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

Prepared for

South Mountain Conservation Landscape Initiative

Jointly Prepared by

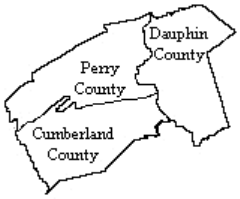
The Center for Land Use at Shippensburg University

Central Pennsylvania Conservancy

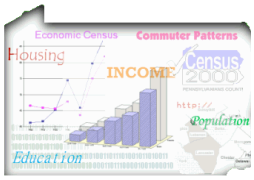
In cooperation with

Cumberland County Planning Commission

Cumberland County GIS Department



Tri-County Planning Commission



Penn State Data Center

February 2010

ACKNOWLEDGEMENTS

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This community build-out analysis project came to fruition through the shared efforts and expertise of:
The Center for Land Use at Shippensburg University and
The Central Pennsylvania Conservancy

With additional cooperation and assistance from:
Appalachian Trail Conservancy
Cumberland County Planning Commission
Cumberland County GIS Department
Tri-County Planning Commission
Pennsylvania State Data Center
Bureau of Conservation and Recreation, Pennsylvania Department of Conservation and Natural Resources

The following individuals played various roles in bringing this project to completion. Their valuable efforts and assistance are appreciated:
Amy Anderson, Placeways, Inc.
Drew Ames, Tri-County Planning Commission
Debra Bowman, President, Central Pennsylvania Conservancy
Danielle Bowers, student, Shippensburg University
Stephanie Rynders, Central Pennsylvania Conservancy
Janet Smith, Geography-Earth Science Department, Shippensburg University
Shippensburg University
Ricky Sones, student, Shippensburg University
Brady Stroh, Penn State Data Center
Kimberly Williams, Appalachian Trail Conservancy
Stephanie Williams, Cumberland County Planning Department

This project was completed using CommunityViz Software, ver. 3.3, produced by Placeways, Inc.

Funding for the Center for Land Use at Shippensburg University is funded by a grant from the U.S. Department of Education Funds for the Improvement of Post-Secondary Education (FIPSE).

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 to 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 Table 8.

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 South Middleton Township?

South Middleton Township completed an update of its Comprehensive Plan in 2007. Substantial changes had occurred locally and regionally since the plans last update in 1999. A build-out analysis will further the purpose of the comprehensive plan by projecting how current trends will impact the future of the community.

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). South Middleton 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

leaves 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 several pages. These maps present hypothetical landscapes for the township in the years 2020 and 2030 respectively.

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

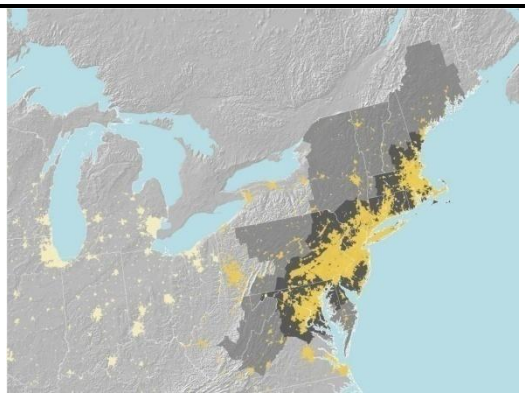
- population projections for 2020 and 2030;

- current pattern of land ownership;
- current pattern of development (buildings);
- current zoning

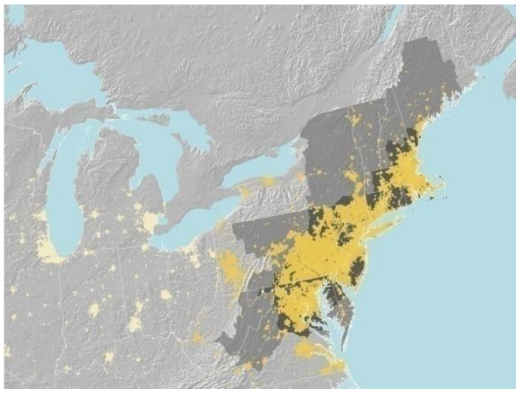
In addition to the build-out maps, a number of other items are included in narrative, tabular, and graphical fashion. These other items speak to other impacts and aspects of the 2020 and 2030 scenarios.

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.

Land consumption in Megalopolis region as of 2000



Projected land consumption in Megalopolis in 2025



Projected land consumption in Megalopolis in 2050

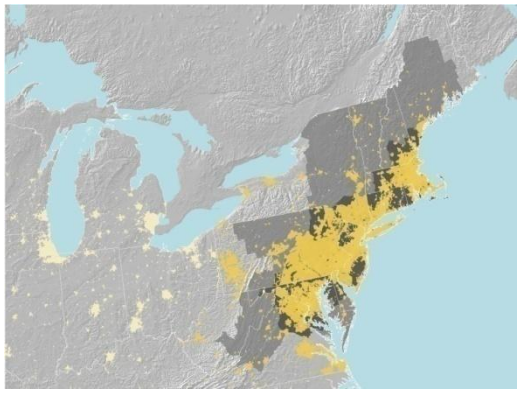


Figure 1:

Projected Land Consumption in the Megalopolis Region, 2000-2050

Source: Regional Plan Association, 2005.

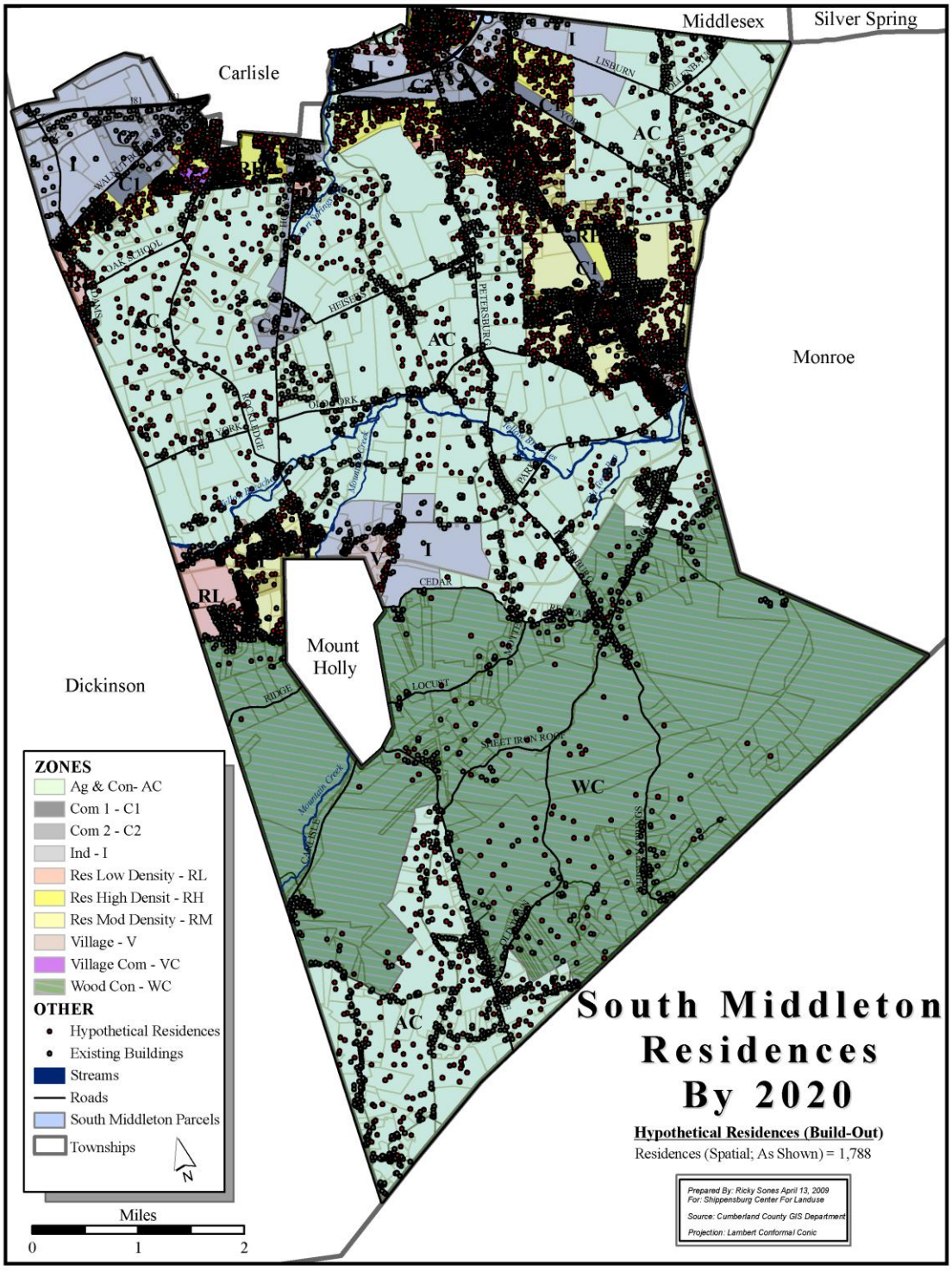


Figure 2. Build-out map for South Middleton Township, 2020.

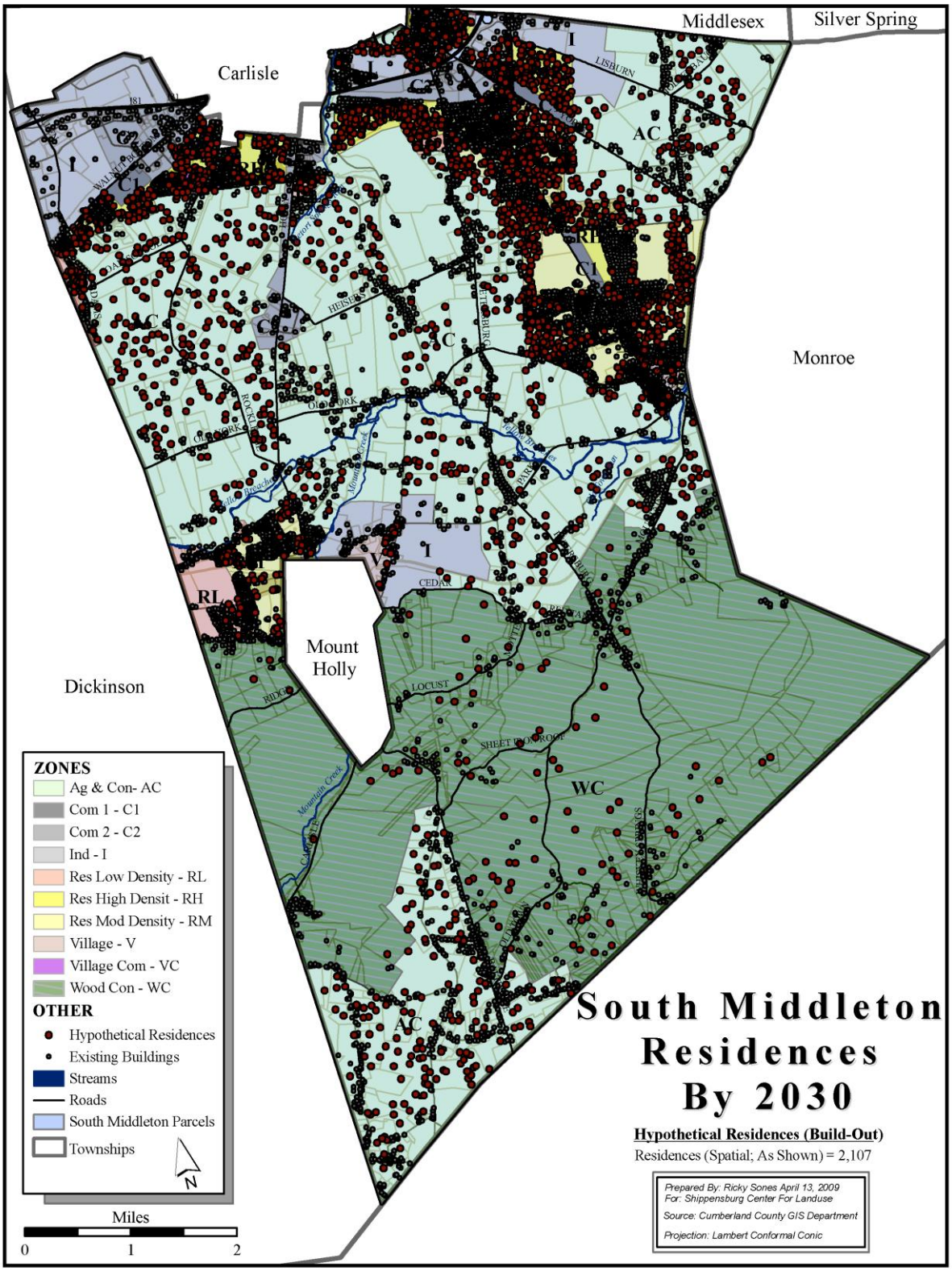


Figure 3. Build-out map for South Middleton Township, 2030.

What are the major findings?

Two related caveats need to be made known prior to any assessment of 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.

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 an 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, it is projected that:

a) An additional 1,788 residential units have been or will be built between 2000 and 2020.

b) An additional 2,107 residential units have been or will be built between 2000 and 2030.

2. The maps for 2020 and 2030 both indicate that the bulk of these new housing units will be built in the three residential zoning districts. Development will also occur in agricultural and conservation developments to a lesser extent.

Comments / Conclusions

1. A visual assessment of the visual build-outs (figures 2 and 3) finds that the majority of future development will be clustered in the residential zoning districts. This demonstrates the strength of South Middleton's land use planning. However there is sprawling development predicted for the Agricultural District and the Woodland Conservation district, which is problematic for the township's intention to preserve its natural resources and agricultural base. The most new development is anticipated in the Agricultural District, while development in the Woodland Conservation District is the most dispersed.

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.

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SOUTH MIDDLETON 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.

South Middleton Township was established in 1810 has an area of approximately 51.6 square miles. The population of the township was approximately 14,262 in 2007, which represents a 1.6 percent increase from the previous year. The majority of the township is located in the Cumberland Valley, but a portion is part of the South Mountain area.

Demographics: Recent Numbers and Projected Growth

The population is expected to continue increasing in South Middleton Township, and the population composition is expected to change also. Project population numbers from the Tri County Planning Commission estimate a continued increase to 17,300 by 2020 and 18,000 by 2030. It is also noteworthy that South Middleton's growth rate of 1.6 percent from 2006 to 2007 is higher than the 1 percent for Cumberland County and 0.2 percent for Pennsylvania. Table 2 provides more details on the regional context of growth in South Middleton. Additionally the number of residential households is estimated to increase from the 5,081 existing in 2000. The number of households is estimated to increase by 1,788 by 2020 and increase by a total of 2,107 by 2030. The number of households is estimated by dividing the projected population by the gross average number of people per household. Table 3 provides a detailed breakdown of population projections and household characteristics.

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.

For these projections, 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.

General Land Use and Development Character

Currently South Middleton Township has predominantly agricultural and forested land uses, occupying 75 percent of the area. Table 4 provides a detailed breakdown of land use in South Middleton.

Suburban and urban land uses occupy 15 to 20 percent of the township, and urbanization will increase into the future. Sprawling, noncontiguous urban development patterns are of a particular concern. Commercial and industrial uses are 5 percent or less of the land.

The land in the township with low slopes of less then 10 percent is the most valuable for both agricultural and development purposes. Therefore population pressures will offer a challenge to the continuation of agriculture. Areas with slopes between 15 and 25 percent have been proposed as a buffer between the developed uses and forested uses that will continue to dominate the areas with slopes over 25 percent.

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 South Middleton 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 Monroe Townships are nearby townships to South Middleton 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	
2030	(No projection)	- - -	8,343	3,272	18,078	7,409	*The total number of occupied households for 2000 were 1,721 (Dickinson), 2,073 (Monroe), and 5,081 (S. Middleton)*
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)	22534	79.3	1907	6.7	625	2.2	3360	11.8
Woodland Conservation (W-C)	6155	27.3	105	5.5	0	0	2498	74.3
Agricultural (AC)	12193	54.1	156	8.2	318	51.0	491	14.6
Residential - Low Density (R-L)	364	1.6	6	0	0	0	3	0.1
Residential – Moderate Density (R-M)	2047	9.1	165	8.7	0	0	191	5.7
Residential – High Density (R-H)	729	3.2	73	3.9	17	2.8	81	2.4
Village (V)	286	1.3	62	3.3	3	0.5	20	0.6
Commercial (C)	244	1.1	569	29.8	0	0	53	1.59
Industrial (I)	513	2.3	743	39.0	286	45.8	20	0.6
VC	0	0	32	1.7	0	0	0	1

Table 5: 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)	28427.7	7313.0	3.9	8183.0	1533.0	518698964.4
Woodland Conservation (W-C)	8759.0	637.0	13.8	538.0	288.0	253080757.6
Agricultural (AC)	13159.5	1418.0	9.3	2007.0	330.0	167357393.0
Residential - Low Density (R-L)	367.8	200.0	1.8	213.0	28.0	8351627.1
Residential – Moderate Density (R-M)	2404.4	2787.0	0.9	2832.0	398.0	26526346.8
Residential – High Density (R-H)	901.8	1205.0	0.7	1181.0	99.0	17611510.5
Village (V)	372.5	637.0	0.6	793.0	398.0	4407083.5
Commercial (C)	866.8	263.0	3.3	366.0	90.0	12161681.2
Industrial (I)	1563.9	159.0	9.8	251.0	41.0	28929518.1
Village Commercial (VC)	32.1	7.0	4.6	2.0	5.0	273046.7

Environmental Character

There are portions of the township that have development constraints. These constraints are not only environmental in nature but also relate to some institutional limitations, including those relating to ownership**.** Soil is an important environmental consideration, because high quality soils are in demand for agricultural and urban land uses. Slope is also an important constraint because of the variable topography, which includes portions of South Mountain.

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 28,427 total acres noted in Table 6, that 18,373 acres may be categorized as "sensitive lands." These lands are those characterized by steep slopes (slopes over 25%), the presence of wetlands, floodplains, or prime agricultural soils, either alone or in combination.

Again, recognizing that some overlap may be found, it is also noted 3,715 acres are publicly owned and another 4,128 acres are placed into agricultural easements**.**

Table 6: 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)	28427.7	1850.8	527.5	1429.8	14564.9	3715.6	4128.1
Woodland Conservation (W-C)	8759.0	1818.5	152.6	147.4	1589.0	2431.2	785.6
Agricultural (AC)	13159.5	29.4	347.5	1020.9	8331.6	793.2	2650.4
Residential - Low Density (R-L)	367.8	N/A	0.8	33.6	294.1	2.9	146.5
Residential – Moderate Density (R-M)	2404.4	0.8	1.1	18.2	1880.2	192.1	238.1
Residential – High Density (R-H)	901.8	0.1	N/A	N/A	659.8	99.1	49.1
Village (V)	372.5	1.6	11.4	81.5	334.5	17.2	4.1
Commercial (C)	866.8	0.4	2.1		479.3	168.2	70.8
Industrial (I)	1563.9	N/A	12.1	128.2	975.7	11.6	N/A
VC	32.1	N/A	N/A	N/A	20.6	N/A	N/A

Community and Land Use Planning in South Middleton Township

Planning efforts in South Middleton Township are ongoing. The comprehensive plan and zoning ordinance are crucial planning documents. The comprehensive plan was last updated in 2007. The comprehensive plan is designed as a framework for other planning documents, and the stated objectives are to: "analyzing the existing features of a community, assessing future trends and patterns and formulating plans for the long -term physical development based upon defined goals and objectives." These objectives include:

- To preserve agriculture and conserve open rural spaces.
- To protect land and land values within the natural limits of the land and the ability of the Township to guide development.
- To prevent urban sprawl by establishing a pattern of growth and development aimed at sustaining our character of life.
- To assure that all development is managed in such a way as to minimize infrastructure costs to the taxpayers of the Township.

The zoning ordinance was originally enacted on January 2, 1970. The most important goals of the zoning ordinance are to:

- Promote health, safety, and general welfare, water supplies, recreational facilities, public grounds, agricultural and industrial use, and preservation of the natural, scenic, and historic values in the environment.
- Prevent overcrowding of land, congestion of transportation, loss of health, life or property from fire, flood or panic of other dangers.

- To preserve prime agriculture and farmland considering topography, soil type and classification, and present use.
- To provide for the use of land for residential housing of various dwelling types to include single – family and two – family dwellings, and reasonable multi-family dwelling in various arrangements.
- To accommodate reasonable overall community growth, including population and employment growth, and opportunities for development of a variety of residential dwellings types and non-residential uses.

South Middleton Township has nine different zoning districts with seven special overlay districts differing in density, land uses, and purposes.

Zones:

- Woodland Conservation District (W-C)
- Agricultural and Conservation District (AC)
- Residential Low Density District (R-L)
- Residential Moderate Density District (R-M)
- Residential High Density District (R-H)
- Village District (V)
- Village Commercial District (VC)
- Commercial District (C)
- Industrial District (I)

Special Overlay Districts:

- Airport Hazard (AH)
- Flood Hazard District (FH)
- Village Historic District (VH)
- Steep Slope Conservation District (SS)
- Scenic River District (SR)
- Wellhead Protection District (WP)
- Special Storm Water Management District (SSM)

Each of these 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.

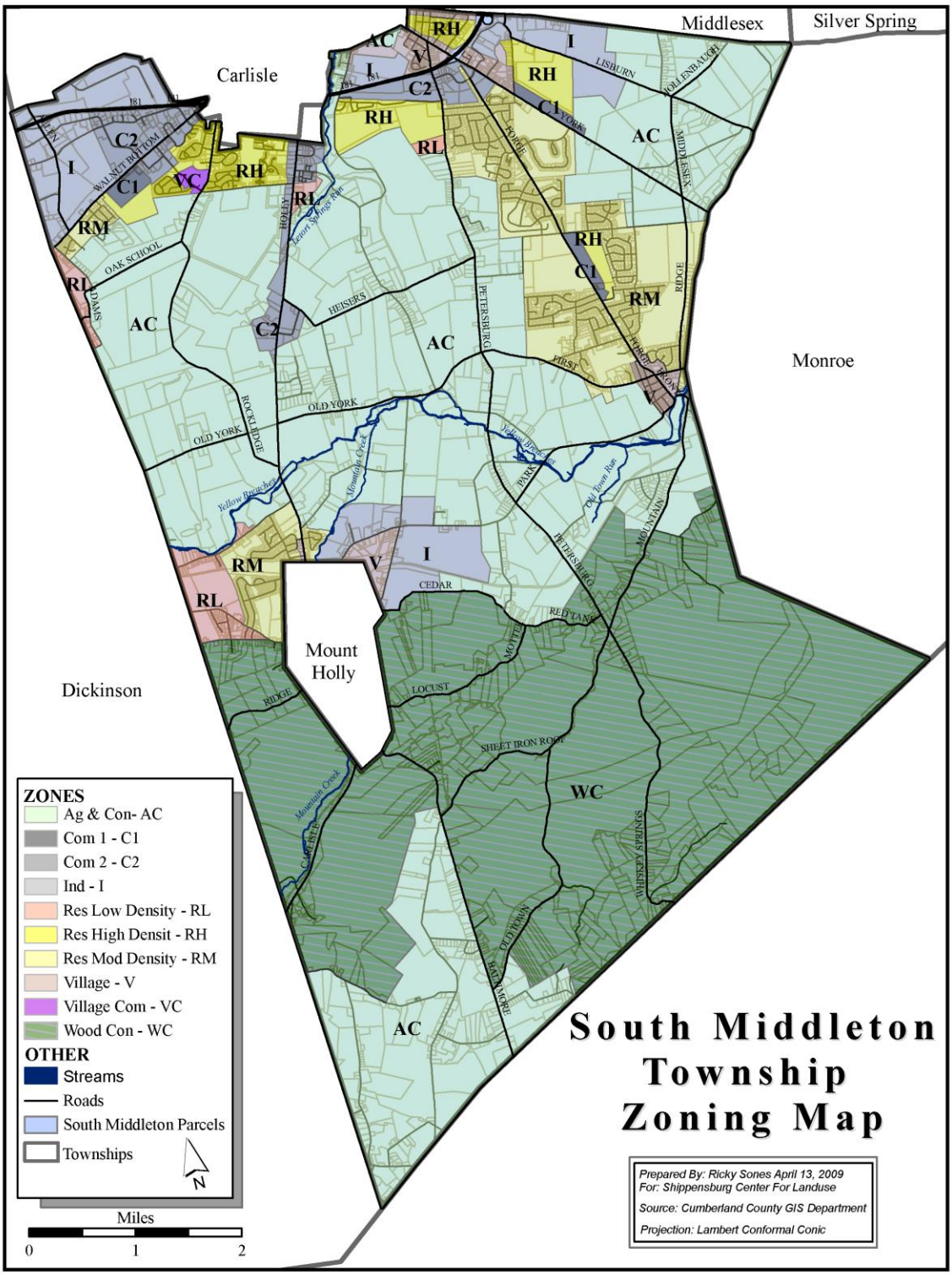


Figure 4. Zoning map for South Middletown Township.

SOUTH MIDDLETON 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 South Middleton 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.

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 South Middleton Township.

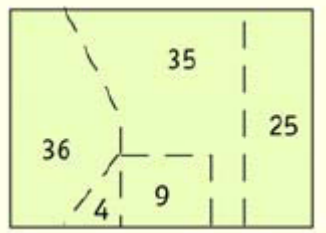
The procedural steps of performing a community build-out analysis are outlined in Table 8. The process is simple in concept, yet as Arendt notes (p. 250) "tedious and time-consuming" – even with computers and GIS software.

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).

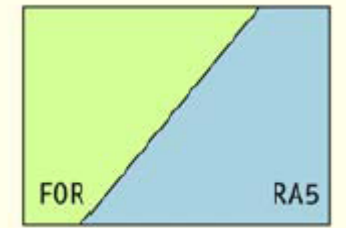
While the particulars vary in case to case, at a minimum a map is produced (as an interim step) that shows all the hypothetical lots (parcels) that can be created and build upon. To add to the realism, a hypothetical structure is illustrated on the new potential lot. Matters may be made even more realistic 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 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

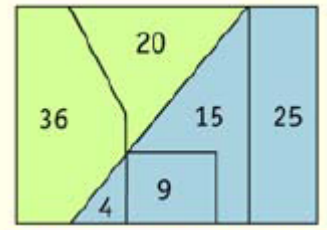
1. Five hypothetical parcels with the acreage of each noted.



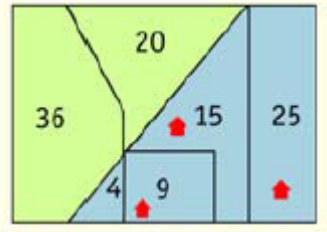
2. Zoning districts across the same landscape. One zone ("FOR)" is a forest zone with a 25 acre minimum lot size requirement. The other zone is a rural zone with a five acre minimum lot size.



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.

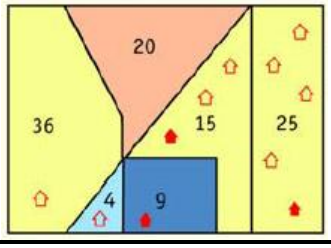


Figure 5: Basic Conceptual Steps of the Build-Out Process Simply Illustrated

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

corporate entity. A special training session with the software was held in March 2009, with Placeways instructor Amy Anderson facilitating the session.

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 6 and 7, best capture the future implications of the current planning regulations. Figure 8 provides an interesting supplement by depicting the location of prime agricultural areas in the Township. When compared with the build-outs, it becomes clear that the majority of future development will occur on high quality agricultural soils. 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 that can be estimated through extrapolation. These local impacts, which are primarily environmental, are substantial. All estimated impacts are summarized in Table 10 below.

Table 7: 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	A. This provides a summary of the estimated numeric building capacity, based the area, planned density, and limitations, for the polygons.	

Specifics	
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.

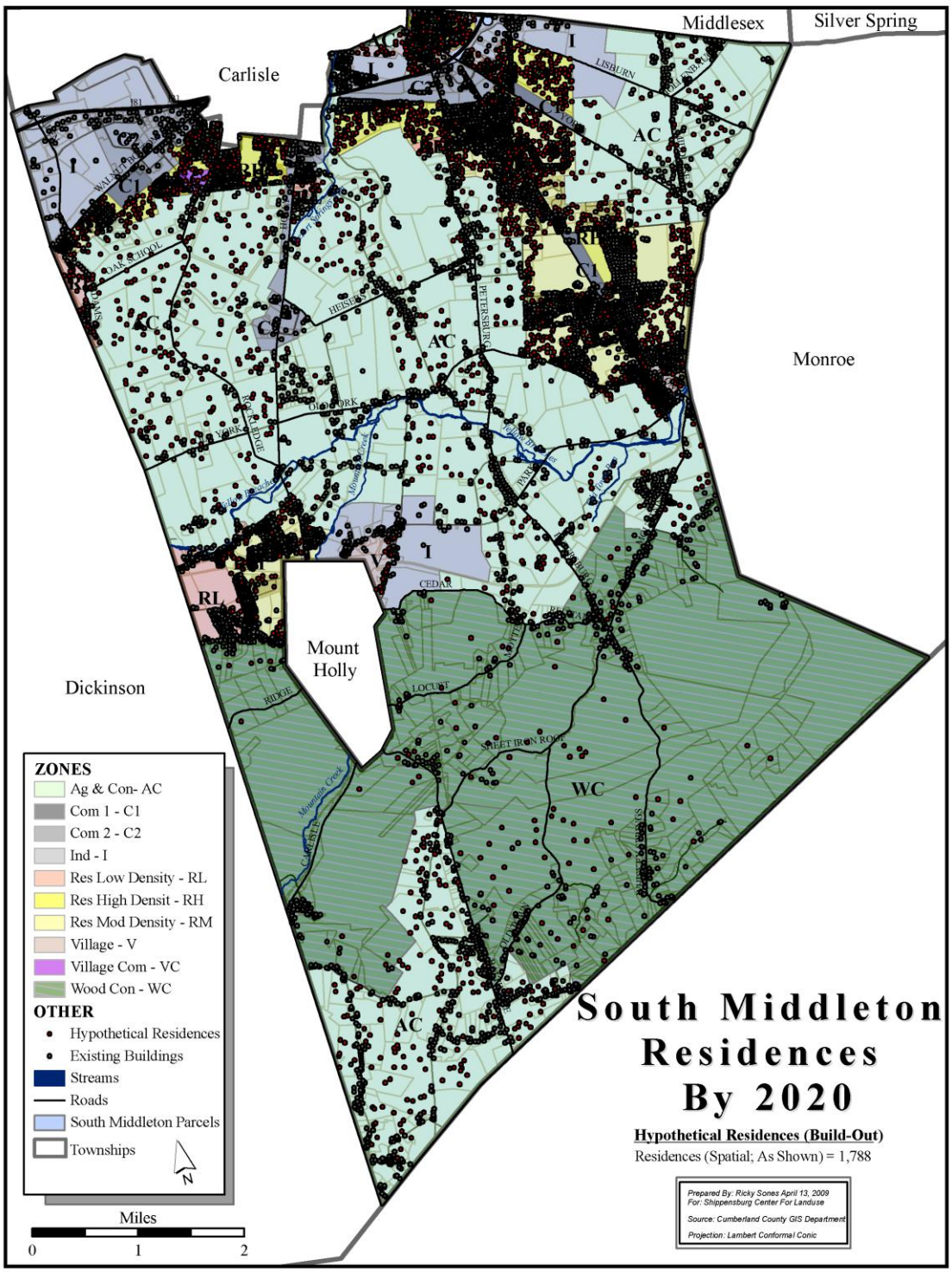


Figure 6. Build-out map for South Middleton Township, 2020.

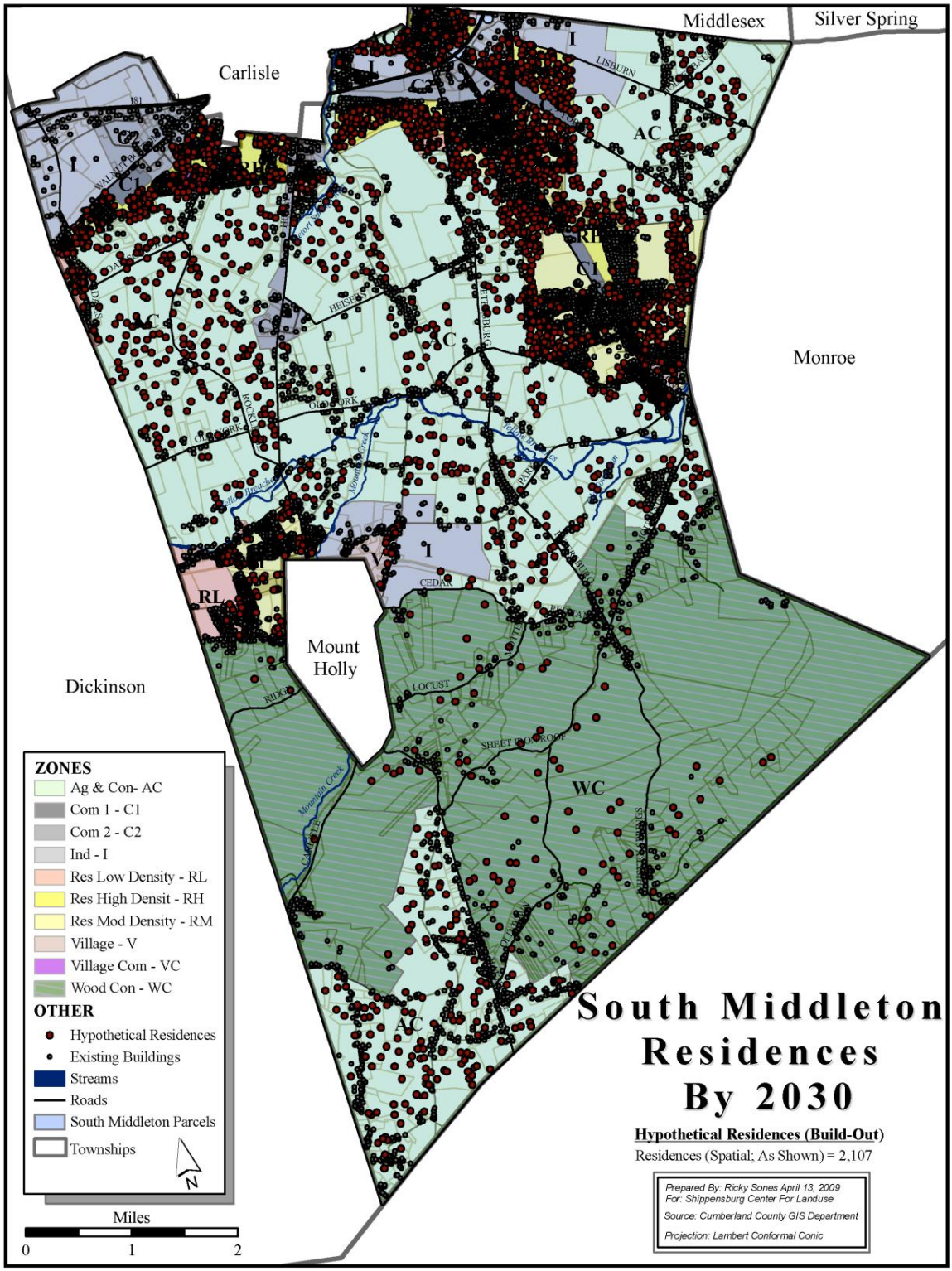


Figure 7. Build-out map for South Middleton Township, 2030.

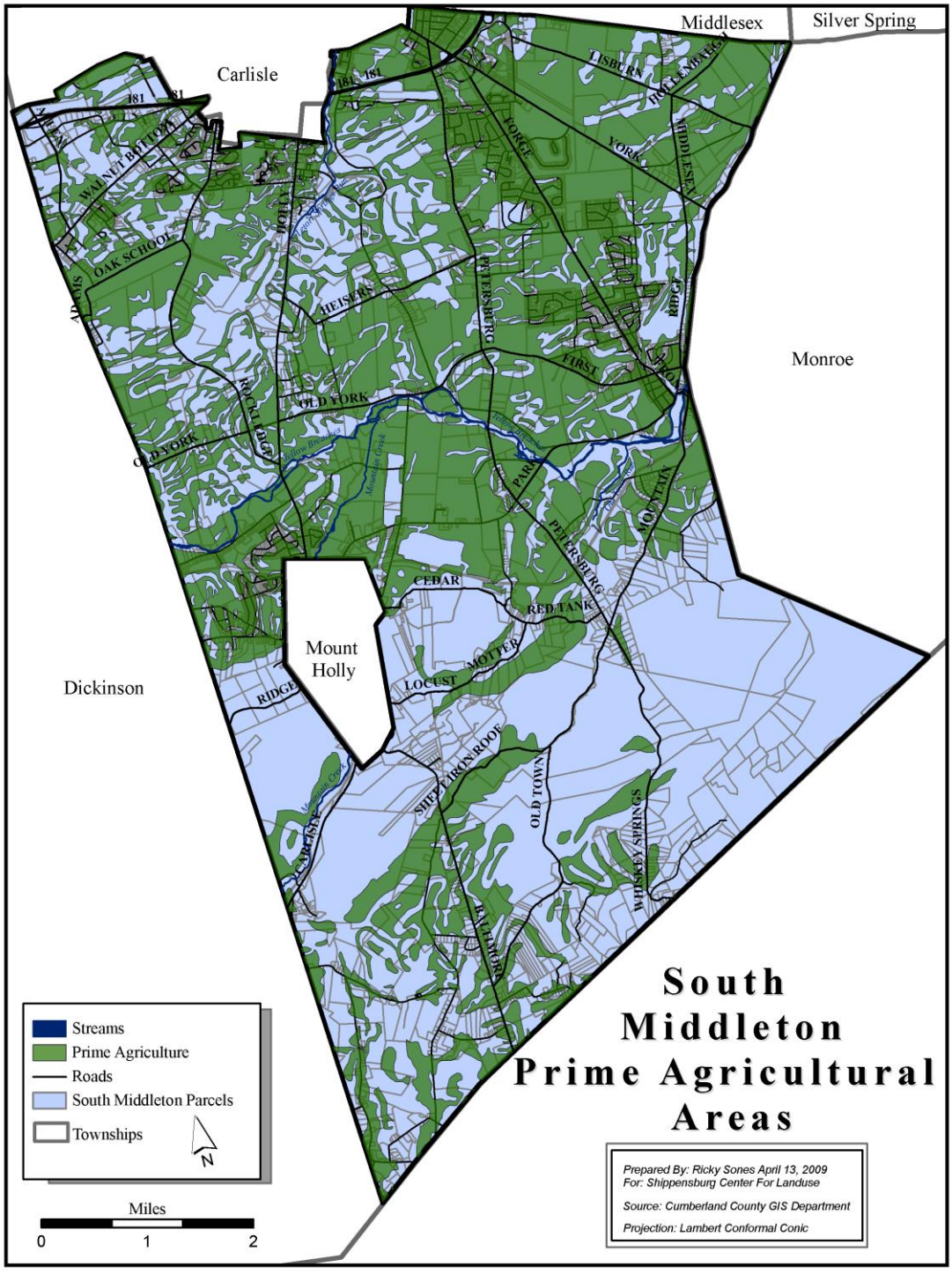


Figure 8. Location of prime agricultural areas in South Middleton Township.