

3.0 Existing Conditions

3.1 Land Use and Zoning

Existing Land Use Conditions Highlights

- The study area’s total land area is nearly 26 square miles.
- Open space and undeveloped land comprises the majority of the study area at 41 percent.
- Most of the study area’s industrial land is located within proximity of US 19's interchange with I-90.
- All three study area municipalities (Summit and Waterford Townships and Waterford Borough) have adopted their own zoning ordinances.
- Sixty percent of the study area is zoned agricultural and open space.
- Commercial development is occurring along the northern portion of US 19 in the study area near the I-90 Interchange. This growth is slowly developing southward along US 19.

3.1.1 Land Use Data Collection Methodology

The first step in assessing the existing land use conditions in the study area was to develop a current land use map. Erie County Department of Planning provided a GIS coverage of the tax parcels for Summit Township and the scanned images of the tax parcels for Waterford Township and Waterford Borough. (Waterford Township and Waterford Borough tax parcels were digitized for a GIS coverage.) Land uses were assigned to each parcel through a combination of aerial imagery interpretation and field verification. Land uses were assigned using detailed NAICS (North American Industrial Classification System) Codes. For the purposes of the final report, these codes were generalized (see **Table 2**).

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

3.1.2 Study Area Land Use

The study area covers approximately 16,459 acres or 25.72 square miles. Table 2 summarizes the land uses found in the study area while a map of study area land uses can be found in the report appendix.

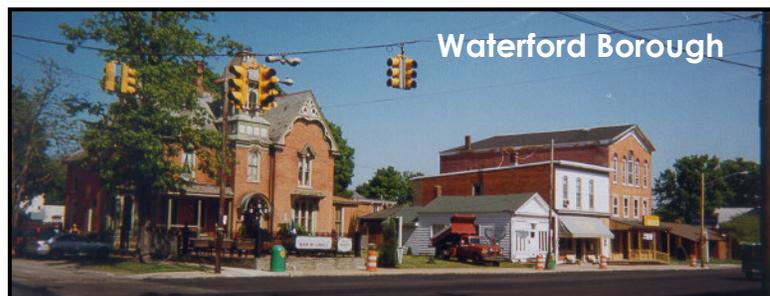


Table 2: Study Area Land Use

Land Use	Acreage	Percent of Total
Open Space/Undeveloped Land	6,582.7	40.3%
Residential (Single Family, Multi-Family)	4,866.4	29.8%
Agriculture/Natural Resources	2,839.5	17.4%
Public, Cultural, Educational & Related	769.0	4.7%
Commercial Retail/Mix Use	693.5	4.2%
Industrial – non manufacturing	183.0	1.1%
Commercial Office	173.9	1.1%
Industrial	177.0	1.1%
Airport	53.3	0.3%

Source: Erie County GIS

The study area is largely undeveloped with approximately 6500 acres (40.3 percent) of **open space/undeveloped land**. For study purposes, agriculture land uses were not considered as undeveloped. However, it should be noted that these parcels could develop as residential or nonresidential land uses if they are no longer actively farmed and/or sold. This land would also have to be in a zoning district that permits such uses.

The considerable amount of undeveloped land and strategic location of the study area holds significant potential for further development. The development of these parcels must be closely coordinated with investment in the transportation infrastructure to maintain an efficient flow of people and goods while enhancing area residents' quality of life.

Residential land uses constitute the most prevalent developed land use, comprising nearly 30 percent of the study area. Most of the residential development consists of single family dwellings with no public water or sewer. Expansion of the existing sewer and water infrastructure into unserved areas holds potential to increase residential development.

The central portions of the study area (from Townhall Road to just north of Waterford Borough) comprise the majority of the undeveloped or **agricultural land**. The eastern portion of the study area is characterized by forested tracts of land, mainly **State Game Lands**, interspersed with residential development. Agriculture uses are dispersed throughout the study area. Agricultural and natural resource uses comprise approximately 17 percent of the study area.

The fourth largest study area land use consists of **public, cultural, and educational related** lands. This land use is comprised of schools and public buildings and comprises nearly 5 percent of the total study area.



Commercial Retail/Mixed Use such as retail shops, grocery stores, restaurants, second floor apartments above retail businesses and others comprise approximately 4 percent of the land uses. Most of this land use is centered along the northern sections of US 19 and in Waterford Borough. Along US 19, commercial retail development is slowly developing southward.

Industrial non-manufacturing land uses comprise slightly over 1 percent of the study area's land uses. Most of these land uses are located within close proximity of I-90's interchange with US 19 on Oliver Road. **Commercial Office** and **Industrial** land uses in the study area comprise the same amount of land as Industrial non-manufacturing.

3.1.3 Existing Zoning

Each municipality in the study area has an adopted zoning ordinance. Each of these ordinances permit a variety of land uses from agriculture to industrial. Table 3 summarizes the definition and requirements for the zoning districts found in the study area. Table 4 illustrates zoning districts in the study area.

Table 3: Study Area Zoning District Summaries

Summit Township Zoning Ordinance

District Name	Type	Purpose	Permitted Uses	Public Water, Sewer, or Both	Minimum Lot Size (sq. ft.)	Maximum Building Height	Maximum Lot Coverage / Structure
A-1	Agriculture	Preserve agricultural land	Dwellings	N/A	60,000	45	10%
			All other	N/A	60,000	45	10%
A-2	Agriculture	Provide a buffer or transition between residential & agriculture	Dwellings	N/A	43,560	45	10%
			All others	N/A	43,560	45	10%
R-1	Residential	Residential & Associated Uses	Single Family and Other uses	N/A	20,000	45	10%
R-2	Residential	Residential & Associated Uses	Single Family Dwelling & Other Uses	N/A	30,000	45	10%
				Public Sewer or Public Water or Both	15,000	45	20%
			Two Family Dwelling	N/A	30,000	45	10%

District Name	Type	Purpose	Permitted Uses	Public Water, Sewer, or Both	Minimum Lot Size (sq. ft.)	Maximum Building Height	Maximum Lot Coverage / Structure
			Three or More Family Dwelling	N/A	35,000 (+5000 / unit over three)	45	10%
R-3	Residential	Residential & Associated Uses	Single Family and Other Uses	N/A	20,000	45	10%
				Both	9,600	45	30%
			Two Family Dwelling	N/A	30,000	45	10%
			Three or More Family Dwelling	N/A	35,000 (+5000 / unit over three)	45	10%
T-1	Transitional	Light business and residential uses	All Uses	N/A	N/A	45	30%
			Single Family and Other uses	N/A	30,000	45	10%
				Both	9,600	45	40%
			Two Family Dwelling	N/A	30,000	45	10%
			Three or More Family Dwelling	N/A	35,000 (+5,000 / unit over three)	45	10%
B-1	Business	Commercial & Research industrial uses	All Uses	N/A	25,000	30	40%
B-2	Business	Commercial & Research Industrial Uses	All Uses	N/A	25,000	30	40%
I-1	Industrial	Existing industries and their expansions	All Uses	N/A	217,800	45	50%
I-2	Industrial	Solid Waste Disposal--Lake View Landfill	All Uses	N/A	217,800	45	50%
I-3	Industrial	Provide space for "Drop-off" Centers	All Uses	N/A	217,800	45	50%
IP	Industrial	Exclusively	All Uses	N/A	2,178,000	50	50%

District Name	Type	Purpose	Permitted Uses	Public Water, Sewer, or Both	Minimum Lot Size (sq. ft.)	Maximum Building Height	Maximum Lot Coverage / Structure
	Park	industrial uses			(43,560 /structure)		
LIP	Light Industrial Park	Exclusively industrial uses	All Uses	N/A	871,200 (43,560 /structure)	50	50%

Waterford Township Zoning Ordinance

District Name	Type	Purpose	Permitted Uses	Minimum Lot Size (sq. ft.)	Maximum Building Height	Maximum Building Coverage
A-1	Conservation	Preserve Agriculture	Agriculture	130,680	45	5%
A-2	Agricultural	Single Family and Agriculture	Agriculture/Residential	43,560	45	10%
R-1	Residential	Single Family and associated uses	Residential	10,500 (4,000 per family)	45	15%
R-2	Residential	Residential uses	Residential	7,200 (2,500 per family)	45	20%
B-1	Business	Retail Commercial	Non Residential	20,000	45	60%
M-1	Industrial	Light Manufacturing	Non Residential	20,000	45	60%
M-1A	Light Industrial	Light Manufacturing	Non Residential	20,000	45	60%

Waterford Borough Zoning Ordinance

District Name	Type	Purpose	Permitted Uses	Minimum Lot Size (sq. ft.)	Maximum Building Height	Maximum Lot Coverage
R-1	Residential	Low Density Residential	SF Res	12,500	35	35%
			Other	12,500	35	40%
R-2	Residential	Diverse Residential	SF Res	7,500	35	40%
			Other Res	7,500 + 800 sq. ft. for each unit over 1	40	40%
			Other	7,500	40	45%
T	Transitional	Commercial /Apartments	Residential	5,500 + 600 sq. ft. for each unit over 1	45	45%
			Other	3,500	50	60%
B-1*	Business	Central Business District	Residential	3,500 + 400 sq. ft. for each unit over 1	45	50%
			Other	3,500	50	60%
B-2*	Business	Non Residential for business expansion	All	20,000	50	70%
F-P	Floodplain	100 Year Floodplain				

*B1 allows more special exception uses than B2

Table 4: Study Area Zoning Districts

Code	District Name	Acres	% of Municipality
Waterford Borough			
R-1	Residential	196.5	31.9%
R-2	Residential	245.9	39.9%
B-1	Business	9.4	1.5%
B-2	Business	94.9	15.4%
T	Transitional	68.4	11.1%
Waterford Township			
A -1	Conservation	303.9	5.2%
A-2	Agriculture	4,259.3	72.8%
R-1	Residential	805.8	13.8%
B-1	Business	387.0	6.6%
M-1	Industrial	93.6	1.6%
Summit Township			
A-1	Agriculture	4,799.9	48.8%
A-2	Agriculture	432.9	4.4%
R-1	Residential	703.2	7.2%
R-2	Residential	2,024.0	20.6%
B-1	Business	1,404.3	14.3%
B-2	Business	43.5	0.4%
I-1	Industrial	341.1	3.5%
T-1	Transitional	0.0	0.0%
Industrial Park	Industrial Park	89.1	0.9%

Of special note from this table is that 60 percent of the study area, or 9,796 acres, is zoned as agriculture/conservation and open space. These zones allow for limited residential development or no development at all.

Low density residential zones comprise approximately 10 percent or just over 1,705 acres of the study area. The development of these future communities must be

closely balanced with the development of the 15 percent of the study area that is zoned for industrial or commercial use. While these zones currently comprise a small portion of the land area, just over 2,462 acres, their traffic could have an impact on the residential quality of life in the region.

3.2 *Social Environment*

Existing Social Environmental Conditions Highlights

- Population in the study area has increased since 1950. Generally, the municipalities in the study area have outpaced Pennsylvania's growth rate over the past 50 years.
 - Waterford Borough's population has declined since its 1980 peak of 1,568.
- The percentage of study area workers who drive alone is higher than that of state (76 percent) and county (80 percent) rates. Rates in Summit Township and Waterford Borough are as high as 87 percent.
- Among the study area municipalities, Waterford Township experienced the largest housing unit growth rate (54.8 percent) over the 1980 to 2000 Census period.

3.2.1 Population

Population growth is a general indicator of a local economy's health and performance over time. Table 5 provides a historic (i.e., 1950-2000) population trend analysis for the study area townships, Erie County and Pennsylvania. Between 1950 and 2000, the population growth rates of Summit (147 percent) and Waterford (161 percent) Townships exceeded the county's overall population growth rate of 28 percent. Although slightly below the county's growth rate, Waterford Borough's population growth rate of slightly over 21 percent exceeded the state's overall population growth rate of nearly 17 percent.

As demonstrated in Figure 2, the study area townships experienced their largest population increases between 1950 and 1980. Post-1980 population growth trends have slowed and in some instances have declined. The thirty year spiking trends may be attributed, in part, to the post World War II baby boom.

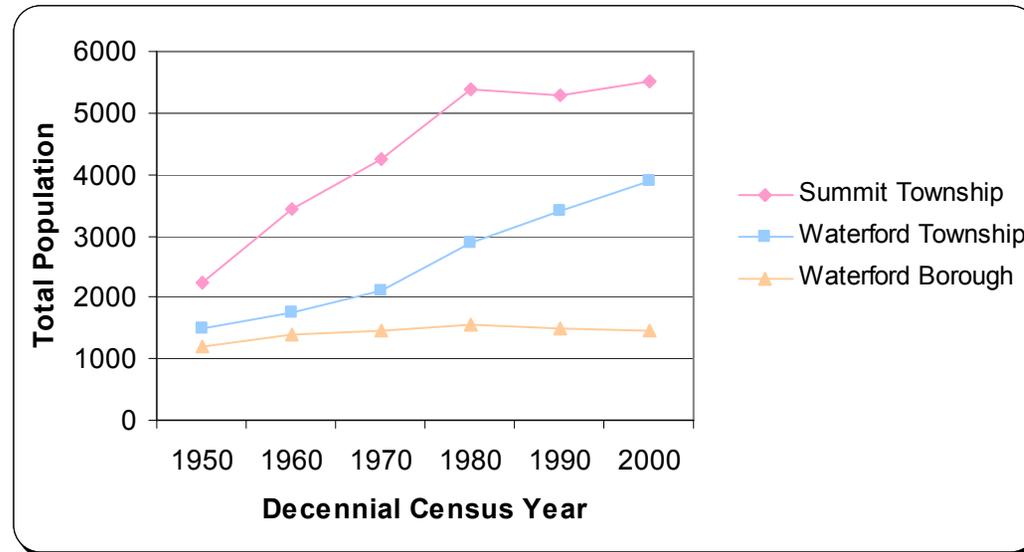
Today, according to the 2000 Census, Summit Township is the study area's most populous municipality, with 5,529 persons.

Table 5: Population Growth Trends, 1950-2000

Municipality	Population by Decennial Census						Change											
	1950	1960	1970	1980	1990	2000	1950-1960		1960-1970		1970-1980		1980-1990		1990-2000		1950-2000	
							#	%	#	%	#	%	#	%	#	%	#	%
Pennsylvania	10,498,012	11,319,366	11,800,766	11,864,720	11,882,842	12,281,054	821,354	7.82	481,400	4.25	63,954	0.54	18,122	0.15	398,212	3.35	1,783,042	16.98
Erie County	219,388	250,682	263,354	279,780	275,572	280,843	31,294	14.26	12,672	5.06	16,426	6.24	(4,208)	(1.50)	5,271	1.91	61,455	28.01
Summit Township	2240	3424	4237	5381	5284	5529	1,184	52.86	813	23.74	1,144	27.00	(97)	(1.80)	245	4.64	3,289	146.83
Waterford Township	1486	1737	2119	2874	3402	3878	251	16.89	382	21.99	755	35.63	528	18.37	476	13.99	2,392	160.97
Waterford Borough	1195	1390	1468	1568	1492	1449	195	16.32	78	5.61	100	6.81	(76)	(4.85)	(43)	(2.88)	254	21.26

Source: U.S. Census Bureau

Figure 2: POPULATION GROWTH TRENDS, 1950-2000



Source: U.S. Census Bureau

3.2.1.1 Population Density and Distribution by Land Area

Population density is a measure of population in relation to total land area. Rural communities, for example, have lower population densities than urban areas. Table 6 and Figure 3 present the decennial population density trends (1970 to 2000) of the study area townships, Erie County and Pennsylvania.

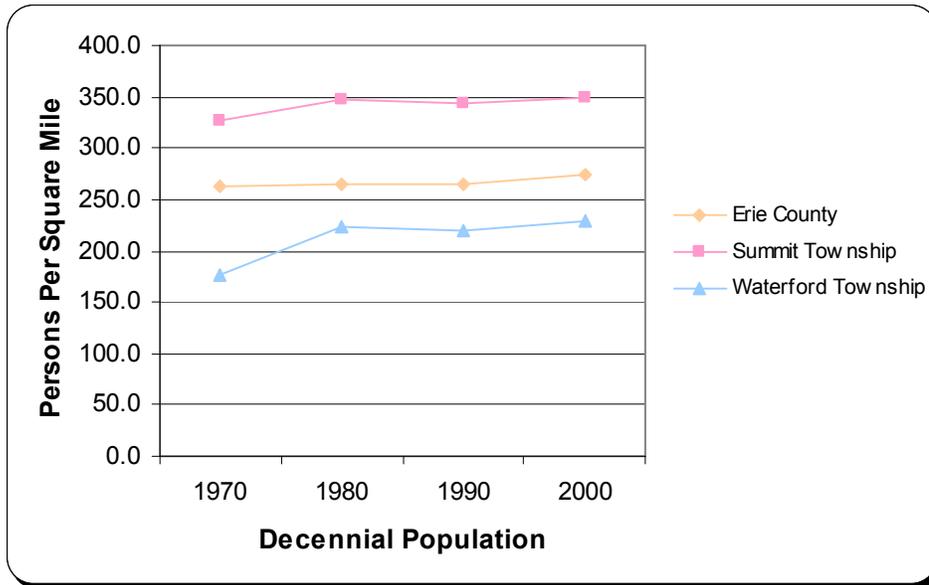
Summit Township posted the largest number of persons per square mile during the period, followed by Waterford Township. In comparison with Erie County, the study area townships are sparsely populated, which demonstrates their rural character. Declining population in Waterford Borough is typical of borough population trends statewide.

Table 6: Population Density, 1970-2000

Municipality	Land Area (Sq. Mi.)	Persons Per Square Mile				Numeric Change		
		1970	1980	1990	2000	1970-1980	1980-1990	1990-2000
Pennsylvania	44,820	263.3	264.7	265.1	274.0	1.4	0.4	8.9
Erie County	804	327.6	348.0	342.8	349.3	20.4	(5.2)	6.6
Summit Township	24.1	175.8	223.3	219.3	229.4	47.5	(4.0)	10.2
Waterford Township	50.2	42.2	57.3	67.8	77.3	15.0	10.5	9.5
Waterford Borough	1.2	1223.3	1306.7	1243.3	1207.5	83.3	(63.3)	(35.8)

Source: U.S. Census Bureau

Figure 3: Population Density Trends, 1970-2000



Source: U.S. Census Bureau

The U.S. Census Bureau classifies municipalities as either “urban” or “rural.” Urban consists of all territory, population, and housing units located in urbanized areas and in places of 2,500 or more living outside urbanized areas. Territory, population, and housing units not classified as urban are defined as “rural.” As presented in Table 7, Waterford Township and Waterford Borough are classified as 100 percent “rural” and Summit Township is classified as 51 percent “rural,” while only 19.6 percent of Erie County’s total population is classified as such.

Table 7: Population Distribution, 2000

Municipality	2000 Census Population*	Urban		Rural			
		#	%	Farm		Non-Farm	
				#	%	#	%
Pennsylvania	12,281,054	9,461,086	77.04	85,362	0.70	2,734,606	22.27
Erie County	280,843	225,835	80.41	1,696	0.60	53,312	18.98
Summit Township	5,529	2,730	49.38	6	0.11	2,793	50.52
Waterford Township	3,878	0	0.00	156	4.02	3,722	95.98
Waterford Borough	1,449	0	0.00	8	0.55	1,441	99.45

*Not based on 100-Percent Count of Population

Source: U.S. Census Bureau, 2000

3.2.2 Age Group Distribution

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

A descriptive analysis of the age groups for each study area township is presented in Table 8 and illustrated in Figure 4. The young adult age group holds the largest share of the study household formations. This is also the prime childbearing age group. Therefore, any decline in the number of persons within this age group will directly impact the area’s birth rate. Furthermore, this age group represents population cohort that comprises most of the local labor force and is most likely engaged in home buying or building activities.

Table 8: Gender by Age Group, 2000

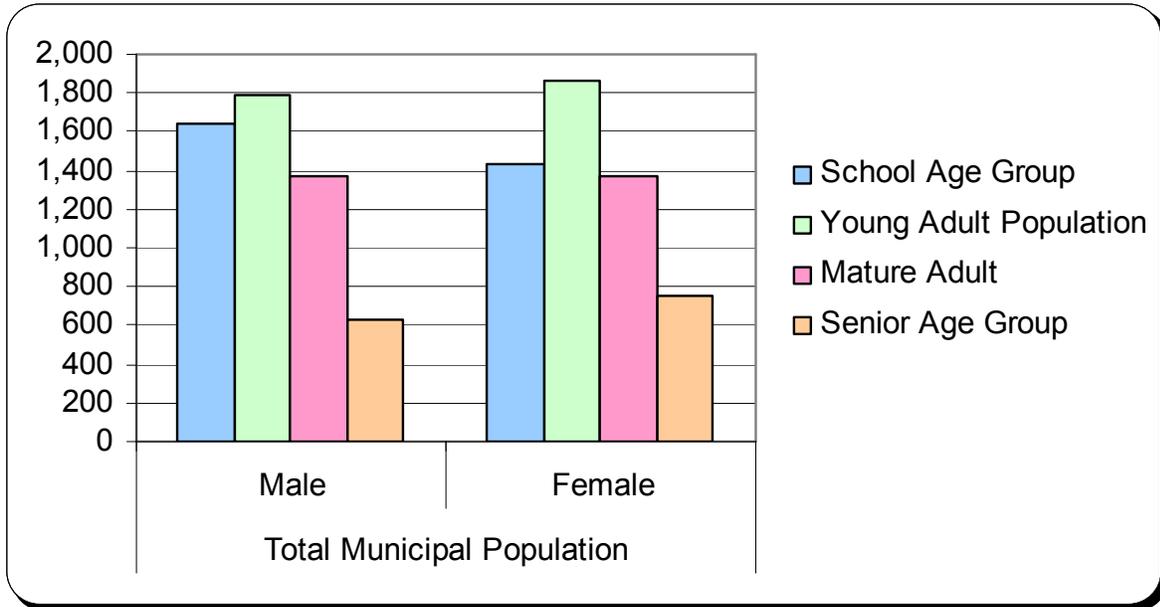
Age Groups	Summit Township		Waterford Township		Waterford Borough		Total Municipal Population	
	Male	Female	Male	Female	Male	Female	Male	Female
School Age Group	754	658	667	578	218	194	1,639	1,430
Under 5	150	132	142	144	50	36	342	312
5-14	404	361	344	311	113	86	861	758
15-19	200	165	181	123	55	72	436	360
Young Adult Population	876	892	677	711	231	257	1,784	1,860
20-24	146	129	86	100	42	42	274	271
25-34	308	314	257	269	80	89	645	672
35-44	422	449	334	342	109	126	865	917
Mature Adult	728	768	478	436	163	170	1,369	1,374
45-54	427	419	288	259	102	101	817	779
55-59	159	185	117	105	36	41	312	331
60-64	142	164	73	72	25	28	240	264
Senior Age Group	391	462	160	171	79	115	630	748
65-74	238	254	108	114	43	63	389	431
75-84	134	157	48	47	29	43	211	247
85 and over	19	51	4	10	7	9	30	70
Gender Total	2,749	2,780	1,982	1,896	691	736	5,422	5,412

*Total Municipal Population = Summit and Waterford Townships and Waterford Borough

Source: U.S. Census Bureau

Equally significant is the distribution of males to females, which directly impacts future family formation patterns and subsequent birth rates. Traditionally, a higher proportion of females to males is considered more favorable in maintaining stable population growth. As presented in Table 8, the number of females exceeded the number of males in all age groups, except the school age group.

Figure 4: Age Group Distribution for Study Area Municipalities, 2000



Source: U.S. Census Bureau

3.2.3 Racial Composition

In April 1997, the US Department of Transportation issued an Environmental Justice Order to identify groups for targeted communities for transportation projects and decision making. The intent of Environmental Justice is to ensure that there is an equal distribution of benefits and impacts of transportation projects to all groups and communities.

Being aware of these groups helps to integrate them into the public involvement process, identify their special transportation needs and priorities, as well as to help determine the effects, if any, of alternative transportation policies.

The 2000 Census categorized the study area’s population into the racial categories outlined in Table 9. The 2000 Census also categorized the Hispanic or Latino composition of the study area’s entire population. As presented in Table 9, the majority of the study area’s population is White (97.3 percent).

Table 9: Racial Composition of Study Area Municipalities

Category		2000 Census	
		#	%
Race	One Race	10,720	98.75%
	White	10,563	97.30%
	Black or African American	68	0.63%
	American Indian and Alaska Native	10	0.09%
	Asian alone	18	0.17%
	Native Hawaiian and Other Pacific Islander	0	0.00%
	Some other race	61	0.56%
	Two or More Races (One Race + Two or More Races)	136	1.25%
	TOTAL	10,856	100.00%
Hispanic or Latino And Race	Hispanic or Latino: (of any race)	46	0.42%
	Mexican	11	0.10%
	Puerto Rican	17	0.16%
	Cuban	1	0.01%
	Dominican Republic	0	0.00%
	Central American	2	0.02%
	South American	2	0.02%
	Other Hispanic or Latino	13	0.12%
	Not Hispanic or Latino	10,810	99.58%
	White only	10,665	98.24%

Source: U.S. Census Bureau

3.2.4 Per Capita Income

Income reflects the relative affluence of a population and its ability to support local public facilities and services. Table 10 presents the historic (1989 to 1999) per capita income trends for the study area municipalities, Erie County, and Pennsylvania. Per capita income is calculated by dividing the aggregate income for persons 15 years and over by the total number of persons in the group.

The per capita income data presented in Table 10 was collected from the 1990 and 2000 Censuses. The U.S. Bureau of Labor Statistics' Consumer Price Index (CPI) for the Northeastern United States urban area was used to adjust the 1989 income levels for inflation to 1999 dollars. The CPI represents changes in prices of all goods and services purchased for consumption by households. User fees, such as water and sewer service, as well as sales and excise taxes paid by the consumer are included in the calculation. Income taxes and investment items such as stocks, bonds, and life insurance are not included.

As shown, the real growth in per capita income for Summit Township and Waterford Borough exceeded the growth rate enumerated for Erie County and these municipal growth rates exceeded Pennsylvania's growth rate of 10.5 percent. This can generally be interpreted as a positive indicator of good jobs and economic performance. The real growth in per capita income for Waterford Township declined by 5.7 percent.

Table 10: Adjusted Per Capita Income, 1989-1999

Municipality	1989 Per Capita Income (Unadjusted)	1989 Per Capita Income in 1999 Dollars	1999 Per Capita Income in 1999 Dollars	Real Growth in Per Capita Income (Percent)
Pennsylvania	\$14,068	\$18,901	\$20,880	10.5%
Erie County	\$12,317	\$16,549	\$17,932	8.4%
Summit Township	\$12,281	\$16,500	\$19,782	19.9%
Waterford Borough	\$11,227	\$15,084	\$17,135	13.6%
Waterford Township	\$12,806	\$17,206	\$16,229	-5.7%

Source: U.S. Census, 1990 & 2000

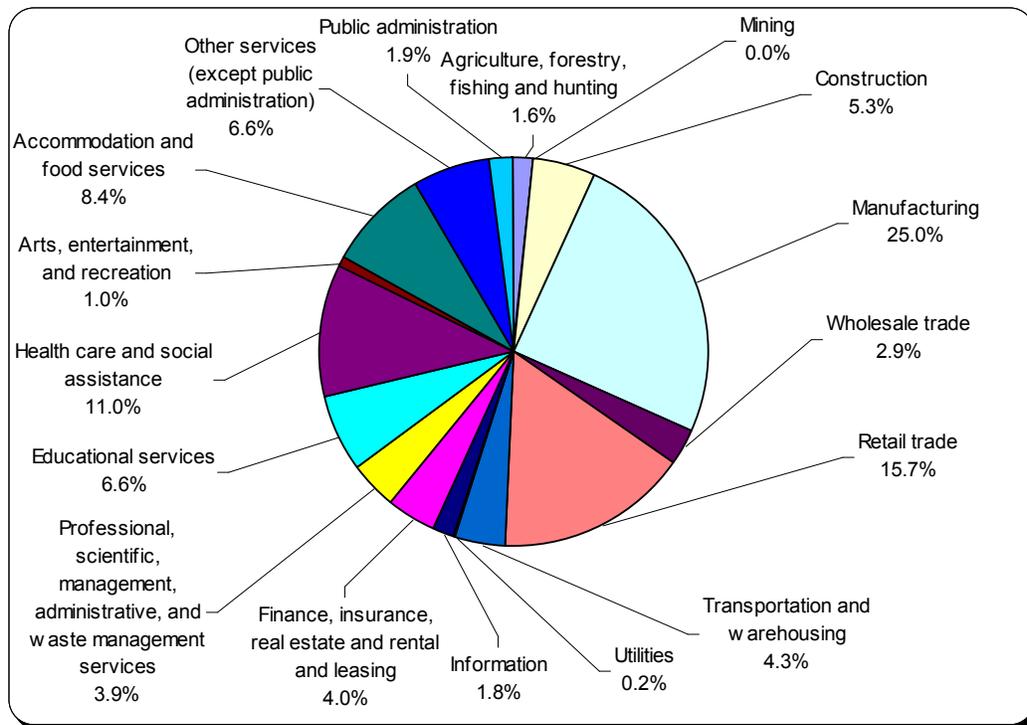
3.2.5 Resident Employment by Industry

Resident employment is defined as all persons 16 years of age and older that are employed within a specified geographic area. This excludes those serving in the armed forces. Like the general population, the resident employment patterns identify the types and predominance of the major industry sectors in a given area.

The most current resident employment data for the study area municipalities and Erie County was collected from the 2000 Census and is presented in Table 11. This data reveals the resident employment of the study area municipalities largely mirrors the resident employment of Erie County as a whole. To this end, the greatest proportions of county and local residents are employed in the manufacturing (durable and nondurable), retail trade and health care and social assistance. Additionally, a greater proportion (3.9 percent) of Waterford Township’s residents are employed in the agricultural industry than in Erie County (0.9 percent). Figure 5 illustrates the distribution of the collective municipal resident employment enumerations.



Figure 5: Employment Distribution by Industry Type, 2000



Source: U.S. Census Bureau

Table 11: Industry Of Employment For Persons 16 Years Of Age And Over, 2000

Source: U.S. Census Bureau

Industry	Erie County		Summit Township		Waterford Borough		Waterford Township	
	#	%	#	%	#	%	#	%
Agriculture, forestry, fishing and hunting	1209	0.9%	0	0.0%	10	1.3%	74	3.9%
Mining	111	0.1%	0	0.0%	0	0%	0	0.0%
Construction	6113	4.7%	137	4.9%	29	3.9%	119	6.3%
Manufacturing	30731	23.8%	711	25.7%	140	18.9%	495	26.3%
Wholesale trade	3305	2.6%	90	3.2%	21	2.8%	45	2.4%
Retail trade	15642	12.1%	410	14.8%	137	18.5%	302	16.0%
Transportation and warehousing	3746	2.9%	103	3.7%	23	3.1%	104	5.5%
Utilities	837	0.6%	0	0.0%	4	0.5%	8	0.4%
Information	2775	2.1%	36	1.3%	16	2.2%	45	2.4%
Finance, insurance, real estate and rental and leasing	6352	4.9%	124	4.5%	39	5.3%	52	2.8%
Professional, scientific, management, administrative, and waste management services	7554	5.8%	116	4.2%	40	5.4%	56	3.0%
Educational services	12155	9.4%	199	7.2%	79	10.7%	78	4.1%
Health care and social assistance	18276	14.1%	304	11.0%	59	8.0%	228	12.1%
Arts, entertainment, and recreation	2039	1.6%	27	1.0%	5	0.7%	21	1.1%
Accommodation and food services	8909	6.9%	274	9.9%	83	11.2%	94	5.0%
Other services (except public administration)	5838	4.5%	171	6.2%	41	5.5%	142	7.5%
Public administration	3733	2.9%	68	2.5%	15	2.0%	19	1.0%
Totals	129,325	100.0%	2,770	100.0%	741	100.0%	1,882	100.0%

3.2.5.1 Place of Work and Resident Commuting Patterns

Understanding the commuting patterns and the characteristics of commuter travel is an essential component in the land use and transportation planning process. Commuting pattern trends are essential for planning highway improvements and developing public transportation services, as well as for designing programs to ease traffic problems during peak periods, conserve energy, and reduce pollution.



Place of work and commuting patterns statistics for the study area municipalities were obtained from the 2000 Census and are presented in Table

12. As shown, the majority of study area workers are employed outside their municipality of residence and commuted to work alone. Due to the lack of public transportation services provided in the study area, no workers reported using such services in their daily commute to work. A modest number of study area residents, however, indicated they carpooled.

Figure 6 compares the mode split for the municipalities in the study area, Erie County and Pennsylvania. As expected, the majority of people commute to work alone. The percentage of those who drove alone in the study area, in fact is actually higher than that of Pennsylvania (76 percent), compared to Erie County (80 percent), Summit Township (87 percent), Waterford Borough (86 percent), and Waterford Township (82 percent).

Table 12 also presents the journey to work travel time statistics for each of the municipalities. A comparison of the travel times for the two townships and Waterford Borough is illustrated in Figure 7. Travel times for the borough and townships' residents are similar overall. The greatest proportion of resident travel times range from 10-34 minutes. In this range, the travel times for Summit Township and Waterford Borough peak in the range of 20-24 minutes, while Waterford Township workers' travel times peak in the range of 30-34 minutes.

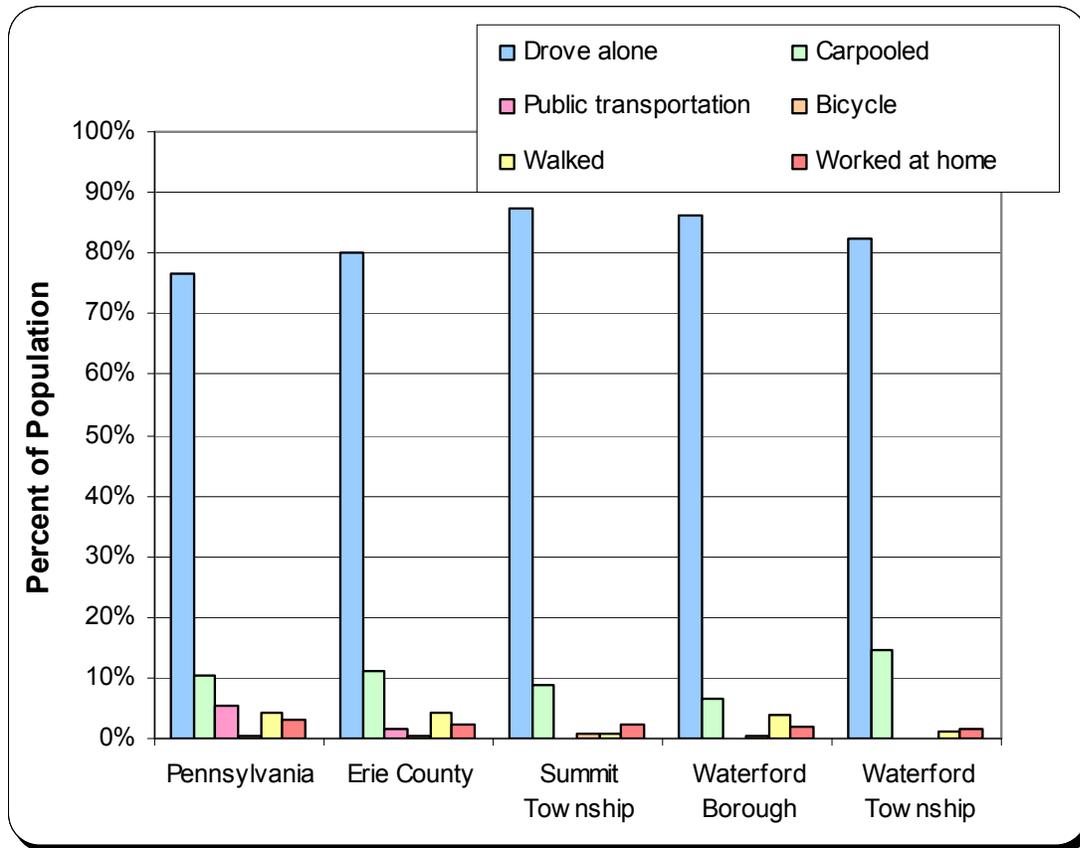


Table 12: Place of Work and Journey to Work, 2000

Category	Total Persons			Total	Percent Total
	Summit Township	Waterford Borough	Waterford Township		
Place of Work					
Total Workers	2691	735	1843	5269	100.0%
Worked in municipality of residence	595	157	203	955	18.1%
Worked outside municipality of residence	2096	578	1640	4314	81.9%
Journey to Work (Mode)					
Total	2433	694	1551	4678	100.0%
Car, truck or van					
Drove alone	2198	533	1207	3938	84.2%
Carpooled	170	90	283	543	11.6
Public Transportation	0	0	0	0	0%
Motorcycle	0	0	0	0	0%
Bicycle	0	0	0	0	0%
Walked	0	52	26	78	1.7%
Other means	0	4	7	11	0.2%
Worked at home	65	15	28	108	2.3%
Journey to Work (Travel Time)					
Total Workers	2691	735	1843	5269	100.0%
Did not Work at home:					
Less than 5 minutes	75	55	62	192	3.7%
5 to 9 minutes	187	107	127	421	8.2%
10 to 14 minutes	430	51	138	619	12.0%
15 to 19 minutes	703	91	221	1015	19.7%
20 to 24 minutes	622	142	302	1066	20.7%
25 to 29 minutes	197	69	212	478	9.3%
30 to 34 minutes	266	137	459	862	16.7%
35 to 39 minutes	18	17	103	138	2.7%
40 to 44 minutes	0	14	74	88	1.7%
45 to 59 minutes	42	14	81	137	2.6%
60 to 89 minutes	46	18	7	71	1.4%
90 or more minutes	40	5	29	74	1.4%
Worked at home	65	15	28	108	2.0%

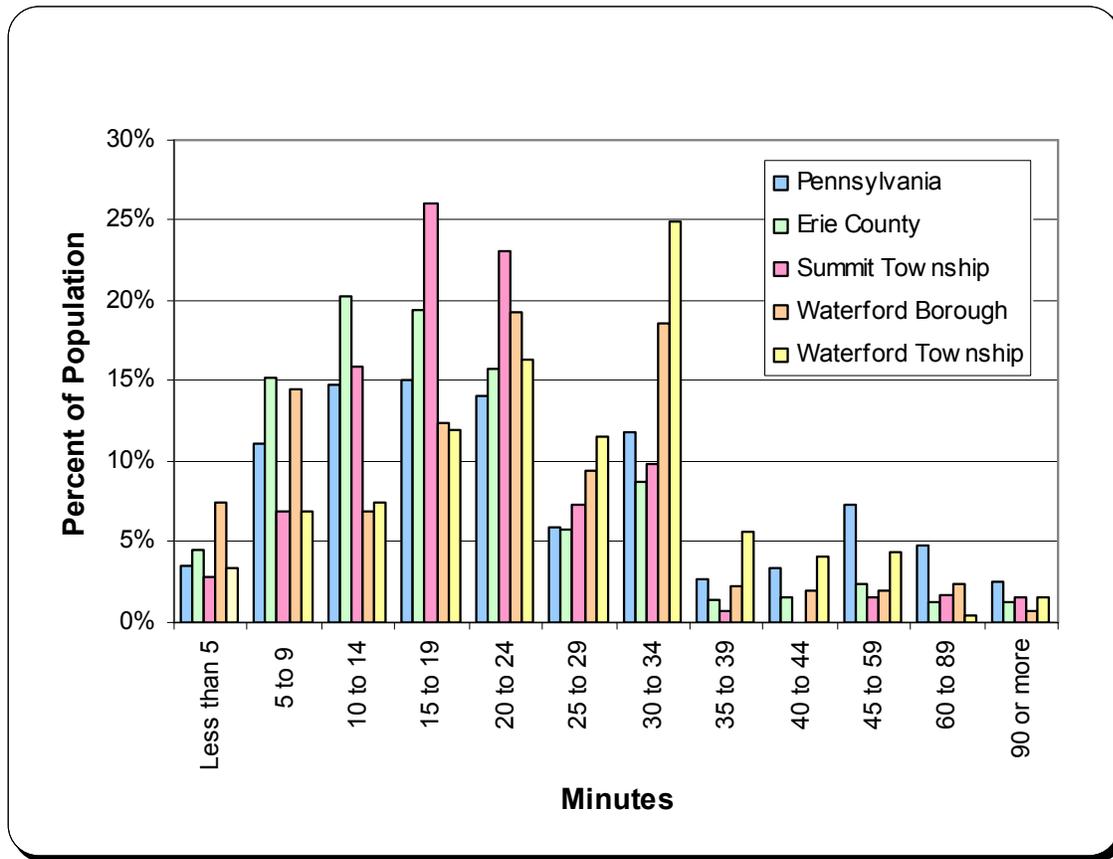
Source: U. S Census, 2000

Figure 6: Mode Split -2000



Source: U.S. Census Bureau

Figure 7: Travel Time To Work, 2000



Source: U.S. Census Bureau

3.2.6 Housing

This section provides a brief analysis of the study area’s housing supply. An understanding of the number and types of housing units further characterizes the study area environment and provides insights into the possible impacts on the local transportation system. It is also important context in relation to the demand for future housing and future trip generation. Data from the U.S. Census Bureau was used to prepare this analysis.

3.2.6.1 Total Housing Units

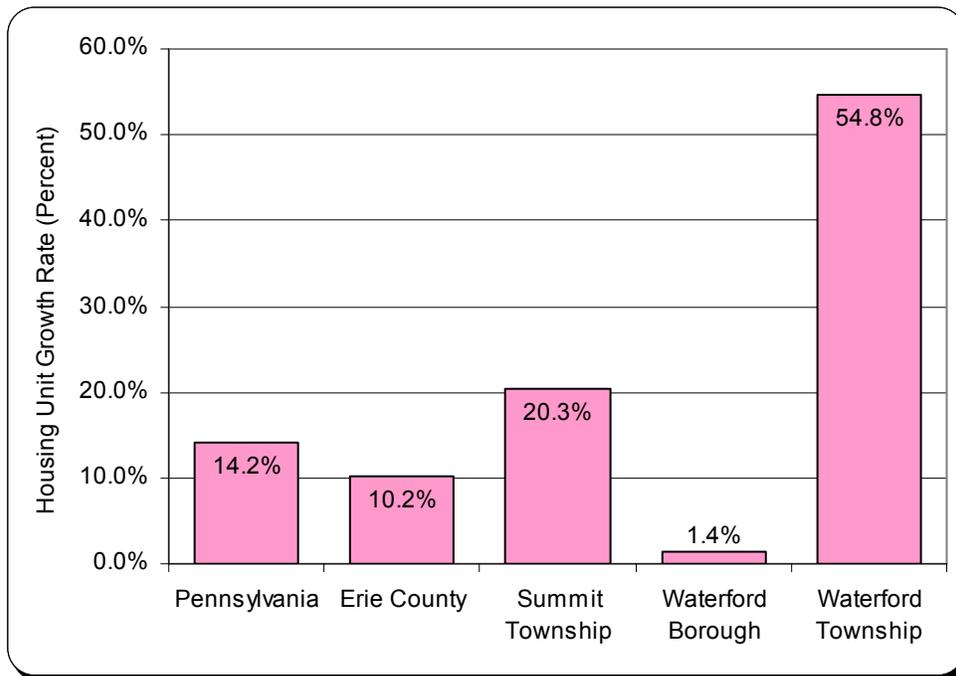
Table 13 presents a historical analysis of the housing unit growth trends for the study area municipalities, Erie County, and Pennsylvania. As shown, Waterford Township experienced the largest housing unit growth rate (54.8 percent) of the study area municipalities over the 1980 to 2000 Census period (Figure 8). Both Summit and Waterford Townships exceeded the housing unit growth rates enumerated for the county and the state during this same period. Clearly, a continuation of this trend places further demands on land and the transportation system. Waterford Borough has experienced a nearly flat growth rate from 1980-2000 (1.4 percent). However, from 1990-2000 the borough experienced an increase of 3.3 percent.

Table 13: Total Housing Unit Growth 1980-2000

Municipality	Total Housing Units			Change					
	1980	1990	2000	1980-1990		1990-2000		1980-2000	
				#	%	#	%	#	%
Pennsylvania	459,6431	4,495,966	5,249,750	(100,465)	(2.2%)	753,784	16.8%	653,319	14.2%
Erie County	103,738	101,564	114,322	(2,174)	(2.1%)	12,758	12.6%	10,584	10.2%
Summit Twp	1,838	1,898	2,212	60	3.3%	314	16.5%	374	20.3%
Waterford Boro	582	571	590	(11)	(1.9%)	19	3.3%	8	1.4%
Waterford Twp	935	1,109	1,447	174	18.6%	338	30.5%	512	54.8%

Source: U.S. Census Bureau, 1980, 1990, 2000

Figure 8: Housing Unit Growth Rate, 1980-2000

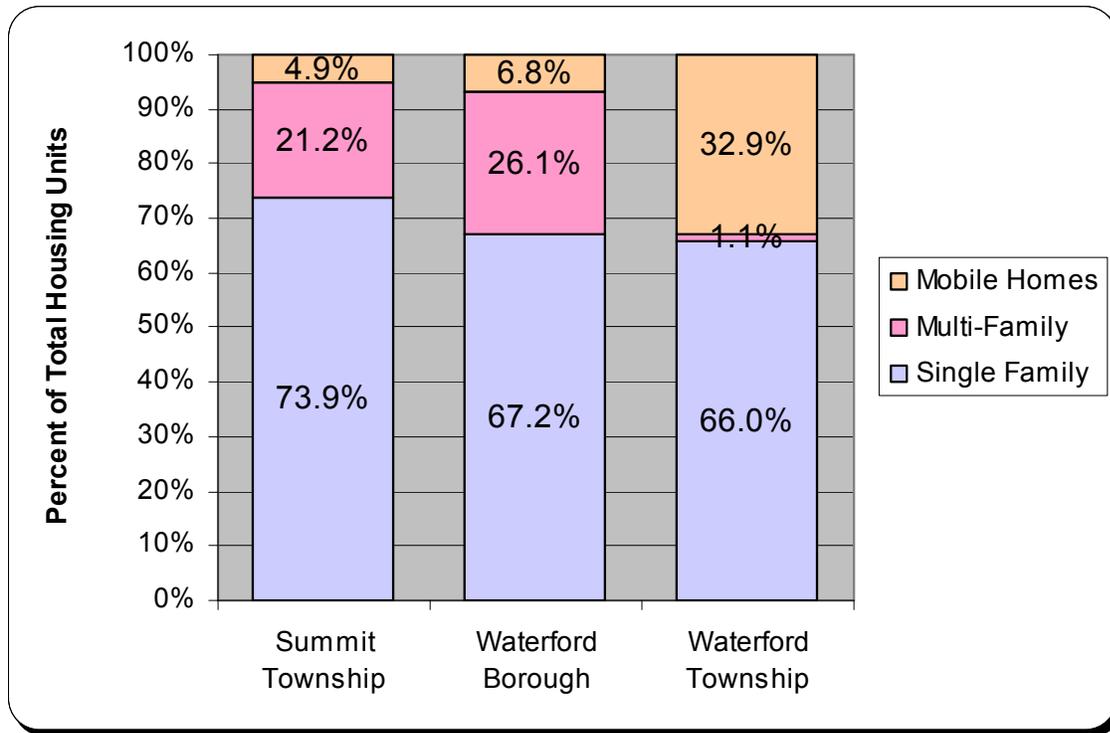


Source: U.S. Census Bureau

3.2.6.2 Housing Unit Types

According to the 2000 Census, the majority of the housing units within the study area municipalities are single family dwellings. Mobile homes ranked second in Waterford Township, whereas multi-family dwelling units ranked second in Summit Township and Waterford Borough (Figure 9).

Figure 9: Housing Unit Type Distribution, 2000



Source: U.S. Census Bureau

3.2.6.3 Housing Unit Density

Historic comparisons of housing unit density values are presented in Table 14. Housing unit density measures the number of housing units per square mile of land area. Greater densities are typically associated with greater traffic, but can offer the greatest potential for public transit utilization. Except for Waterford Borough, the 2000 Census revealed that among the two study area townships, Summit Township recorded the highest housing unit density value of the study area townships with 91.8 units per square mile.

Table 14: Housing Unit Density, 1980-2000

Municipality	Land Area (Sq. Mi.)	Total Housing Units Per Square Mile		
		1980	1990	2000
Pennsylvania	44,819	102.6	100.3	117.1
Erie County	804	129.0	126.3	142.2
Summit Township	24.1	76.3	78.8	91.8
Waterford Borough	1.2	485.0	475.8	491.7
Waterford Township	50.2	18.6	22.1	28.8

Source: U.S. Census Bureau

3.3 Existing Transportation Conditions

Existing Transportation Conditions Highlights

- The highest traffic volumes in the US 19 corridor are immediately south of I-90, at 18,166 AADT.
- Data from Erie County's travel demand model (2000 base year) indicate the study area's roadway network is not congested, with peak volume to capacity (V/C) ratios generally below capacity.
- The intersections of US 19 with PA 97 are the most congested locations within the study area during peak periods.

3.3.1 Transportation System Data Collection Methodology

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

Twenty-four Hour ADT Count Locations:

- US 19 Northbound prior to Split with PA 97
- US 19 Southbound prior to PA 97 Merge
- US 19 Northbound after Merge with PA 97
- US 19 Southbound after Merge with PA 97
- US 19 Southbound Prior to Merge with PA 97
- US 19 Southbound Inside Lane
- PA 97 Southbound North of I-90
- Townhall Road (Westbound)
- Townhall Road (Eastbound)
- Robison Road (Eastbound)
- Robison Road (Westbound)
- I-90 Westbound Ramp – Left Turn lane at US 19
- I-90 Eastbound Ramp – Right Turn lane at US 19
- I-90 Westbound Ramp – Left Turn lane at PA 97
- I-90 Eastbound Ramp – Right Turn lane at PA 97.

Intersection Count Locations:

- State Route 3014 at US 19
- Dorn Road at US 19
- Oliver Road at US 19
- Robison Road at PA 97
- Townhall Road at PA 97.

Traffic Counts on Area of Impact Highways

Table 15 displays the 2003 daily/24-hour traffic volumes for several major roadways in the study area. These actual volumes were integrated into the travel demand model as the base level of traffic. Additional traffic generated associated with future land use scenarios is “added” to this base level of traffic to estimate future traffic volumes.

Table 15: Study Area Roadways: Base 24-hour Traffic Volumes

Highway Location	2003 Directional Volumes	
	North/South	East/West
1. US 19 Northbound prior to Split with PA 97	6559	
2. US 19 Southbound prior to PA 97 Merge	4225	
3. US 19 Northbound after Merge with PA 97	4098	
4. US 19 Southbound after Merge with PA 97	6244	
5. US 19 Southbound Prior to Merge With PA 97	4225	
6. US 19 Southbound Inside Lane	4987	
7. PA 97 Southbound North of I-90	4896	
8. Townhall Road (Westbound)		363
9. Townhall Road (Eastbound)		420
10. Robison Road (Eastbound)		2035
11. Robison Road (Westbound)		2113
12. I-90 Westbound Ramp – Left Turn lane at US 19	2099	
13. I-90 Eastbound Ramp – Right Turn lane at US 19	2529	
14. I-90 Westbound Ramp – Left Turn lane at PA 97	2165	
15. I-90 Eastbound Ramp – Right Turn lane at PA 97	1347	

Table 16 below outlines peak hour volume for each major intersection in the US 19 corridor.

Table 16: US 19 Peak Hour Volume by Major Intersection

Intersection	Peak Hour Volume	
	AM	PM
US 19 at Oliver Rd	1,514	2,137
US 19 at Dorn Rd	870	1,101
US 19 at Townhall Rd	848	1,103
US 19 at S.R. 3014	1,057	1,387
PA 97 at Robison Rd	878	1,054

3.3.2 Existing Traffic Conditions

Existing traffic conditions were summarized directly from the Erie County Travel Demand Model’s 2000 base year. These base year statistics are shown below in Figure 10.

Figure 10: Existing Traffic Conditions - 2000 Base

ID	Location	24 Hour Vol		AM Peak Vol		AM Peak V/C Ratios		PM Peak Vol		PM Peak V/C Ratios	
		SB/EB	NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB	NB/WB
1	US 19 South of I-90	9,172	9,014	656	837	0.52	0.67	799	699	0.64	0.56
2	US 19 North of Townhall Rd.	6,407	6,633	666	478	0.61	0.43	494	650	0.45	0.59
3	US 19 North of Elk Creek	5,855	5,955	622	447	0.57	0.41	455	586	0.41	0.53
4	US 19 South of Moore	5,429	5,469	576	430	0.52	0.39	428	538	0.39	0.49
5	US 19 North of Talcott	5,111	5,108	524	426	0.52	0.43	415	490	0.42	0.49
6	US 19 North of Rt. 97 Merge	4,795	4,787	485	417	0.49	0.42	396	450	0.40	0.45
7	US 19/PA 97 South of 19/97 Merge	7,511	7,421	669	780	0.67	0.98	691	609	0.69	0.76
8	Moore between US 19 and Rt. 97	161	155	5	18	0.01	0.04	19	10	0.02	0.02
9	Townhall between Old French and Rt. 97	216	144	8	14	0.02	0.01	22	10	0.04	0.01
10	Robinson between Parson and Old French	1,477	1,249	145	111	0.15	0.11	135	106	0.14	0.11
11	Rt. 97 South of I-90	4,606	4,083	349	449	0.35	0.45	431	296	0.43	0.30
12	Rt. 97 North of Townhall Rd.	3,214	3,312	385	270	0.39	0.27	241	319	0.24	0.32
13	Rt. 97 North of Elk Creek	3,008	2,854	260	341	0.24	0.31	281	219	0.26	0.20
14	Rt. 97 North of Talcott	2,833	2,981	337	258	0.31	0.23	218	277	0.20	0.25
15	Rt. 97 North of US 19 Merge	2,950	3,100	332	274	0.33	0.27	234	281	0.23	0.28
16	US 19/PA 97 North of US 19/PA 97 Split	8,184	8,038	709	825	0.71	0.83	450	657	0.45	0.66
17	US 19 South of US 19/PA 97 Split	2,844	2,676	229	263	0.21	0.24	257	213	0.23	0.19
18	PA 97 South of US 19/PA 97 Split	5,402	5,424	486	568	0.49	0.57	499	450	0.50	0.45

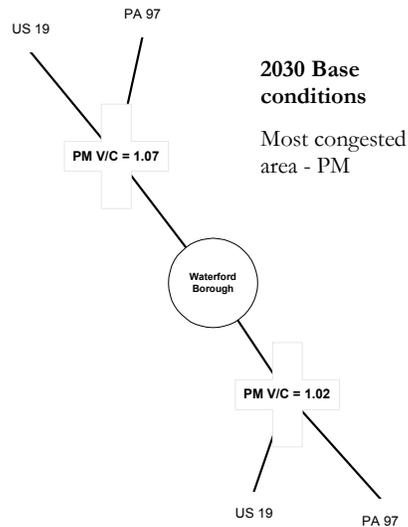
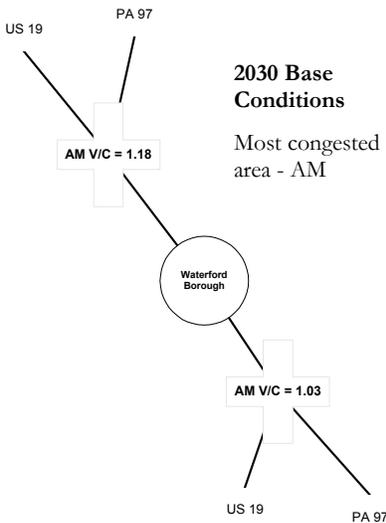
The model outputs show that the network is not congested with peak volume to capacity (V/C) ratios generally below capacity. There are a few locations that are at or near capacity. US 19/PA 97 both north and south of Waterford Borough are the most congested locations within the study area during peak periods. This congestion is primarily a result of AM peak period commuter traffic.

3.3.3 2030 Base Projection

The Erie County Travel Demand Model includes a 2030 base projection which represents the highway network with committed projects such as those from the regional Transportation Improvement Program (TIP). These projects are included in the model network and reflect the improvements. Figure 11 shows future base year traffic conditions for 2030.

Figure 11: Future Year Base Traffic Conditions - 2030

ID	Location	24 Hour Vol		AM Peak Vol		AM Peak V/C Ratios		PM Peak Vol		PM Peak V/C Ratios	
		SB/EB	NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB	NB/WB
1	US 19 South of I-90	10,967	11,343	785	946	0.63	0.76	881	831	0.70	0.66
2	US 19 North of Townhall Rd.	9,752	9,110	731	785	0.66	0.71	831	687	0.76	0.62
3	US 19 North of Elk Creek	9,089	8,828	701	797	0.64	0.72	778	683	0.71	0.62
4	US 19 South of Moore	8,608	8,428	684	757	0.62	0.69	735	664	0.67	0.60
5	US 19 North of Talcott	8,221	8,095	680	707	0.68	0.71	687	651	0.69	0.65
6	US 19 North of Rt. 97 Merge	7,861	7,750	668	669	0.67	0.67	648	631	0.65	0.63
7	US 19/PA 97 South of 19/97 Merge	11,834	11,392	944	946	0.94	1.18	923	855	0.92	1.07
8	Moore between US 19 and Rt. 97	179	164	7	16	0.01	0.03	10	10	0.01	0.02
9	Townhall between Old French and Rt. 97	226	152	8	14	0.02	0.01	24	10	0.05	0.01
10	Robinson between Parson and Old French	1,893	2,855	165	264	0.17	0.26	153	247	0.15	0.25
11	Rt. 97 South of I-90	6,747	5,872	492	560	0.49	0.56	580	425	0.58	0.43
12	Rt. 97 North of Townhall Rd.	5,288	5,016	402	517	0.40	0.52	484	381	0.48	0.38
13	Rt. 97 North of Elk Creek	4,960	4,635	391	475	0.36	0.43	446	355	0.41	0.32
14	Rt. 97 North of Talcott	4,882	4,704	386	510	0.35	0.46	436	353	0.40	0.32
15	Rt. 97 North of US 19 Merge	4,948	4,764	399	489	0.40	0.49	428	365	0.43	0.37
16	US 19/PA 97 North of US 19/PA 97 Split	12,193	12,728	1,019	1,031	1.02	1.03	943	1,022	0.94	1.02
17	US 19 South of US 19/PA 97 Split	3,896	3,699	320	332	0.29	0.30	340	296	0.31	0.27
18	PA 97 South of US 19/PA 97 Split	8,993	8,656	725	701	0.73	0.70	699	663	0.70	0.66



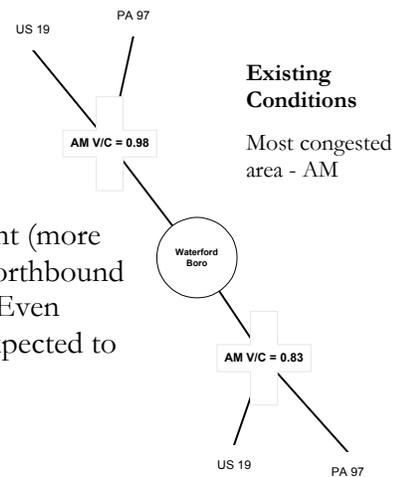
Existing traffic is oriented toward Erie, meaning morning commuters (NB) have the most significant impact on congestion. In future years this distinction is expected to be less apparent. Although the morning northbound congestion remains the greatest on US 19/PA 97 both north and south of Waterford Borough, southbound movements and afternoon peak travelers also have a significant impact on the area’s traffic congestion.

Figure 12: Existing vs. 2030 Base Comparison

ID	Location	% Change in Daily Traffic		AM Level of Service				PM Level of Service			
		SB/EB	NB/WB	Existing		2030		Existing		2030	
				SB/EB	NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB	NB/WB
1	US 19 South of I-90	19.6%	25.8%	A	B	B	C	B	A	C	B
2	US 19 North of Townhall Rd.	52.2%	37.3%	B	A	B	C	A	A	C	B
3	US 19 North of Elk Creek	55.2%	48.2%	A	A	B	C	A	A	C	B
4	US 19 South of Moore	58.6%	54.1%	A	A	B	B	A	A	B	B
5	US 19 North of Talcott	60.8%	58.5%	A	A	B	C	A	A	B	B
6	US 19 North of Rt. 97 Merge	63.9%	61.9%	A	A	B	B	A	A	B	B
7	US 19/PA 97 South of 19/97 Merge	57.6%	53.5%	B	E	E	F	B	C	E	F
8	Moore between US 19 and Rt. 97	11.2%	5.8%	A	A	A	A	A	A	A	A
9	Townhall between Old French and Rt. 97	4.6%	5.6%	A	A	A	A	A	A	A	A
10	Robinson between Parson and Old French	28.2%	128.6%	A	A	A	A	A	A	A	A
11	Rt. 97 South of I-90	46.5%	43.8%	A	A	A	A	A	A	A	A
12	Rt. 97 North of Townhall Rd.	64.5%	51.4%	A	A	A	A	A	A	A	A
13	Rt. 97 North of Elk Creek	64.9%	62.4%	A	A	A	A	A	A	A	A
14	Rt. 97 North of Talcott	72.3%	57.8%	A	A	A	A	A	A	A	A
15	Rt. 97 North of US 19 Merge	67.7%	53.7%	A	A	A	A	A	A	A	A
16	US 19/PA 97 North of US 19/PA 97 Split	49.0%	58.3%	C	D	F	F	A	B	E	F
17	US 19 South of US 19/PA 97 Split	37.0%	38.2%	A	A	A	A	A	A	A	A
18	PA 97 South of US 19/PA 97 Split	66.5%	59.6%	A	A	C	C	A	A	B	B

Currently there is minor congestion on the highway network but all roadway segments analyzed remain below capacity. By the year 2030 this is expected to change along US 19/PA 97 both north and south of Waterford Borough. The congestion is expected to remain during peak periods primarily northbound in both locations. Southbound movements are estimated to have congestion during these periods but will be less severe.

There is an increase in segment traffic between 50 and 60 percent (more or less). The greatest percent increase is along Robison Road northbound which rose from 1,250 daily vehicles to 2,850 vehicles per day. Even though this is a significant percentage increase the roadway is expected to remain well below capacity and free flowing.



3.3.4 Corridor Safety Audit

In addition to the traffic data that was collected, a Safety Audit Stage 5, Operation/Existing Roads was also conducted. Representatives from the PennDOT 1-0 maintenance office and Erie County Department of Planning participated in a windshield tour of the corridor to discuss any known or perceived issues within the US 19 corridor study area. The following points were noted as part of this survey:

- Street parking only exists in Waterford Borough; however, some spaces appear to be close to the intersection, causing pedestrians to move off of the sidewalk and closer to traffic when waiting to cross.
- Several areas appear as though they will encroach upon sight distance when foliage is in full growth, including but not limited to the intersections of US 19 and SR 3014 in Waterford Borough, US 19 at Dorn Rd, and US 19 at Townhall Road.
- Vertical curves in the area near the intersection of Townhall Road may be deficient for the 55 mph posted speed limit.
- Passing zones are present, however, it was noted that a high number of crashes seem to be taking place near passing zones and some illegal passing zones.

- The southbound approach to Robison Road should be more clearly marked for the left lane drop to a left-turn lane.
- The configuration of the intersection of PA 97 and US 19 could be confusing at times due to the presence of Circuit Road to the north.
- In Waterford Borough, a transit stop is located at the intersection with no way for a transit vehicle to exit the travel lane.
- Raised pavement markers (RPMs) should be installed in the area near the interchange where the road surface is light.
- Pedestrian signal heads should be considered for Waterford Borough, the traffic signal here appears to need adjusted. Timings should also be checked at the interchange.
- In many places parallel swales are unprotected.
- Access management was noted as an issue throughout the US 19 Corridor. When feasible, access points should be aligned to create traditional 4-leg intersections to avoid multiple conflict points for motorists traveling within the corridor.

