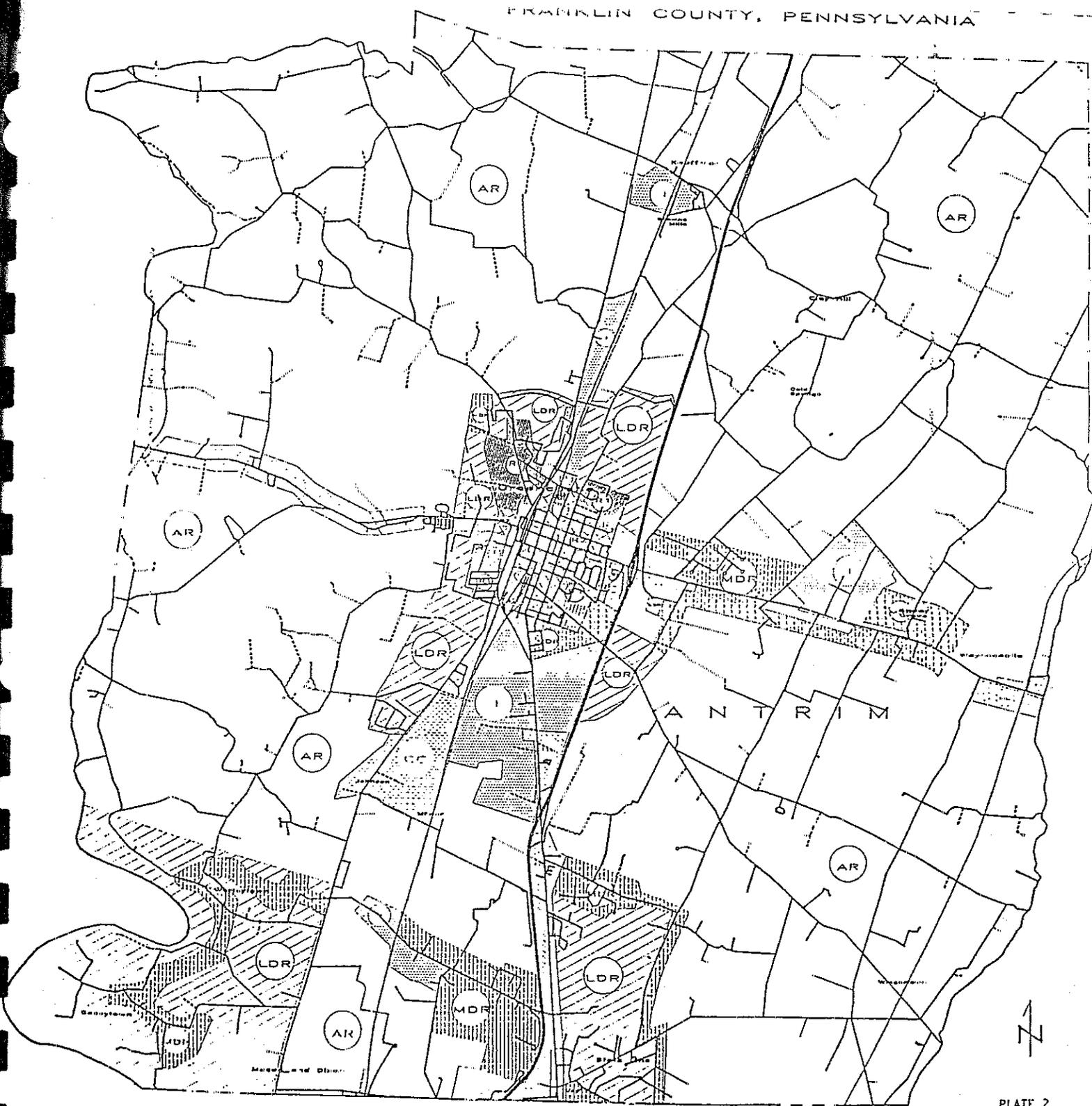


PLATE 2

ZONING

(R1) Residential

(R2) General Residential

(RM) Residential - Mobile

(AR) Agricultural Residential



(LDR) Low Density Residential



(MDR) Medium Density Residential



(CC) Community Commercial



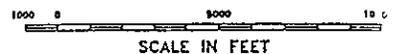
(CCII) Community Commercial II



(HC) Highway Commercial



(I) Industrial



SCALE IN FEET

DANIEL P. DEVITS
SHEPPERSBURG, PENNSYLVANIA

1990

ANTRIM TOWNSHIP AND BOROUGH OF GREENCASTLE
FRANKLIN COUNTY, PENNSYLVANIA

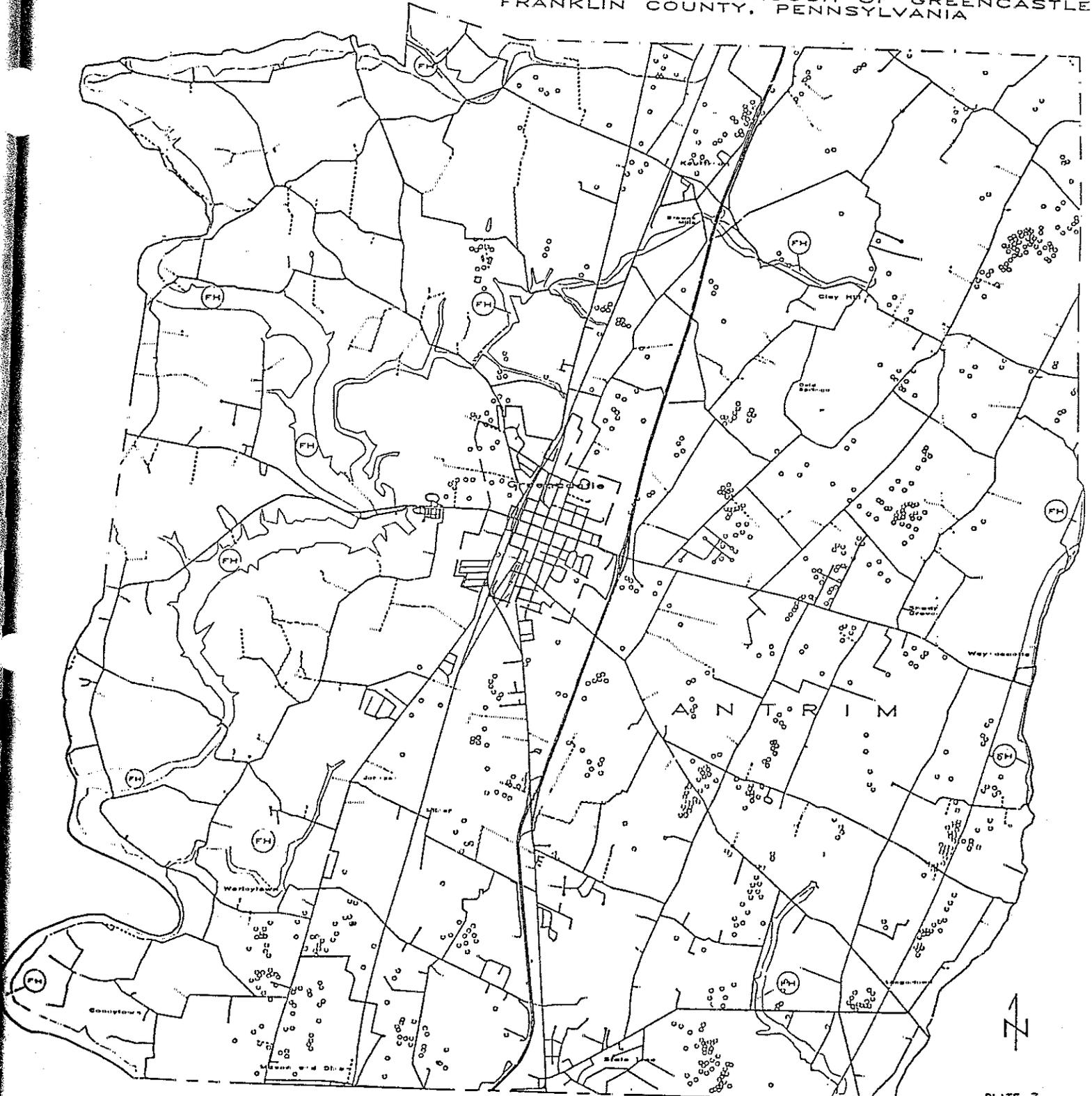
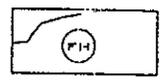


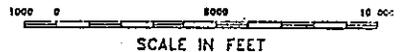
PLATE 3

ENVIRONMENTAL CONDITIONS:
Floodprone Areas
And
Sinkholes



FLOODZONE HAZARD

○ SINKHOLE (CLOSED DEPRESSION)



SCALE IN FEET

DANIEL P. DEWITT
1899 PENNSYLVANIA

1991

ANTRIM TOWNSHIP AND BOROUGH OF GREENCASTLE
FRANKLIN COUNTY, PENNSYLVANIA

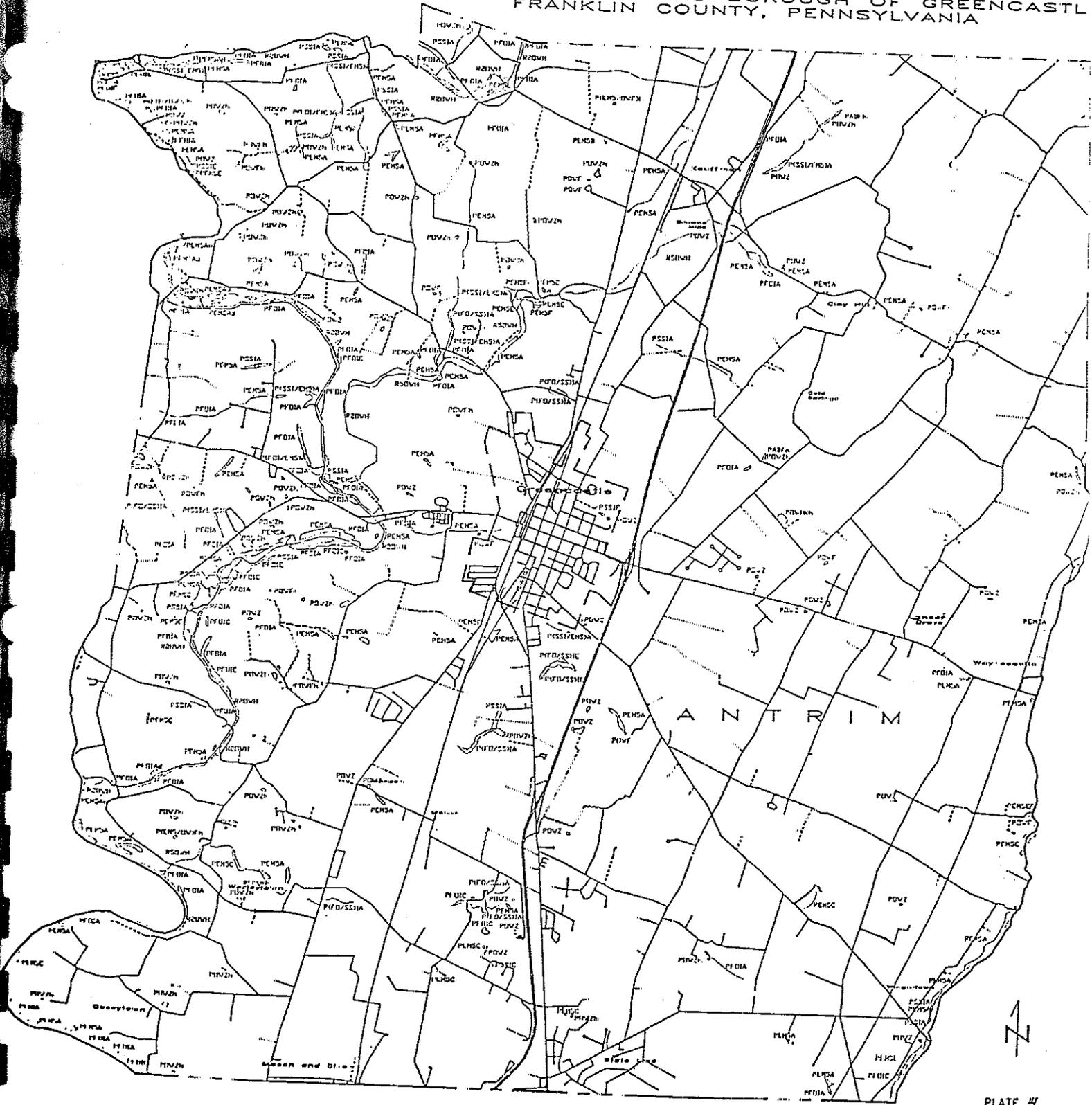


PLATE #1

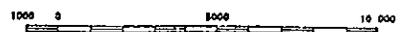
LEGEND

R-1 RIVERINE
 1. Seasonally flooded (partially or completely flooded)
 2. Permanently flooded (partially or completely flooded)
 3. Seasonally flooded (partially or completely flooded)
 4. Permanently flooded (partially or completely flooded)
 5. Seasonally flooded (partially or completely flooded)
 6. Permanently flooded (partially or completely flooded)
 7. Seasonally flooded (partially or completely flooded)
 8. Permanently flooded (partially or completely flooded)

R-2 RIVERINE
 1. Seasonally flooded (partially or completely flooded)
 2. Permanently flooded (partially or completely flooded)
 3. Seasonally flooded (partially or completely flooded)
 4. Permanently flooded (partially or completely flooded)
 5. Seasonally flooded (partially or completely flooded)
 6. Permanently flooded (partially or completely flooded)
 7. Seasonally flooded (partially or completely flooded)
 8. Permanently flooded (partially or completely flooded)

R-3 RIVERINE
 1. Seasonally flooded (partially or completely flooded)
 2. Permanently flooded (partially or completely flooded)
 3. Seasonally flooded (partially or completely flooded)
 4. Permanently flooded (partially or completely flooded)
 5. Seasonally flooded (partially or completely flooded)
 6. Permanently flooded (partially or completely flooded)
 7. Seasonally flooded (partially or completely flooded)
 8. Permanently flooded (partially or completely flooded)

ENVIRONMENTAL CONDITIONS
WETLANDS



SCALE IN FEET

DAVID P. DEWITT
SHEPPSBURG, PENNSYLVANIA

ANTRIM TOWNSHIP AND BOROUGH OF GREENCASTLE
FRANKLIN COUNTY, PENNSYLVANIA

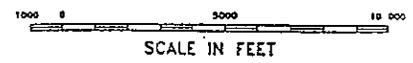


PLATE 5

LEGEND

-  STREAMS
 -  DRAINAGE DIVIDE
 -  FRACTURE TRACE
 -  FAULTS
 -  GENERALIZED DIRECTION OF FLOW
- Zones along which groundwater tends to flow in greater quantity and velocity

ENVIRONMENTAL CONDITIONS:
Drainage



SCALE IN FEET

DANIEL P. DEVITAS

ANTRIM TOWNSHIP AND BOROUGH OF GREENCASTLE
FRANKLIN COUNTY, PENNSYLVANIA

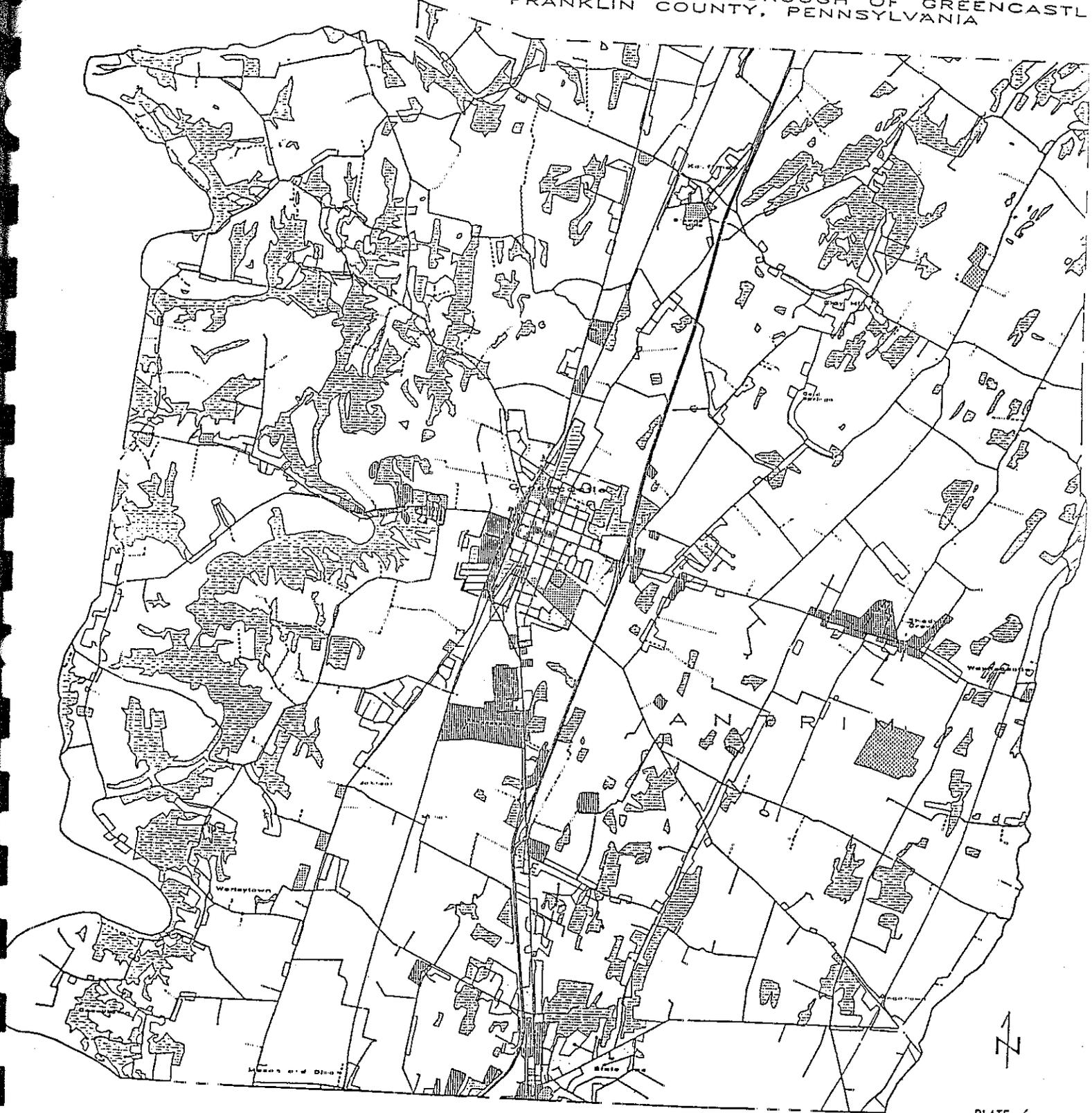


PLATE 6

LEGEND

- | | | |
|--------------------------------|---|--------------------|
| RESIDENTIAL | COMMERCIAL | ORCHARD |
| MULTIPLE FAMILY
RESIDENTIAL | INDUSTRIAL | FOREST |
| AGRICULTURAL | COMMERCIAL/INDUSTRIAL
UNDIFFERENTIATED | AGRICULTURE/VACANT |

LAND USE



DAVID P. DENNIS
SHIPPENSBURG, PENNSYLVANIA
1991

ANTRIM TOWNSHIP AND BOROUGH OF GREENCASTLE
FRANKLIN COUNTY, PENNSYLVANIA

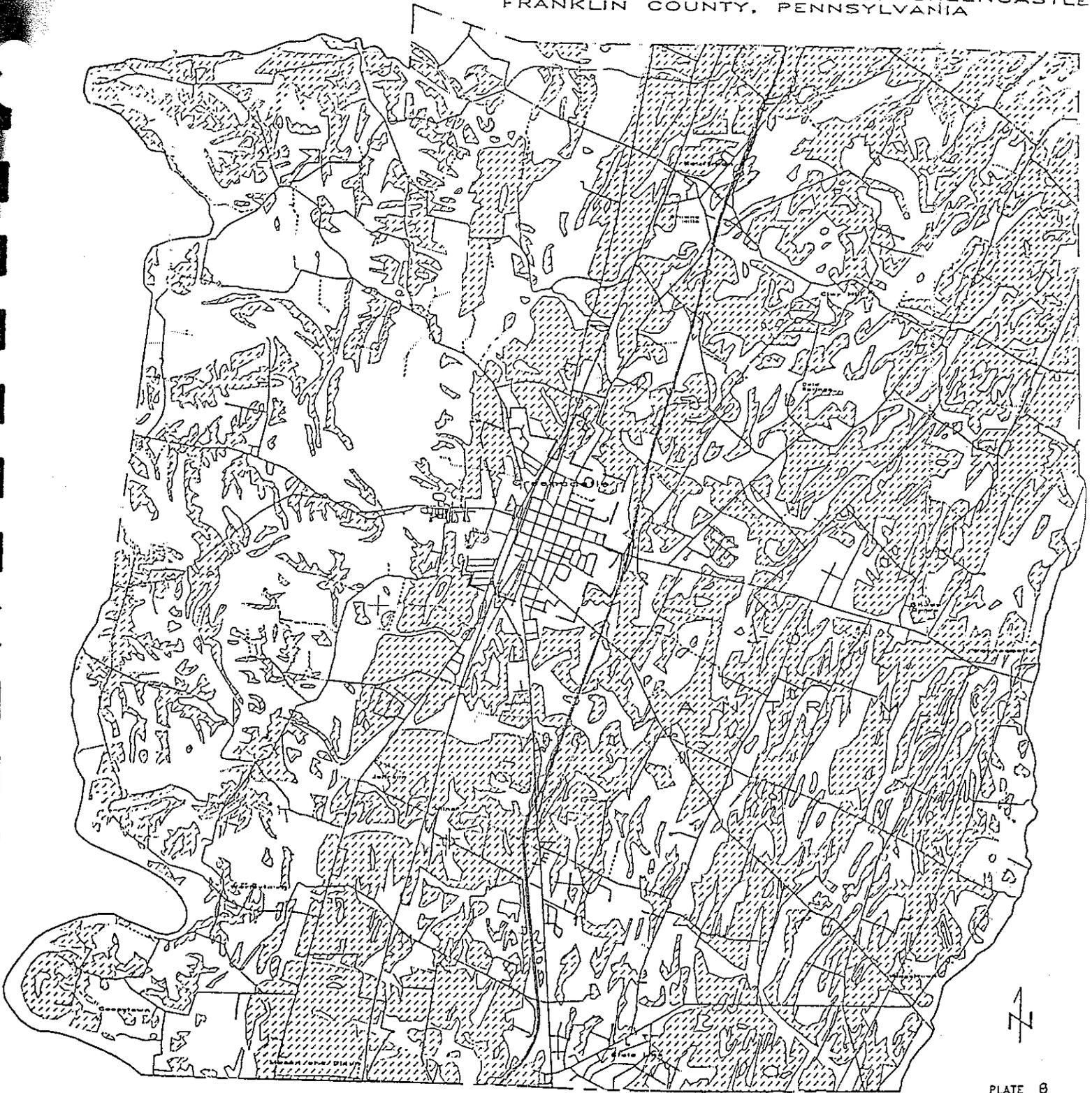


PLATE 8

PRIME AGRICULTURAL LANDS

 Prime Agricultural Land

1000 0 8000 10 00
SCALE IN FEET

DANIEL P. DEWITT
SHERIFFSburg, PENNSYLVANIA
1991

ANTRIM TOWNSHIP AND BOROUGH OF GREENCASTLE
FRANKLIN COUNTY, PENNSYLVANIA

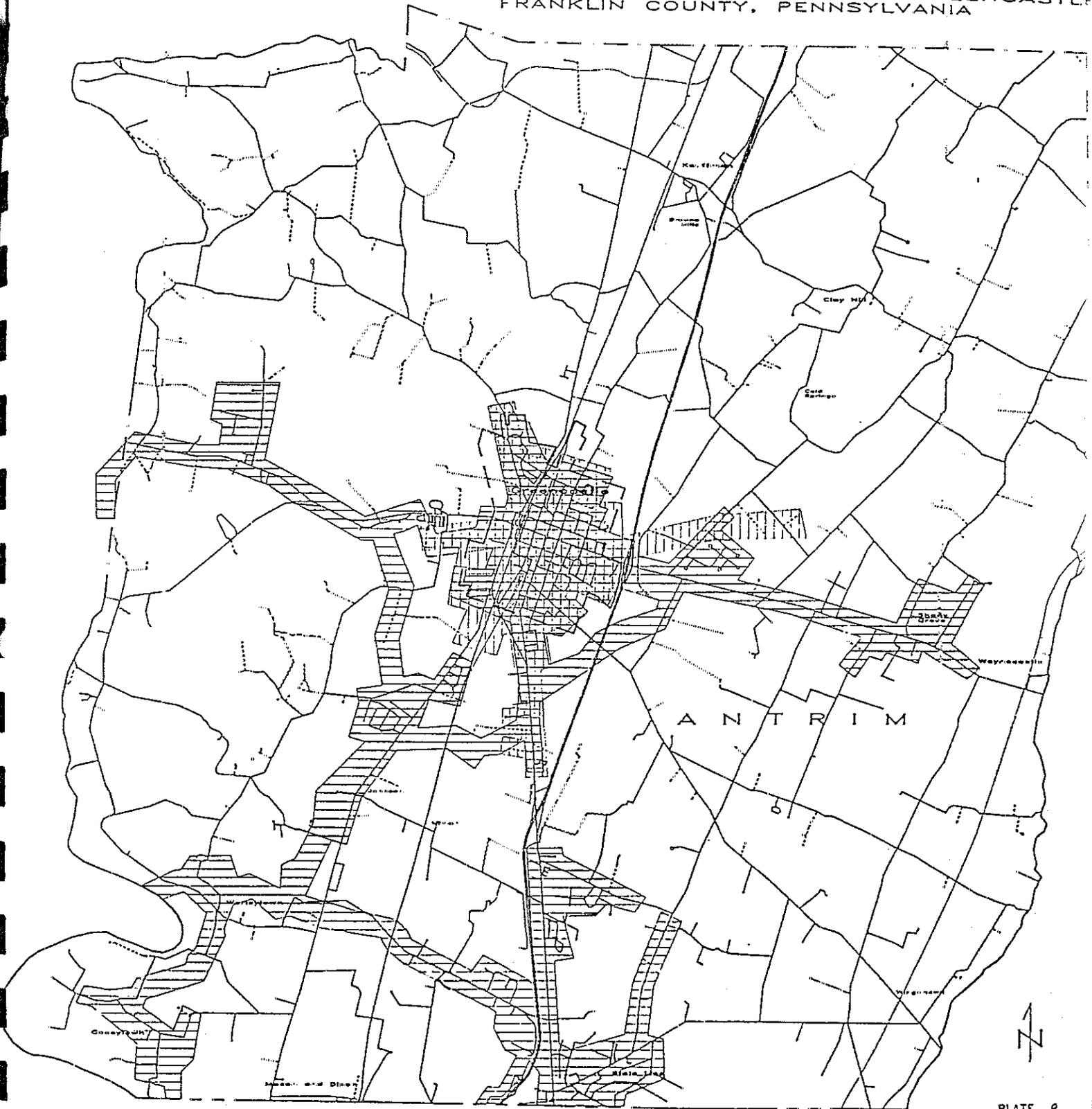


PLATE 9

LEGEND

-  Areas Served By Sewer Systems (500' Buffer)
-  Area Served By Water Systems (500' Buffer)

UTILITY SERVICE AREA



SCALE IN FEET

DANIEL P. BOYTS
SHERIDSPURG, PENNSYLVANIA

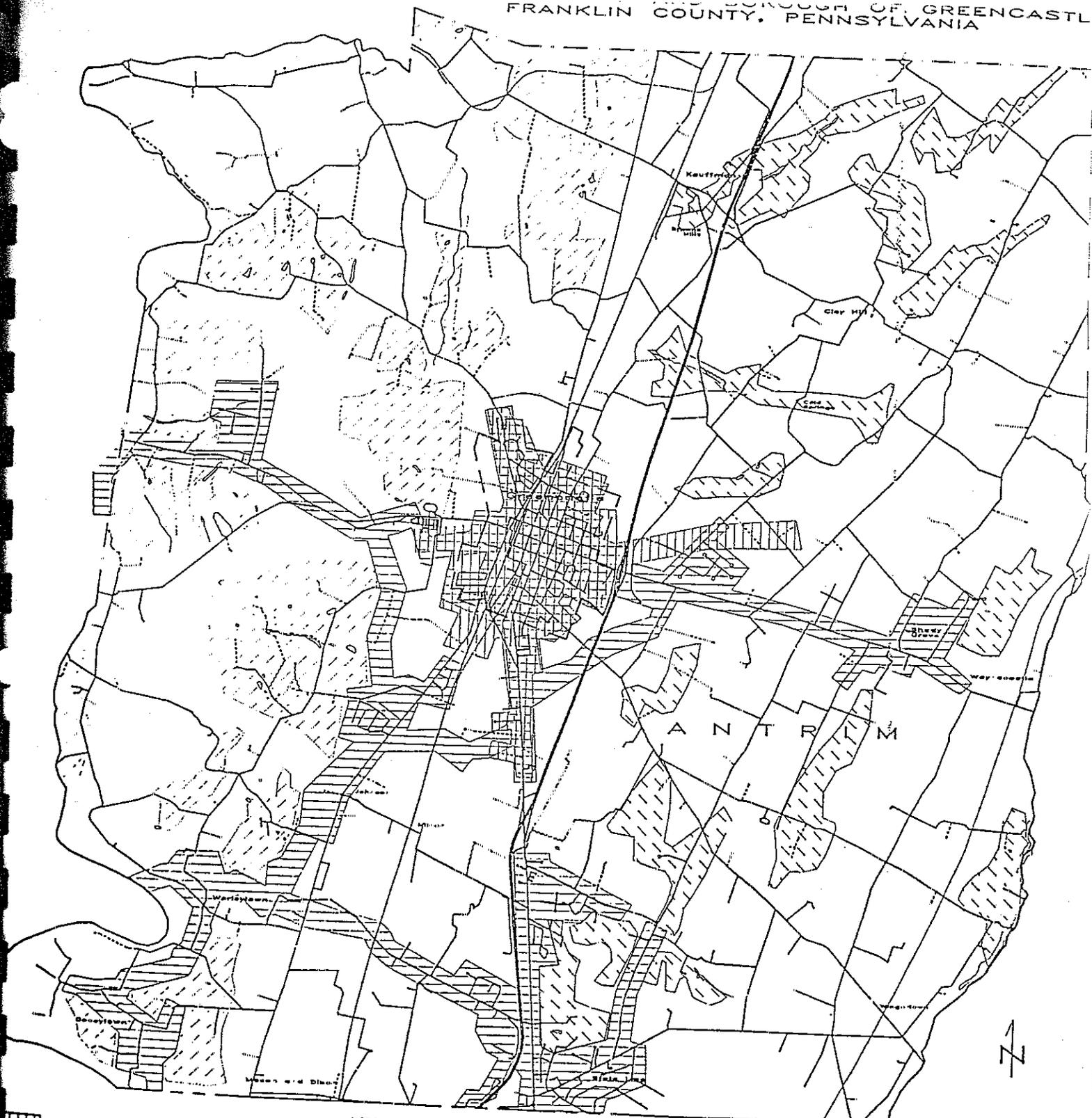


PLATE 10

- LEGEND**
-  Developable land Serviced by both Sewer and Water Systems (500' Buffer)
 -  Developable Land Serviced by Existing Sewer Systems (500' Buffer)
 -  Developable Land Serviced by Existing Water Systems (500' Buffer)

- IV  Developable Land - Shale Land
- V  Developable Land - Limestone Land
-  Wetlands

GENERAL PLANNING MAP



DAVID P. DEYER
 SHIPPENSBURG, PENNSYLVANIA
 1991

Note: 1) existing utilities, 2) non-prime agricultural, 3) not floodprone, and 4) absence of prominent sinkhole development. Wetlands are indicated.

