A Community Build-Out Analysis of Monroe Township, Cumberland County, Pennsylvania

Prepared for

South Mountain Conservation Landscape Initiative

Jointly Prepared by

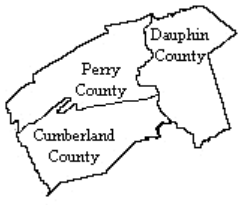
The Center for Land Use at Shippensburg University

Central Pennsylvania Conservancy

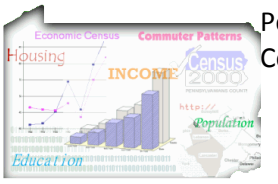
In cooperation with

Cumberland County Planning Commission

Cumberland County GIS Department



Tri-County Planning Commission



Penn State Data Center

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With additional cooperation and assistance from:
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EXECUTIVE SUMMARY

What is a "community build-out analysis?" What is the value of this?

Community build-out analysis is a tool for examining the effectiveness of a community's zoning and other land use regulations. In most cases, **a build-out is used present a scenario of what development will likely occur and where it will occur over the long term, given the current zoning.** The scenarios typically presented are 10 or 20 years into the future and are based on current growth trends, as well as current development patterns. Build-out results typically include numeric tables and tabulations of the projected development along with the projected fiscal and environmental impacts. The scenarios are most powerfully presented through use of maps and other graphics that underscore and provide a simple, yet effective, evaluation of the community's current zoning and land use planning. A detailed technical discussion of how build-outs are performed may be found in the Appendix.

The build-out analysis provides the community a chance to soundly evaluate the effectiveness of its land use planning efforts and provide insight into how such efforts may be improved. With particular respect to South Central Pennsylvania, a municipality will be better able to assess whether its zoning regulations, together with other land use regulations, are stringent enough to preserve its rural character and protect its natural and other environmental assets. The analysis can even speak to the fiscal implications of the projected development scenarios.

Why Monroe Township?

In 2007, Monroe Township completed an update of its comprehensive plan. A build-out analysis speaks the township's concerns across all seven of the following objectives, which are presented in the Executive Summary of the Monroe Township 2007 Comprehensive Plan Update. Those especially relevant are italicized.

- *Preserve agricultural areas for agricultural use;*
- *Protect, conserve, and preserve natural resources;*
- *Preserve and enhance the character of Monroe Township;*
- Provide for the housing needs of present and future residents;
- *Provide for controlled growth in appropriate areas;*
- Provide needed community services; and
- Provide for safe and efficient movement of people and goods by a variety of transportation
- Facilities

Like the rest of the region, the township is situated at the "growth edge" of Megalopolis (see Figure 1) and is within a region characterized by sustained and comparatively rapid growth. In fact, Adams, Cumberland, Franklin, and York counties have been and are projected to be among the state's fastest growing (Table 1). Monroe Township, of course, is within Cumberland County.

Table 1
Selected Growth Rate Rankings of Local Counties Among All 67 Pennsylvania Counties

County	*Rank in Growth, 2000-08*	*Rank in Growth, 2007-08*	*Rank in Projected Growth, 2000-2030*
Adams	7	12	16
Cumberland	13	5	12
Franklin	6	2	25
York	5	4	15

*Sources: assorted U.S. Census Bureau and Pennsylvania State Data Center materials.

This large regional scale situation within Megalopolis, combined with more local factors such as:

- proximity to Interstate 81;
- being within the commuting range of Harrisburg and other cities;
- availability of undeveloped land; and
- appealing rural community character with nearby natural amenities

leave the township poised for continued steady (or perhaps even more rapid) growth.

What is in this report?

Apart from the Executive Summary, this report consists of two broad components. The first is a "Where are We Now?" component that presents the descriptive land use and planning background of the township. The second component is entitled "Where we could be" and it presents a reasonable scenario of future development patterns for each of the years 2020 and 2030.

Of the several specific or particular items in this report, the one of the greatest significance is the spatial build-out maps, presented both here on next two pages. These maps present hypothetical landscapes for the township in the years 2020 and 2030 respectively.

In other words, **they reasonably illustrates where future residential development will occur in each of these years** given Monroe Township's:

- population projections for 2020 and 2030;
- current pattern of land ownership;
- current pattern of development (buildings);
- current zoning

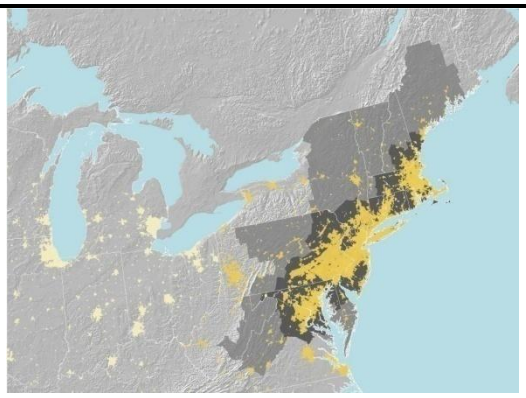
In addition to the build-out maps, a number of other items are included in narrative, tabular, and graphical fashion. These other items speak to other impacts and aspects of the 2020 and 2030 scenarios.

In the build-out maps on pages six and seven below (figures 2 and 3, for 2020 and 2030, respectively), existing buildings of any kind are represented by the blue point symbols. The red point symbols represent hypothetical residential buildings.

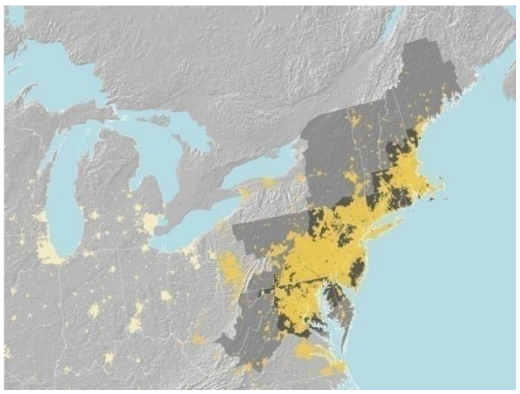
What are the major findings?

Two related caveats need to be made known prior to any assessment how effective land use regulations are. First, there is no clear, widely acceptable method of evaluating zoning. Such evaluations are qualitative and not comparable from setting to setting.

Land consumption in Megalopolis region as of 2000



Projected land consumption in Megalopolis in 2025



Projected land consumption in Megalopolis in 2050

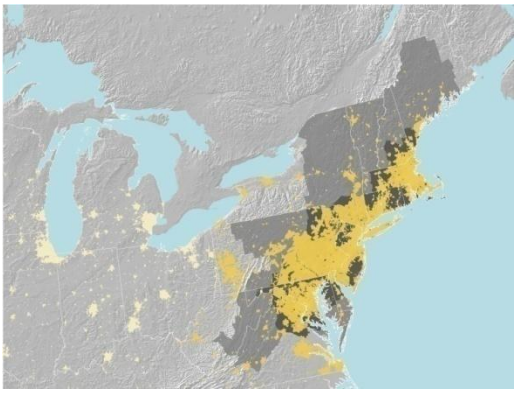


Figure 1:
Projected Land Consumption in the Megalopolis Region, 2000-2050

Source: Regional Plan Association, 2005.

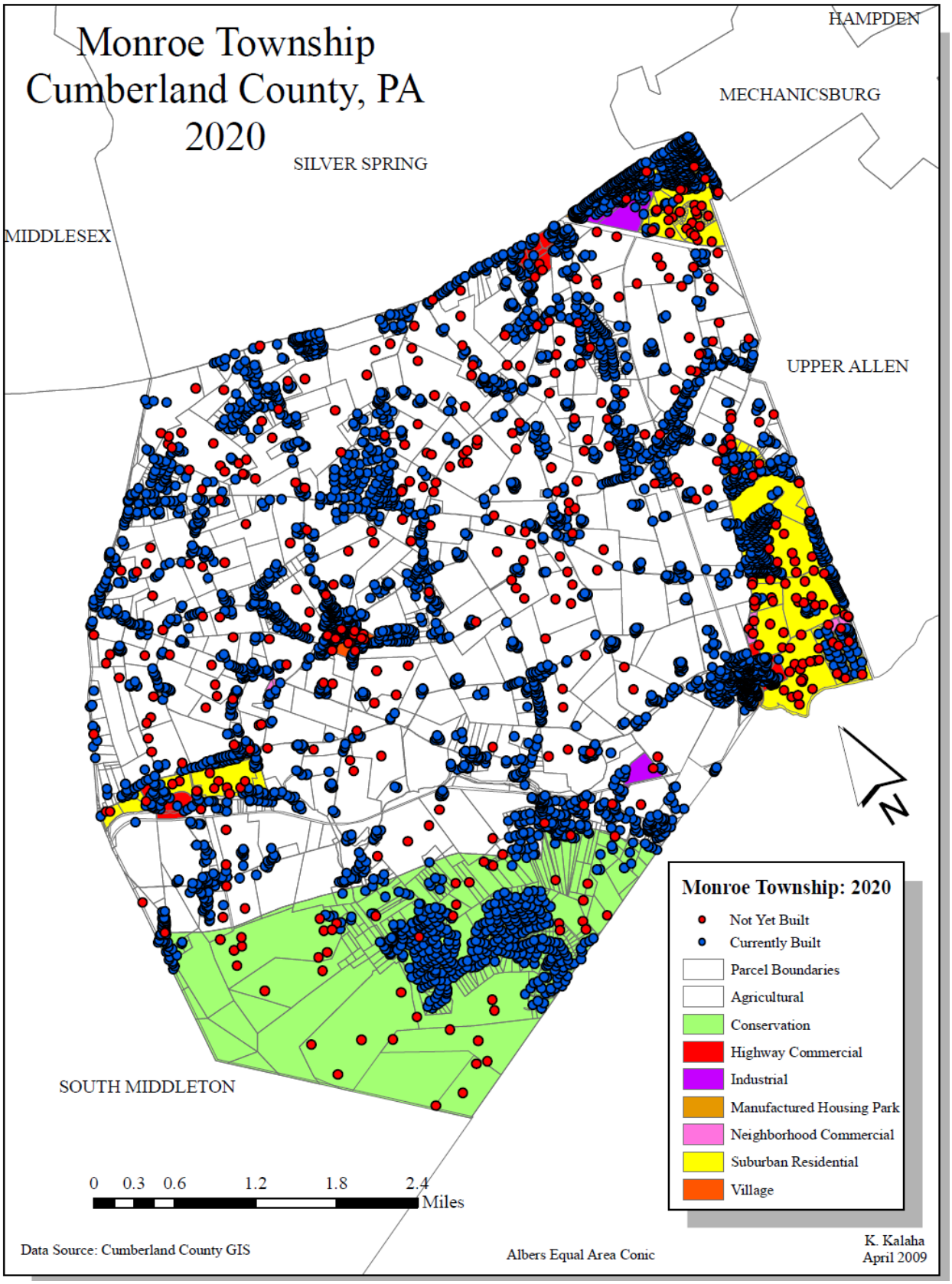


Figure 2: **Hypothetical Build-Out for Monroe Township, Cumberland County in 2020**

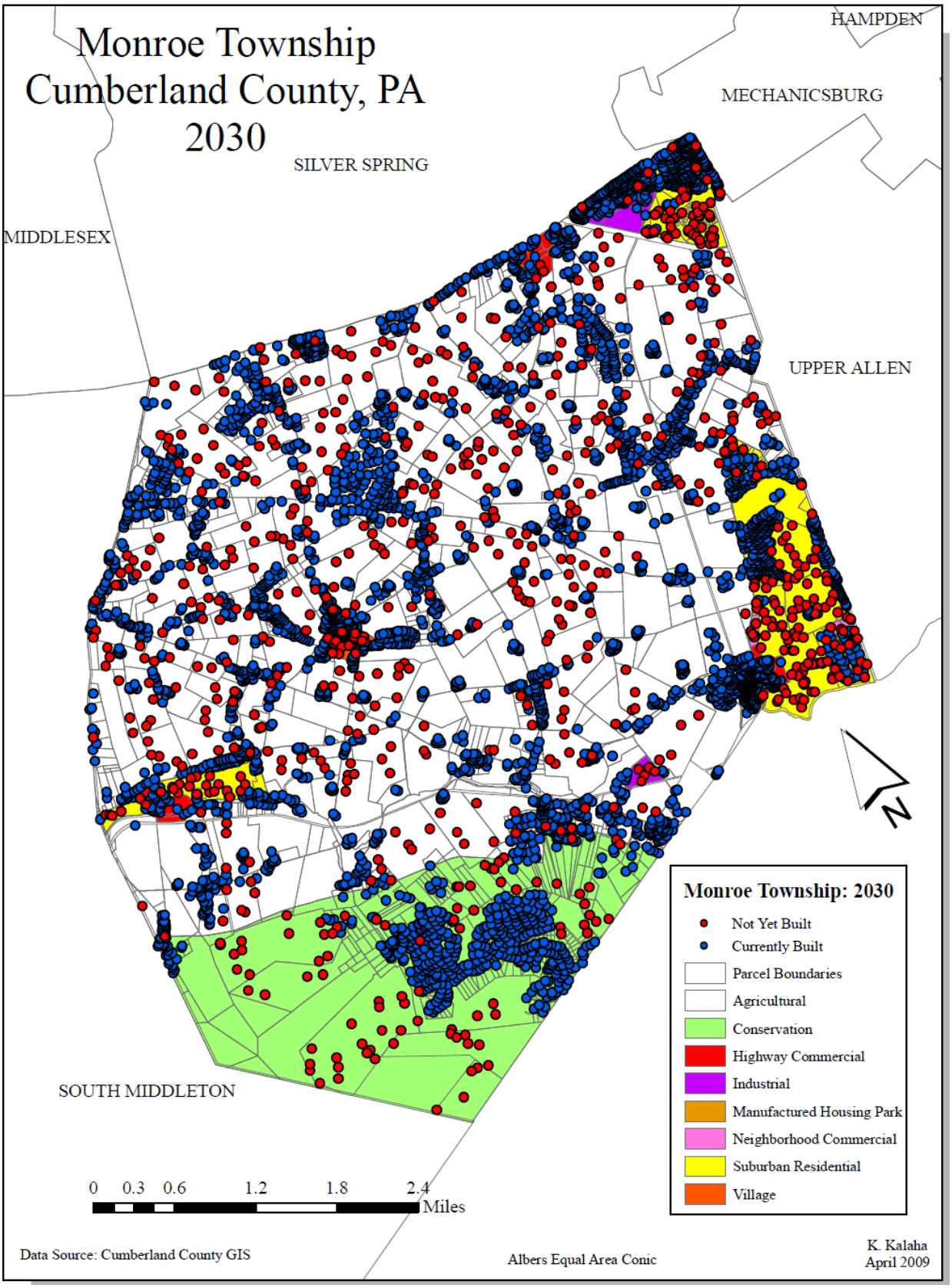


Figure 3: **Hypothetical Build-Out for Monroe Township, Cumberland County in 2030**

A second caveat is that any evaluation and decision on whether the zoning is "good, bad, or in between" is necessarily a political one that is dealt with by township supervisors, planning commission, residents and other stakeholder groups. Economic interests, neighborhood interests, and environmental interests all need to be taken into consideration.

Also, it is important to note, again, that the maps produced portray a reasonable hypothetic scenario and do not show where actual homes will be constructed. In some rare cases, a hypothetical residence will appear in an area not feasible for construction. The analysis nor the software can account for every factor.

That being said, there is still a role for planning expertise and a independent critique. The following findings, comments, and conclusions may be made based on this community-wide build-out analysis.

Findings

1. Given the current pattern of land parcelization, the zoning as it now exists, and population projections found in the Monroe Township Comprehensive Plan Update, it is projected that:

a) An additional 1,107 residential units have been or will be built between 2000 and 2030.

b) A projected number is 685 residential units have been or will be built between 2000 and 2020.

2. The maps for 2020 and 2030 both show that the bulk of these new housing units will be distributed in the Agricultural District and the Conservation District. In fact, the maps only show a portion of the housing units that will be built. For the 2020 map, 405 of the projected 685 new residential units are displayed. For the 2030 map, only 774 of the projected 1,107 new residential units are displayed.

Comments / Conclusions

1. A visual assessment of the visual build-outs (figures 2 and 3) finds that many of the township's planning objectives may be compromised by the hypothetical pattern shown. This is particularly true of the Agricultural District. Especially problematic are the following objectives:

- Preserve agricultural areas for agricultural use;
- Protect, conserve, and preserve natural resources;
- Preserve and enhance the character of Monroe Township; and
- Provide for controlled growth in appropriate areas;

Elaborating upon and complementing these objectives, further conclusions can be drawn from the build-outs. These include:

- Greater farmland fragmentation will occur, further reducing the viability of agricultural operations. The vicious cycle of decreased farming leading to decreased services and in

turn to increased farming costs will accelerate. The scale economies of current agricultural operations will be further eroded.

- A greater number of land use conflicts between residential and agricultural land uses will occur, as larger numbers of suburbanites will be even more dispersed across the existing agricultural landscape.
- The open space amenity of farmlands will further deteriorate.
- Opportunities for commercially viable local grown foods may decrease as agricultural activities wane in the face of increased sprawl.
- Fiscal costs will increase as new, low density development will demand greater public service provision. The costs of these new services will outweigh increased tax revenues coming from new residential development, eventually resulting in a greater tax burden.

2. To address the points made above, changes in the zoning ordinance, subdivision regulations, and other land use planning policies are needed. Without carefully considered changes, the township will fail to accomplish the vision for Monroe Township stated in the Comprehensive Plan.

A broad mix of potential changes may be considered and potentially adopted. These include:

- An increase in the minimum lot sizes for the conservation and agricultural districts.
- Use "conservation subdivision" clustering techniques that go further than standard cluster development provisions in terms of amount of land protected and sets aside land more appropriate for conservation.
- Employing a transfer of development rights (TDR) program allows the transfer of development activities from areas less suitable for development to areas that are more suitable (including areas already serviced by public sewer, public water, and other utilities).
- Greater use of setbacks with respect to environmental features. Several streams already have setback requirements, so expanding the setback requirement to apply to other streams.
- A better funded purchase of development rights (PDR) in coordination with ongoing and successful countywide efforts.
- Collaboration with other townships that may include joint municipal zoning and mult-municipal transfer of development rights.

Not all of these potential changes be adopted, but certainly a combination of changes will be more effective than one single action. The decisions on which are most appropriate for belongs to the people, the Planning Commission and the Supervisors of Monroe Township.

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MONROE TOWNSHIP:
"WHERE WE ARE NOW"

This section briefly presents descriptive and analytical background of the current demographic, land use, development characteristics of the township, along with a succinct overview of the selected land use planning activities.

Monroe Township is a small to medium sized rural township of rural character in Cumberland County, South Central Pennsylvania (Figure 4). With an estimated 5,799 residents as of 2007, the township in recent years is experiencing steady, sustained population growth at a rate similar to the county at large, which itself is among the state's most rapid growing. The township's 2007 Comprehensive Plan Update notes that the township is experiencing development pressures from more rapidly growing neighboring townships (Table 2).

It should be noted that a large section of the township lies within the South Mountain area.

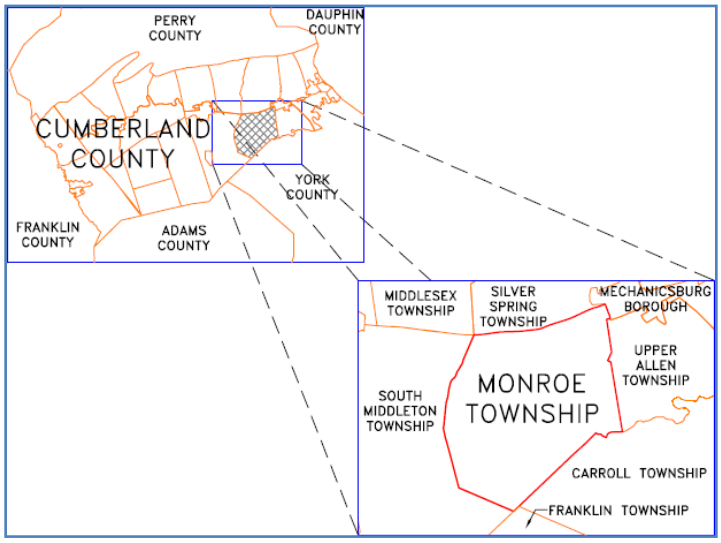


Figure 4: Location Map of Monroe Township

Source: *2007 Comprehensive Plan Update*. Remington, Vernick and Beach, Engineers.

Demographics: Recent Numbers and Projected Growth

Projecting from these recent population growth trends, the township's comprehensive plan states that, on average, another 100 to 110 people will be added to population each year. This is consistent with projections from Tri-County Planning Commission (Table 3) showing future populations of 7,273 for 2020 and 8,343 for 2030. These are very reasonable projections given the factors already identified in the Executive Summary, which include:

- being situated at the growth edge of Megalopolis even as the region is expected to grow by the year 2050 by another 18 million, up from the current 50 million.
- Local factors such as proximity to Interstate 81;
- being within the commuting range of Harrisburg and other metropolitan centers;
- availability of comparatively lower priced undeveloped land; and
- appealing rural community character with nearby natural amenities.

From these projections, a number of future dwelling units may also be projected. It is assumed that average household sizes and vacancy rates will remain the same for the future as they were for 2000.

These rates are generally stable over time and between townships. Such assumptions work well for practical purposes of accomplishing this analysis.

Calculations used in estimating future residential housing units:

1. (Future Population) / (Gross Avg. Number of People per Household) = Future Number of Occupied Households

Calculations used in estimating future residential housing units for 2020 and 2030:

2020: (7,273) / (2.55) = 2,852; Projected number of residential dwelling units: 2,852.

2030: (8,343) / (2.55) = 3,272; Projected number of residential dwelling units: 3,272.

General Land Use and Development Character

Within the township's 26.1 square miles in area, rural residential land use predominates. Based on the Cumberland County Assessor's land use coding system and parcel information, most of the township (approximately 91%) is residential (Table 4). Much of that 91% is large lot residential use. Most of the remaining land use is "institutional" and comprised of by public areas such as land along the Appalachian Trail. There is a smattering of commercial and industrial uses.

Leading uses, by land use code (LUC) include residential and agricultural land uses. An overwhelming majority of parcels (2,085 of 2,923, or 71.3%) are classified as "residential 1 family." In terms of acreage, "agricultural" land (with or without buildings) adds up to 10,395 acres, or 63.9% of all land (16,260 acres) analyzed. See Table 5a and 5b for these and more details.

In considering what areas are not developed, one can predictably see from Table 6 that many parcels and an overwhelming amount of undeveloped acreage is in the Conservation District (142 parcels without structures and comprising 1,939 acres) and Agricultural District (306 parcels without structures, comprising 3864 acres). Clearly then, these areas are where open space may be best protected.

At the same time, it is the Agricultural Districts that holds the largest number of structures (this includes buildings other than residences). With 2,312 structures, the district holds nearly three-fifths of all structures in the township. Given that these 2,312 structures may be found upon 8,630 acres, there is still plenty of space within these developed parcels that may be conserved.

The land use information is approximate, given that some parcels straddle township boundaries, interpretation of use, and vagaries of record keeping.

Table 2: Population Characteristics and Trends of Monroe Township in Local, County, and State Context

Year	Dickinson Township		Monroe Township		South Middleton Twp.		Cumberland County		Pennsylvania	
	Population	% Change from prev.	Population	% Change from prev.	Population	% Change from prev.	Population	% Change from prev.	Population	% Change from prev.
2007	5,284	1.7%	5,799	0.8%	14,262	1.6%	228,019	1.0%	12,432,792	0.2%
2006	5,194	1.8%	5,755	1.1%	14,042	1.8%	225,772	1.3%	12,402,817	0.3%
2005	5,104	2.3%	5,695	0.3%	13,796	0.7%	222,818	0.9%	12,367,276	0.2%
2004	4,990	1.5%	5,680	0.6%	13,697	1.4%	220,890	0.8%	12,348,618	0.2%
2003	4,915	1.6%	5,648	0.4%	13,509	1.2%	219,218	0.9%	12,327,250	0.2%
2002	4,839	1.5%	5,623	0.8%	13,354	1.3%	217,308	1.0%	12,305,751	0.1%
2001	4,768	1.4%	5,578	0.9%	13,186	1.9%	215,113	0.7%	12,287,542	0.1%
2000	4,702	21.7%	5,530	1.1%	12,939	25.1%	213,674	9.4%	12,281,054	3.4%
1990	3,865	27.3%	5,468	13.1%	10,340	15.6%	195,257	8.7%	11,881,643	0.1%
1980	3,037	25.7%	4,836	45.4%	8,941	18.9%	179,625	13.6%	11,864,720	0.5%
1970	2,416	19.3%	3,326	44.7%	7,521	38.7%	158,177	26.7%	11,800,766	4.3%
1960	2,025	4.6%	2,298	22.6%	5,424	29.0%	124,816	32.2%	11,319,366	7.8%
1950	1,936		1,875		4,204		94,448		10,498,012	

Sources: U.S. Census Bureau, Tri-County Planning Commission, and respective comprehensive plans.

Dickinson and South Middleton Townships are nearby townships to Monroe Township that are subject to concurrent build-out studies.

Table 3: Projected Populations, Average Household Size, and Projected Numbers of Residential Units

Year	Dickinson Township		Monroe Township		South Middleton Twp.		Comments on Households & Housing Units
	Projected Pop.	Projected Housing Units	Projected Pop.	Projected Housing Units	Projected Pop.	Projected Housing Units	*The total number of occupied households for 2000 were 1,721 (Dickinson), 2,073 (Monroe), and 5,081 S. Middleton*
2030	(No projection)	- - -	8,343	3,272	18,078	7,409	
2020	6,436	2,514	7,273	2,852	17,300	7,090	*The total number of housing units along with the "vacancy rate" for each township in 2000 was 1,834, 6.6% (Dickinson); 2,165, 4.4% (Monroe); and 5,302, 4.3% (S. Middleton)*
2000	*Avg. household size*	2.73	*Avg. household size*	2.67	*Avg. household size*	2.51	
2000	*population divided by total housing units*	2.56	*population divided by total housing units*	2.55	*population divided by total housing units*	2.44	
	Additional Number of Housing Units Compared to 2000						
2030	(not calculated)		1,107		2,107		
2020	680		685		1,788		

Note: the values from 2001 through 2007 are U.S. Census Bureau estimates; the values prior to those are decennial census counts.
Note: the projected number of residential units is a rough estimate that simply takes total projected population divided by average household size in 2000. Replacements units and vacancy rates are not accounted for.

Sources: U.S. Census Bureau, Tri-County Planning Commission, and respective comprehensive plans.

Table 4: Land Uses by Zoning Designation

	Residential Use (codes 100 to 299)		Commercial Use (codes 300 to 399)		Industrial Use (codes 400 to 499)		Institutional / Special Use / Communication (codes 600 to 720)	
ZONING DISTRICT	*Acres*	*%*	*Acres*	*%*	*Acres*	*%*	*Acres*	*%*
All districts (zones)	14838.64	91.26%	434.55	2.67%	1.43	0. 01%	984.88	6.06%
Conservation (C)	2173.58	81.42%	15.36	0.58%	N/A	N/A	480.74	18.01%
Agricultural (A)	11530.08	94.75%	235.36	1.93%	0.96	0.01%	402.85	3.31%
Suburban Residential (R-1)	989.96	90.33%	10.81	0.99%	N/A	N/A	95.17	8.68%
Highway Commercial (HC)	40.84	29.92%	95.21	69.74%	0.47	0.34%	N/A	N/A
Industrial (I)	23.51	30.97%	52.41	69.03%	N/A	N/A	3.25	4.28%
Manufactured Housing Park (MHP)	2.68	10.93%	21.85	89.07%	N/A	N/A	N/A	N/A
Neighborhood Commercial (NC)	19.85	89.09%	2.43	10.91%	N/A	N/A	N/A	N/A
Village (V)	58.13	93.58%	1.12	1.80%	N/A	N/A	2.87	4.62%

Table 5a: Leading Land Uses, by Land Use Code, in Terms of Frequency (with Associated Acreage)*

Rank	*Code*	*Description*	*Number of Parcels*	*Total Acreage*
1	101	Residential 1 family	2,085	2,672
2	112	Agricultural (with buildings)	237	7,430
3	100	Residential vacant land	219	368
4	113	Agricultural (without buildings)	88	2,965
5	600	Vacant, exempt land	51	654
	Sub-total		2,680	14,089
	totals	For entire township	2923	16,260

Table 5b: Leading Land Uses, by Land Use Code, in Terms of Acreage (with Associated Frequency)*

Rank	*Code*	*Description*	*Total Acreage*	*Number of Parcels*
1	112	Agricultural (with buildings)	7,430	237
2	113	Agricultural (without buildings)	2,965	88
3	101	Residential 1 family	2,672	2,085
4	600	Vacant, exempt land	750	51
5	303	General commercial	654	27
6	118	Mountain – vacant (10+ acres)	368	14
	Sub-total		2,694	14,839
	totals	For entire township	16,260	2923

**for studied parcels; not all of the township's parcels were used.*

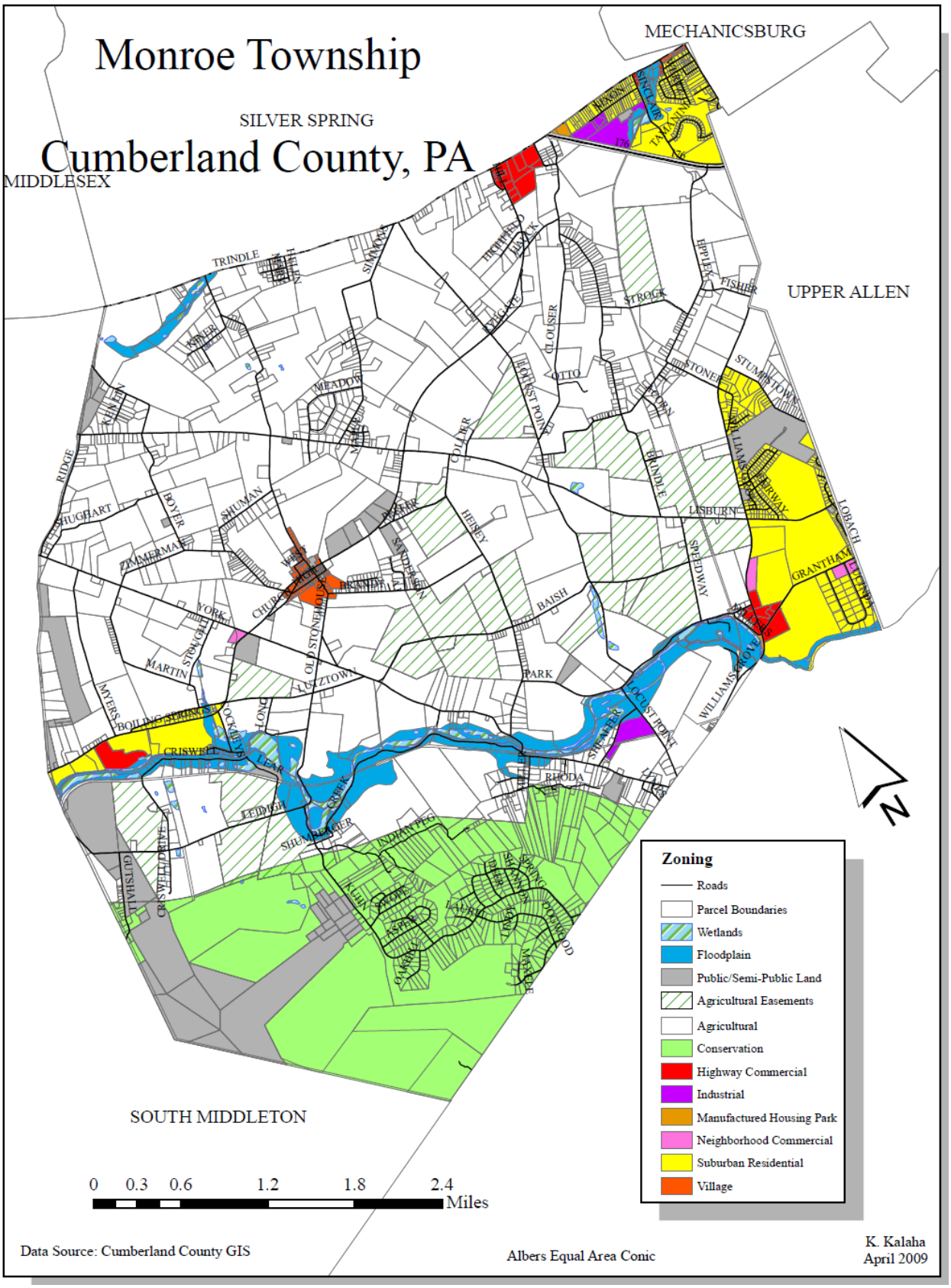


Figure 5: Monroe Township, Cumberland County (zoning)

Table 6: Overview of Land Use and Development Status, by Zone, January 2009

ZONING DISTRICT	Total Acreage	Total Parcels	Avg. Parcel Size (acres)	No. of Structures	No. of Parcels w/o Structures	Acreage of Parcels w/o Structures
All districts (zones)	16843.39	2690 parcels (separate PIN numbers) 2923 polygons	5.79	3961 structures	512 parcels (separate PIN numbers) 668 separate polygons	6340.74
Conservation (C)	2860.74	508 parcels (separate PIN numbers) 511 polygons	5.26	438 structures	142 parcels 144 separate polygons	1939.36
Agricultural (A)	12493.86	1,463 parcels (separate PIN numbers) 1569 polygons	8.32	2,312 structures	306 parcels 346 separate polygons	3863.67
Suburban Residential (R-1)	1148.83	638 parcels (separate PIN numbers) 648 polygons	1.72	731 structures	137 parcels 139 separate polygons	453.09
Highway Commercial (HC)	143.39	39 parcels (separate PIN numbers) 41 polygons	3.50	143 structures	12 parcels	35.26
Industrial (I)	81.09	10 parcels (separate PIN numbers) 11 polygons	7.92	17 structures	3 parcels 4 separate polygons	25.66
Manufactured Housing Park (MHP)	25.61	7 parcels (separate PIN numbers) 7 polygons	3.51	124 structures	5 parcels	2.69
Neighborhood Commercial (NC)	23.37	7 parcels (separate PIN numbers) 7 polygons	3.18	1 structure	6 parcels	19.88
Village	66.50	127 parcels (separate PIN numbers) 129 polygons	0.49	195 structures	12 parcels	1.13

Environmental Character

When one examines Figure 5 (a map of environmental features within Monroe Township) and Table 7, "Environmental and Other Limitations to Development," it immediately becomes clear that substantial portions of the township have development constraints. These constraints are not only environmental in nature but also relate to some institutional limitations, including those relating to ownership.

There are substantial degrees of areal overlap between the various categories environmental and institutional limitations. However, even overlap is taken it to account, it should be noted that of the 16,843 total acres noted in Table 7, that 11,097 acres may be categorized as "sensitive lands." These lands are those characterized by steep slopes (slopes over 25%), the presence of wetlands, as floodplains, or consisting of prime agricultural soils, either alone or in combination, make up roughly 2/3 of the township.

Again, recognizing that some overlap may be found, it is also noted 982 acres are publicly owned and another 1,688 acres are placed into agricultural easements.

Community and Land Use Planning in Monroe Township

Planning efforts in Monroe Township are ongoing, as the latest comprehensive plan revisions were recently adopted in March, 2007. In addition to the comprehensive plan, the township also has zoning and a subdivision and land development ordinance.

Each of these three planning tools is widely used and accepted across the state. The purpose of a comprehensive plan is to provide a road map in achieving a community's long term vision. Zoning is the regulation of land use, bulk, and density for the purposes of the community's health, safety, welfare, and morals, as well as to minimize public and private nuisances. Zoning is nearing its 100th anniversary as a widely accepted and implemented planning tool in the United States. Subdivision and land development ordinances, or SALDOs, are used to address transportation, environmental, public services implications, and other aspects of community development related to land subdivision and development activity. This is done to provide protect consumers and local governments in a common sense fashion.

Monroe Township's original comprehensive plan was enacted in 1968. As noted earlier, the latest update (2007) to Monroe Township's comprehensive plan strives to:

- Preserve agricultural areas for agricultural use;
- Protect, conserve, and preserve natural resources;
- Preserve and enhance the character of the township;
- Provide for the housing needs of present and future residents;
- Provide for controlled growth in appropriate areas;
- Provide needed community services;

- Provide for safe and efficient movement of people and goods by a variety of transportation facilities.

The supervisors responsible for the update were A.W. Castle III, Samuel M. Simmons III, and John B. Dwyer.

Monroe Township's Official Subdivision and Land Development Ordinance was first adopted on December 21, 1998 (Ord. #98-7). The ordinance was later amended on October 9, 2008 (Ord. #08-01). In order to subdivide one's property, proper steps must be taken in to ensure that all subdivisions are legal. Preliminary Plans (complete and exact development plan compiled for the preparation of the Final Plans) are submitted to the township 14 days prior to the planning commission meeting. Applicants are also required to submit a Sewer Facilities Plan Revision or Supplement in conjunction with the Preliminary Plan. Prospective developers must publicly display their plan, which includes street locations, parking, building/lot layout, storm water detention/retention basin, water supply, sanitary sewage disposal, and other planned features.

Monroe Township's zoning ordinance was originally enacted on September 17, 1998. Significant portions of this ordinance were amended in 2002, 2006, & 2008. There are nine land use zones within Monroe Township; only eight are currently in use (the Village Overlay zone is not in use). In Monroe Township, zoning is administered by the Planning Commission, the Board of Supervisors, the Zoning Hearing Board, the Zoning Officer, and the township staff.

Several summary tables (Tables 8a, 8b, 8c, 8d, and 8e, below) of selected use, density, and bulk requirements and rules are found below. While these tables do not capture the full complexity of the zoning regulations, they reasonably portray allowed densities by use and by zone. The zoning, together with the current patterns of land ownership (parcelization) and current patterns of development, are what set the stage for a community build-out analysis.

The next section of new section of text starts on page 24.

Table 7: Environmental and Other Limitations to Development

ZONING DISTRICT	*Total Acreage*	*Acreage by Ownership and Other Constraints*					
		Steep Slopes	*Wet-lands*	*Flood-plain*	*Prime Ag. Soils*	*Public or Quasi-Public Ownership / Use*	*Agricultural Easements*
All districts (zones)	16843.39	529.05	185.41	776.32	9606.84	982.18	1688.04
Conservation (C)	2860.74	519.89	1.49		104.77	480.74	24.11
Agricultural (A)	12493.86	2.38	158.66	655.52	8480.21	400.16	1663.93
Suburban Residential (R-1)	1148.83	6.68	12.34	71.21	798.29	95.16	N/A
Highway Commercial (HC)	143.39	0.0931	6.02	21.50	94.97	N/A	N/A
Industrial (I)	81.09	N/A	2.31	11.54	21.47	3.25	N/A
Manufactured Housing Park (MHP)	25.61	N/A	4.58	16.54	19.67	N/A	N/A
Neighborhood Commercial (NC)	23.37	N/A	N/A	N/A	21.15	N/A	N/A
Village (V)	4.39	N/A	N/A	N/A	66.24	2.87	N/A

Table 8a: Conservation (C) Zone Area Design Requirements

Use	*Minimum Lot Area*	*Min. Lot Width*	*Max. Lot Coverage*	*Minimum Yard Setbacks*			*Max. Bldg. Height*
				Front	*Sides*	*Rear*	
					One (both)		
Agriculture, horticulture or forestry related uses	See provisions for Agriculture Zone (A) in Section 201 of Zoning Ordinance						
Public and / or non-profit parks & playgrounds, public utilities; natural areas, or wildlife refuges	5,400 sq. ft.	60’	40%	50’	20’ (40’)	35’	35’
Single-family dwellings & residences;, provided both public sewer and water are utilized	22,000 sq. ft.	100’	35%	35’	15’ (30’)	35’	35’
Single-family dwellings, etc., and other permitted uses	43,560 sq. ft. * (one acre)	150’	20%	35’	15’ (30’)	35’	35’
Single-family dwellings, etc., and other permitted uses, if no more than 50% of site possesses slopes in excess of 15%	87,120 sq. ft. * (two acres)	150’	10%	35’	15’ (30’)	35’	35’
Residential accessory buildings and structures	N / A	N / A	N / A	Not permitted in req. front yard	15’ (30’)	15’	20’

*all uses relying upon on-lot disposal systems must comply with the Monroe Twp. On-Lot Management Ordinance

Source: Monroe Township Zoning Ordinance. Article 2, Sect. 200.5. Pg. 32.

Table 8b: Agricultural (A) Zone Area and Design Requirements

Uses	*Min. Req. Lot Area*	*Min. Req. Lot Width*		*Min. Req. Lot Depth*	*Req. Min. Yard Setbacks*				*Max. Permitted Impervious Lot Coverage*	*Max. Permitted Bldg. Height*
		At Bldg. Setback	*At Lot Frontage*		*Front*	*One Side*	*Both Sides*	*Rear*		
Agriculture, horticulture, and forestry-related uses	10 acres for uses existing (Sept. 1998); 20 acres for new uses	200’	N / A	200’	60’	25’ on each side		50’	10%	150’ provided setback equals structure height
Single-family detached dwellings and other principal uses	80,000 sq. ft. (1 dwelling unit per 1.84 acres)	200’	150’	350’	75’	40’	80’	75’	30%	35’
Public and non-profit parks and public utilities underground structures	5,400 sq. ft.	60’	60’	90’	25’	20’	40’	35’	40%	35’
Residential accessory buildings and structures	N / A	N / A	N / A	N / A	Not permitted in req. front yard	10’	20’	10’	Same as above	20’

Table 8c: Suburban Residential (R-1) Zone Use Design Standards

Utilized Public Utilities	*Min. Lot Area*	*Min. Lot Width at Bldg. Setback Line and (frontage)*	*Max. Lot Coverage*	*Minimum Yard Setbacks*			*Max. Permitted Height*
				Front	*Sides – One (both)*	*Rear*	
On-Lot Sewage and Public Water	43,560 sq. ft.	200’ (180’)	20%	35’	15’ (15’)	35’	35’
Public Sewer	32,000 sq. ft.	180’ (160’)	30%	35’	15’ (15’)	35’	35’
Both Public Sewer and Public Water	20,000 sq. ft.	140’ (120’)	35%	35’	15’ (15’)	35’	35’

*all uses relying upon on-lot disposal systems must comply with the Monroe Twp. On-Lot Management Ordinance

Source: Monroe Township Zoning Ordinance. Article 2, Sect. 202.1. Pg. 41.

Table 8d: Village (V) Zone Use Design Standards

Min. Lot Area	*Min. Lot Width*	*Min. Lot Coverage*	*Required Front Yard*	*Minimum Side Yards*		*Minimum Rear Yard*
				One Side	*(Both Sides)*	
6,000 sq. ft.	30’	25%	10’	10’	20’	50’

*all uses relying upon on-lot disposal systems must comply with the Monroe Twp. On-Lot Management Ordinance

Source: Monroe Township Zoning Ordinance. Article 2, Sect. 203.5. Pg. 43.

Table 8e: Design / Use Standards in Other Selected Zones of Monroe Township

Zone	*Public Utilities Utilized*	*Minimum Lot Area*	*Minimum Lot Width*	*Maximum Lot Coverage*	*Maximum Permitted Height*
Neighborhood Commercial (NC)					
	None	43,560 sq. ft.	200’	35%	35’
	Public Sewer or Public Water	30,000 sq. ft.	150’	45%	35’
	Both Public Sewer and Public Water	15,000 sq. ft.	100’	60%	35’
Highway Commercial (HC)					
	None	43,560 sq. ft.	200’	45%	35’
	Public Sewer or Public Water	30,000 sq. ft.	150’	55%	35’
	Both Public Sewer and Public Water	15,000 sq. ft.	100’	70%	35’
Industrial (I)					
	General	43,560 sq. ft.	150’	70%	35’
Manufactured Housing Park (MHP)					
	General	4,250 sq. ft.	50’	N / A	N / A

MONROE TOWNSHIP:
"WHERE WE MAY BE HEADED"

This section presents a scenario of where the township may be in terms of patterns of residential development in 2020 and 2030. First, the generalized process of developing a community build-out analysis is succinctly described and explained. Then, the particulars of this build-out project for Monroe Township are presented.

Community build-out analysis is a useful tool in projecting the future consequences of long term planning in a given community. These future consequences may variously relate to community character, fiscal conditions, adequate provision of community services, impacts to school enrollment, and the community's vision of itself in the next 20 to 50 years and beyond. It also is useful in projecting the environmental consequences of poor (or good!) planning in terms of automobile emissions, energy use, water consumption, and agricultural / forest land fragmentation.

With Monroe Township, this project is most directly concerns with the implications of the current zoning for both the township's desired rural character and for conserving the scenic and environmental resources of the South Mountain area.

Conducting a Community Build-Out Analysis

With changes in computer technology, availability of GIS (geographic information system) software, and availability of suitable data, build-out analyses is becoming a more commonly employed tool for examining the effectiveness of planning, particularly zoning. Prior to these changes, build-out projects were even more labor intensive. The technique first appeared during the 1960s in association with Ian McHarg's planning work in the urban fringe of the Baltimore, Md. Metropolitan area (Arendt, 1994). Complementing these three changes, noted Randall Arendt helped popularize the tool in 1994 with his publication of *Rural by Design*.

It should be noted that Arendt suggests that communities not simply use such analyses as a way of illustrating "shortcomings" of the community's prior planning efforts (1994:253). Rather, it should be thought of as a "preview of the area's future prospects under the present regulations (p. 250). Ideally such maps are complemented with maps identifying areas that should remain un-built and other areas more appropriate for construction. However, this is not done in this case study of Monroe Township.

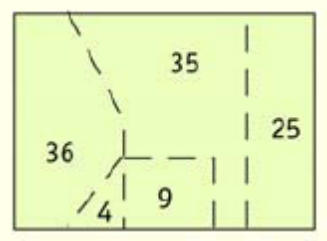
The procedural steps of performing a community build-out analysis are illustrated in Figure 6 and outlined in Table 9. The process is simple in concept, yet as Arendt notes (p. 250) "tedious and time-consuming" – even with computers and GIS software.

The most basic and "required ingredients" to a build-out analysis project are the parcel map, the zoning map, and a map of current development. To make such an analysis more realistic to a township, areas that are prohibitive or limited to development also need to be mapped. These include areas with environmental limitations (i.e., areas with prohibitively steep slopes of 25% or more) or areas that have institutional or ownership constraints (most notably publicly owned lands, but also private lands that cannot or will not be developed (i.e., land owned by utilities or land under agricultural easement).

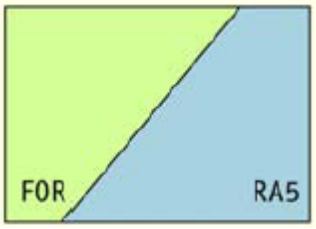
While the particulars vary in case to case, at a minimum a map is produced (as an interim step) that shows all the hypothetical lots (parcels) that can be created and build upon. To add to the realism, a hypothetical structure is illustrated on the new potential lot. Matters may be made even more realistic when three dimensional images (termed "visual build-outs") of such potential future development is produced. All the maps in this project are two-dimensional or "spatial" build-outs.

In this analysis, ESRI ArcGIS 9.3 software was used in conjunction with CommunityViz software (version 3.2) process the spatial data. ESRI ArcGIS 9.3 software is the most widely used mapping and geographic information system

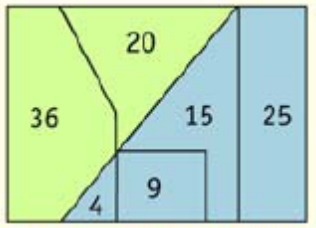
1. Five hypothetical parcels with the acreage of each noted.



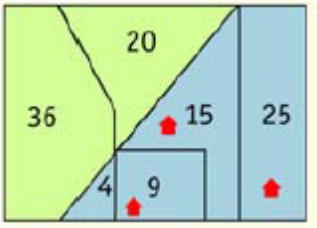
2. Zoning districts across the same landscape. One zone ("FOR)" is a forest zone with a 25 acre minimum lot size requirement. The other zone is a rural zone with a five acre minimum lot size.



3. Laying the zoning over the parcel map one begins to see what areas are potentially subject to greater development.



4. Current existing dwelling units are portrayed on the landscape.



5. Given a grossly calculated potential parcelization, a number of new, hypothetical dwelling units allocated and placed on to the landscape.

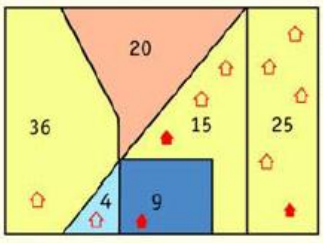


Figure 6: Basic Conceptual Steps of the Build-Out Process Simply Illustrated

Graphics taken from Center for Rural Vermont *Community Build-Out Analysis Manual*.

Table 9: Generalized Process / Outline in Completing Community Build-Out Analysis

Stage	*Action / Operation*	*Data Used, Conceptually Described*
1. General Operations for all Build-Outs (Numeric, Spatial, & Visual)	A. Combine parcel and zoning data to produce a 'hypothetical' maximum number of parcels, or polygons.	• Parcels • Zoning • Existing buildings
	B. Consider areas with special zoning designations (i.e., overlay districts)	• i.e., floodplain overlay zone
	Sequentially eliminate lands from consideration that have ownership, institutional or other related restrictions to development	• Federally owned lands • State owned lands • Township owned lands • Agricultural easements • Land trust properties • Other public land uses (school districts, cemeteries) • utilities
	C. Sequentially consider lands with prohibitive environmental constraints (may eliminate areas not already addressed by overlay zones)	• steep slopes • areas in the 100 year floodplain • stream buffers (of 75' from selected streams) • wetlands
	D. Transferring Density – may be allowed to correct for or ignore certain dimensional constraints	
	E. Considerations for different types of land uses: • Residential – these are represented as points or even building footprints • Commercial – may assume use of building footprints and consideration of Floor Area Ratio (FAR) • mixed use – this is allowed / provided for	
	F. Considerations of "efficiency" are also an option. This is where land lost for roads may be accounted for.	
	G. Accounting for the existing buildings	• existing buildings
2. Numeric Build-Out Specifics	A. This provides a summary of the estimated numeric building capacity, based the area, planned density, and limitations, for the polygons.	
3. Spatial Build-Out Specifics	A. This provides a spatial, two-dimensional representation of where buildings, represented by points, could be placed. This takes into account parcel (polygon) geometry and, thus setback rules, road frontage requirements, minimum separation distances, and other considerations are taken into account. These factors are:	
	• setback distances • minimum separation distances between buildings	• Building footprints • Floor area ratios
	B. With respect to the new parcel polygons, hypothetical buildings may be placed either randomly, in grid fashion, or along roads. These hypothetical building placements may differ by zone. These new hypothetical buildings are in a layer which may be edited. For example, individual building may be moved or deleted.	
4. Visual Build-Out Specifics	A. Visual build-out provides a three dimensional scene of the hypothetical landscape. This hypothetical landscape features various building types, depending on how the settings are configured and assumptions made by the user. 3-D models of buildings are placed at the points of both actual and hypothetical buildings. This hypothetical layer may be draped on to actual areal photos of the existing landscape. This may use user supplied imagery or Google Earth imagery.	
5. Time Scope Application *(optional)*	A. This may be used to visualize how the projected or forecasted development in a given scenario may occur over time.	

Software. CommunityViz 3.2 is the latest version of an "add on" software that is specifically designed for land use, environmental, and community planning applications, as well as community visioning. CommunityViz is a project of the Orton Family Foundation and Placeways, LLC. According to The Orton Family Foundation's website (http://www.orton.org), the organization's mission is to "We are committed to helping towns steer and embrace growth and change while enhancing the cultural, social, environmental and economic qualities that are the essence of what makes a place a valued home to its citizens." Placeways software was developed in close association with the Orton Family Foundation mission and its outreach activities, though today it is a separate corporate entity. A special training session with the software was held in March 2009, with Placeways instructor Amy Anderson facilitating the session.

Additional Findings and Conclusions of the Community Build-Out Analysis

The findings and conclusions contained here are largely supplemental and complementary to those already noted in the Executive Summary (pages 5-9).

Most powerfully presenting the results of this project are the build-out maps. Figures 2 and 3, reproduced here as Figures 7 and 8, best capture the future implications of the current planning regulations. From examining these maps it is clear that the rural character of the township is jeopardized. What makes these maps even more surprising is that they do not even show the entire number of projected housing units for each of the two time periods (2020 and 2030). This is because the CommunityViz software could not allocate each of the hypothetical units to a particular hypothetical location.

In addition to the impacts noted in the Executive Summary, there are further impacts of that can be estimated through extrapolation. These local impacts, which are primarily environmental, are substantial. All estimated impacts are summarized in Table 10 below.

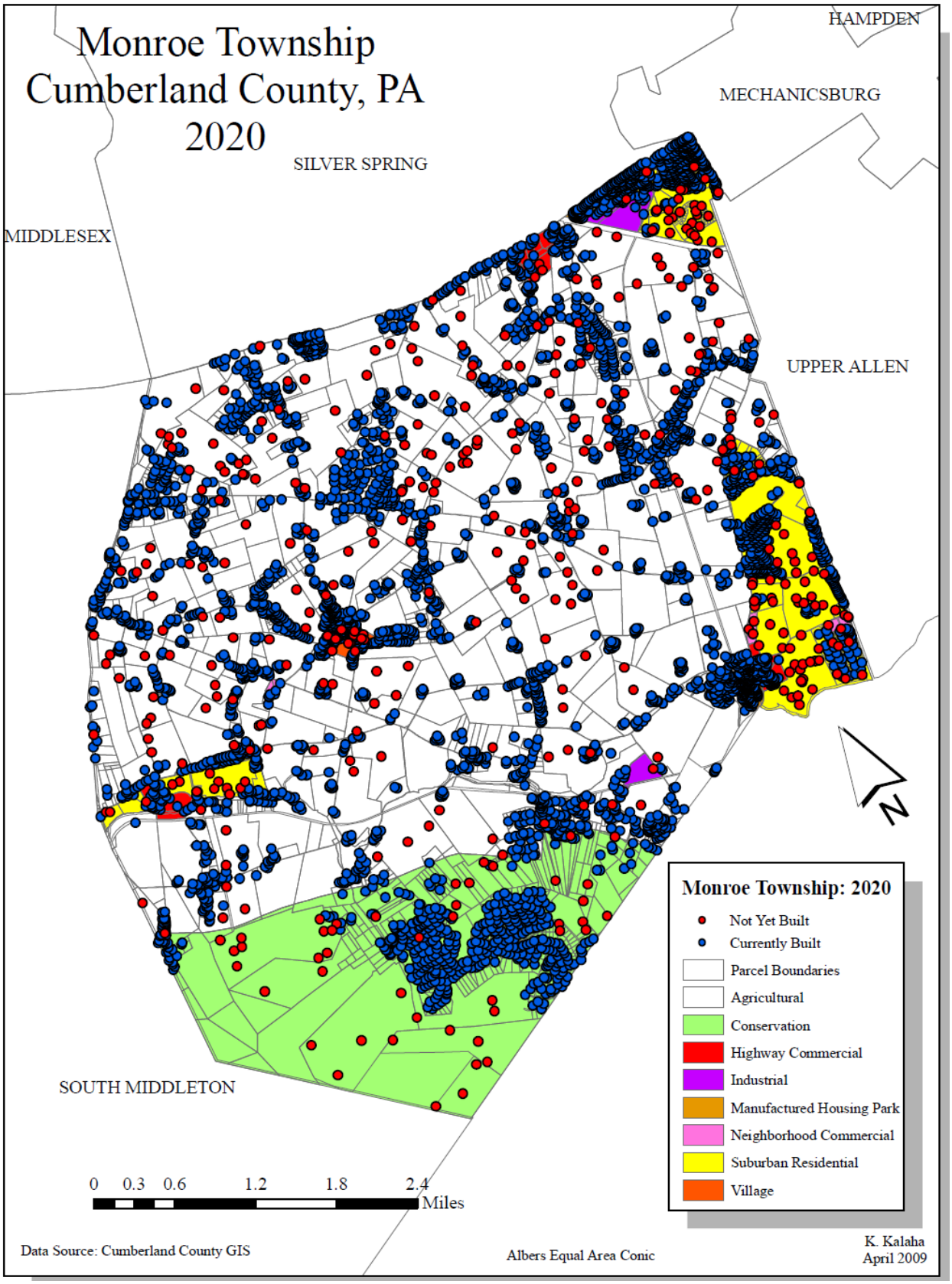


Figure 7: Hypothetical Build-Out for Monroe Township, Cumberland County in 2020

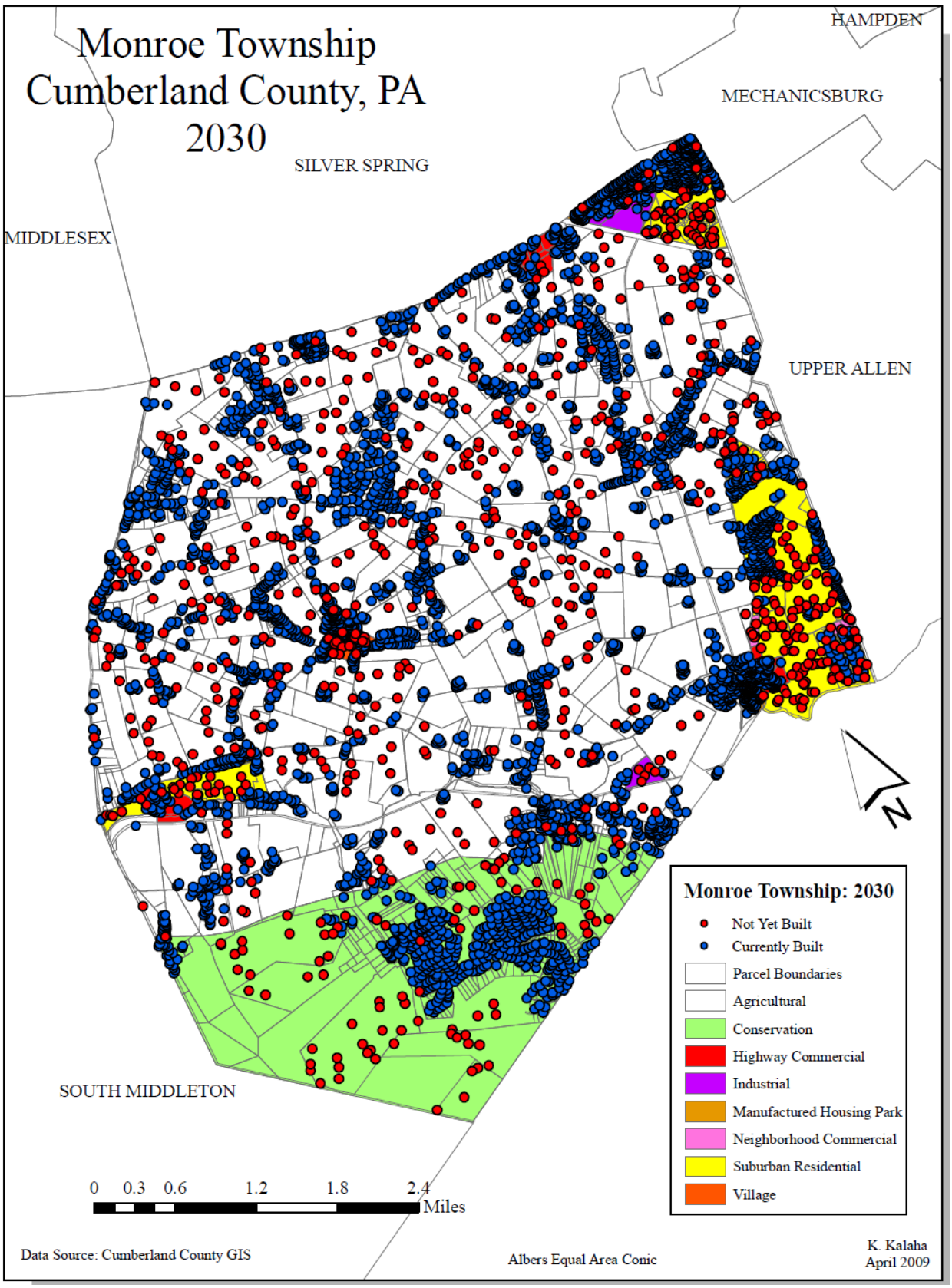


Figure 8: Hypothetical Build-Out for Monroe Township, Cumberland County in 2030

Table 10: Summary of Build-Out Impacts for Monroe Township for the Years 2020 and 2030		
Item	Impact	Notes
Projected Population (2020)	1,474	Additional residents compared to 2007
Projected Population (2030)	2,544	Additional residents compared to 2007
Projected Residential Housing Units (2020)	685	Additional residential housing units compared to 2000
Projected Residential Housing Units (2030)	1107	Additional residential housing units compared to 2000
Displayed New Housing Units from 2020 Map (Fig. 7)	405	
Displayed New Housing Units from 2030 Map (Fig. 8)	774	
Further impacts (2020 scenario)based on 405 new housing units displayed in Figure 7		
Annual CO emissions	376,720	lbs.
Annual CO2 emissions	3,530	tons
Annual hydrocarbon emissions	47,584	lbs.
Annual NOx emissions	23,618	Lbs.
Residential energy use	40,905	million BTU / yr.
Residential water use	57,799,575	gallons / yr.
School children	196	
Vehicle trips per day	2,410	
Further impacts (2030 scenario)based on 774 new housing units displayed in Figure 8		
Annual CO emissions	719,955	lbs.
Annual CO2 emissions	6,747	tons
Annual hydrocarbon emissions	90,938	lbs.
Annual NOx emissions	45,137	Lbs.
Residential energy use	78,174	million BTU / yr.
Residential water use	110,461,410	gallons / yr.
School children	374	
Vehicle trips per day	4,605	
Further Impacts for 2020 and 2030 calculated using CommunityViz software and based on standard assumptions as calculated by an assortment of federal governmental agencies. Details provided upon request.		