

- New development is clustering around the Interstates creating traffic and quality of life issues. What land use controls, such as overlay districts, should be considered to help manage growth better around interchanges?
- Residential development is rapidly occurring in the Agricultural Conservation Areas due to subdivision. How should the Subdivision and Zoning Ordinances be changed to better control the amount of subdivision allowed in the Agricultural Conservation Areas to prevent further fragmentation of agricultural lands?
- Rezoning have been declining in recent years and are occurring mostly in the Community Development Areas. How should rezonings be used to help effectively target growth in the desired areas?
- The largest percentage of land in the county is classified as forest, predominantly due to the public lands. How should the land that is controlled by the county be managed?

M. Buildout Analysis

A buildout analysis is an impact assessment of the current land use regulations in a given area. The analysis depicts what growth will occur under current zoning designations and future land use policies. This information can then be used to estimate the effects on land availability, services, and infrastructure from the future growth.

For the Augusta County buildout analysis, existing zoning criteria and Planning Policy Area descriptions were applied to individual vacant and underdeveloped parcels throughout the county. The results illustrate the number of residential units that could be built in each zoning district and Planning Policy Area in the future. The results also illustrate future development using a worst-case scenario based on the maximum densities allowed for each analyzed parcel.

1. Zoning Buildout Analysis

Density requirements form the basis for the zoning buildout analysis. This information was available in the zoning designations and associated lot requirements found in the county Zoning Ordinance. For the purposes of this analysis, only the zones that permit residential development were analyzed, as residential development is the most frequent new development in the county and creates the majority of the impacts to public services and infrastructure. The analysis provides no information on the future amounts of commercial or industrial development and subsequently assumes that all zoned residential land will be developed for residential use only. The analysis also assumes that all agricultural zoned land will become residential as residential uses are allowed by right in these areas. The zones that were considered include: General Agriculture (GA), Exclusive Agriculture (XA), Rural Residential (RR), Single Family

Residential (SF), Duplex Residential (DR), Townhouse Residential (TH), Multifamily Residential (MF), and Manufactured Home Park (MHP).

The first step in the process was to identify which parcels in the county are currently zoned for residential use in one of the eight categories mentioned above. This was done using the zoning and parcel level data in the county's Geographic Information System (GIS).

The next step was to identify any vacant or underdeveloped parcels from the parcels zoned for residential use. Vacant parcels were separated into two categories – greater than two acres and less than two acres. Vacant parcels greater than two acres provide enough acreage for multiple units and potential subdivision. Vacant parcels less than two acres in size but greater than 0.1 acres were considered independently because although they may not be further subdivided, they could easily support the development of one residential unit. Therefore, each identified vacant parcel that was less than two acres was assumed to include one new unit at buildout.

Underdeveloped parcels were any parcels greater than or equal to five acres with only one existing residential unit. In the agricultural areas this definition was further expanded to include any large parcels that may contain more than one residential unit but have five acres or more for each unit. For example, a parcel that was 300 acres in size and had three houses on it would be considered underdeveloped because each house has an average lot size of 100 acres. **Table 55** below shows the acres available for development in each zoning district.

Table 55. Available Acres by Zoning District in Augusta County

Zoning District	Vacant < 2 Acres	Vacant >= 2 Acres	Under- developed >=5 Acres	Total (Acres)	Percent of Total
General Agriculture	2,385	101,889	116,315	220,589	60.73
Exclusive Agriculture	308	52,246	80,328	132,882	36.58
Rural Residential	17	2,304	4,172	6,493	1.79
Single Family Residential	534	1,154	1,174	2,862	0.79
Duplex Residential	1	0	136	137	0.04
Townhouse Residential	3	31	0	34	0.01
Multifamily	4	95	26	125	0.03
Manufactured Housing	0	102	0	102	0.03
Total	3,252	157,821	202,151	363,224	100.00

Source: Kimley-Horn and Associates, 2005.

Note: Zoning Districts only include those which permit residential uses by right.

In determining the parcels available for development in the agricultural districts, there was no consideration given to public road frontage. The reason this factor was not considered as a limit to future development was because it was assumed that road frontage could be acquired and, therefore, the current minimum road

frontage requirements would not prevent new development from occurring. Under the current regulations, lots can also be created without frontage in the general agriculture and exclusive agriculture districts under the family member exception, which allows a new lot to be created for family members.

The identified vacant and underdeveloped parcels were then reduced by 25 percent.⁴⁵ This reduction was performed to account for any zoning restrictions or other suitability issues that may limit the buildable area of a given parcel. **Table 56** shows the results of the 25 percent reduction and the amount of buildable area by acre in each zoning category.

Table 56. Buildable Acres by Zoning District in Augusta County

Zoning District	Total* (Acres)	Buildable Acres
General Agriculture	218,204	163,653
Exclusive Agriculture	132,574	99,431
Rural Residential	6,476	4,857
Single Family Residential	2,328	1,746
Duplex Residential	136	102
Townhouse Residential	31	23
Multifamily	121	91
Manufactured Housing	102	77
Total	359,972	269,980

Source: Kimley-Horn and Associates, 2005.

Note: Zoning Districts only include those which permit residential uses by right.

*: Vacant parcels less than 2 acres are not included in the total acres as they are assumed to contribute 1 new unit per parcel.

The total buildable acreage was then divided by the maximum density allowed for each district to determine the number of units allowed per parcel. For the vacant parcels less than 2 acres it was assumed that each parcel would contain one new unit and those units have been added to the total units. The total number of future units at buildout by zoning district is shown in **Table 57**. According to the current zoning regulations 278,961 new residential units could be developed in Augusta County. An estimated 95 percent of these new units would be located in areas that are currently zoned as Agriculture.

⁴⁵ This method was applied in a similar analysis conducted for Roanoke County, Virginia titled *Build-Out Analysis in GIS as a Planning Tool with a Demonstration for Roanoke County, Virginia* by Mary A. Zirkle, Virginia Tech, April 2003.

Table 57. Future Units at Buildout by Zoning District in Augusta County

Zoning District	Max Allowable Density (Units/Acre)	Buildable Acres	Units from <2 acre parcels	Total Units	Percent of Total
General Agriculture	1	163,653	2,771	166,424	59.66
Exclusive Agriculture	1	99,431	314	99,745	35.76
Rural Residential	0.5	4,857	15	2,444	0.88
Single Family Residential	3.63	1,746	1,154	7,492	2.69
Duplex Residential	5.19	102	1	530	0.19
Townhouse Residential	17.29	23	7	405	0.14
Multifamily	16	91	3	1,459	0.52
Manufactured Housing	6	77	0	462	0.16
Total	--	269,980	4,265	278,961	100.00

Source: Kimley-Horn and Associates, 2005.

Note: Zoning Districts only include those which permit residential uses by right.

The total number of units was then used to estimate future population based on the average number of persons per households. According to the 2000 Census the average number of persons per household in Augusta County was 2.56. The results of this calculation are shown in **Table 58** below. **Map 47** shows the results of the zoning buildout analysis graphically.

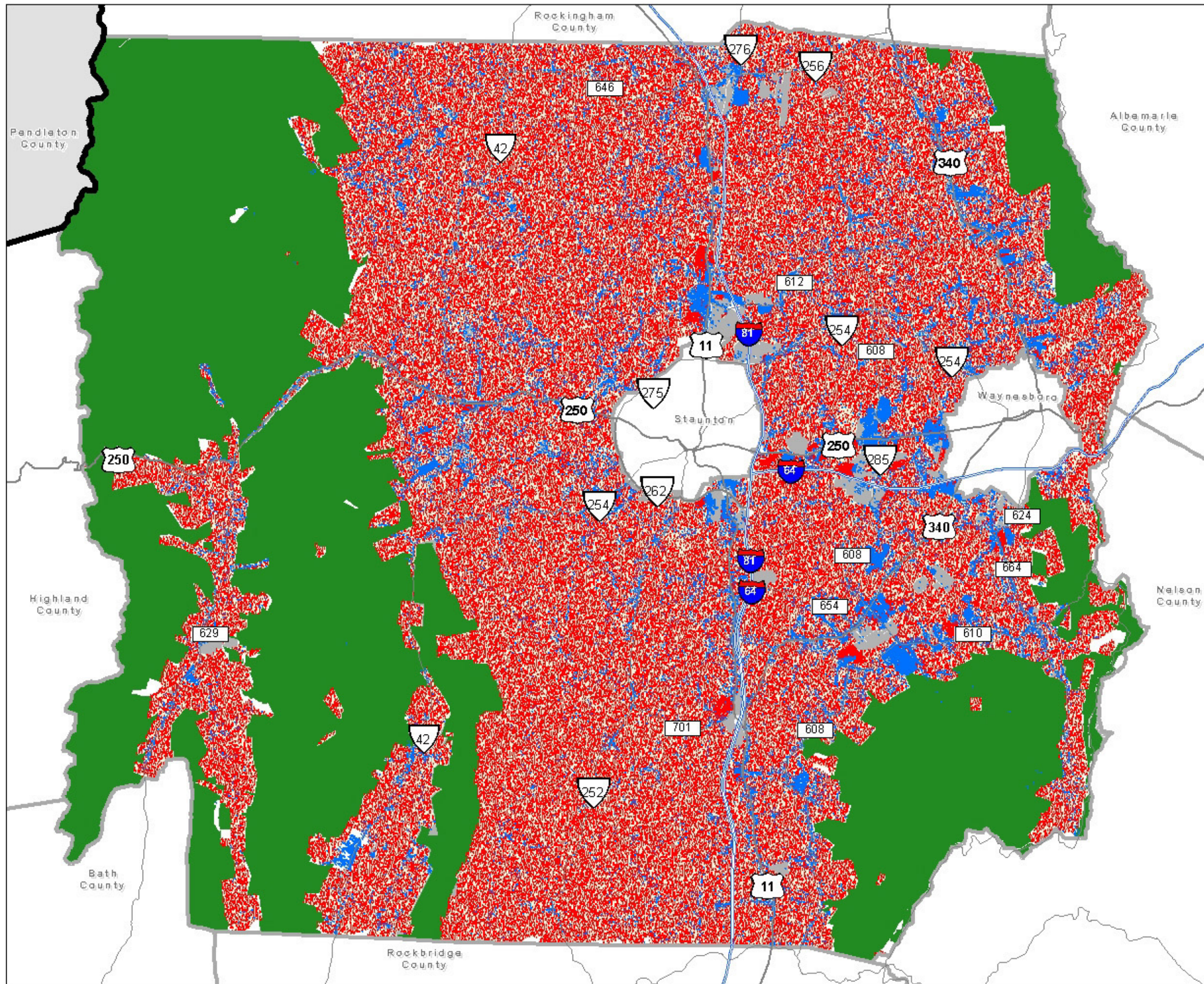
Table 58. Future Population at Buildout by Zoning District in Augusta County

Zoning District	Average Persons Per Household*	Total Units	Future Population at Buildout
General Agriculture	2.56	166,424	426,045
Exclusive Agriculture	2.56	99,745	255,347
Rural Residential	2.56	2,444	6,257
Single Family Residential	2.56	7,492	19,180
Duplex Residential	2.56	530	1,357
Townhouse Residential	2.56	405	1,037
Multifamily	2.56	1,459	3,735
Manufactured Housing	2.56	462	1,183
Total	--	278,961	714,141
Current Population			67,100
Future Total Population			781,241

Source: Kimley-Horn and Associates, 2005.

Note: Zoning Districts only include those which permit residential uses by right.

* Based on 2000 Census.



- LEGEND**
- 1 Dot = 1 New Unit
 - New Units - Existing Zoning Buildout
 - Existing Units
- Other Areas**
- Developed/Undevelopable Areas
 - Interstate
 - US Highway
 - State Highway
 - Public Land
 - West Virginia
 - State Boundaries



0 1 2 3 4 5 Miles

Source: Augusta County

Map 47
Build Out
Existing Zoning - 2521
 Augusta County
 Comprehensive Plan
 2007-2027



2. Comprehensive Plan Planning Policy Areas Buildout Analysis

The Planning Policy Area buildout analysis was conducted as a means to compare the current zoning regulations to the future land uses and densities recommended by the 1994 Comprehensive Plan. The current Plan identifies several Planning Policy Areas, each with their own proposed future land uses and densities.

It is important to understand that the policies set forth in the Comprehensive Plan are not land use regulations. These policies are not requirements for future development in the Planning Policy Areas. It is the current Zoning Ordinance that determines the type and nature of development within the Planning Policy Areas and any other zoned portion of the county. The Comprehensive Plan Planning Policy Area future land uses and densities are a set of guidelines that are referred to by the Planning Commission when considering rezoning.

The Planning Policy Area buildout includes parcels that are within the Urban Service Areas, Potential Urban Service Areas, Community Development Areas, Potential Community Development Areas, Rural Conservation Areas, and Agricultural Conservation Areas designated for a future residential use. In order to determine which parcels met these criteria, GIS was used to compare the parcel data with the mapped Planning Policy Areas and designated future land uses.

Once the residential parcels were identified the vacant and underdeveloped parcels were then selected using the same assumptions and approach as in the zoning buildout analysis. **Table 59** below shows the vacant and underdeveloped acreages in each of the Comprehensive Plan Planning Policy Areas.

Table 59. Available Acres by the 1994 Comprehensive Plan Planning Policy Area in Augusta County

Policy Area - Proposed Residential Density	Vacant < 2 Acres	Vacant >= 2 Acres	Under-developed >=5 Acres	Total (Acres)	Percent of Total
Urban Service - High	22	344	393	759	0.21
Urban Service - Medium	479	3,744	4,306	8,529	2.39
Potential Urban Service - Medium	2	34	447	483	0.14
Potential Urban Service - Low	51	2,565	2,927	5,543	1.55
Community Development - High	15	74	122	211	0.06
Community Development - Med	73	406	287	766	0.21
Community Development - Low	768	7,838	9,225	17,831	4.99
Potential Community Development - Low	99	5,215	7,669	12,983	3.64
Rural Conservation - Low	902	30,540	42,033	73,475	20.57
Ag Conservation - Low	995	102,830	132,774	236,599	66.24
Total	3,406	153,590	200,183	357,179	100.00

Source: Kimley-Horn and Associates, 2005.

After all of the developable parcels were identified the buildable area for each parcel was defined. As in the zoning buildout analysis, a reduction of 25 percent was calculated for the total acreages in each Planning Policy Area. This was done in order to consider any zoning restrictions or other suitability issues that may limit the buildable area of a given parcel. **Table 60** shows the results of the 25 percent reduction and the amount of buildable area by acre in each planning policy area.

Table 60. Buildable Acres by the 1994 Comprehensive Plan Planning Policy Area in Augusta County

Policy Area - Proposed Residential Density	Total* (Acres)	Buildable (Acres)
Urban Service - High	737	553
Urban Service - Medium	8,050	6,038
Potential Urban Service - Medium	481	361
Potential Urban Service - Low	5,492	4,119
Community Development - High	196	147
Community Development - Med	693	520
Community Development - Low	17,063	12,797
Potential Community Development - Low	12,884	9,663
Rural Conservation – Low	72,573	54,430
Ag Conservation - Low	235,604	176,703
Total	353,773	265,331

Source: Kimley-Horn and Associates, 2005.

* Vacant parcels less than 2 acres are not included in the total acres as they are assumed to contribute 1 new unit per parcel.

The total buildable acreage was then divided by the maximum density allowed for each Planning Policy Area to determine the number of units allowed per parcel. Potential Urban Service Areas and Potential Community Development Area densities were based on the policies of the next lowest category (Community Development and Rural Conservation) as designated in the Comprehensive Plan. In the Rural Conservation Areas, Agricultural Conservation Areas, Potential Urban Service Areas, and Potential Community Development Areas some parcels were not assigned future land uses. In those cases the densities from the policy descriptions in the Comprehensive Plan were utilized.

The total numbers of future units at buildout by Planning Policy Area are shown in **Table 61**. Approximately 82,521 new residential units could be developed in Augusta County according to the future land use policies. An estimated 41 percent of these new units would be located in Urban Service Areas and 23 percent would be located in the Agricultural Conservation Areas.

Table 61. Future Units at Buildout by the 1994 Comprehensive Plan Planning Policy Areas in Augusta County

Policy Area - Proposed Residential Density	Max Allowable Density (Units/Acre)	Buildable (Acres)	Units from <2 acre parcels	Total Units	Percent of Total
Urban Service - High	16.00	553	23	8,871	10.75
Urban Service - Medium	4.00	6,038	1,047	25,199	30.54
Potential Urban Service - Medium	4.00	361	6	1,450	1.76
Potential Urban Service - Low	0.50	4,119	79	2,139	2.59
Community Development - High	16.00	147	22	2,374	2.88
Community Development - Med	4.00	520	122	2,202	2.67
Community Development - Low	0.50	12,797	1,064	7,463	9.04
Potential Community Development - Low	0.20	9,663	105	2,038	2.47
Rural Conservation – Low	0.20	54,430	1,067	11,953	14.48
Ag Conservation - Low	0.10	176,703	1,162	18,832	22.82
Total	--	265,331	4,697	82,521	100.00

Source: Kimley-Horn and Associates, 2005.

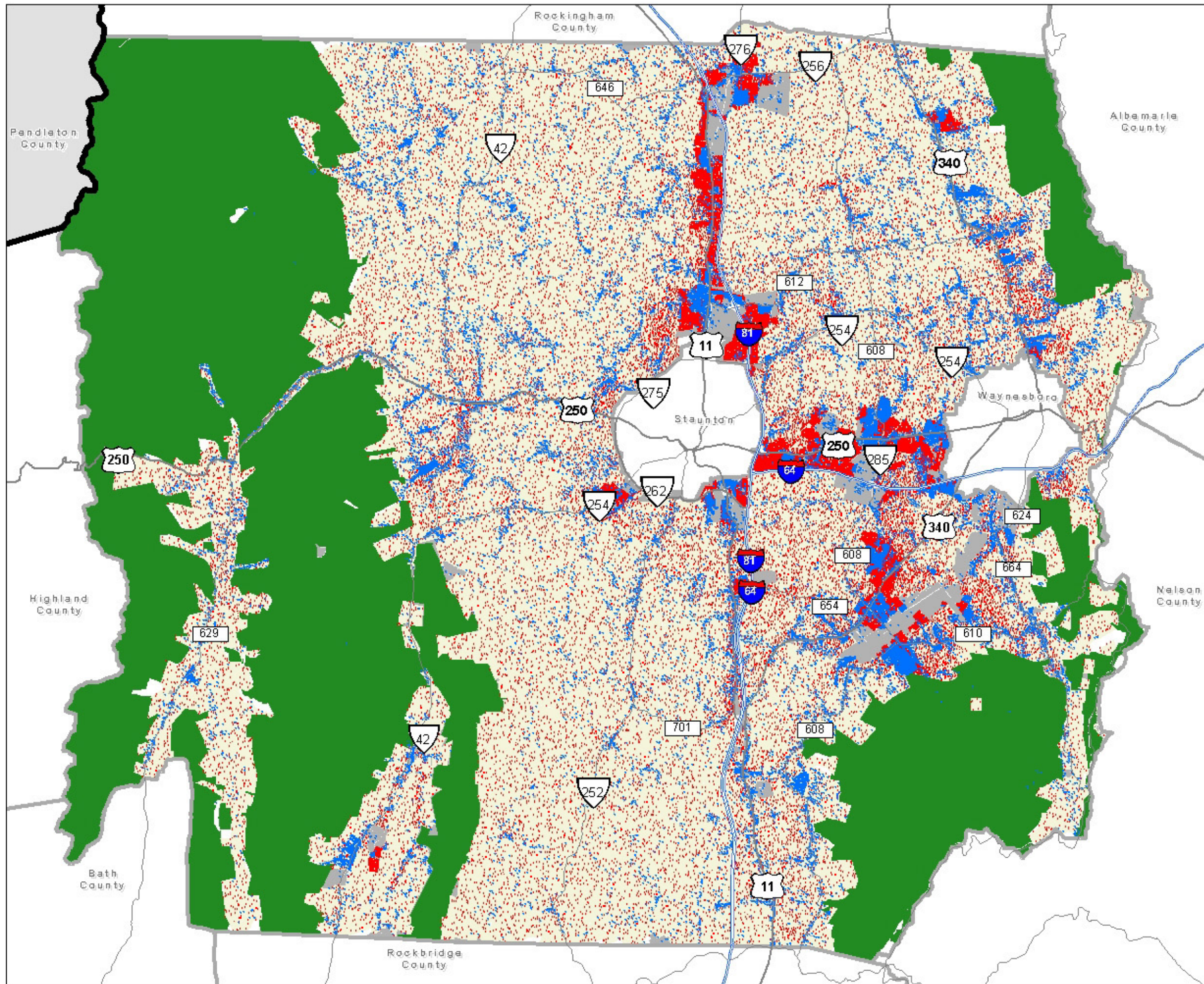
The total number of units was then used to estimate future population based on the average number of persons per households. According to the 2000 Census the average number of persons per household in Augusta County was 2.56. The results of this calculation are shown in **Table 62** below. **Map 48** illustrates graphically the results of the Planning Policy Area buildout analysis.

Table 62. Future Population at Buildout by the 1994 Comprehensive Plan Planning Policy Areas in Augusta County

Policy Area - Proposed Residential Density	Average Persons Per Household*	Total Units	Future Population at Buildout
Urban Service - High	2.56	8,871	22,710
Urban Service - Medium	2.56	25,199	64,509
Potential Urban Service – Medium	2.56	1,450	3,712
Potential Urban Service - Low	2.56	2,139	5,476
Community Development - High	2.56	2,374	6,077
Community Development - Med	2.56	2,202	5,637
Community Development - Low	2.56	7,463	19,105
Potential Community Development - Low	2.56	2,038	5,217
Rural Conservation – Low	2.56	11,953	30,600
Ag Conservation - Low	2.56	18,832	48,210
Total	--	82,521	211,253
Current Population			67,100
Future Total Population			278,353

Source: Kimley-Horn and Associates, 2005.

* Based on 2000 Census



LEGEND

- 1 Dot = 1 New Unit
- New Units - Planning Policy Areas
- Existing Units
- Other Areas
 - Developed/Undevelopable Areas
 - Interstate
 - US Highway
 - State Highway
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 - West Virginia
 - State Boundaries



0 1 2 3 4 5 Miles



Source: Augusta County

Map 48
Build Out 1994
Comprehensive Plan - 2157
 Augusta County
 Comprehensive Plan
 2007-2027



**Kimley-Horn
and Associates, Inc.**

3. Conclusions

The purpose of this analysis was to illustrate the differences between the current Zoning Ordinance and the policies of the existing Comprehensive Plan in terms of the allowable future residential development. The results of the zoning analysis illustrate how the county will develop in the future under the current land use regulations. The Planning Policy Area analysis shows how the county would like to develop based upon the policies that were created in the 1994 Comprehensive Plan.

As illustrated by the numerical data, the number of future residential units allowed under the Zoning Ordinance (278,961) is much greater than the number that would be created under the current policies of the Comprehensive Plan (82,521). It is important to note that the results of this analysis are not meant to indicate that buildout, at the levels described above, will occur within the 20 year planning period of the Comprehensive Plan Update. In fact, at the current rate of growth, based on average building permits issued per year over the last seven years (540)⁴⁶, it will take approximately 516 years to reach full buildout according to the zoning analysis and 152 years to reach full buildout according to the Planning Policy Area analysis.

The key factor contributing to the difference in the total future units are the density requirements in the Zoning Ordinance and Planning Policy Areas. The density requirements under the Zoning Ordinance allow for a greater number of residential units than under the Planning Policy Areas. In particular, when approached from a worst-case scenario standpoint for this buildout analysis, the Zoning Ordinance directs the largest amount of residential development towards the agricultural areas. This is due in large part to the amount of vacant or underdeveloped land that is zoned within those classifications, a total of 353,471 acres or 97 percent of the total available land. It is also based on the current maximum density allowance (1 unit per acre) which equates to a potential of 266,169 new residential units at buildout, approximately 95 percent of the total projected units. Comparatively, the other residential zoning categories contribute a very small amount to the total available land and future units.

The likelihood of future residential development occurring in agricultural areas is not as strong in the Planning Policy Area analysis. The amount of developable land in the agricultural areas is still higher than any other category at 310,074 acres or 87 percent of the total acres. However, the difference is that the developable density based on the Comprehensive Plan is 1 unit for every 10 acres in the Agricultural Conservation Areas and 1 unit for every 5 acres in the Rural Conservation Areas (which are intended to remain largely agricultural). This greatly reduces the potential amount of future residential development to a total of 30,785 units in both categories combined.

⁴⁶ New Housing Units 1998-2004, Augusta County Building Inspection Department , 2004 Annual Report

The Planning Policy Area analysis also shows that the Comprehensive Plan supports the location of future development in areas that are within or adjacent to existing development. According to the calculations, 51,736 of the total projected new units (63 percent) would be created in areas that already have development and appropriate infrastructure or have been determined to be suitable for development and infrastructure. This is much higher than shown in the zoning analysis.

The Planning Policy Area analysis results represent how the county will develop based upon the vision that was created with the last Comprehensive Plan in 1994. In order for this vision to be carried out fully, the Zoning Ordinance must be brought into line with the densities and future land uses described in the Comprehensive Plan. One approach to resolving the current disconnect would be to revise the Zoning Ordinance to limit development in the agricultural areas. Specifically, the county would need to address the subdivision and minimum lot size rules, which in their current form would provide virtually no limit to the amount of parcels that could be created in the agricultural areas, as evidenced in the zoning buildout analysis. Without revising the Zoning Ordinance another way to address this issue is through rezoning. Through the approval of additional residential development in the Urban Service and Community Development Areas, the county can begin to encourage development in patterns that are more consistent with the policies of the Comprehensive Plan. If the county were not to approve any further rezonings, the development would occur at the level described by the findings of the zoning buildout analysis, which is very different from the results of the Planning Policy Area analysis and the tenets of the Comprehensive Plan.

4. Future Planning Issues

Based on the results of the buildout analysis the following planning issues have been identified:

- The policies and future land uses that have been identified in the current plan for the Planning Policy Areas need to be reevaluated. Do the existing policies accurately support the future growth vision of the county?
- Further consideration should be given to the relationship between the growing demand for residential development and the Planning Policy Area densities. How should the density requirements be revised to support the Comprehensive Plan?
- Directing the location of new development by restricting available land through density limits may artificially increase the cost of land in the county. How can the county direct future growth toward targeted areas without greatly increasing the cost of living?

- A revision of the Zoning Ordinance might be required in order to bring the land use regulations in line with the goals of the Comprehensive Plan. How can the county incorporate the goals of the Comprehensive Plan into the land use regulations?