



# Webster County

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Land Use Master Plan 2013



The Webster County Courthouse in Webster County, West Virginia  
(Photo by Tim Kiser)

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## Executive Summary

This Land Use Master Plan (LUMP) conveys information on Webster County's current demographic and geographic status. This plan will be used to evaluate the potential of post-mine sites for development, and evaluate Webster County's investment position.

Senate Bill (SB) 603 mandates the development of a LUMP by counties with surface mining operations. The LUMP will be an effective tool towards achieving Webster County's development goals. The Nick J. Rahall Appalachian Transportation Institute (RTI) will coordinate with the Office of Coalfield Community Development to provide this essential information. To the knowledge of the researchers Webster County has not undertaken serious post-mine development. This plan will help Webster take advantage of its post-mine sites.

Webster County has continually lost population since 1980. The county's median age and age distribution are average for the state, and indicate a population capable of productivity in the labor force. The population is also projected to decrease past 2030.

Employment consists mainly of Government services; Trade, Transportation, and Utilities; Education and Health Services; and Natural Resources and Mining. Government and natural resources are the major wage contributors: Government due to the sheer size of the sector in Webster County, and natural resources and mining because of the highly technical and therefore

lucrative mining support activities. Even as Webster County total wages have been on the rise, the labor force is only about half of the specified population. Of particular note is the amount of income, as opposed to wages, derived from government transfers. Forty-one percent of Webster County income is from government transfers. Alas, Webster County is not alone in this situation, as West Virginia finds many of its counties deriving almost a third of their incomes from government transfers.

Webster County's total enrollment has dropped continuously from 2002 to 2012, due to the falling population. Webster County's dropout rate is about average for the state. Webster County's residents have relatively poor education achievement overall, with almost a third of residents not having a high school education or equivalent.

Utility prices are varied throughout the county, and this plan provides municipal and private rates for electricity, sewer, and water. Broadband, an increasingly important utility in the age of globalization, is highlighted to show the necessity for improvement and access, and showcase the developable properties of this utility.

Transportation is an important issue in any development strategy. Webster County has no interstate, no US Routes, and no airport. Its rail system, because of Webster's status as a coal generating county, is extensive.

Webster County also has seven historic sites in the National Register and several pieces

of historic architecture designated by the state. Historic preservation can be a basis for tourism, cultural identity, and community cohesion.

This plan also reviews energy and environmental issues in Webster County. The environment of the county should be considered in an overall development strategy. Webster County is heavily forested and contains a national forest, a state park, and several wildlife management areas. Webster County is also not on the list of air pollution non-attainment areas, which is positive. Webster County is within a favorable site for Marcellus Shale development, and is active in the production of wood byproducts, a major renewable resource. Half of the county is also favorable to EGS geothermal development.

This information is as critical as the site information for several reasons. One is that development is not a process that can occur in a vacuum. Without understanding the resources available in the county, and the demand for more investment, money will end up wasted. Another is that investment requires active partners who will need information on each of the county's essential demographic topics to determine their level of risk. Without this, investors will not be persuaded to enter the county. Finally, this information can help policy makers target their land use strategies to any of these topics, as long as they understand the situation.

Site analysis is integral to this report. Researchers identified all the post mine sites

given certain criteria for Webster County. The researchers created a distance analysis using a scoring system based on distance to certain essential utilities and features, summed the scores, and plotted each score for each mine site. A workforce analysis was conducted to determine available labor within certain radii for each site, and a retail analysis was conducted to determine which areas had the most retail activity.

The top five mine sites were then identified, and are displayed individually. Map A contains the sites available in a view of the county.

The tables below are comprehensive comparisons of the five post-mine sites. In Tables A and B, distances and total scores are compared between sites, providing an idea of the more suitable sites under a considered criterion. For example, if we want to look for a site which is located closest to power lines, the answer is site ranking #1, permit ID S201492. However, if we wanted the site closer to an interstate, the best site is site ranking #5, permit ID S200302.

Table C explains how each criterion contributes to the final total score and importance of the weights. Because of the assumption that one criterion may be more important than others (different weights), the site with higher absolute and relative scores is still able to receive a smaller total score than others.

**Table A: Distances comparison between top five sites for potential development**

<b>Suitability Ranking</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Weight</b>
Existing Highway	3.05	4.47	3.80	8.49	9.32	<b>8</b>
Proposed Highway	58.77	59.31	58.77	58.30	58.66	<b>9</b>
Intermodal Terminal Facilities	65.61	67.03	66.36	63.20	64.03	<b>6</b>
Interstate	25.21	24.45	25.96	23.54	21.56	<b>8</b>
National Waterway Network Ports	99.23	99.12	98.64	98.05	97.53	<b>5</b>
Sewer Treatment Facilities	10.74	12.16	11.49	12.29	13.12	<b>7</b>
Solid Waste Treatment Facilities	14.60	16.04	15.35	12.26	13.09	<b>8</b>
Tri-state Airport	106.87	106.79	106.30	105.71	105.21	<b>3</b>
Yeager Airport	81.13	80.38	81.89	79.46	77.49	<b>3</b>
Broadband	0.44	0.90	1.15	1.36	0.61	<b>9</b>
Gas Pipes	10.17	10.45	9.87	9.28	9.32	<b>6</b>
National Waterway Network	40.73	41.03	40.45	39.86	39.85	<b>4</b>
Power Lines	2.50	3.18	3.18	3.47	4.38	<b>10</b>
Oil Pipes	7.32	7.76	7.19	6.65	6.89	<b>6</b>
Railroad	2.01	2.31	2.67	3.21	3.71	<b>5</b>
Sewer Lines	2.00	2.53	2.71	3.10	3.95	<b>8</b>
Water Lines	0.45	1.02	1.16	1.62	2.42	<b>10</b>

**Table B: Total score comparison between top five sites for potential development**

<b>Suitability Ranking</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Weight</b>
Existing Highway	80	80	80	42	28	<b>8</b>
Proposed Highway	6.75	6.75	6.75	9	9	<b>9</b>
Intermodal Terminal Facilities	4.5	4.5	4.5	6	6	<b>6</b>
Interstate	2	4	2	4	6	<b>8</b>
National Waterway Network Ports	2.5	2.5	3.75	3.75	5	<b>5</b>
Sewer Treatment Facilities	35	35	35	26.25	26.25	<b>7</b>
Solid Waste Treatment Facilities	30	18	18	40	40	<b>8</b>
Tri-state Airport	1.5	1.5	2.25	2.25	3	<b>3</b>
Yeager Airport	1.5	1.5	0.75	1.5	2.25	<b>3</b>
Broadband	90	67.5	45	45	67.5	<b>9</b>
Gas Pipes	15	15	31.5	42	31.5	<b>6</b>
National Waterway Network	3	2	3	4	4	<b>4</b>
Power Lines	100	100	100	100	75	<b>10</b>
Oil Pipes	31.5	31.5	31.5	42	42	<b>6</b>
Railroad	50	37.5	37.5	25	12.5	<b>5</b>
Sewer Lines	80	80	80	80	60	<b>8</b>
Water Lines	100	100	100	100	75	<b>10</b>
<b>Total Score</b>	633.25	587.25	581.5	572.75	493	

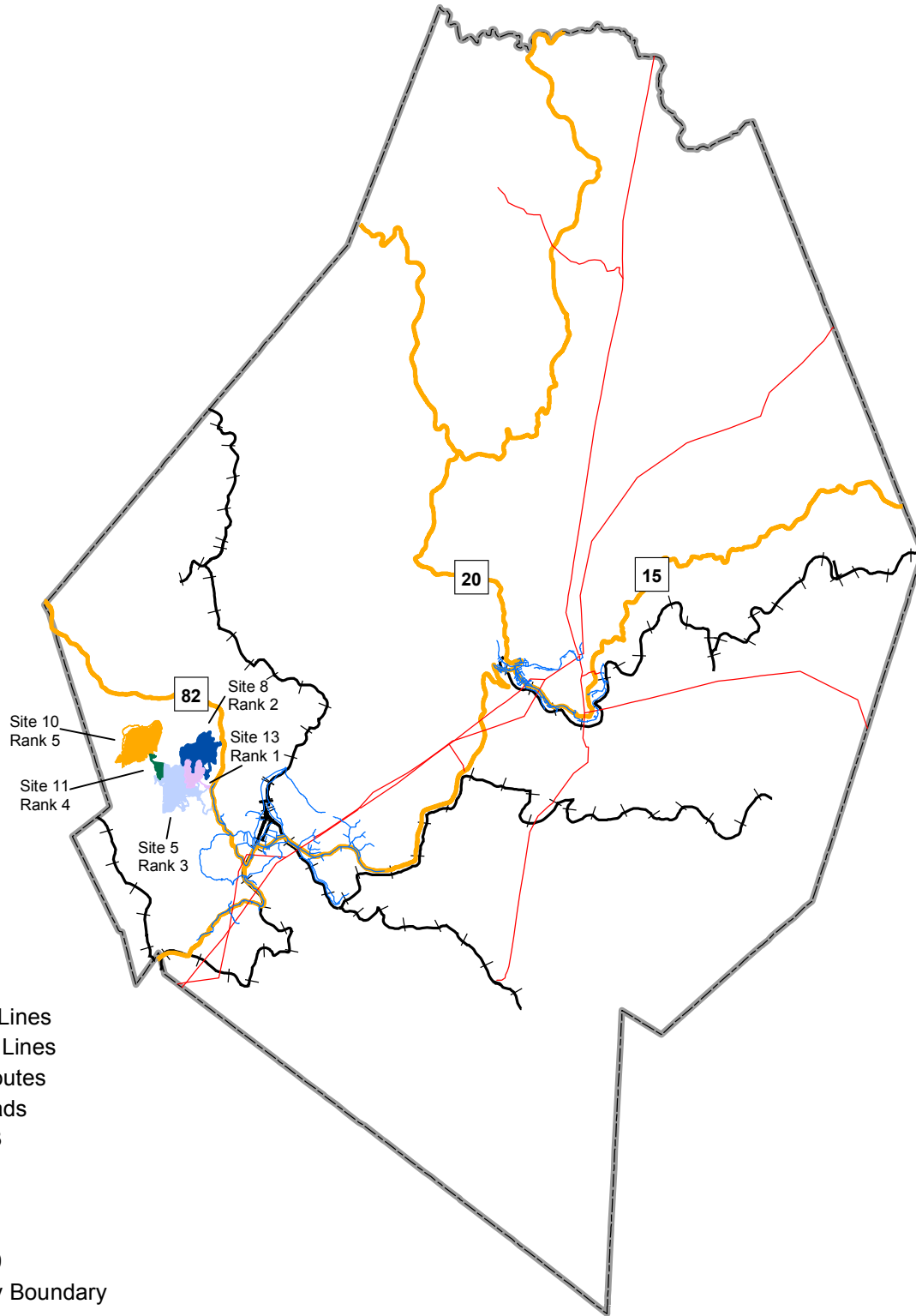
**Table C: Absolute/relative score comparison between top five sites for potential development**

<b>Suitability Ranking</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Weight</b>
Existing Highway	10	10	10	7	7	<b>8</b>
Proposed Highway	1	1	1	1	1	<b>9</b>
Intermodal Terminal Facilities	1	1	1	1	1	<b>6</b>
Interstate	1	1	1	1	1	<b>8</b>
National Waterway Network Ports	1	1	1	1	1	<b>5</b>
Sewer Treatment Facilities	5	5	5	5	5	<b>7</b>
Solid Waste Treatment Facilities	5	3	3	5	5	<b>8</b>
Tri-state Airport	1	1	1	1	1	<b>3</b>
Yeager Airport	1	1	1	1	1	<b>3</b>
Broadband	10	10	10	10	10	<b>9</b>
Gas Pipes	5	5	7	7	7	<b>6</b>
National Waterway Network	1	1	1	1	1	<b>4</b>
Power Lines	10	10	10	10	10	<b>10</b>
Oil Pipes	7	7	7	7	7	<b>6</b>
Railroad	10	10	10	10	10	<b>5</b>
Sewer Lines	10	10	10	10	10	<b>8</b>
Water Lines	10	10	10	10	10	<b>10</b>
<b>Total Absolute Score</b>	89	87	89	88	88	
<b>Suitability Ranking</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Weight</b>
Existing Highway	10	10	10	7.5	5	<b>8</b>
Proposed Highway	7.5	7.5	7.5	10	10	<b>9</b>
Intermodal Terminal Facilities	7.5	7.5	7.5	10	10	<b>6</b>
Interstate	2.5	5	2.5	5	7.5	<b>8</b>
National Waterway Network Ports	5	5	7.5	7.5	10	<b>5</b>
Sewer Treatment Facilities	10	10	10	7.5	7.5	<b>7</b>
Solid Waste Treatment Facilities	7.5	7.5	7.5	10	10	<b>8</b>
Tri-state Airport	5	5	7.5	7.5	10	<b>3</b>
Yeager Airport	5	5	2.5	5	7.5	<b>3</b>
Broadband	10	7.5	5	5	7.5	<b>9</b>
Gas Pipes	5	5	7.5	10	7.5	<b>6</b>
National Waterway Network	7.5	5	7.5	10	10	<b>4</b>
Power Lines	10	10	10	10	7.5	<b>10</b>
Oil Pipes	7.5	7.5	7.5	10	10	<b>6</b>
Railroad	10	7.5	7.5	5	2.5	<b>5</b>
Sewer Lines	10	10	10	10	7.5	<b>8</b>
Water Lines	10	10	10	10	7.5	<b>10</b>
<b>Total Relative Score</b>	130	125	127.5	140	137.5	



# Top Five Sites for Potential Development

## Webster County



- Water Lines
- Power Lines
- WV Routes
- Railroads
- Site 13
- Site 8
- Site 5
- Site 11
- Site 10
- County Boundary

0 1.25 2.5 5 7.5 10 Miles

Source: Rahall Transportation Institute Analysis 2013

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### Site's General Info

Permittee	Icg Eastern, Llc
Facility Name	Jacks Run Valley Fills No. 2
Permit ID	S201492
Issue Date	10/14/1992
Expiration Date	10/14/2017
Current Acres	179.8
Lat	38° 26' 08.0000"
Long	80° 35' 25.0000"
Nearest Post Office	Cowen

Site Number	<b>13</b>
Suitability Ranking	<b>1</b>
Total Score	<b>633.25</b>

### Distance Analysis Results

Existing Highway	3.05
Proposed Highway	58.77
Intermodal Terminal Facilities	65.61
Interstate	25.21
National Waterway Network Ports	99.23
Sewer Treatment Facilities	10.74
Solid Waste Treatment Facilities	14.60
Tri-state Airport	106.87
Yeager Airport	81.13
Broadband	0.44
Gas Pipes	10.17
National Waterway Network	40.73
Power Lines	2.50
Oil Pipes	7.32
Railroads	2.01
Sewer Lines	2.00
Water Lines	0.45



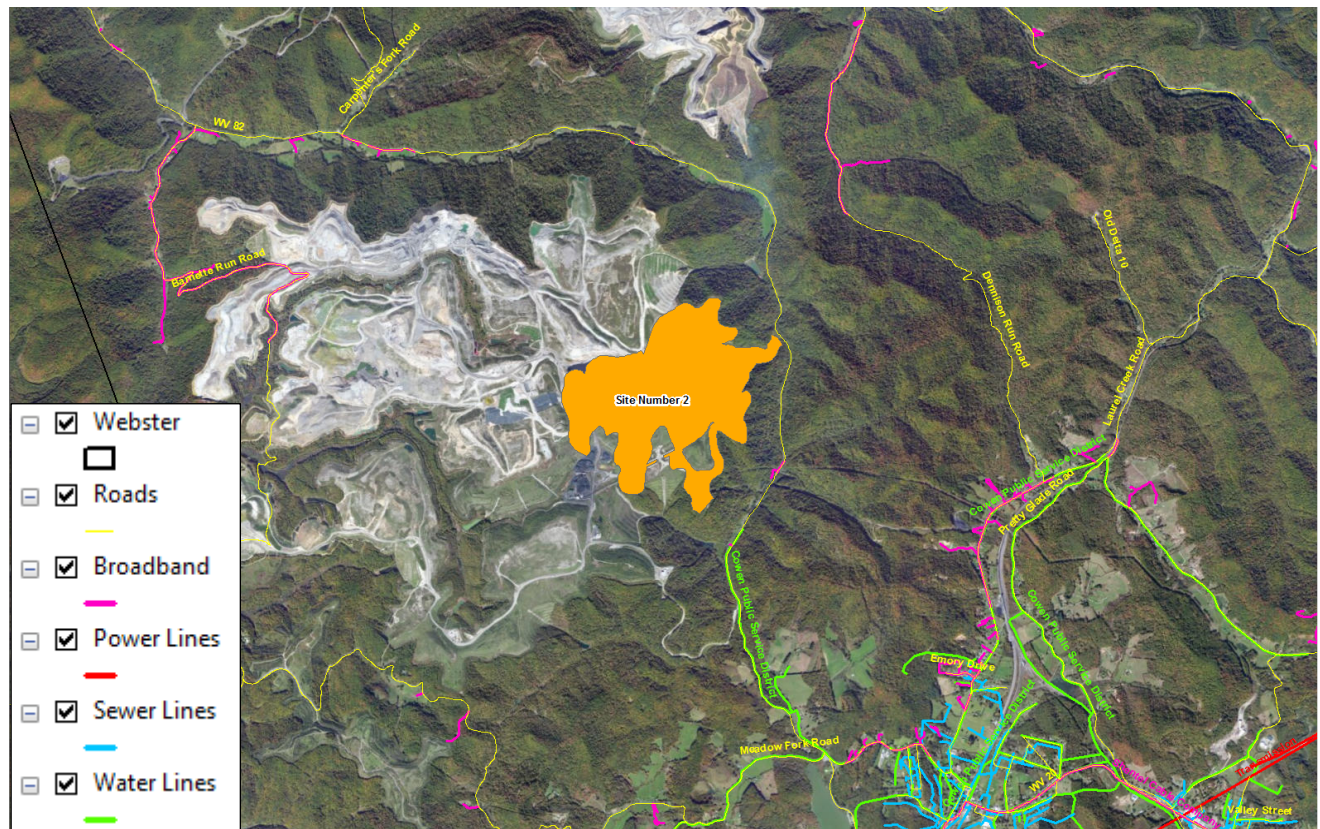
### Site's General Info

Permittee	Icg Eastern, Llc
Facility Name	Unknown
Permit ID	S024076
Issue Date	10/29/1976
Expiration Date	1/4/2013
Current Acres	588
Lat	38° 26' 46.0000"
Long	80° 35' 32.0000"
Nearest Post Office	Cowen

Site Number	<b>8</b>
Suitability Ranking	<b>2</b>
Total Score	<b>587.25</b>

### Distance Analysis Results

Existing Highway	4.47
Proposed Highway	59.31
Intermodal Terminal Facilities	67.03
Interstate	24.45
National Waterway Network Ports	99.12
Sewer Treatment Facilities	12.16
Solid Waste Treatment Facilities	16.04
Tri-state Airport	106.79
Yeager Airport	80.38
Broadband	0.90
Gas Pipes	10.45
National Waterway Network	41.03
Power Lines	3.18
Oil Pipes	7.76
Railroads	2.31
Sewer Lines	2.53
Water Lines	1.02



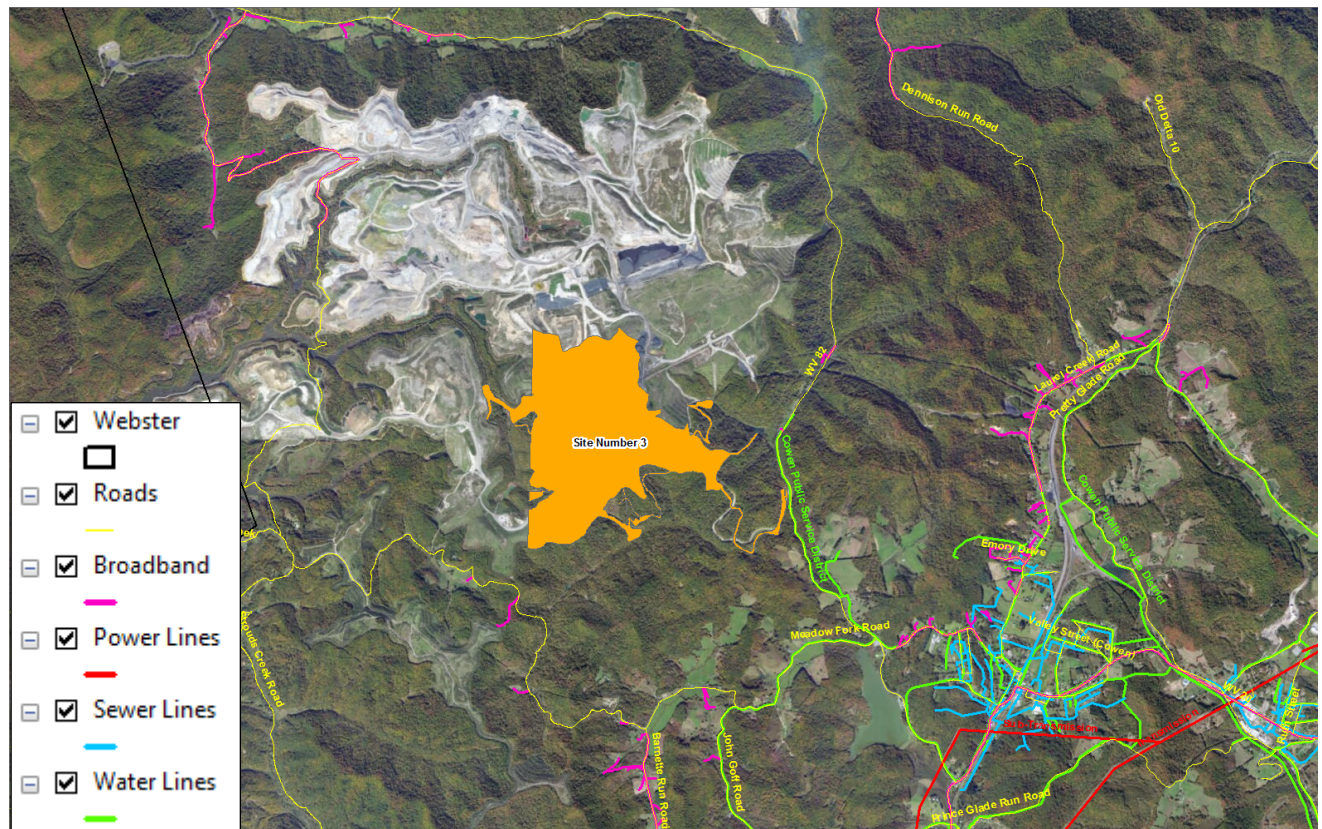
### Site's General Info

Permittee	Icg Eastern, Llc
Facility Name	Unknown
Permit ID	S003576
Issue Date	2/6/1976
Expiration Date	1/4/2018
Current Acres	605
Lat	38° 26' 29.0000"
Long	80° 36' 04.0000"
Nearest Post Office	Unknown

Site Number	<b>5</b>
Suitability Ranking	<b>3</b>
Total Score	<b>581.50</b>

### Distance Analysis Results

Existing Highway	3.80
Proposed Highway	58.77
Intermodal Terminal Facilities	66.36
Interstate	25.96
National Waterway Network Ports	98.64
Sewer Treatment Facilities	11.49
Solid Waste Treatment Facilities	15.35
Tri-state Airport	106.30
Yeager Airport	81.89
Broadband	1.15
Gas Pipes	9.87
National Waterway Network	40.45
Power Lines	3.18
Oil Pipes	7.19
Railroads	2.67
Sewer Lines	2.71
Water Lines	1.16



### Site's General Info

Permittee	Icg Eastern, Llc
Facility Name	Knight-Ink No. 2 Surface Mine
Permit ID	S200498
Issue Date	7/29/1998
Expiration Date	7/29/2008
Current Acres	89
Lat	38° 26' 20.0000"
Long	80° 36' 43.0000"
Nearest Post Office	Cowen

Site Number	<b>11</b>
Suitability Ranking	<b>4</b>
Total Score	<b>572.75</b>

### Distance Analysis Results

Existing Highway	8.49
Proposed Highway	58.30
Intermodal Terminal Facilities	63.20
Interstate	23.54
National Waterway Network Ports	98.05
Sewer Treatment Facilities	12.29
Solid Waste Treatment Facilities	12.26
Tri-state Airport	105.71
Yeager Airport	79.46
Broadband	1.36
Gas Pipes	9.28
National Waterway Network	39.86
Power Lines	3.47
Oil Pipes	6.65
Railroads	3.21
Sewer Lines	3.10
Water Lines	1.62



### Site's General Info

Permittee	Icg Eastern, Llc
Facility Name	O'Brien Fork #1 Surface Mine
Permit ID	S200302
Issue Date	12/17/2003
Expiration Date	12/17/2013
Current Acres	593.3
Lat	38° 27' 00.0000"
Long	80° 37' 18.0000"
Nearest Post Office	Tioga

Site Number	<b>10</b>
Suitability Ranking	<b>5</b>
Total Score	<b>493</b>

### Distance Analysis Results

Existing Highway	9.32
Proposed Highway	58.66
Intermodal Terminal Facilities	64.03
Interstate	21.56
National Waterway Network Ports	97.53
Sewer Treatment Facilities	13.12
Solid Waste Treatment Facilities	13.09
Tri-state Airport	105.21
Yeager Airport	77.49
Broadband	0.61
Gas Pipes	9.32
National Waterway Network	39.85
Power Lines	4.38
Oil Pipes	6.89
Railroads	3.71
Sewer Lines	3.95
Water Lines	2.42



## **I. Introduction**

Senate Bill (SB) 603, passed in the 2001 Legislative Session, mandates the development of a Land Use Master Plan (LUMP) by counties with surface mining operations. The creation of a LUMP would facilitate the development of economic or community assets, secure developable land and infrastructure, and ensure that post-mining land use proposed in any reclamation plan is in compliance with the specified land use in the approved LUMP. In order to promote acceptable principles of smart growth within the desired community it has become evident that a sustainable land use plan is needed to determine development needs within a community. The detailed document addresses the physical development needs of properties within the coalfield counties and provides guidelines, strategies, and a framework for future decisions relating to land use and projected community needs.

The 1977 Surface Mining Control and Reclamation Act established a program for the regulation of surface mining activities and the reclamation of coal-mined lands. The Act requires that coal operators minimize the disturbance and adverse impact on the environment and community in addition to restoring the mined property to its approximate original contour. Special provisions are granted for operators who offer development plans for post-mining land use, in which the coal operators (private sector) make capital investments towards land development that would benefit the community (public sector) affected by the mining operations. This unique opportunity, also known as Public-Private Partnership (P3), has far-reaching consequences on those communities with coal mining operations. The operators utilize the LUMP, created by the county officials with post-mine land use in mind, to gain insight into the land and infrastructure needs of the local community and then materialize the development opportunities described in the LUMP. The LUMP leverages private investment to facilitate public development, which is critical to the sustainability of counties and communities. Community sustainability requires a transition from poorly managed land to land-use planning practices that create and maintain efficient infrastructure, ensure close-knit neighborhoods and sense of community, and preserve our natural systems.

RTI, a nationally recognized center of excellence for rural transportation research, was established through the Transportation Equity Act for the 21st Century passed by Congress in 1998 and is funded through a grant from the Research and Innovative Technology Administration (RITA) of the US Department of Transportation. As a University Transportation Center, RTI has cultivated relationships with private industry and public agencies to leverage resources, technology and strategic thinking to improve mobility and to stimulate economic development. RTI has taken the lead in conducting site-specific research, supporting multimodal planning and analysis to improve mobility and global connectivity for rural regions. The Office of Coalfield Community Development (OCCD) was created by the 1999 Legislative Session to assist communities affected by surface mining activity throughout the State. With the passage of SB 603 in 2001, the responsibilities of the OCCD changed to include working with local economic development agencies to develop land use master plans and include the

recommendations of local economic redevelopment authorities in the reclamation plans of surface mine permits. The OCCD established criteria to consider development of these sites, provided for certain land uses as post-mining land uses and stipulated that master plans must comport to environmental reclamation requirements. The office allows existing and future surface mining permits to include master plan criteria and reclamation standards.

This plan provides information and analysis specifically for Webster County. Webster County's economy is typical of coalfield counties, with Government, Natural Resources, and Trade Transportation and Utilities making up the bulk of employment and wages. The resulting combination has led to a constant increase in total wages. However, this has not translated to a complete success, as the population continues to decrease, age, and lack varied job opportunities. This plan will put focus on these issues, encouraging an analysis of the range of options available to policymakers, including land use planning.

## **II. Planning Area**

Webster County was formed in 1860, three years before West Virginia became a state. It was named for Daniel Webster, twice United States Secretary of State and a Senator from Massachusetts. The county had, and has, vast natural resources that were used during the Industrial Age. As with many of the coalfield counties, the boom from natural resource extraction brought people and money to the area, but through the Great Depression and the withdrawal of many natural resource industries, Webster began to slip. Some indications show a recovery in the natural resources sector, but other indications reveal troubled times.<sup>1</sup>

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<sup>1</sup> Kirk, Brandon Ray, "Webster County," *The West Virginia Encyclopedia*, Accessed June 5, 2013, <http://www.wvencyclopedia.org/articles/949>.



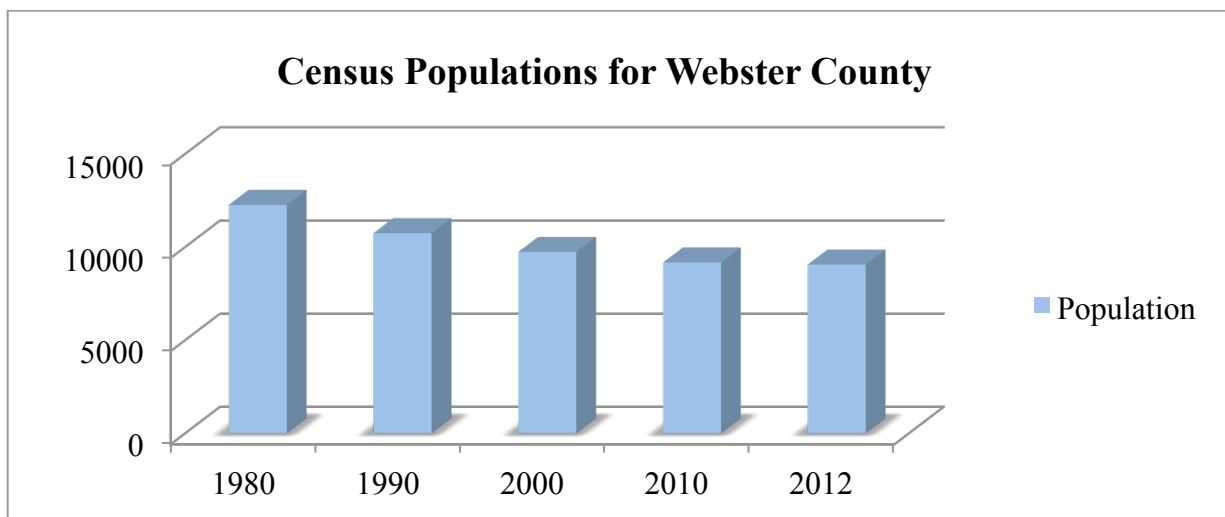
### III. Existing Conditions

This information will provide a background understanding of the demographic trends in the county. This base information is meant to provide overall detail on Webster County's status as it stands. Part IV will deal with possible future site development information, to be considered with the demographic data to target strategies for investment.

#### Population

The population of Webster County in 2011 was 9,202 according to the 2011 American Community Survey (ACS) 5-year estimates, ranking it 47<sup>th</sup> in county population among the 55 counties in West Virginia.<sup>2</sup> The decennial censuses show that Webster County steadily lost population, and records indicate the fall in population stretches back to 1940. However, population appears to be leveling out, and fewer residents have moved away over the past decade.

**Figure 1**



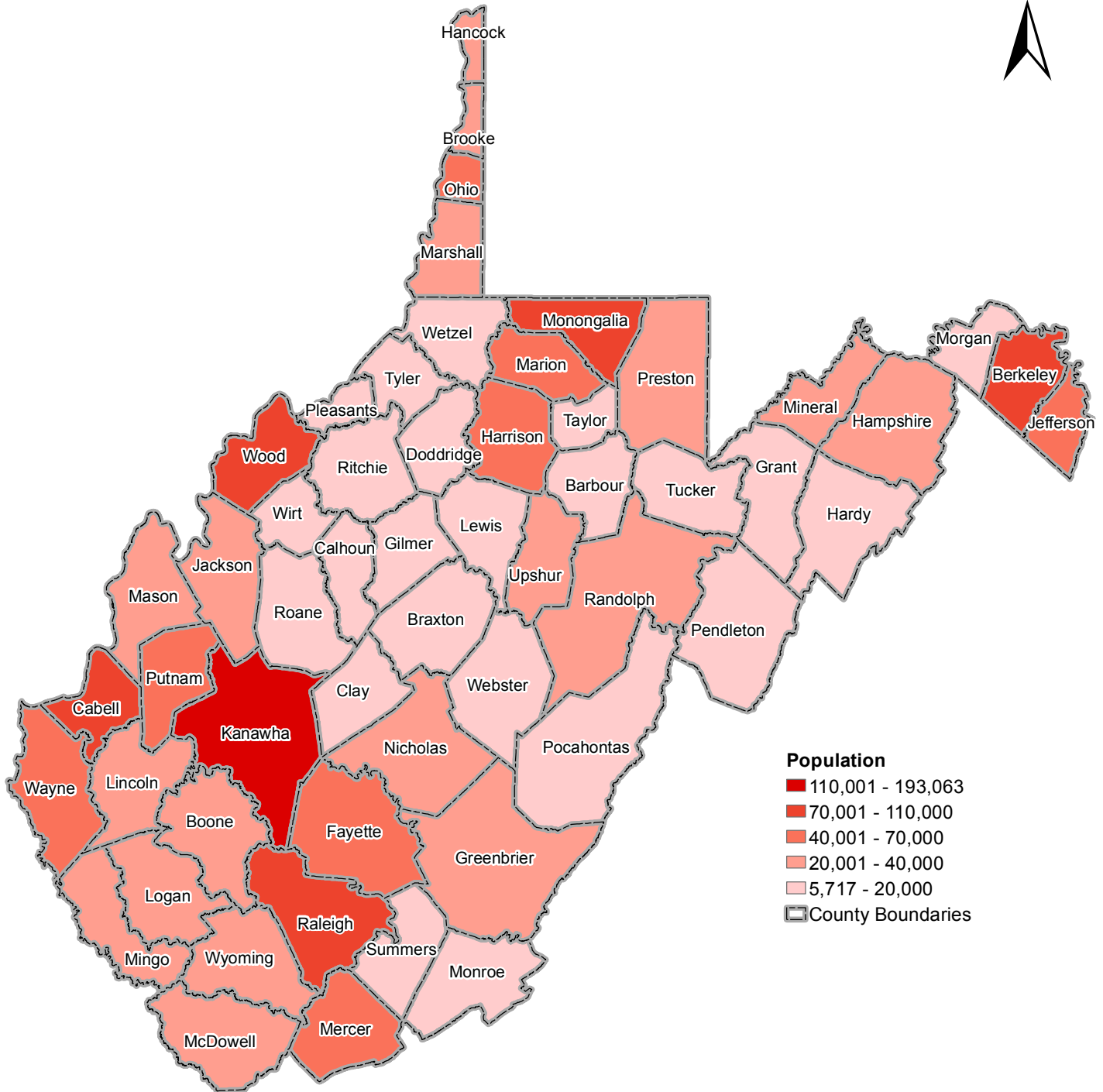
Source: Stats Indiana, USA Counties in Profile

Map 1 illustrates the Webster County population compared to West Virginia overall. Webster is at the lowest end of the spectrum, making it one of the most rural counties in West Virginia.

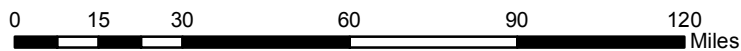
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<sup>2</sup> United States Census Bureau, "2011 American Community Survey 5-year Estimates," Accessed April 20, 2013, [www.factfinder2.census.gov](http://www.factfinder2.census.gov)

# Demographic Population



**Population**  
 ■ 110,001 - 193,063  
 ■ 70,001 - 110,000  
 ■ 40,001 - 70,000  
 ■ 20,001 - 40,000  
 ■ 5,717 - 20,000  
 □ County Boundaries



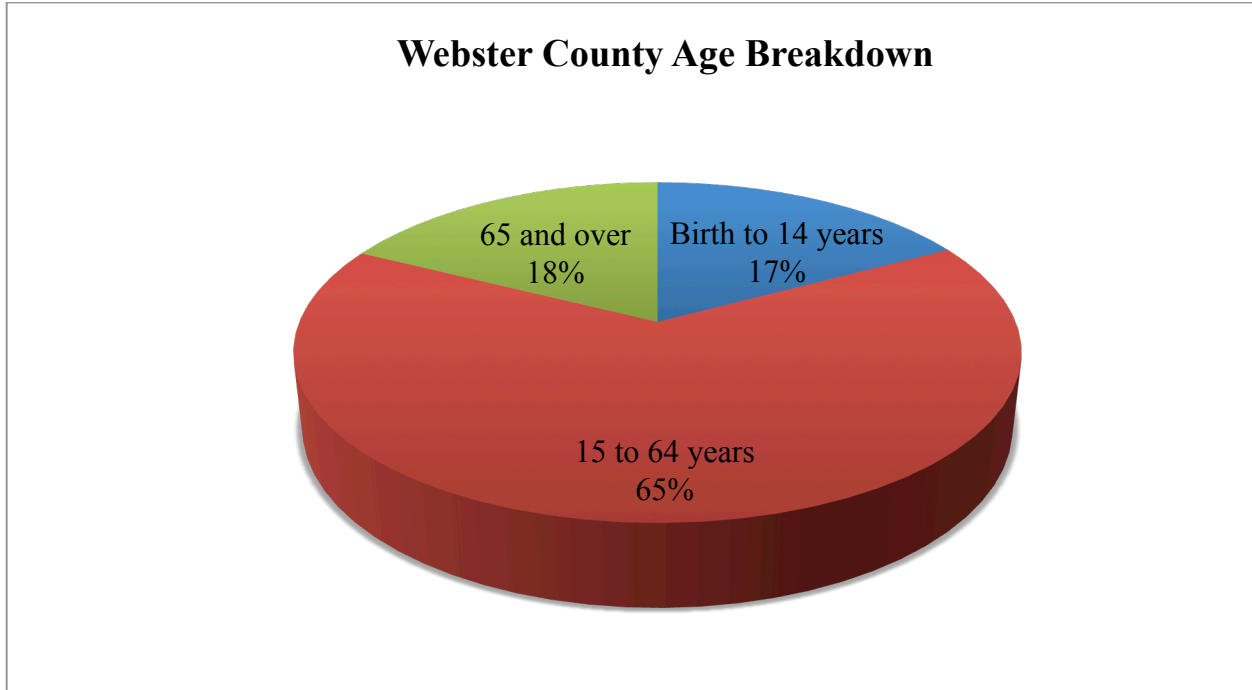
Source: United States Census Bureau 2011

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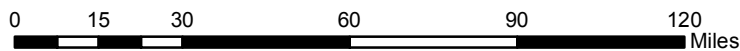
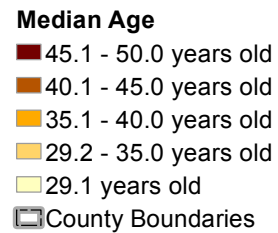
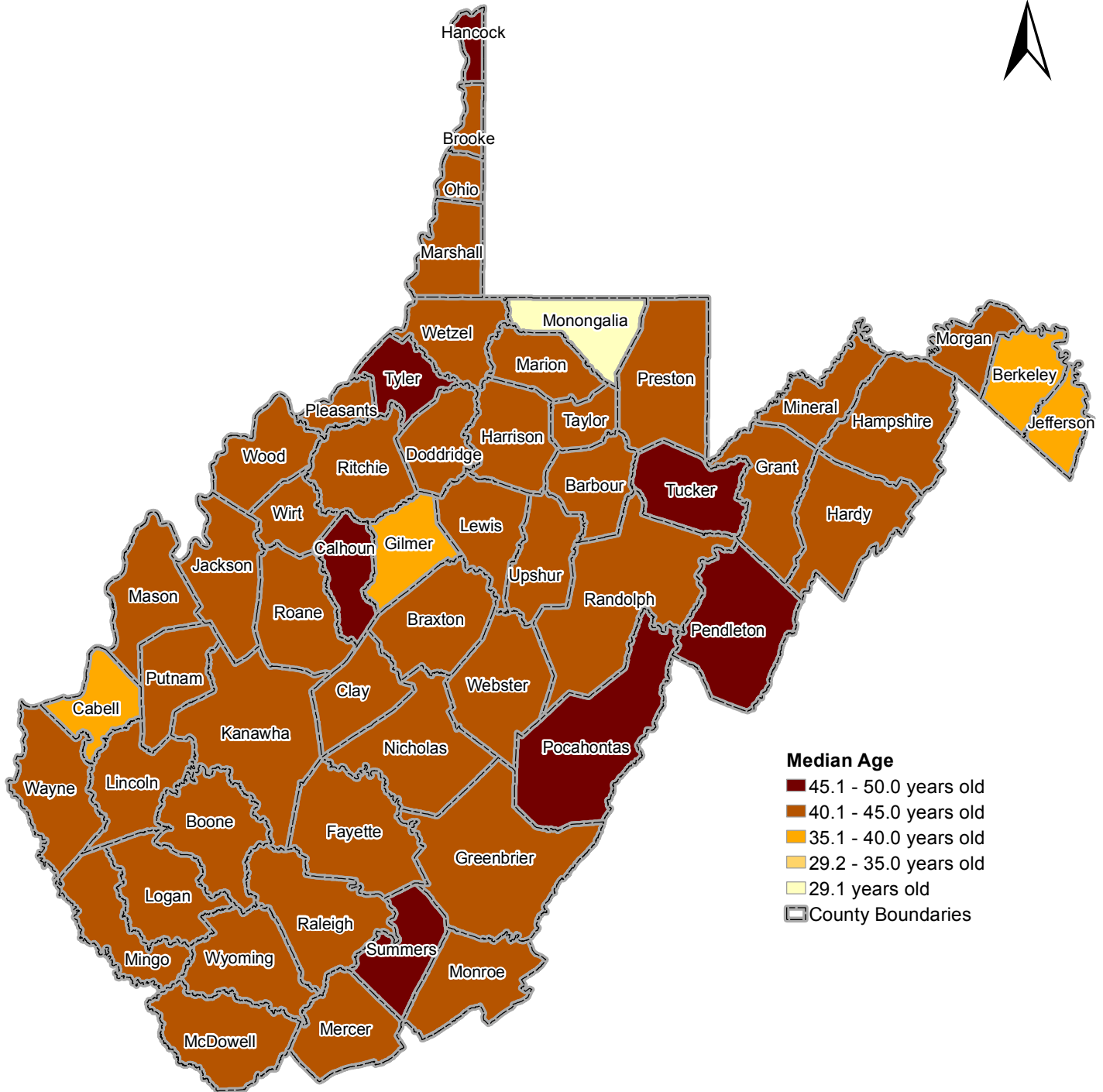
According to the ACS, almost 25 percent of Webster County residents are 60 years of age and over, while almost 16 percent are between 5 and 17 years of age and almost 6 percent are below the age of 5. As a result, approximately 2,000 people are of retirement age. The median age in Webster is 44, which is the same as the West Virginian median age (Map 2). The majority of the population is of working age, as denoted in Figure 2.

**Figure 2**



Source: 2011 American Community Survey 5-Year Estimate Calculation

# Demographic Median Age



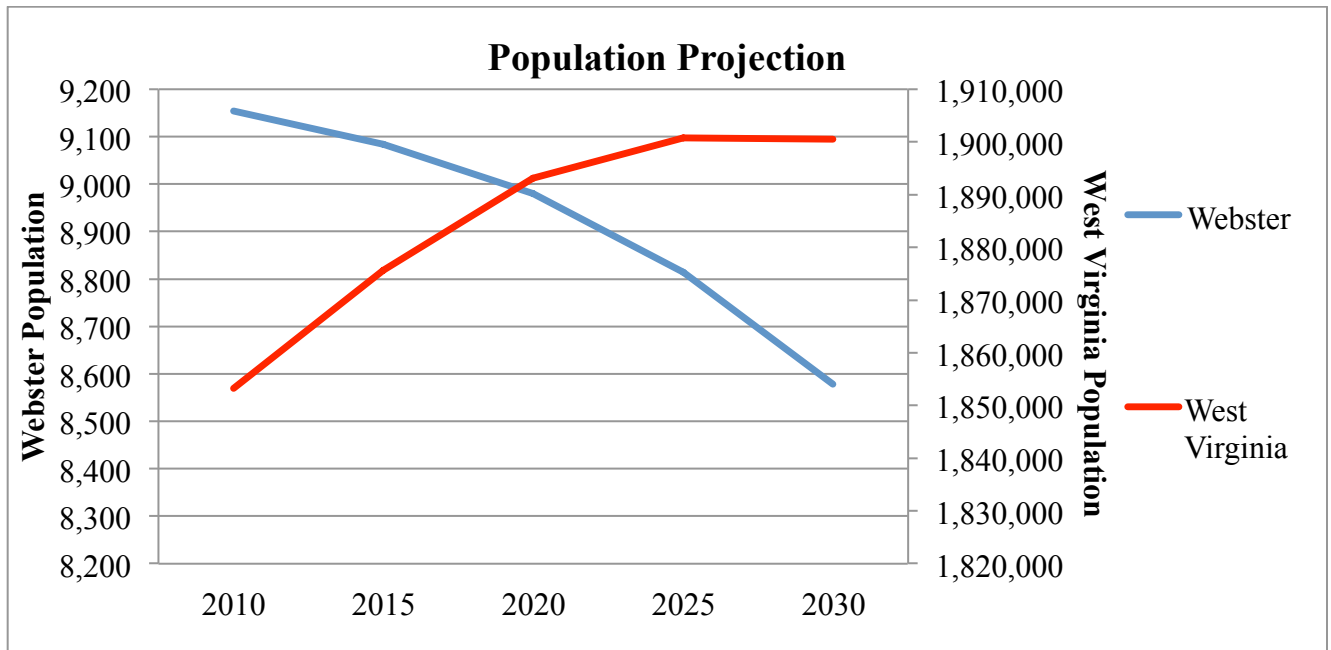
Source: United States Census Bureau 2011

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The Bureau of Business and Economic Research at West Virginia University projects a 6.3 percent decrease in the Webster County population between 2010 and 2030, which is significantly different from the projected growth of West Virginia.<sup>3</sup> The model for the projection is based on past population patterns and statistics, and should not be taken as permanent. The projected decrease is derived from the consistent decrease from 1980 to 2012 and the lack of any noticeable increase in between these census and ACS years.

**Figure 3**



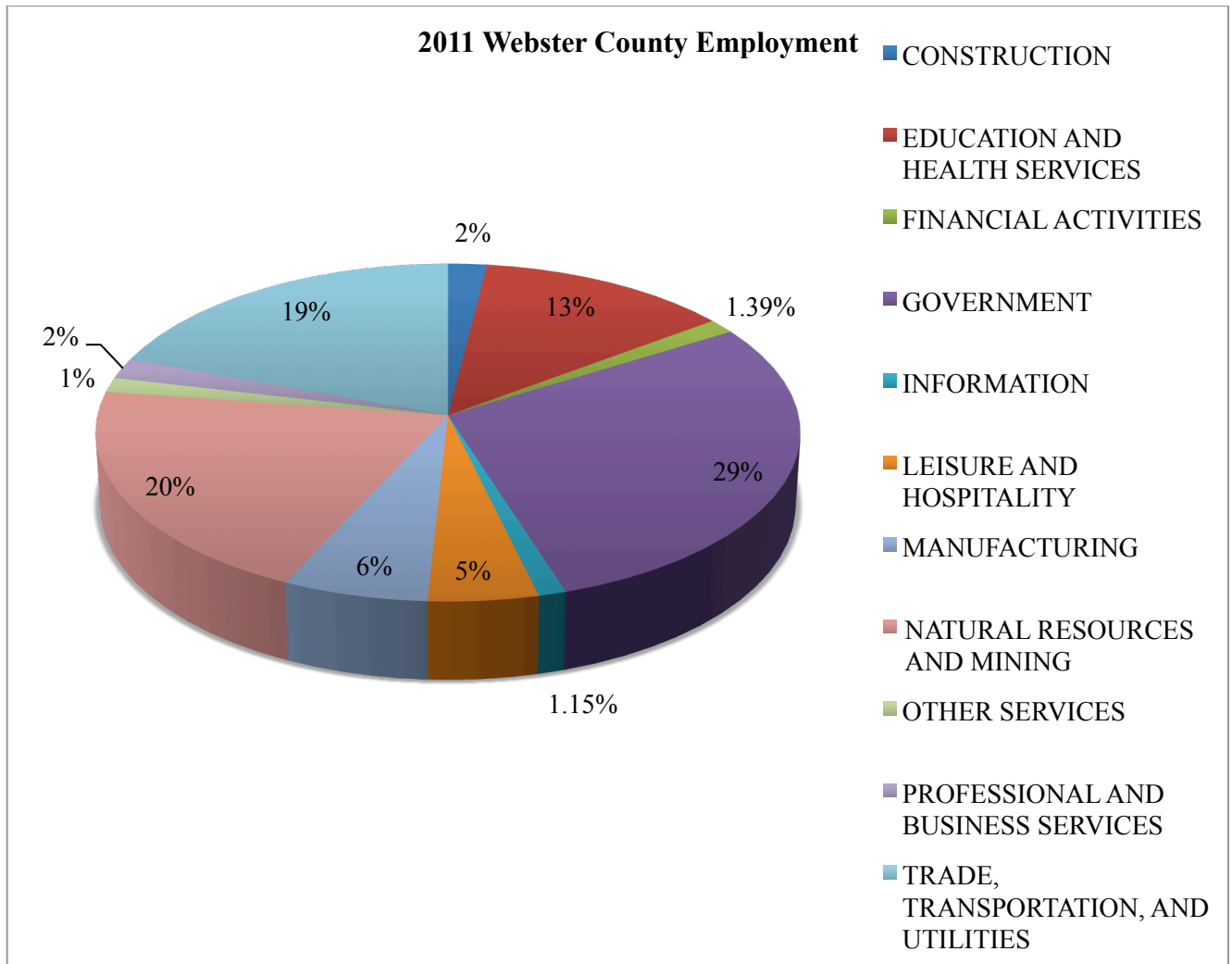
Source: WVU Bureau of Business and Economic Research

### **Employment**

Workforce WV has a complete dataset on employment numbers and wages. The total number of employed in 2011 was 2,091. Approximately 29 percent of wage earners in Webster County worked in Government and a fifth worked in Natural Resources and Mining. Webster County’s employment mix is consistent with West Virginia employment patterns as a whole and with coalfield counties in particular; Government is the primary employer, followed by Natural Resources, followed by Trade, Transportation, and Utilities. This mix is fairly diversified, but recession, coal company cost cutting, and political whims are all great risks to future prosperity.

<sup>3</sup> Christiadi. “Population Projection for West Virginia Counties.” Bureau of Business and Economic Research, College of Business and Economics, West Virginia University, Morgantown, WV (August 2011).

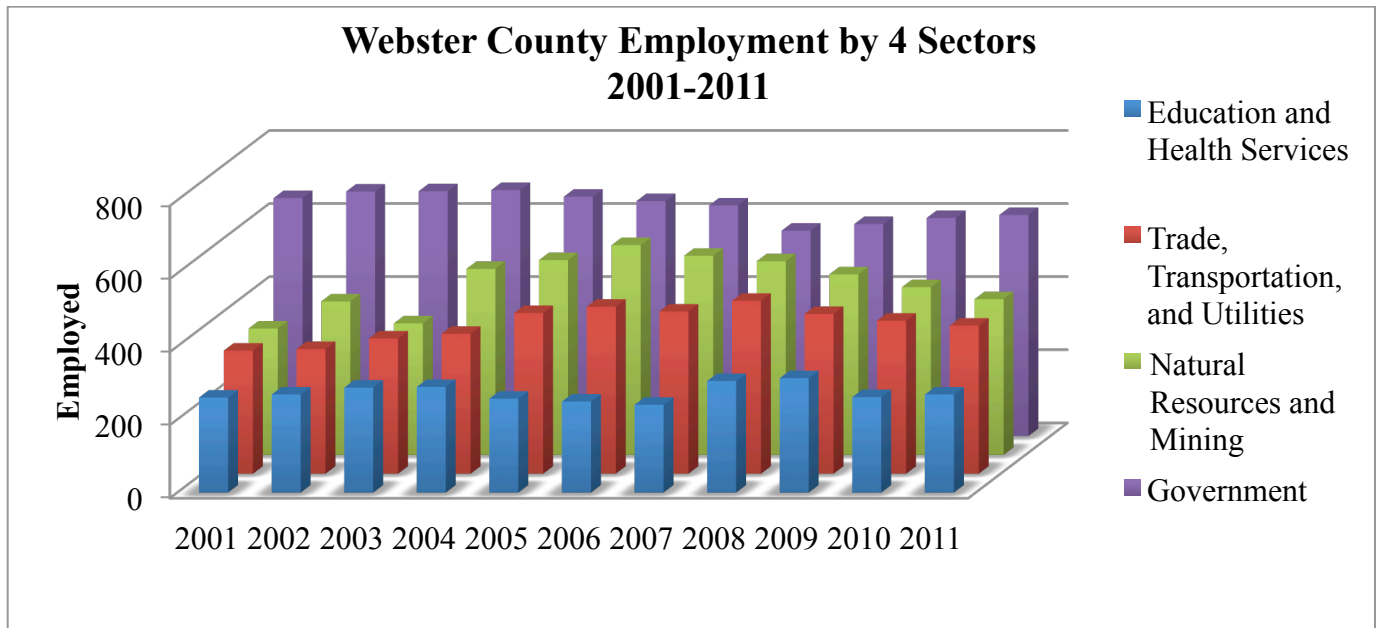
**Figure 4**



Source: Workforce WV

Four sectors have been the major contributors to employment throughout the past decade: Government; Natural Resources and Mining; Trade, Transportation and Utilities; and Education and Health Services. Government has consistently been the highest employer, while Natural Resources and Mining has been second despite the evident layoffs in 2006 and beyond. Trade, Transportation, and Utilities appears soon to overtake Natural Resources and Mining, despite suffering from the nationwide recession in 2008. Education and Health Services has stayed relatively consistent.

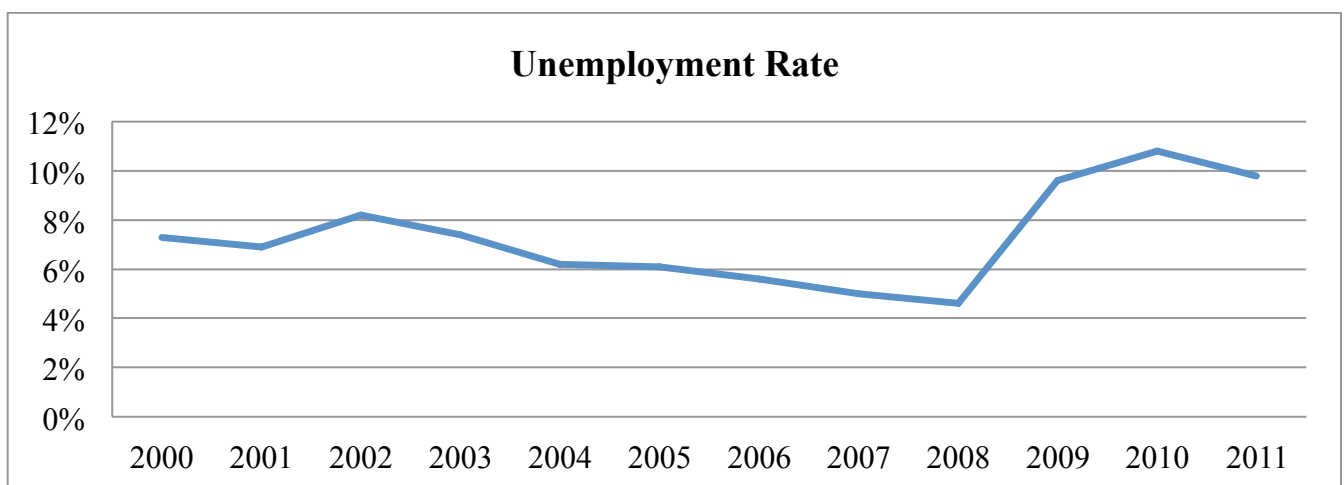
**Figure 5**



Source: Workforce WV

The civilian labor force in the county is one of the most interesting statistics when determining potential investors. As Map 3 shows, Webster’s participation rate is at the bottom of the scale. This is a condition many coalfield counties face. Unemployment was decreasing until the recession in 2008 and natural resource sector cost cutting. (Figure 6). Unemployment skyrocketed to almost 11 percent, but appears to show signs of recovery. Map 4 provides 2011 unemployment rates for Webster compared with the rest of the State.

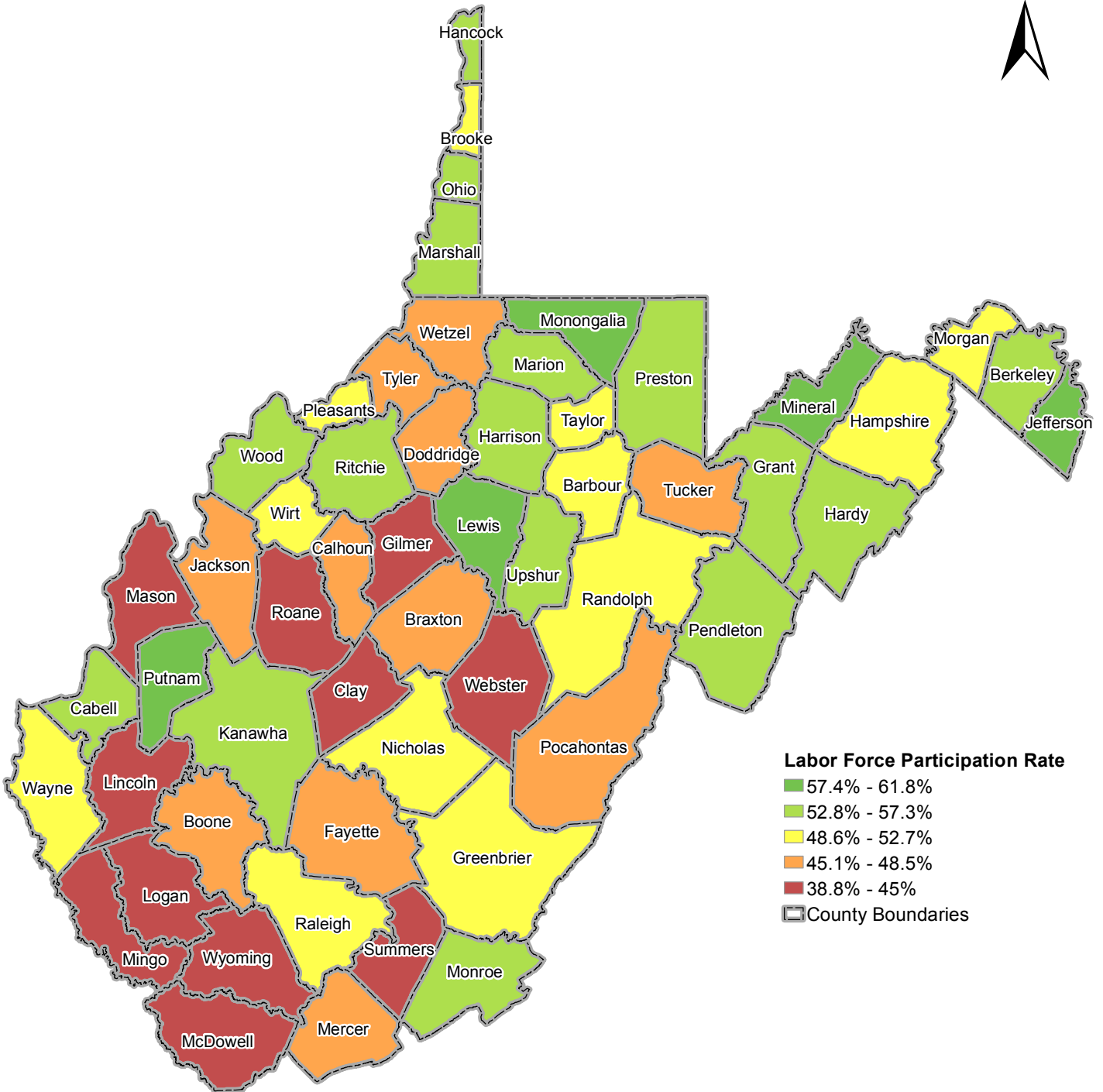
**Figure 6**



Source: Workforce WV

# Demographic

## Labor Force Participation Rate



**Labor Force Participation Rate**

57.4% - 61.8%

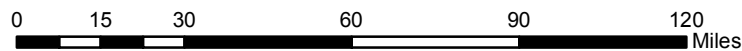
52.8% - 57.3%

48.6% - 52.7%

45.1% - 48.5%

38.8% - 45%

County Boundaries



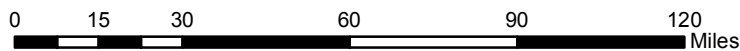
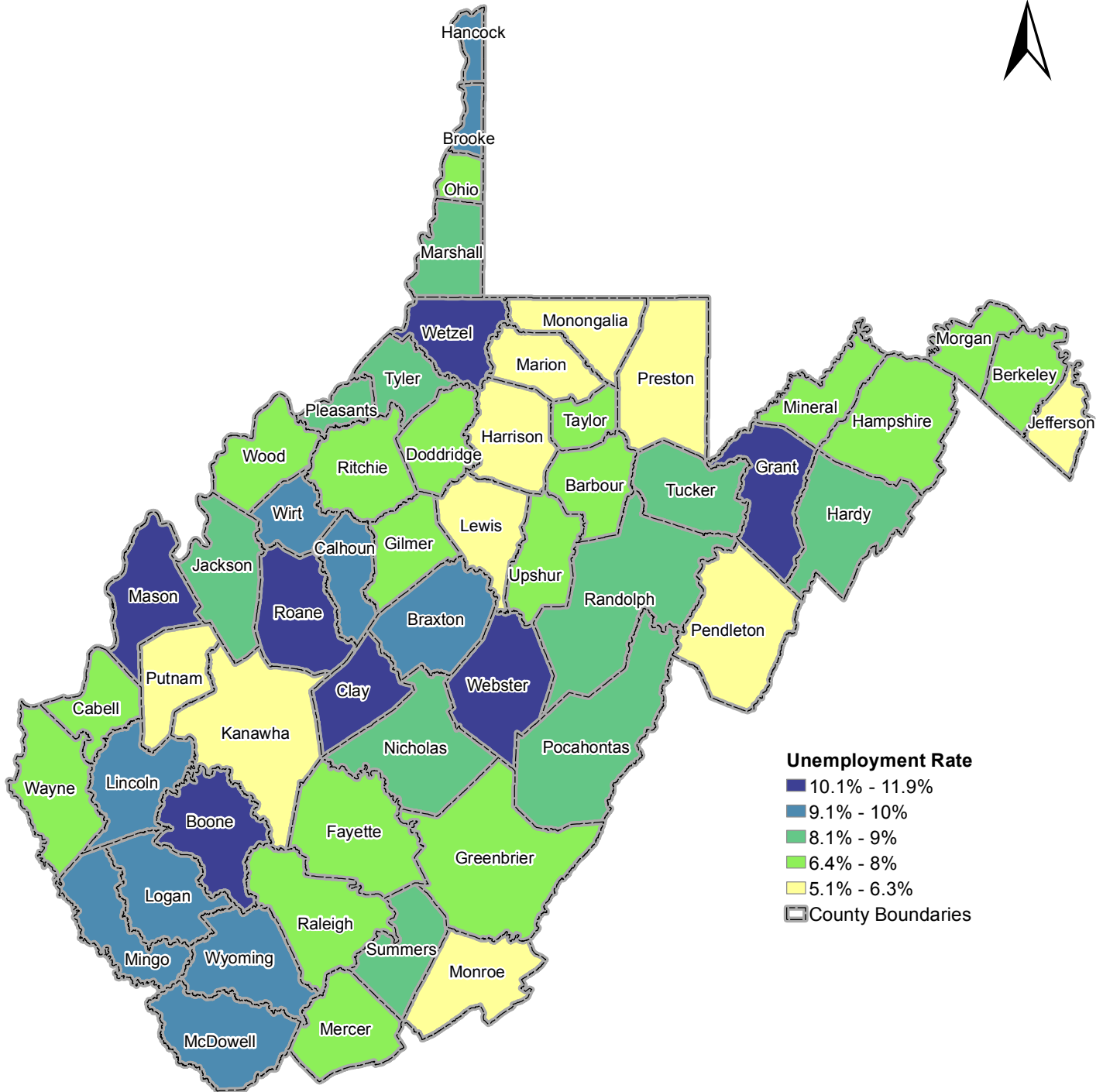
Source: Population, United States Census Bureau 2011; Civilian Labor Force, Workforce WV

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# Demographic Unemployment Rate



Source: Workforce WV 2011

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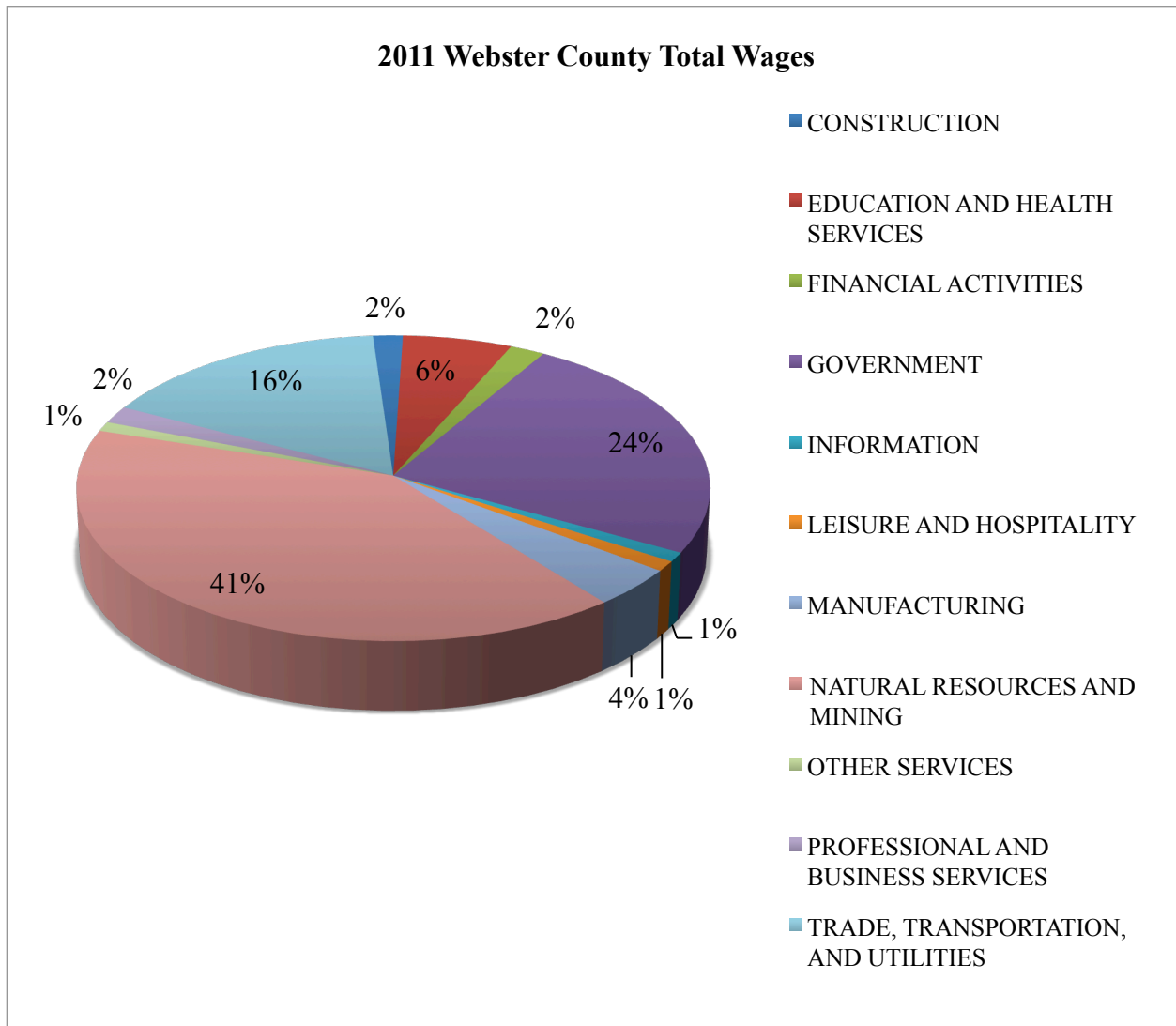


## Wages and Income

Webster County's wage contributors vary widely in the level of contribution. The highest, Natural Resources and Mining, is because the majority of wages comes from the complex support activities for mining, such as exploration and geological analysis (Figure 7).

Government is next because of the sheer size of the sector in the county, and the other sectors that are the top four employers are the next two highest wage contributors.

**Figure 7**

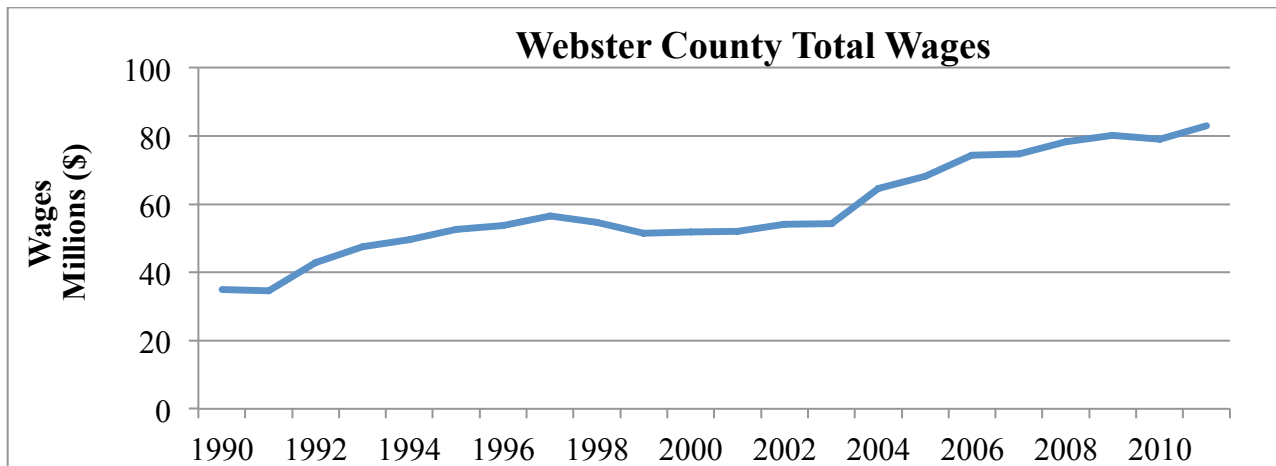


Source: Workforce WV

Historically, wages for Webster County have shown a tendency to rise, though there was some stagnation in the late 90s and early 2000s. Webster County has managed to keep many of its support activities for mining and government jobs, allowing for wages to rise despite recession and cost-cutting factors that led to an increase in unemployment in other sectors. Figure 8 shows

total wages for Webster County, which have consistently shown an upward trajectory. Recession-endurable government and mining-support jobs make up so much of the Webster County portfolio that this outcome is mostly to be expected. However, such a situation is not inherently sustainable, as it is based on two very finite resources: resources to extract, and political acceptance of government spending.

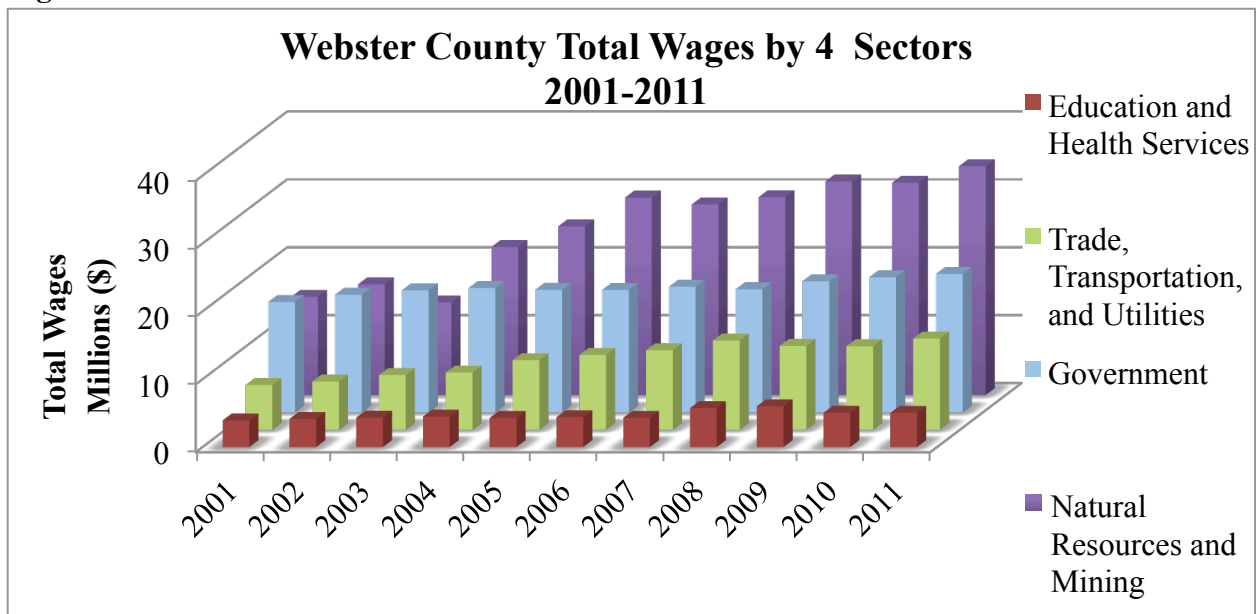
**Figure 8**



Source: Workforce WV

Figure 9 confirms the general trend in wages, also showcasing the dominance of two major sectors. Government has always been a major sector in Webster, but around 2004 the expansion of mining support activities, and the wages that come with it, becomes apparent.

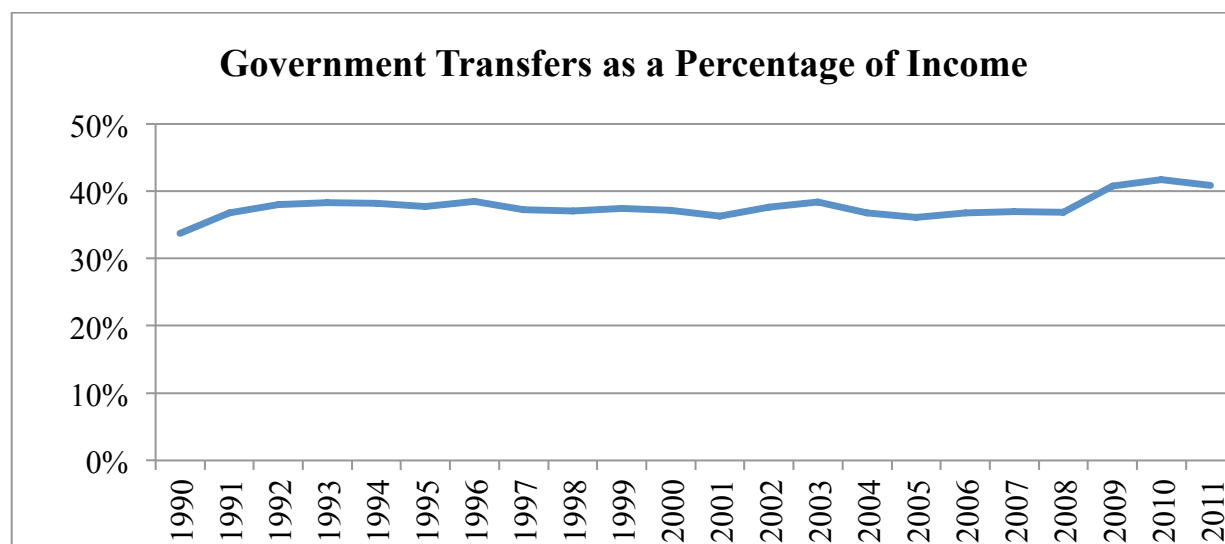
**Figure 9**



Source: Workforce WV

In most American counties, one would find that the majority of income for people stems from wages. In Webster County, however, an important distinction must be made between income and wages. Income is the total receipt of earnings resulting from any economic activity, while wages are derived from actual work in an employed setting. Therefore, dividends from stockholdings are considered income, but not wages. The distinction is necessary in the case of Webster County because in 2011, Webster County wages were \$83 million for all industries.<sup>4</sup> Income for the County was larger (around \$230 million). Though there are many components to income other than work earnings, 41 percent of total Webster County income is derived from government transfers.<sup>5</sup> Government transfers accounted for about 95 percent of total transfers to Webster County, dwarfing transfers from private institutions such as charities. Government transfers have consistently contributed over a third of county income over the past 20 years. This does not count the wages for government workers.

**Figure 10**



Source: United States Bureau of Economic Analysis

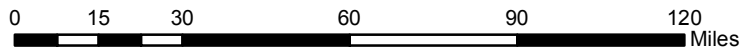
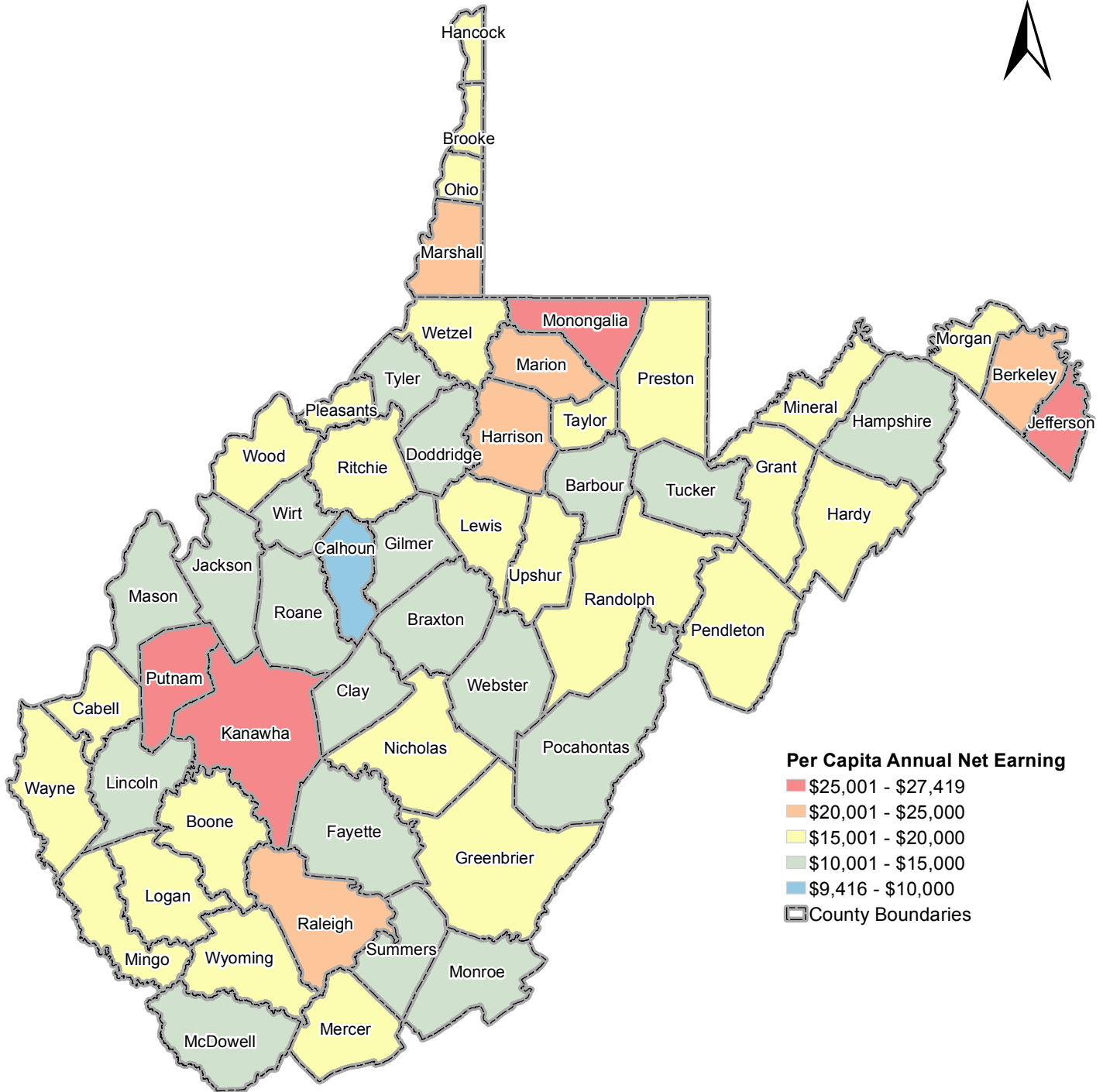
The total personal income of Webster County is therefore made up of 41 percent government transfers and about 36 percent wages from work. Webster County has one of the highest ratios of government transfers, the 4<sup>th</sup> highest. According to the BEA, per capita income was \$24,896 for Webster County. Earned income, or income from work, is displayed in Map 5, and Webster is ranked low in earned income in West Virginia.

<sup>4</sup> “Employment and Wages – 2011, Webster County,” Workforce WV, Accessed February 13, 2013, <http://www.workforcewv.org/lmi/EW2011/ew11x059.htm>

<sup>5</sup> “Tables CA 04 and CA 35 analysis,” Bureau of Economic Analysis, Regional Economic Accounts, Local Area Person Income and Employment, Accessed February 13, 2013, <http://www.bea.gov/regional/index.htm>.

# Demographic

## Per Capita Annual Net Earning



Source: United States Census Bureau 2011

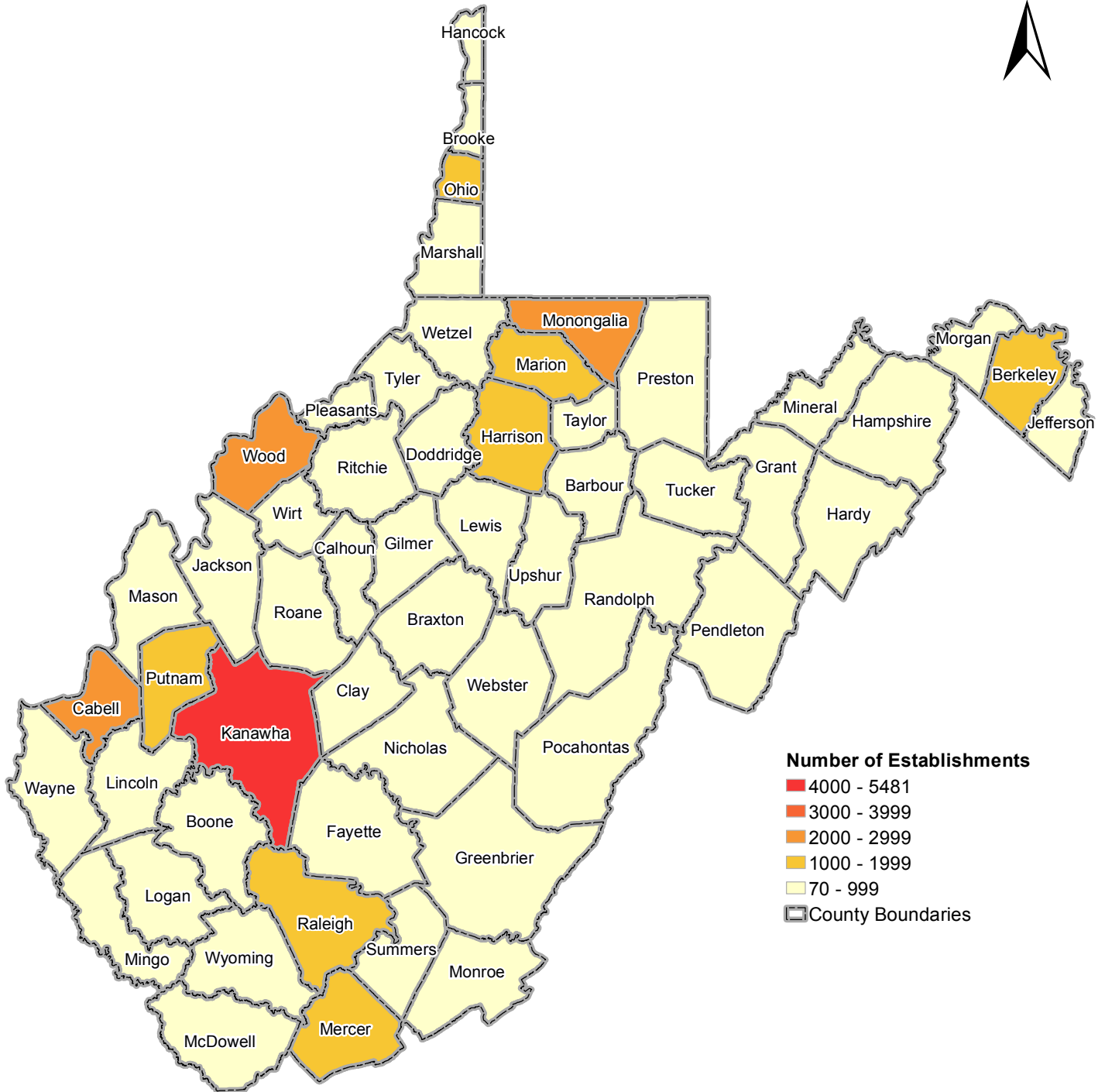
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Another measure of economic health is the number of establishments that do business in the area. Map 6 shows the number of establishments in each county in West Virginia. Webster County appears to be at the lowest end of the spectrum. The number of establishments may be misleading, as the natural resources sector and government services are characterized by a small number of firms.

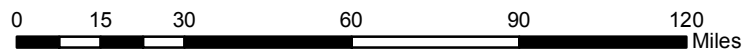
# Demographic

## Number of Establishments



### Number of Establishments

- 4000 - 5481
- 3000 - 3999
- 2000 - 2999
- 1000 - 1999
- 70 - 999
- County Boundaries



Source: United States Census Bureau 2011

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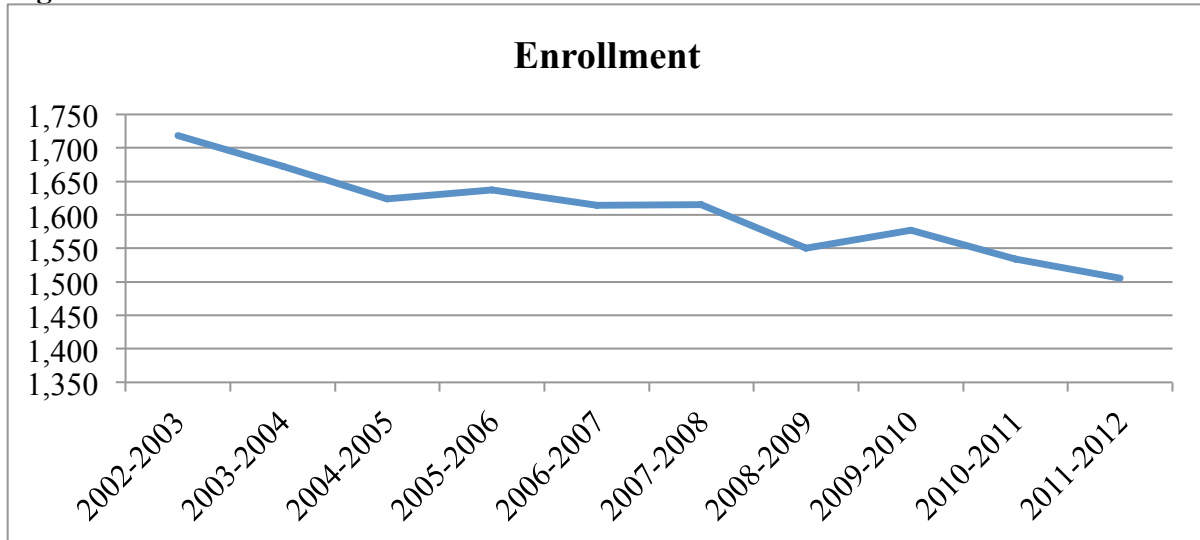


## Education

Webster County has one high school, one middle school, and 4 elementary schools as of the 2011-2012 school year.<sup>6</sup>

Webster County 2<sup>nd</sup> month school enrollment has shown pretty steady decline in recent years, reflecting the declining population. This makes Webster County's 2<sup>nd</sup> month enrollment one of the lowest in the state (Map 7).

**Figure 11**



Source: WVEIS

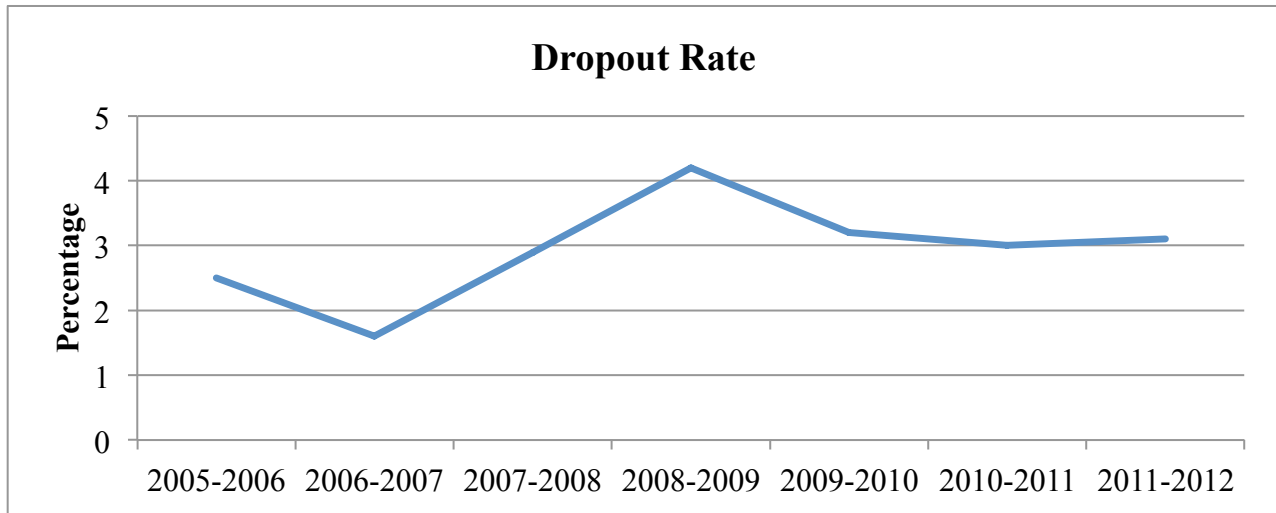
The West Virginia Education Information System (WVEIS) also has dropout rates for the school years from 2005 to 2012. Dropout rates for grades 7-12, which showcase the most likely time for school dropouts, do not follow the total enrollment statistic, as total enrollment is computed with the grades below 7<sup>th</sup> grade as well. Dropout rates spiked from 2006 to 2009, and then began a decrease due to the recession cutting off job opportunities for non-graduates. The spike may have been due to the appearance of more technically-oriented mining jobs (Figure 12).

---

<sup>6</sup> "School Profiles," West Virginia Education Information System, West Virginia Department of Education, Accessed February 13, 2013, [http://wveis.k12.wv.us/nclb/profiles/c\\_profile.cfm?cn=043](http://wveis.k12.wv.us/nclb/profiles/c_profile.cfm?cn=043).



**Figure 12**

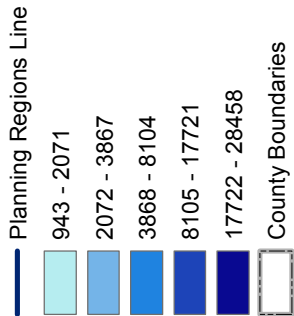
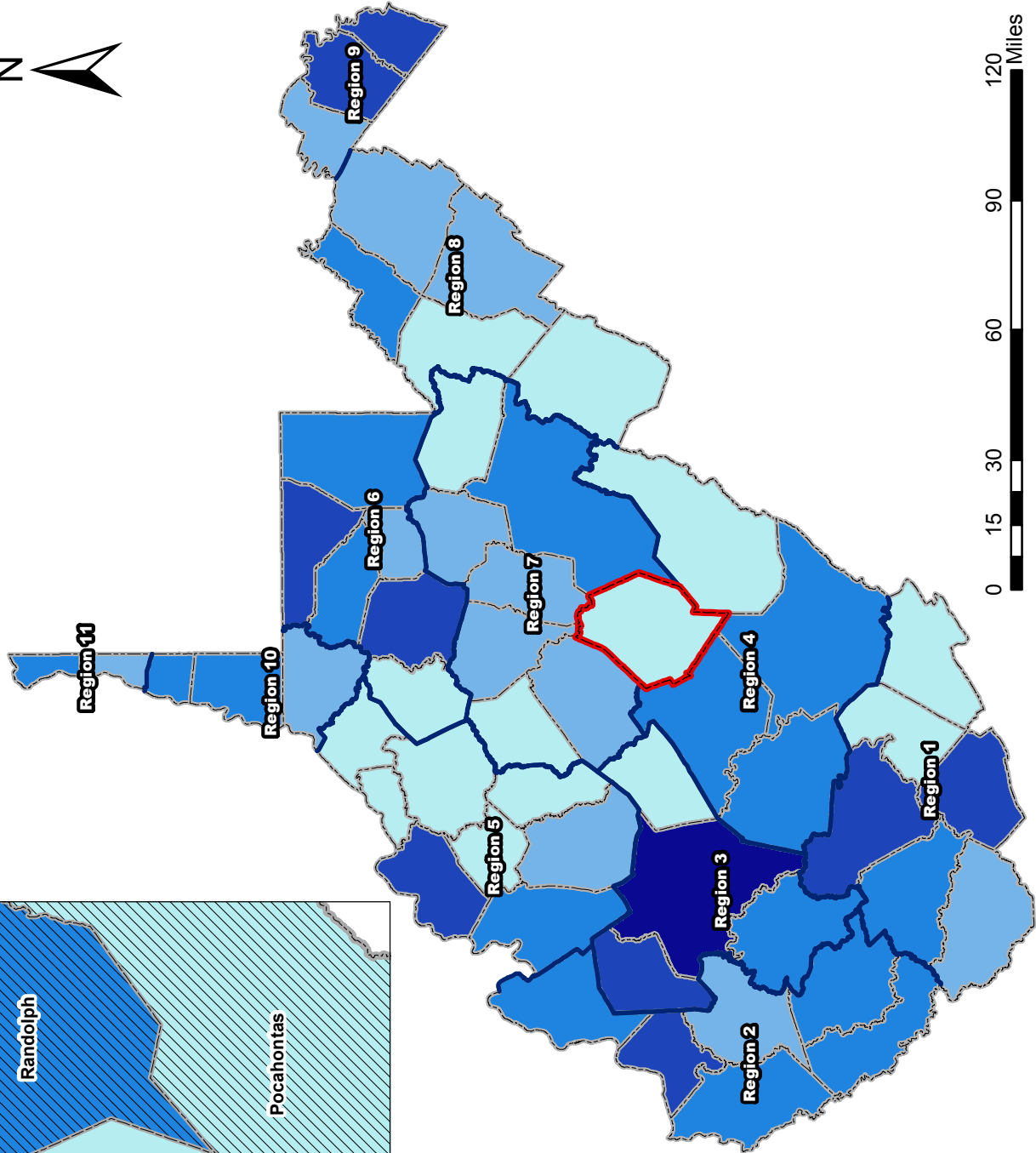
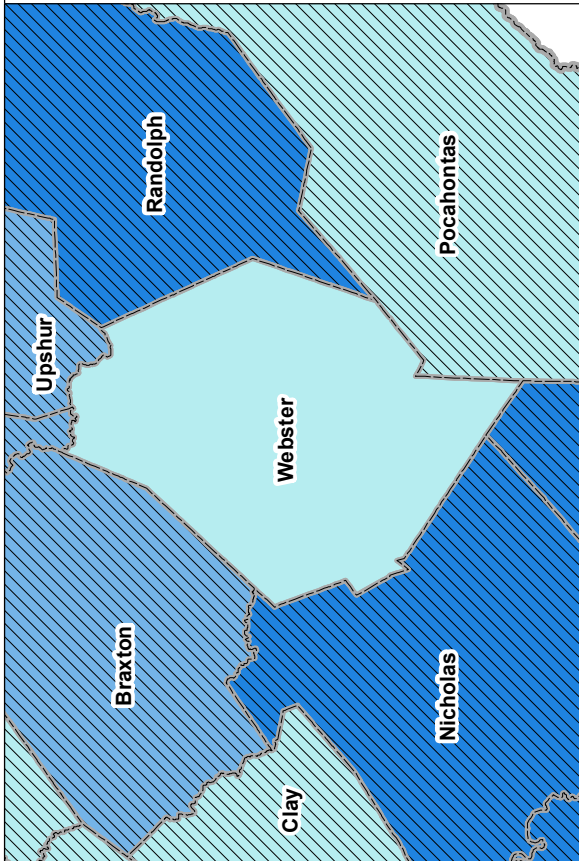


Source: WVEIS

Webster County currently has an average dropout rate. Map 8 shows each county's dropout rate. Maps 9 and 10 show the total graduates and the graduation rate by county. The graduation rate is below average, and the number of total graduates is one of the lowest in the state, due mostly to the rural nature of the county. Webster County's six schools' locations are noted in Map 11. Not coincidentally, the major schools are located on the main roads in the county. The largest school by attendance in the county is Webster County High School. The significance of the locations of these schools is the access to major transportation routes. The schools appear to be built in order for parents and students to maintain steady access, which is important to discourage dropping out and to maintain attendance levels.

# NCLB - Second Month Enrollment

Webster County



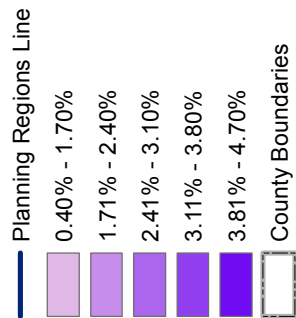
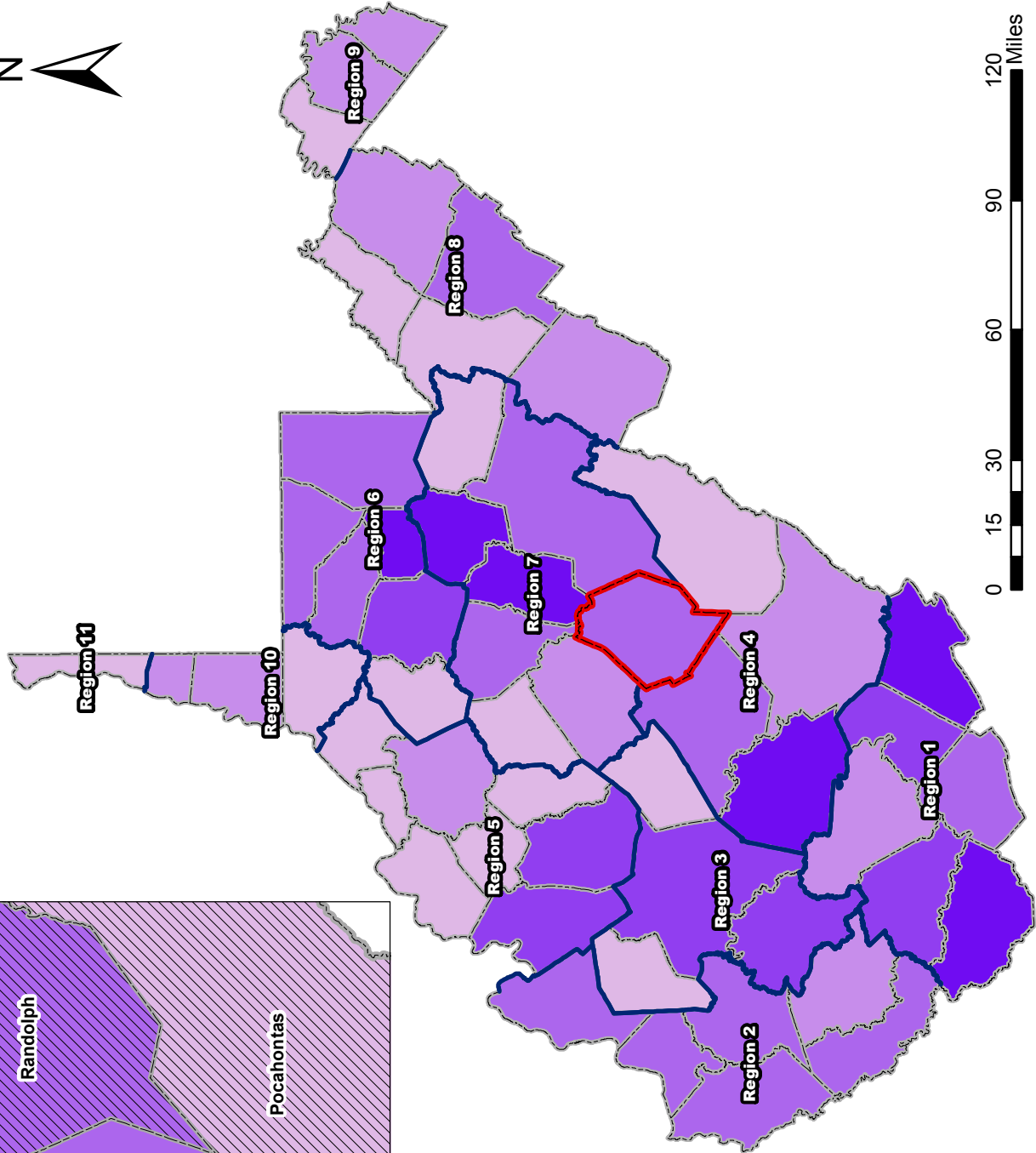
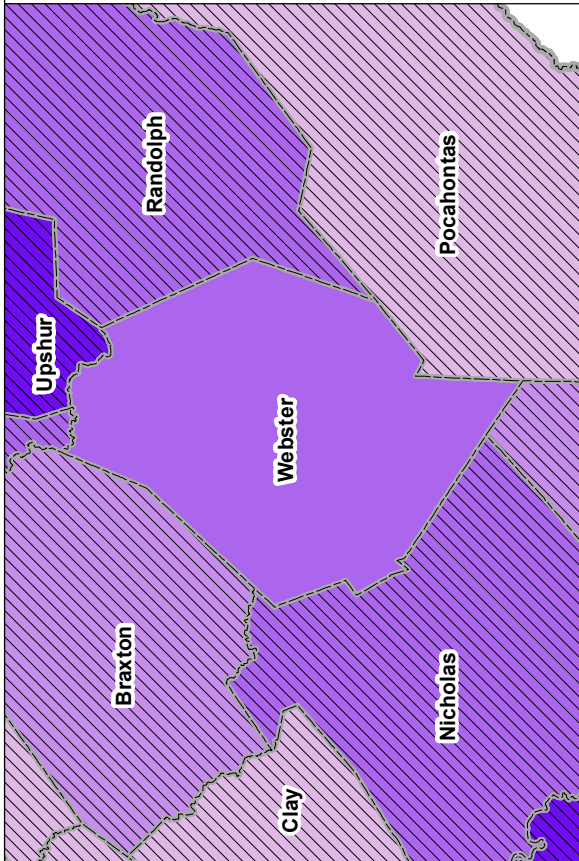
Source: West Virginia Department of Education 2012

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# NCLB - Dropout Rate

## Webster County



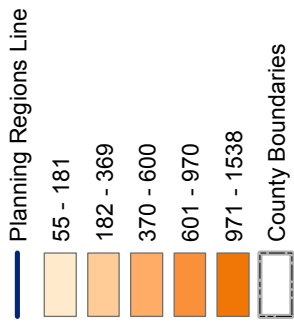
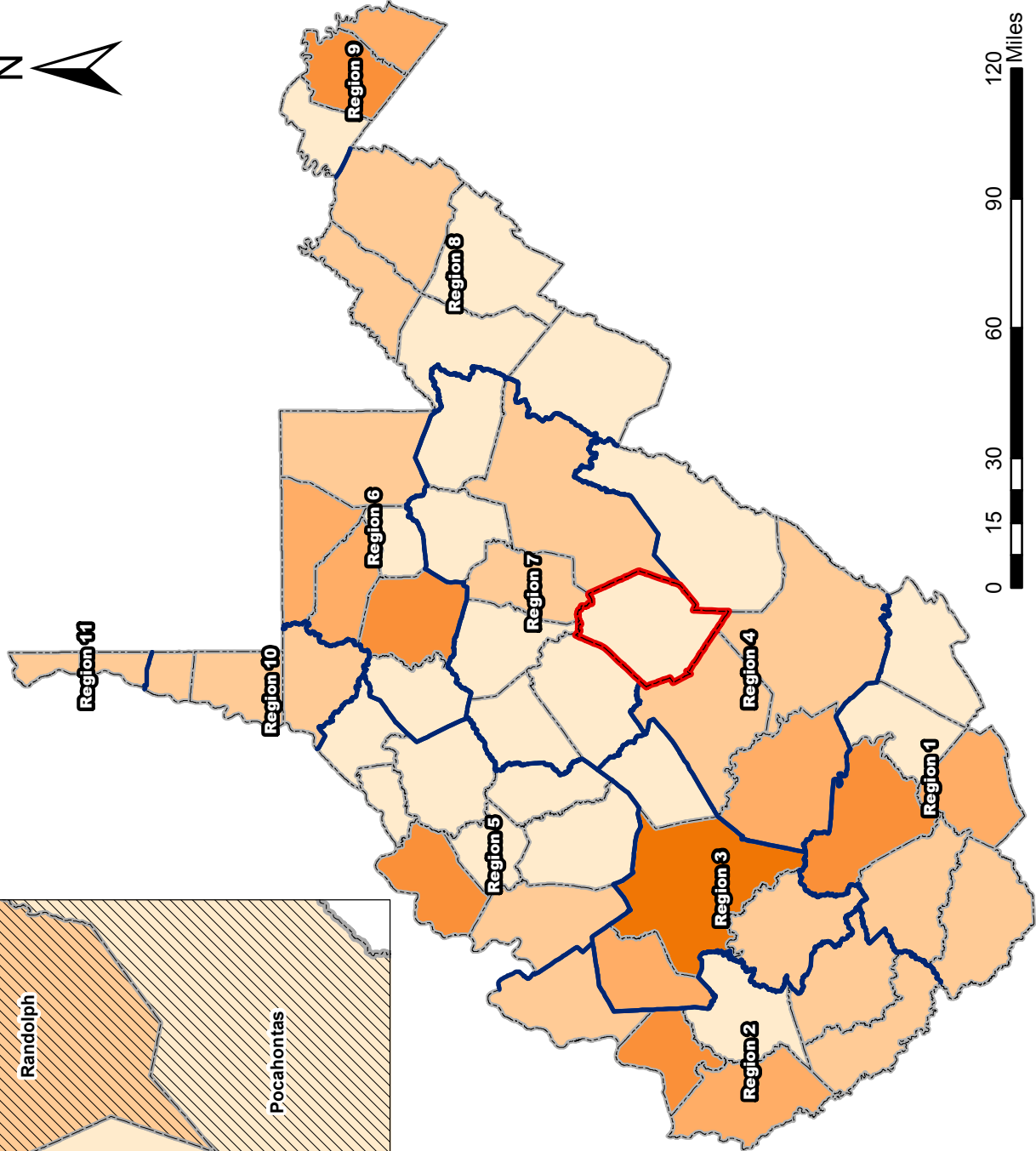
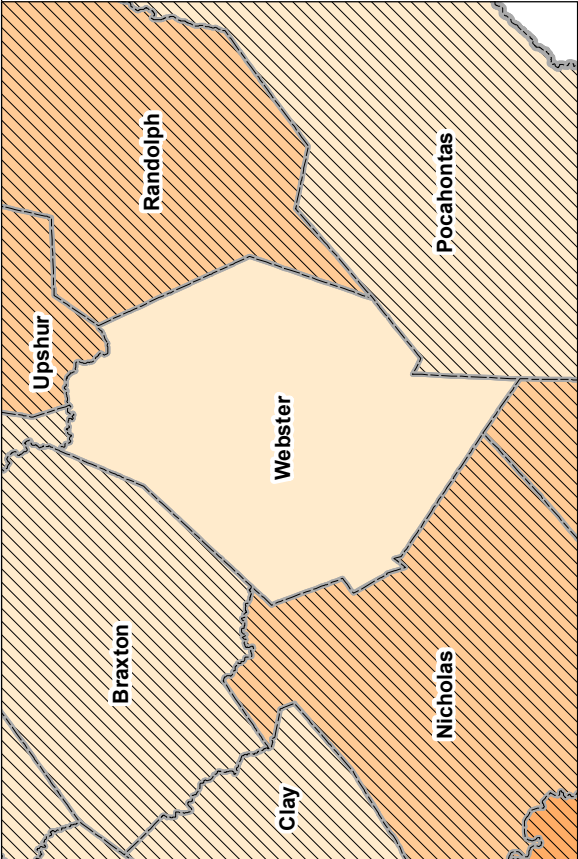
Source: West Virginia Department of Education 2012

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# NCLB - Total Graduates

## Webster County



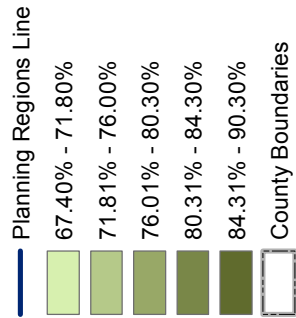
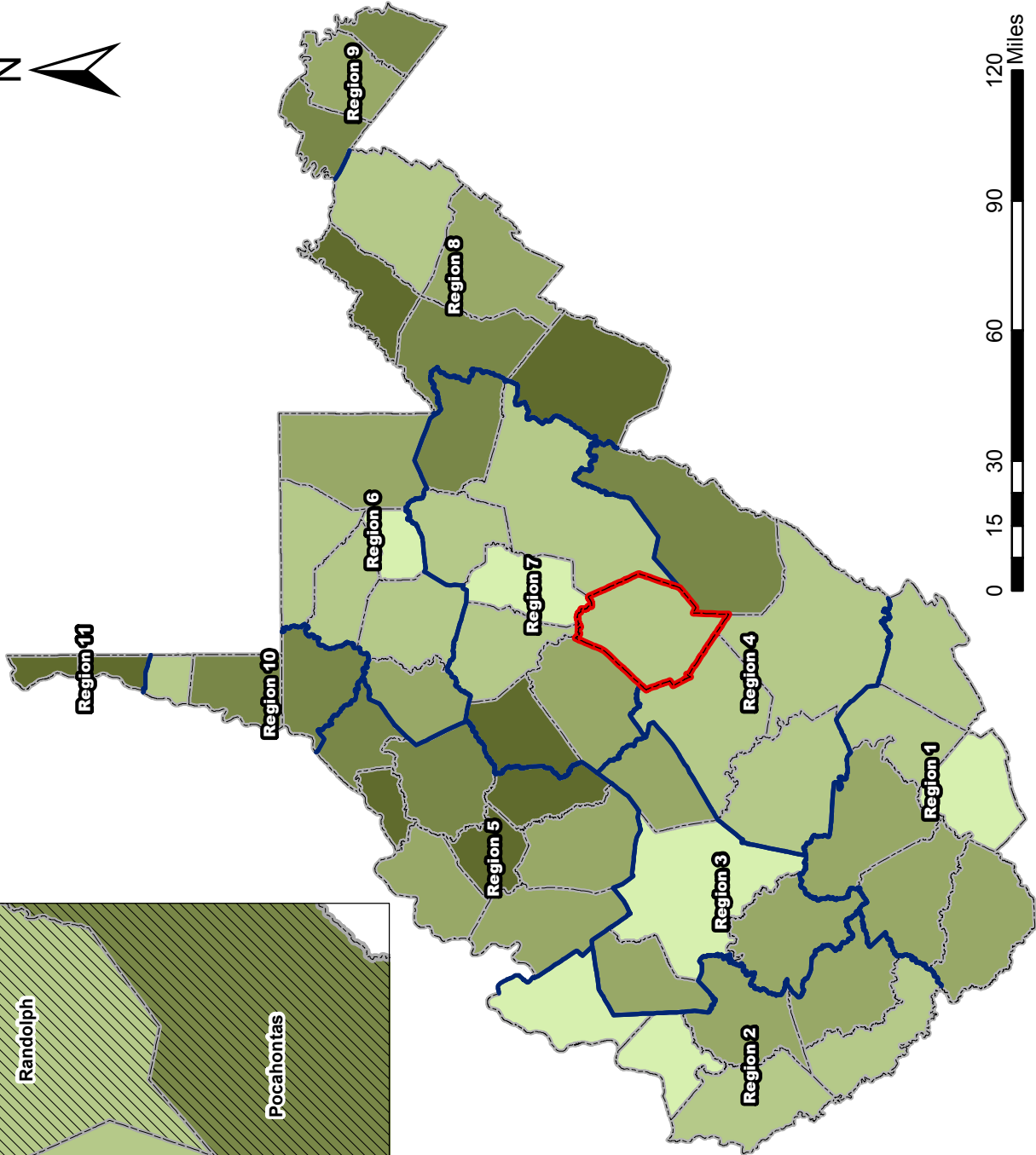
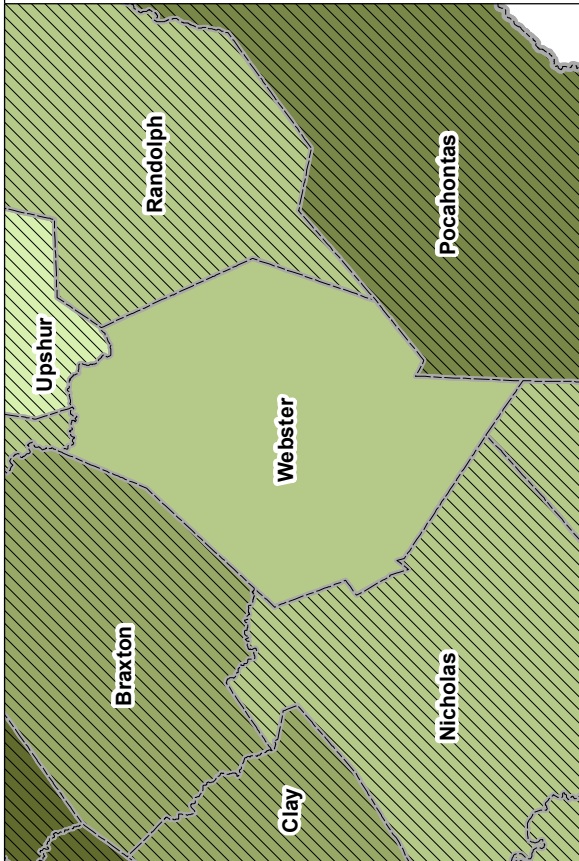
Source: West Virginia Division of Natural Resources, Statewide Addressing and Mapping 2008

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# NCLB - Graduates Rate

Webster County



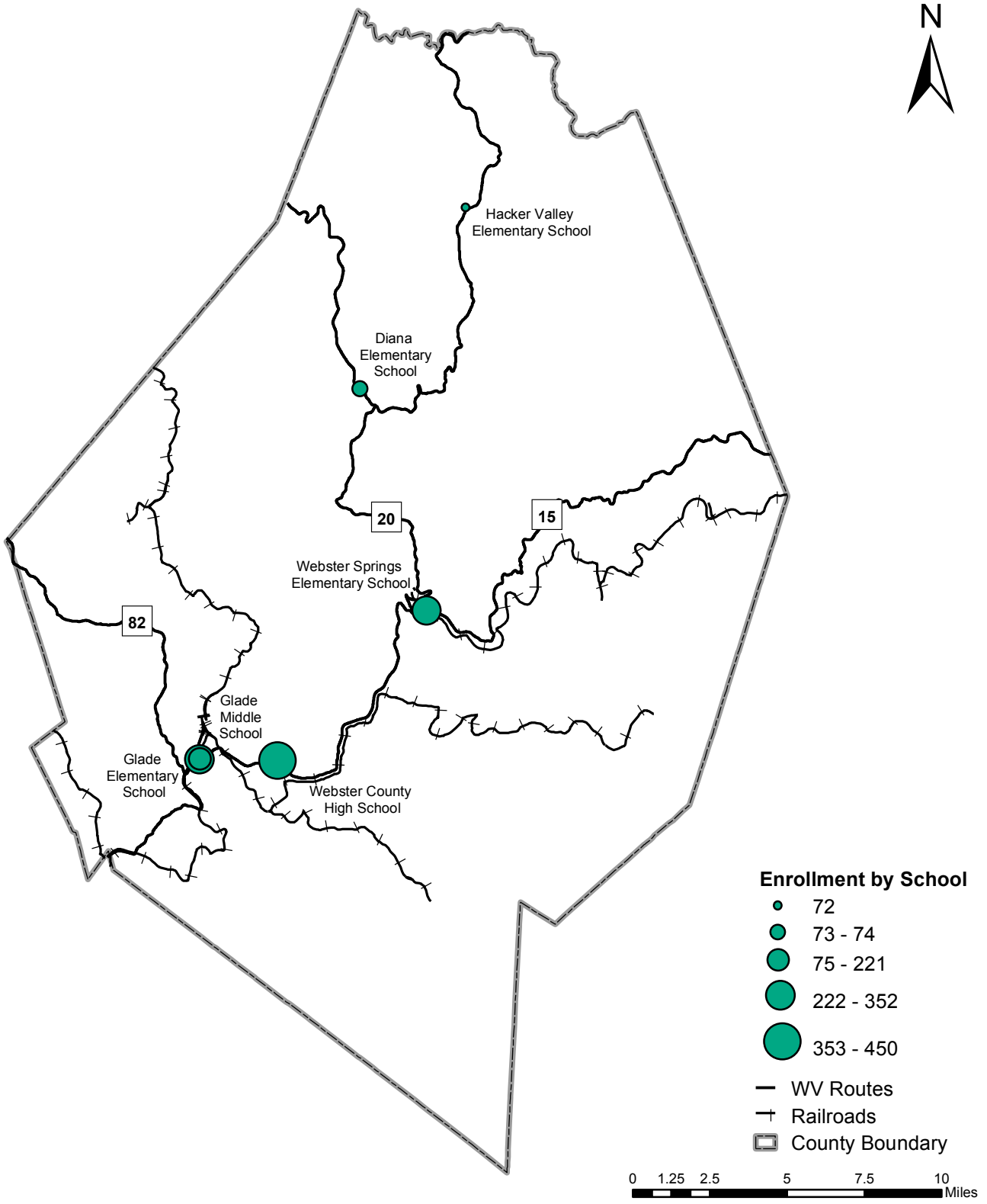
Source: West Virginia Division of Natural Resources, Statewide Addressing and Mapping 2008

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# Total Attendance by School - 2012

## Webster County



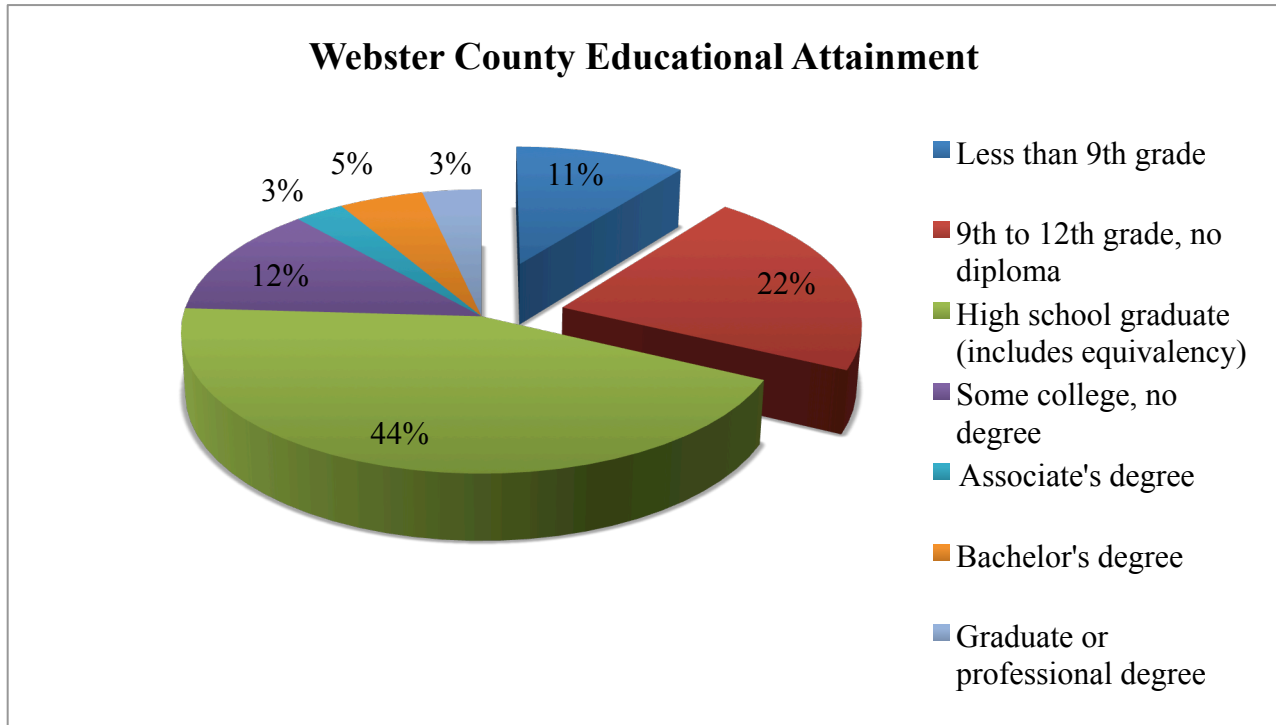
Source: West Virginia Department of Education 2012

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The ACS also maintains data on the educational attainment of the population that is 25 years and over. Forty-four percent of these residents have a high school diploma or equivalent. However, 33 percent have less than a high school diploma. This is a rather high number and particularly concerning when the relationship between education and jobs is considered.

**Figure 13**



Source: 2011 American Community Survey 5-Year Estimates

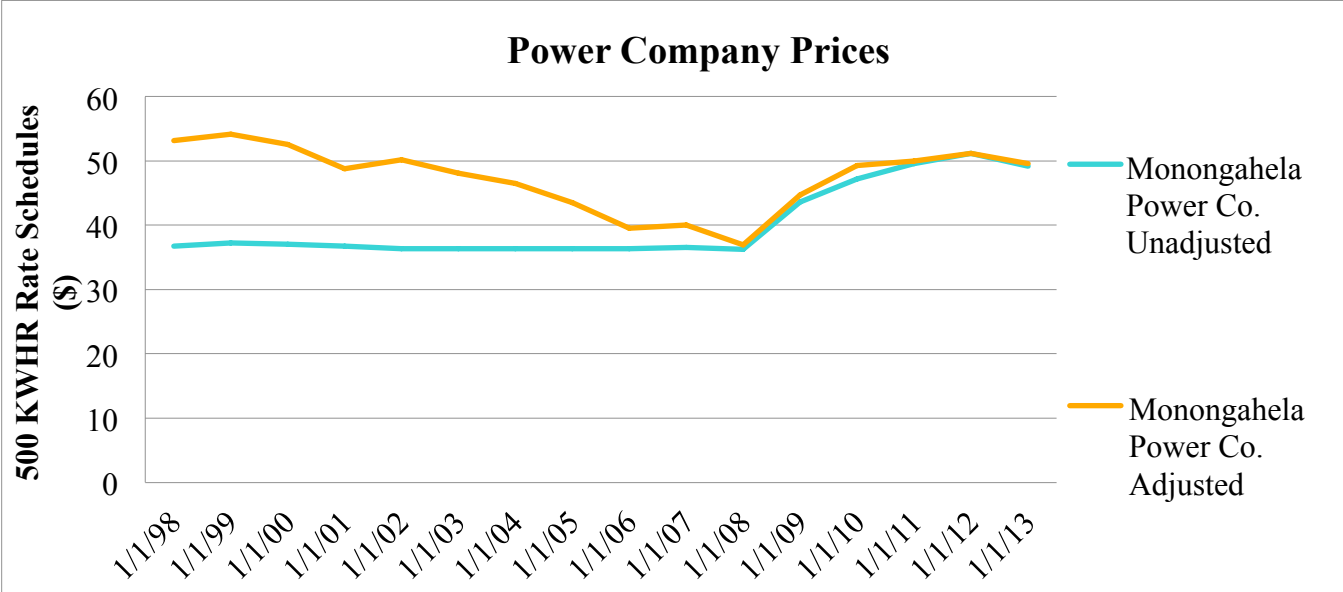
### **Utilities and Infrastructure**

Webster County has 15 utility companies according to the West Virginia Public Service Commission (PSC). Economic development depends on infrastructure, and Webster County has several providers of water and sewer, and one provider of electricity. Monongahela Power Company provides residential, industrial, and large-capacity service to Webster County.

The West Virginia Public Service Commission maintains tariff rates for all companies involved in providing utilities. Of particular importance are electricity tariffs; the monitoring of these tariffs is an ongoing project. To that end, the PSC observes the growth rate of tariffs and possesses a 20-year comparison based on the average residential utility rate of the State. This provides a significant overview of how electric prices behave in West Virginia as a whole. As Figure 14 shows, if the tariffs are not adjusted by the Consumer Price Index (CPI), it would appear that rates are constantly increasing. Viewing rates in such a manner would be a misunderstanding, and would be incorrect in reference to a State with the highs and lows of West

Virginia’s past. The Bureau of Labor Statistics has a CPI for electricity prices dating to 1998. The adjusted and unadjusted prices are provided in Figure 14.

**Figure 14**



Source: WV Public Service Commission and United States Bureau of Labor Statistics

The graph shows that electricity rates steadily decreased in real terms through 2006 and remained fairly constant with adjustment. Both adjusted and unadjusted prices have increased since 2006. Many possible factors contributed to this rise, including the increased costs of energy and the increased demand. Map 12 also shows the distribution of power lines, plants, and substations within West Virginia and Webster County.

The two other utilities of particular importance are water and sewer. Table 1 displays water and sewer metered rates for the providers of those services. They are all public services with varying rates and categories. Webster County has 4 public sewer and water providers. Maps 13 and 14 show the water and sewer facilities and the served areas for each of these utilities, as well as the solid waste management facilities in West Virginia, including the one located in Webster.

**Table 1: Webster County Water and Sewer Rates**

<b>Cowen Public Service District</b>	
<b>Water Rates</b>	
First 2000 gallons used per month	8.02 per 1000 gallons
Next 10000 gallons used per month	6.05 per 1000 gallons
All Over 12000 gallons used per month	4.16 per 1000 gallons
<b>Sewer Rates</b>	
First 2000 gallons used per month	7.98 per 1000 gallons
Next 10000 gallons used per month	7.70 per 1000 gallons



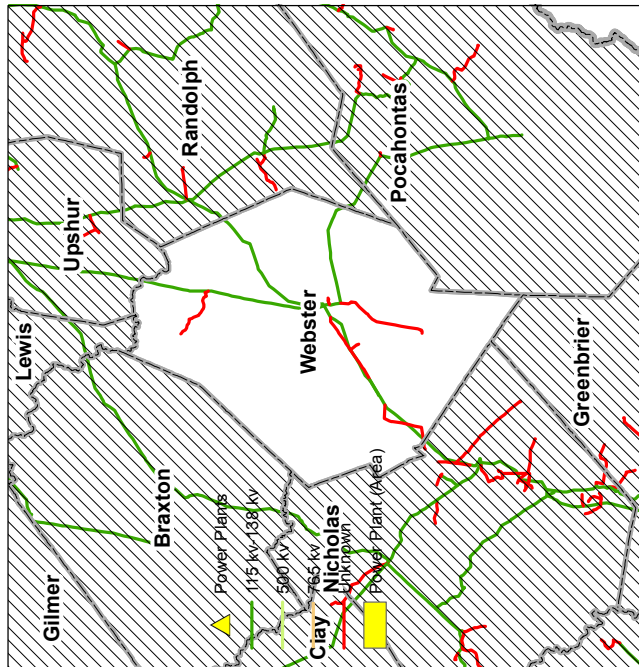
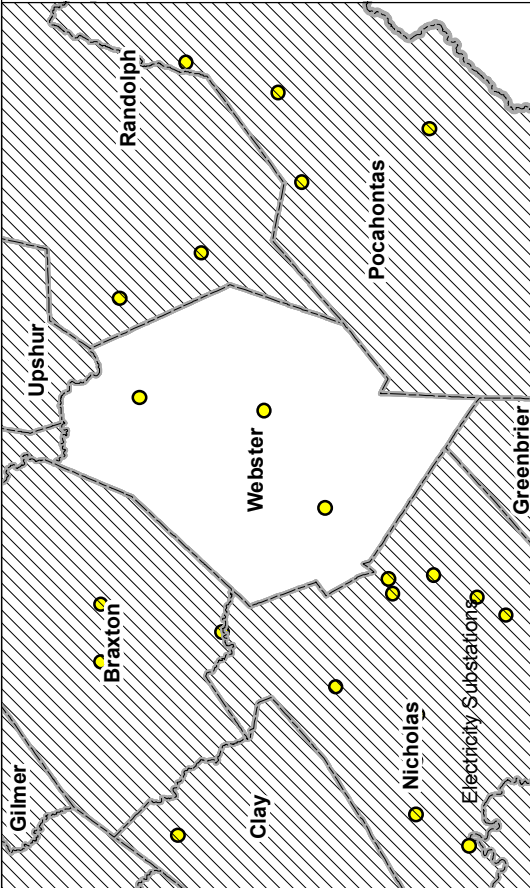
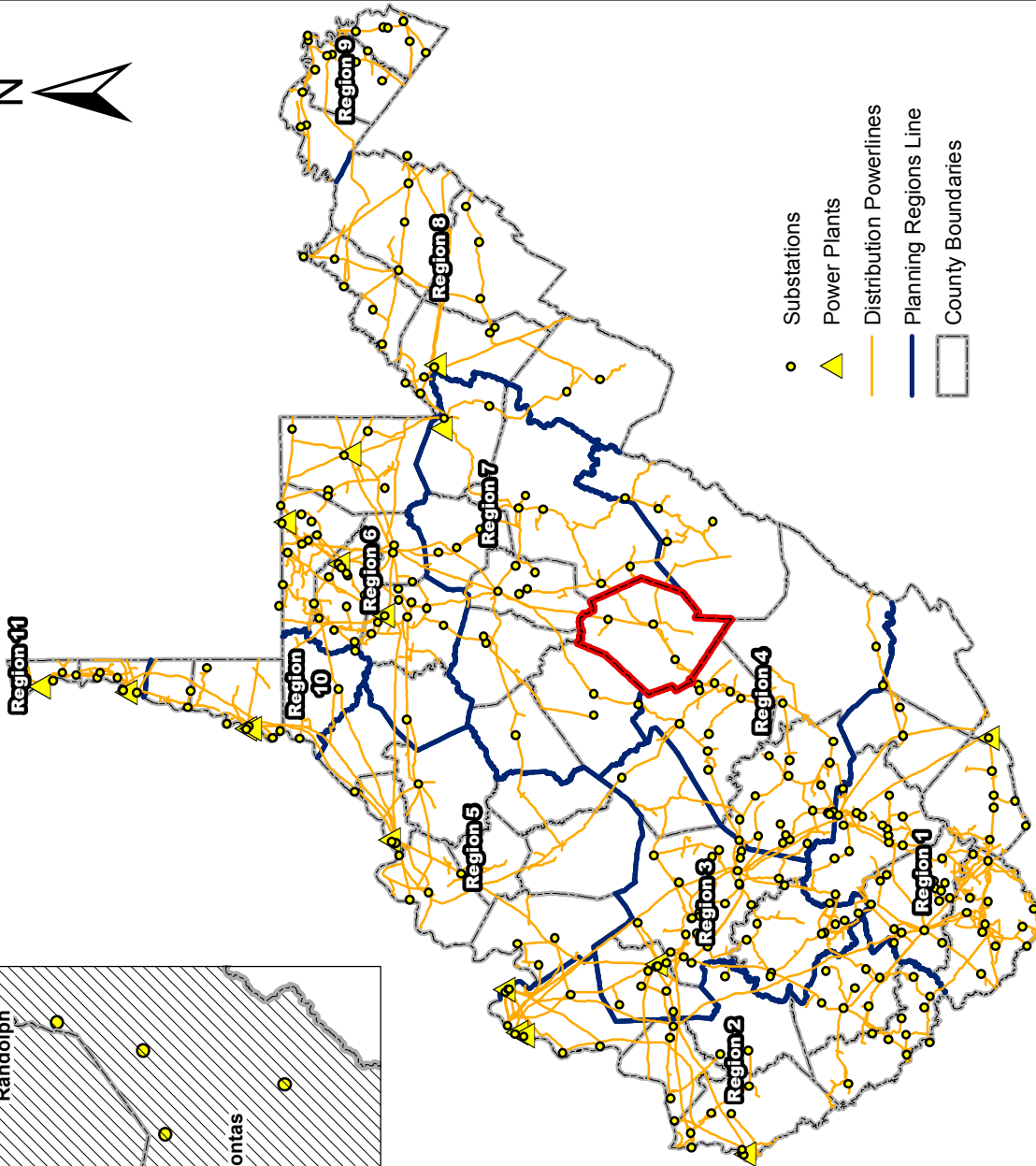
All Over 12000 gallons used per month	7.37 per 1000 gallons
<b>Bolair Public Service District</b>	
<b>Water Rates</b>	
First 2000 gallons used per month	10.35 per 1000 gallons
Next 3000 gallons used per month	8.85 per 1000 gallons
Next 5000 gallons used per month	7.84 per 1000 gallons
All Over 10000 gallons used per month	7.35 per 1000 gallons
<b>Craigsville Public Service District</b>	
<b>Sewer Rates</b>	
First 3000 gallons used per month	9.92 per 1000 gallons
Next 3000 gallons used per month	7.93 per 1000 gallons
Next 4000 gallons used per month	6.93 per 1000 gallons
All Over 10000 gallons used per month	3.46 per 1000 gallons
<b>Webster Springs Public Service District</b>	
<b>Sewer Rates</b>	
First 2000 gallons used per month	10.45 per 1000 gallons
Next 3000 gallons used per month	9.21 per 1000 gallons
Next 5000 gallons used per month	6.28 per 1000 gallons
Next 20000 gallons used per month	5.50 per 1000 gallons
Next 30000 gallons used per month	4.97 per 1000 gallons
Over 60000 gallons used per month	4.67 per 1000 gallons

A private water company, West Virginia American Water Company, also services Webster County. The general service rates are listed in the table below, and are rounded to the nearest cent. The levels are higher than usual because the company services West Virginia's major cities as well as smaller municipalities.

<b>West Virginia American Water Company</b>	
First 1500 gallons used per month	Minimum charge based on meter size
Next 28500 gallons used per month	9.61 per 1000 gallons
Next 870000 gallons used per month	6.33 per 1000 gallons
Next 81000000 gallons used per month	4.61 per 1000 gallons
All Over 9000000 gallons used per month	3.00 per 1000 gallons

# Utilities - Electricity

Webster County



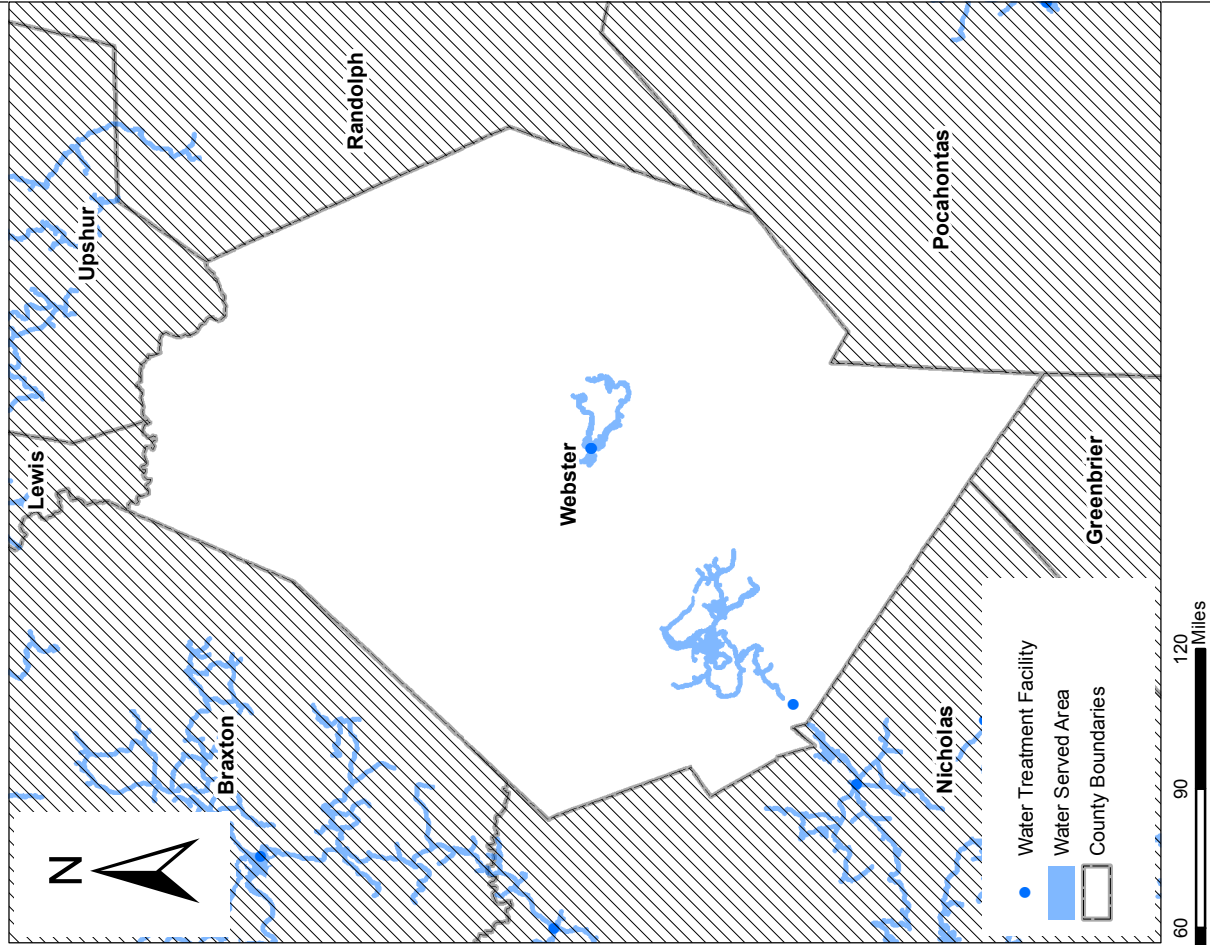
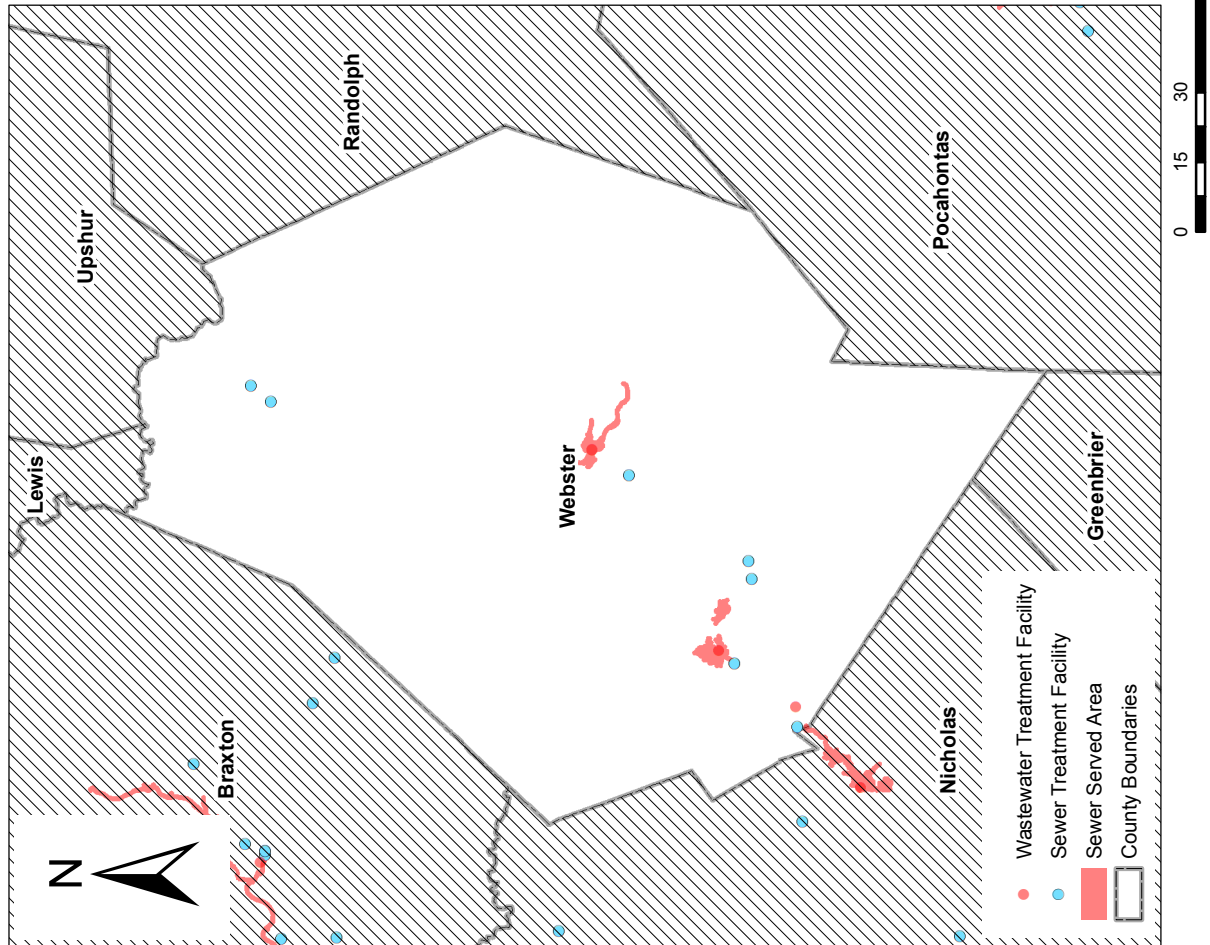
Source: West Virginia Division of Natural Resources, Statewide Addressing and Mapping 2008

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# Utilities - Water and Sewer

## Webster County



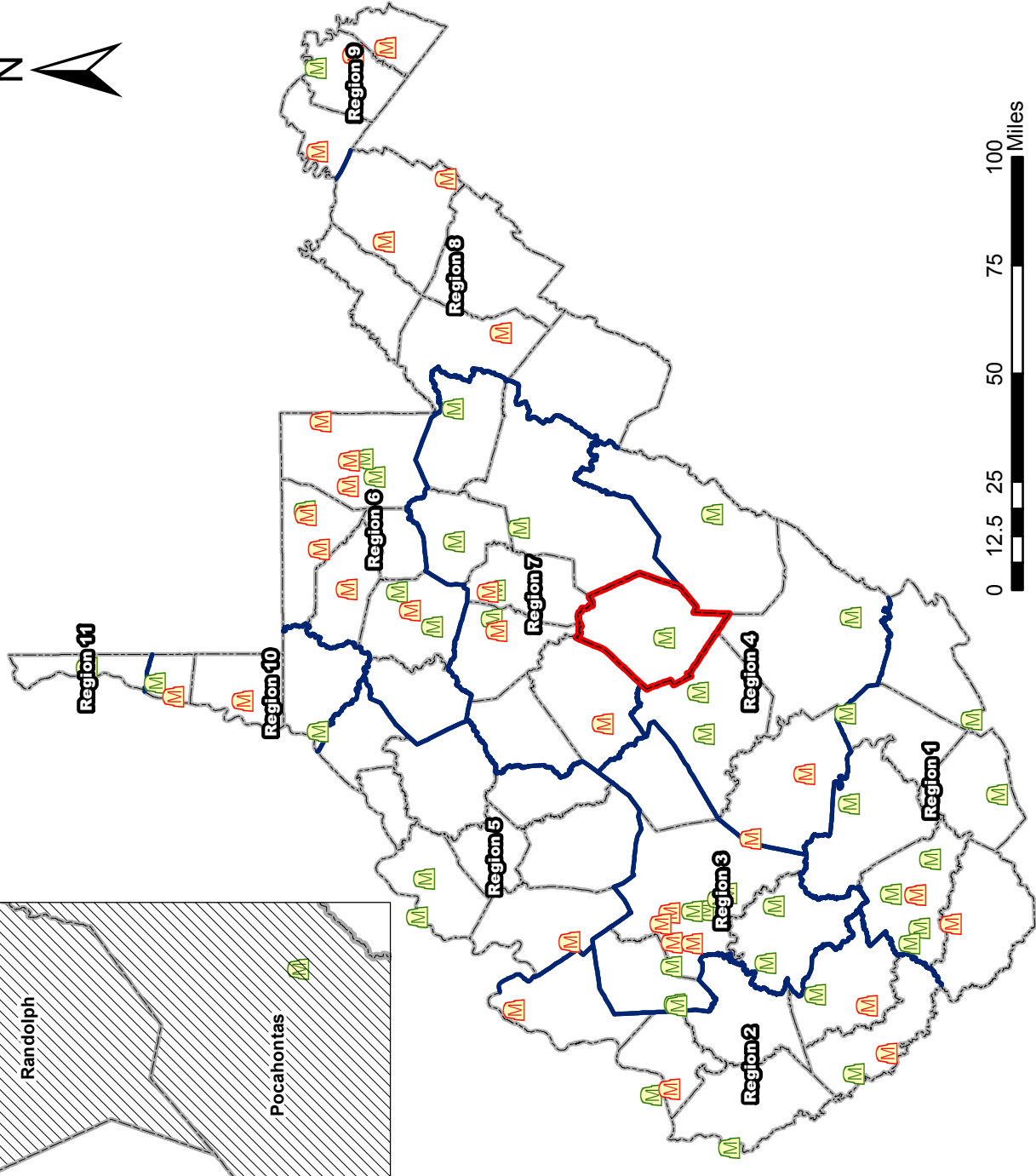
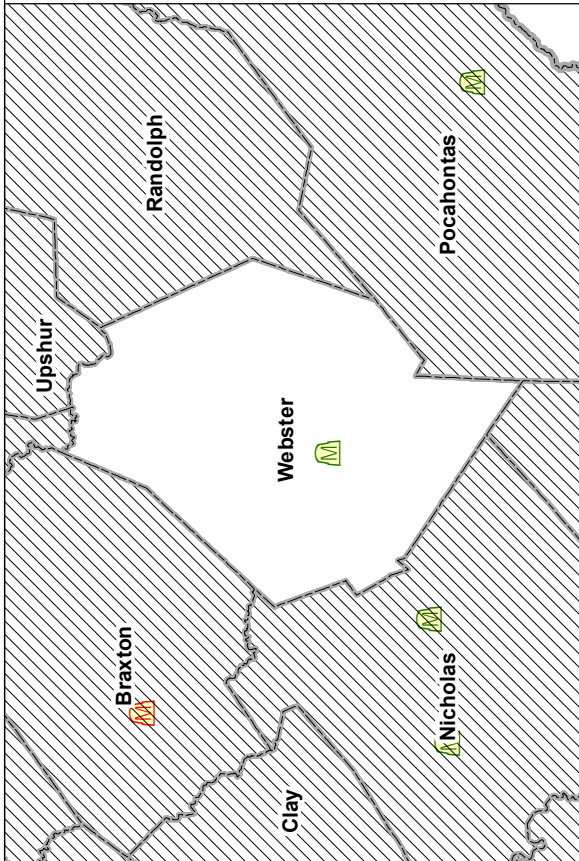
Source: West Virginia Infrastructure and Jobs Development Council N.A.





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# Utility - Solid Waste Facility

Webster County



-  Closed
-  Operating
-  Planning Regions Line
-  County Boundaries

Source: West Virginia Department of Environmental Protection 2002

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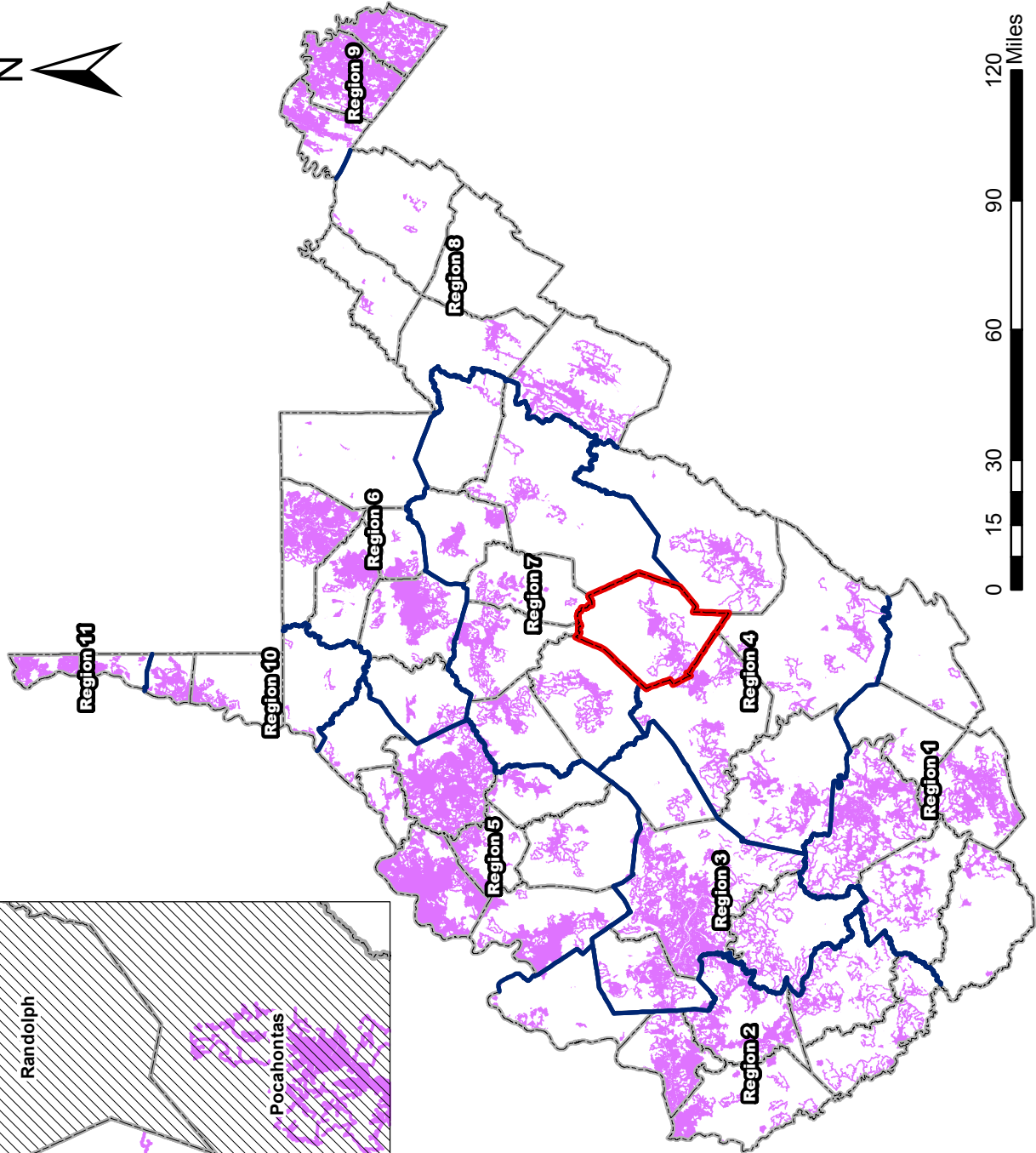
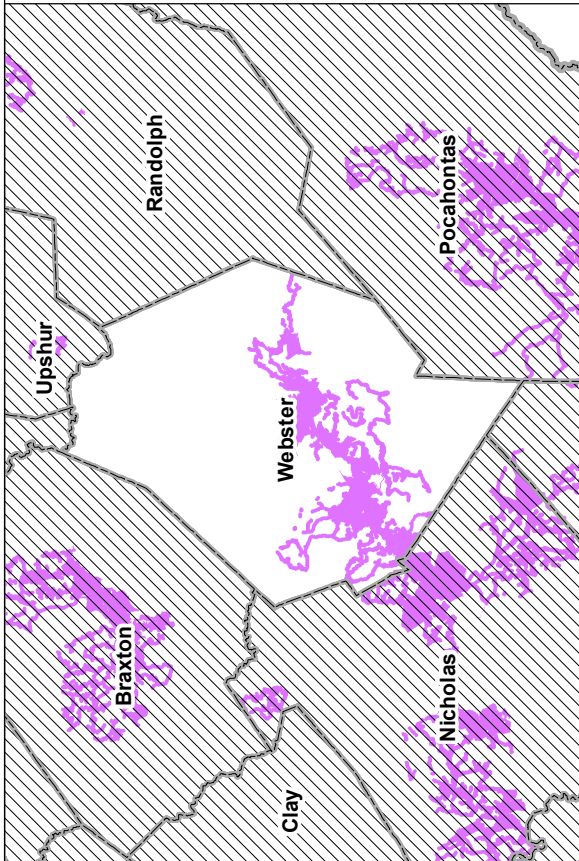
One essential modern convenience, now widely understood as an essential utility in a globalized world, is broadband access. The following 11 maps demonstrate Webster County's broadband infrastructure in relation to the State's. The largest number of providers in Webster County is 3 in areas with higher population density than the rest of the county. Webster County broadband infrastructure closely resembles other coalfield counties. Of particular note is spotty parts of half the county contain fixed wireless, the connection of two fixed points wirelessly by radio or other links, and the rather large swaths of area without broadband coverage. Fixed wireless coverage is not common to other West Virginia counties. The lack of broadband is extensive, part of a pattern of rural counties not containing broadband access.




Map 15 shows physical cable infrastructure running from ISPs to other structures. DSL, BPL, and other copper represent the transferal system of broadband (Map 16). Map 17 shows the entire wire system, represented by physical wires, while Maps 18 and 19 show the maximum uploading and downloading speeds for the system. Map 20 shows the total number of providers, which is denser in the more economically developed areas of the State. Map 21 has fixed wireless coverage, or the connection between two fixed points wirelessly by radio or other links, and the next two maps show the maximum uploading and downloading speeds in a given area (22 and 23). Map 24 shows the location of mobile wireless coverage, including for smartphones and tablets, and Map 25 shows areas where no broadband coverage is reported in any way.

Each of these maps shows the same pattern in Webster County internet service as exhibited by WV. Internet service, specifically broadband, is non-existent in many rural areas, and instead focuses on population centers. While this may be financially wise, it deprives rural areas of an increasingly integral link to a globalized economy and society. All areas now need broadband service, and a complete inventory of these services is needed to plan for future investment in any given area.

# Broadband - Internet Cable and FTTP Coverage

## Webster County



-  Planning Regions Line
-  Cable and FTTP
-  County Boundaries



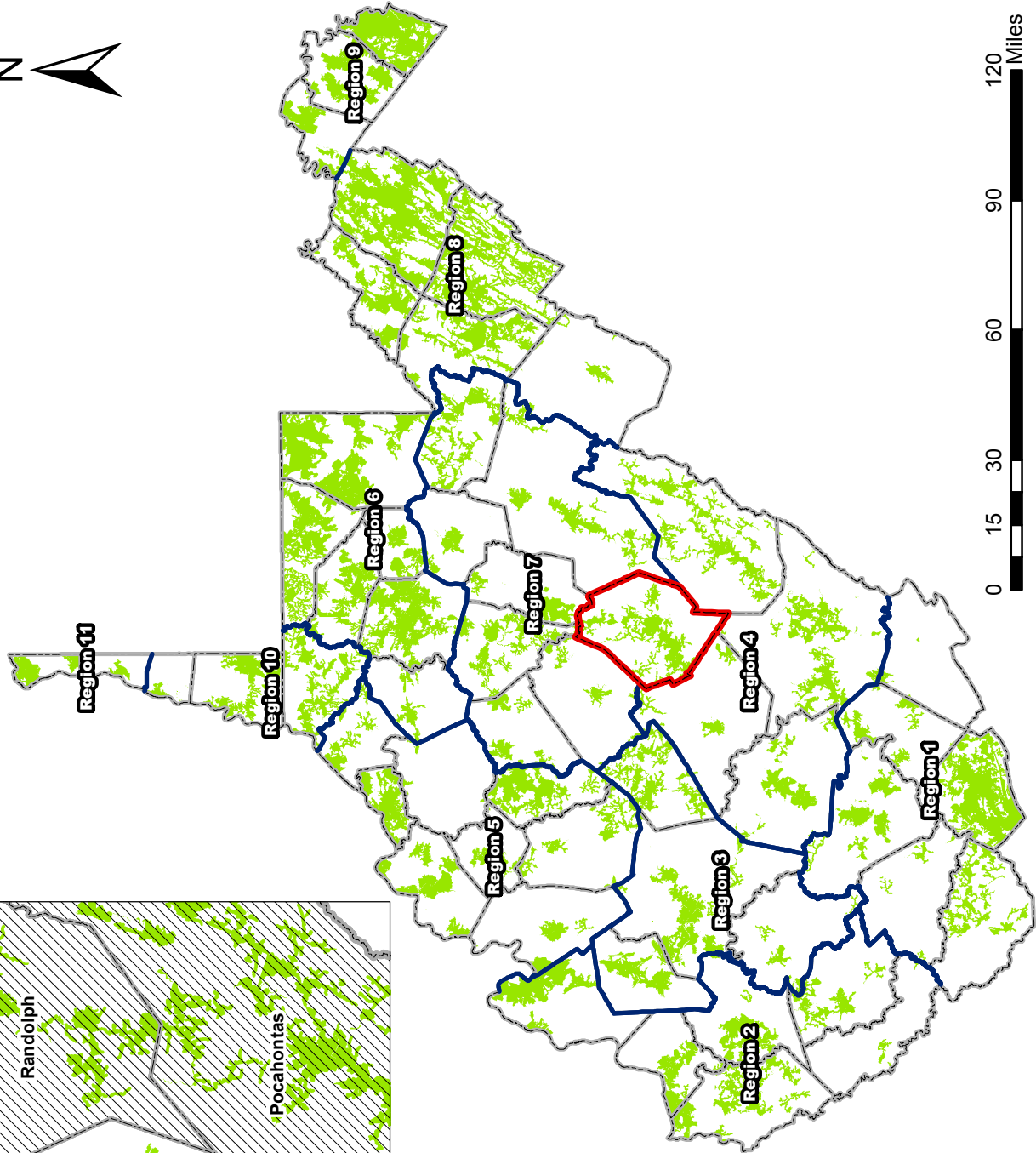
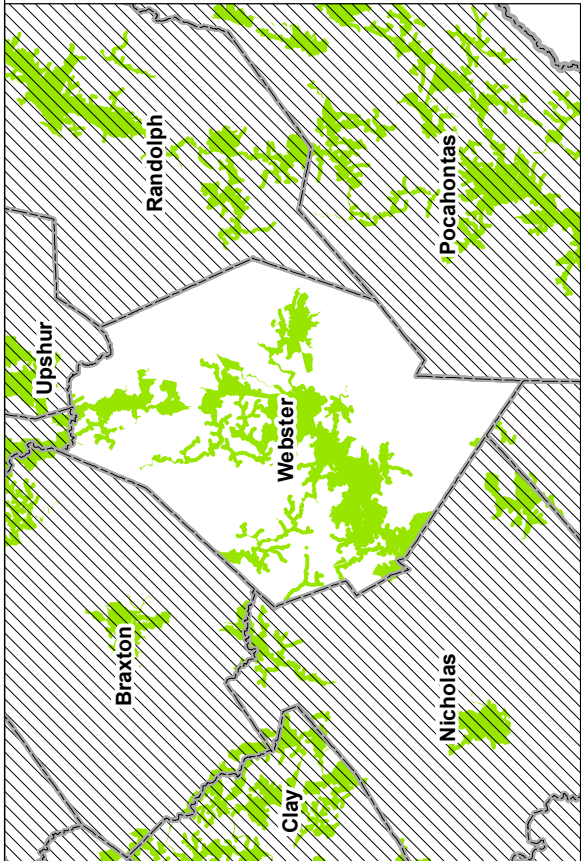
Source: West Virginia Broadband Mapping Program 2012




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# Broadband - Internet DSL, BPL, Other Copper

## Webster County



-  Planning Regions Line
-  DSL, BPL, Other Copper
-  County Boundaries



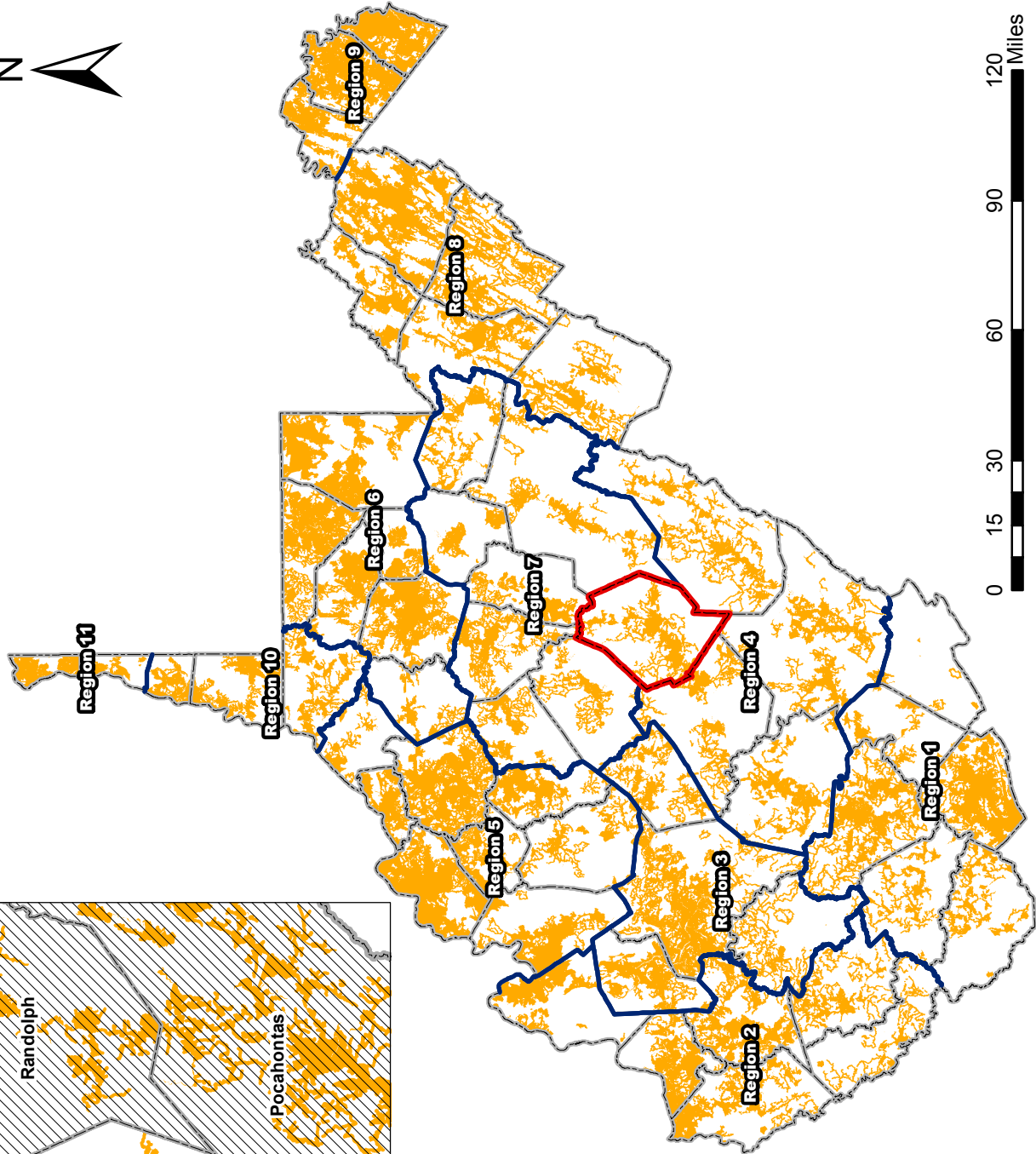
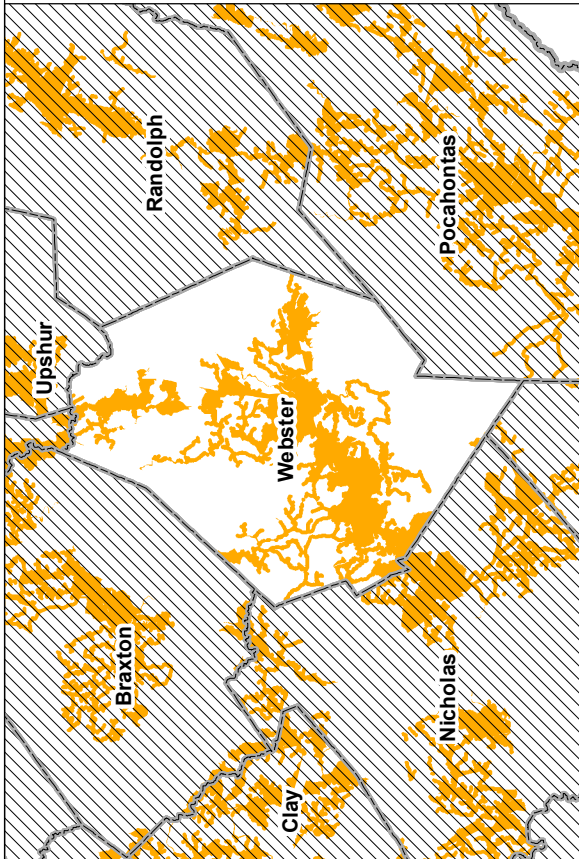
Source: West Virginia Broadband Mapping Program 2012

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# Broadband - Internet Wireline Coverage

Webster County



- Planning Regions Line
- Wireline Coverage
- County Boundaries



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TRANSPORTATION INSTITUTE  
[www.rti.org](http://www.rti.org)

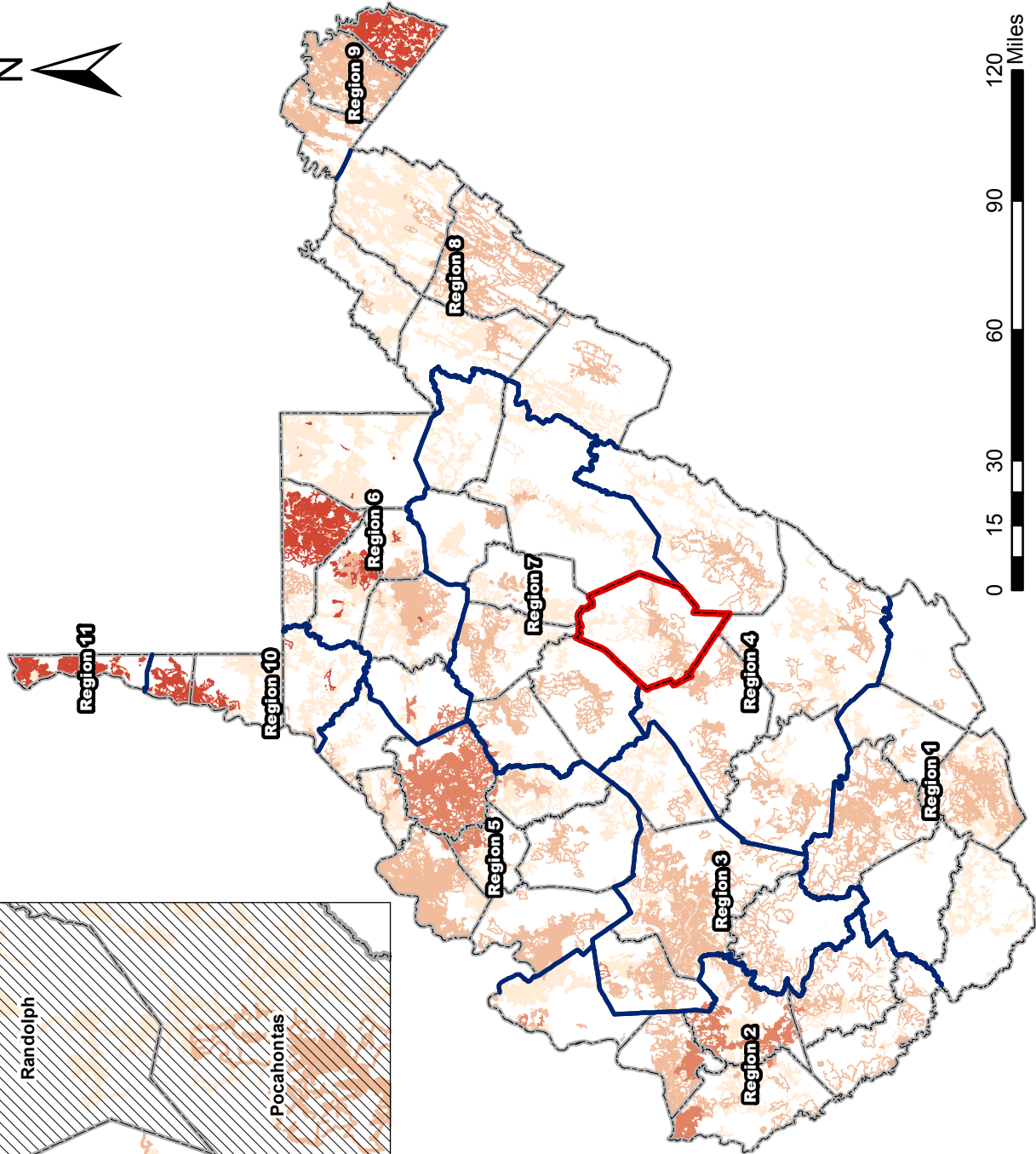
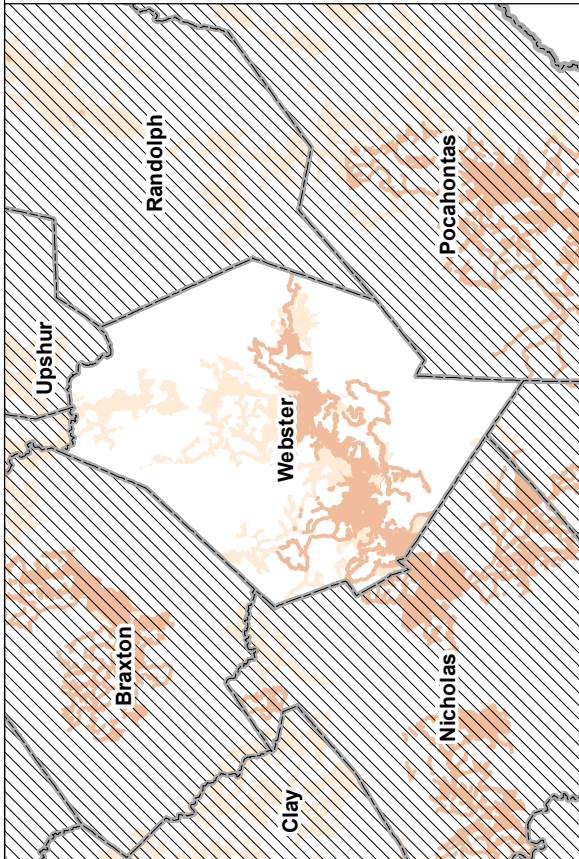
Source: West Virginia Broadband Mapping Program 2012

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# Broadband - Internet MaxUp Speed Wireline

## Webster County



- Planning Regions Line
- 200 - 768 kbps
- 768 kbps - 3 mbps
- 3 - 10 mbps
- 10 - 25 mbps
- Greater than 25 mbps
- County Boundaries

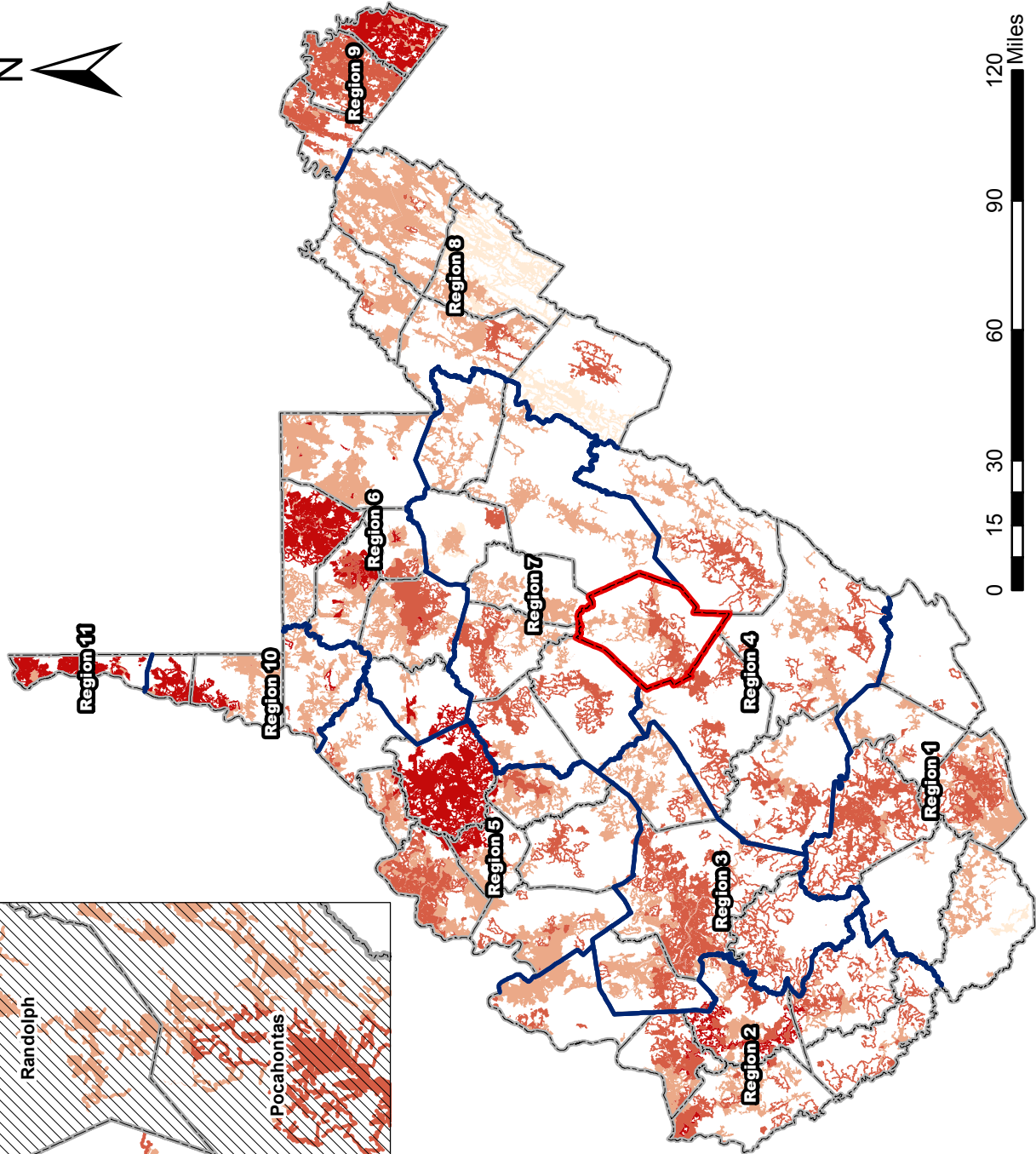
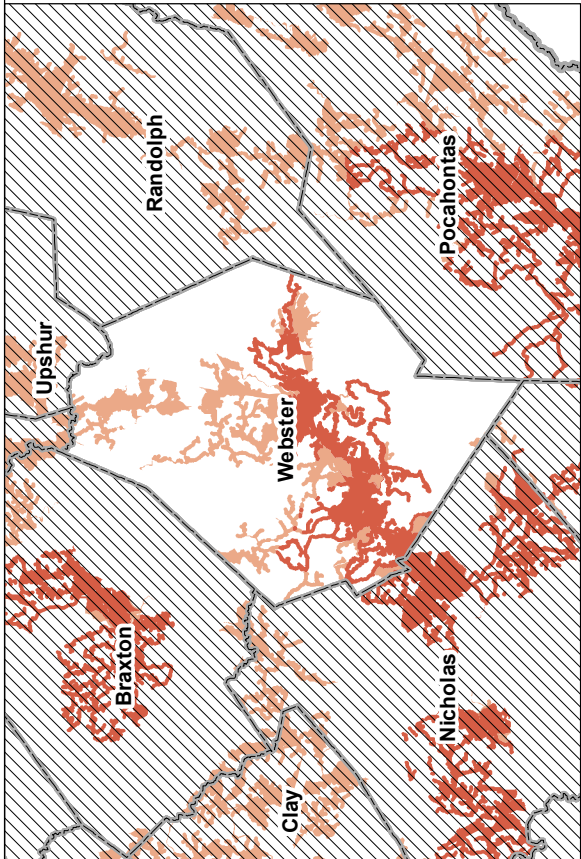








Source: West Virginia Broadband Mapping Program 2012

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# Broadband - Internet MaxDown Speed Wireline

Webster County



-  Planning Regions Line
-  768 kbps - 3 mbps
-  3 - 10 mbps
-  10 - 25 mbps
-  Greater than 25 mbps
-  County Boundaries



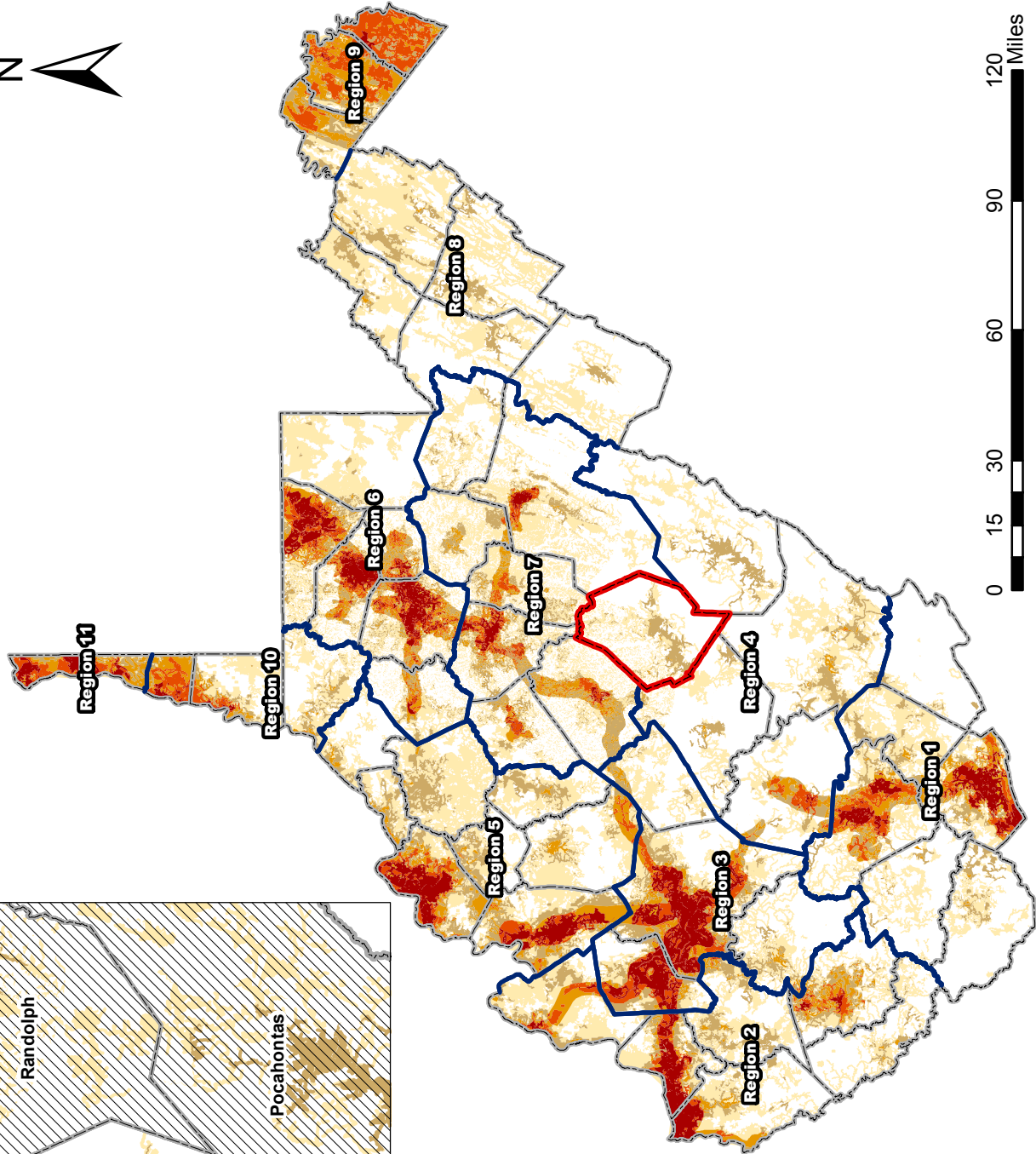
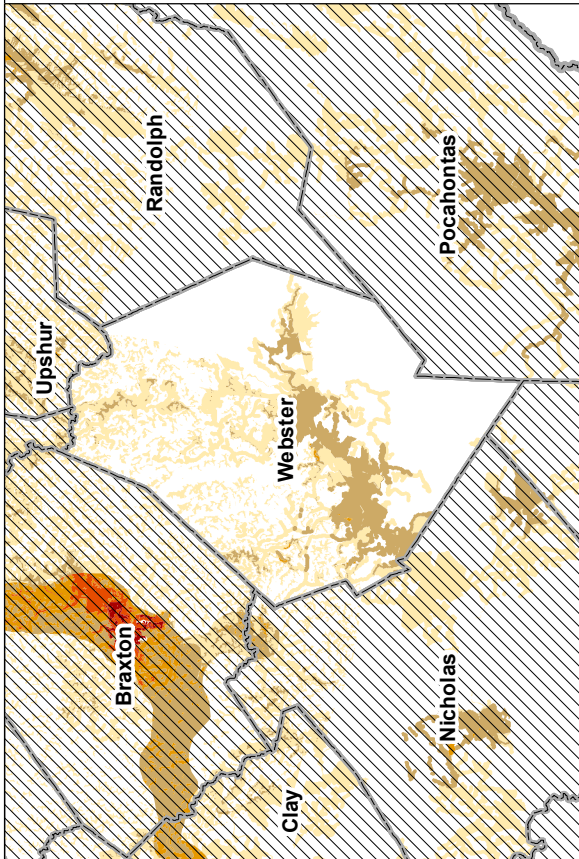
Source: West Virginia Broadband Mapping Program 2012








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# Broadband - Internet Total Number of Providers

Webster County



-  Planning Regions Line
-  1 Provider
-  2 Providers
-  3 Providers
-  4 Providers
-  5 Providers
-  County Boundaries



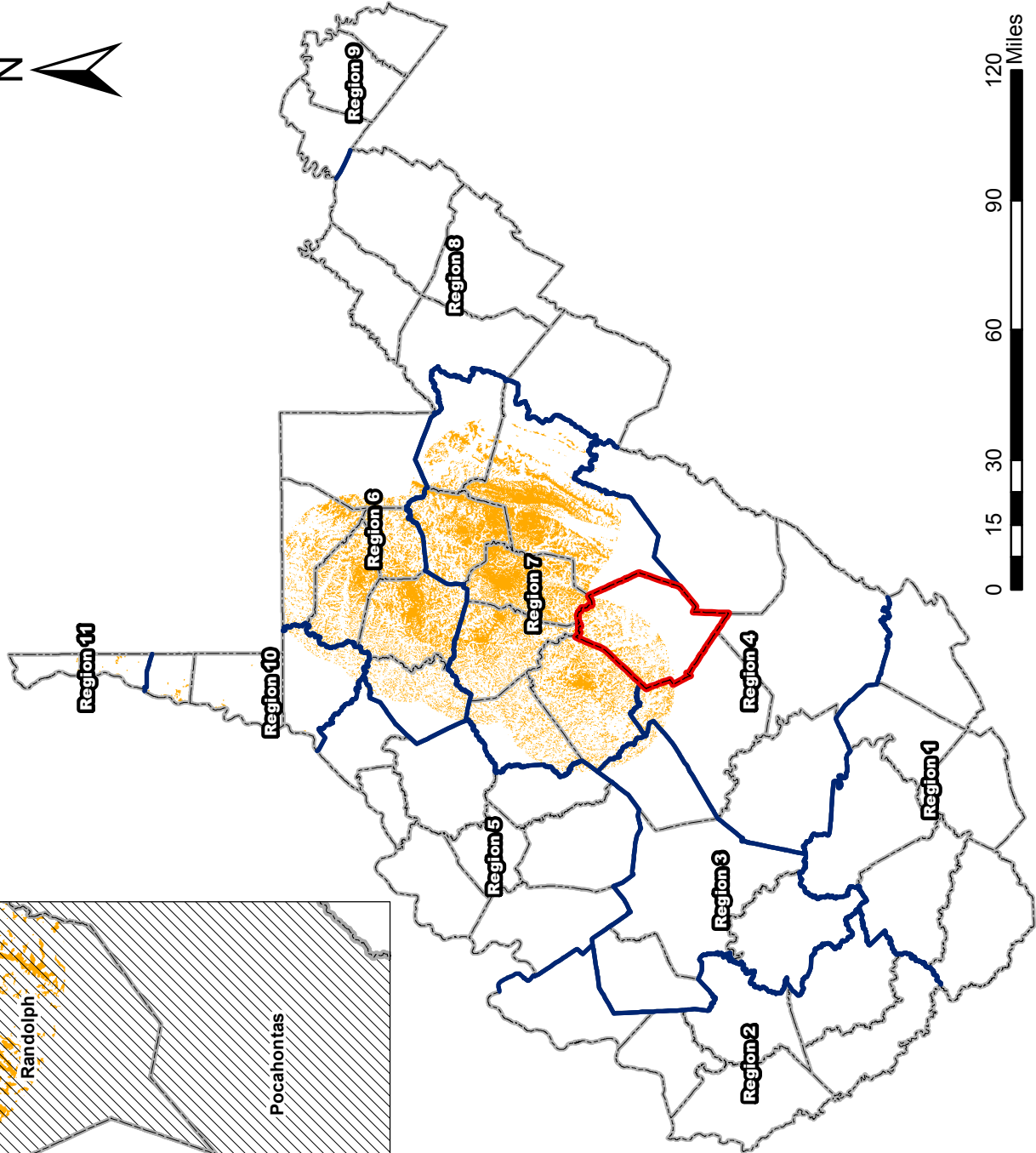
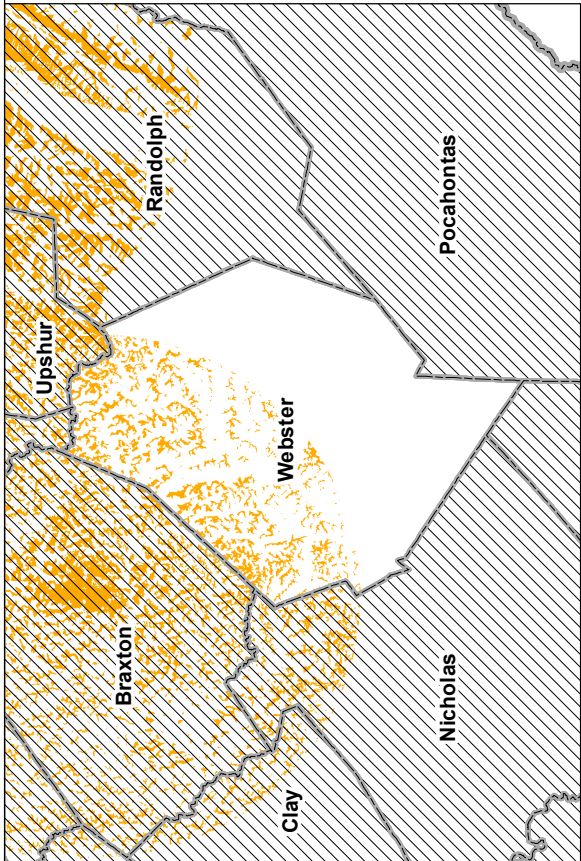
Source: West Virginia Broadband Mapping Program 2012




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# Broadband - Internet Fixed Wireless Coverage

Webster County



-  Planning Regions Line
-  Fixed Wireless
-  County Boundaries

Source: West Virginia Broadband Mapping Program 2012

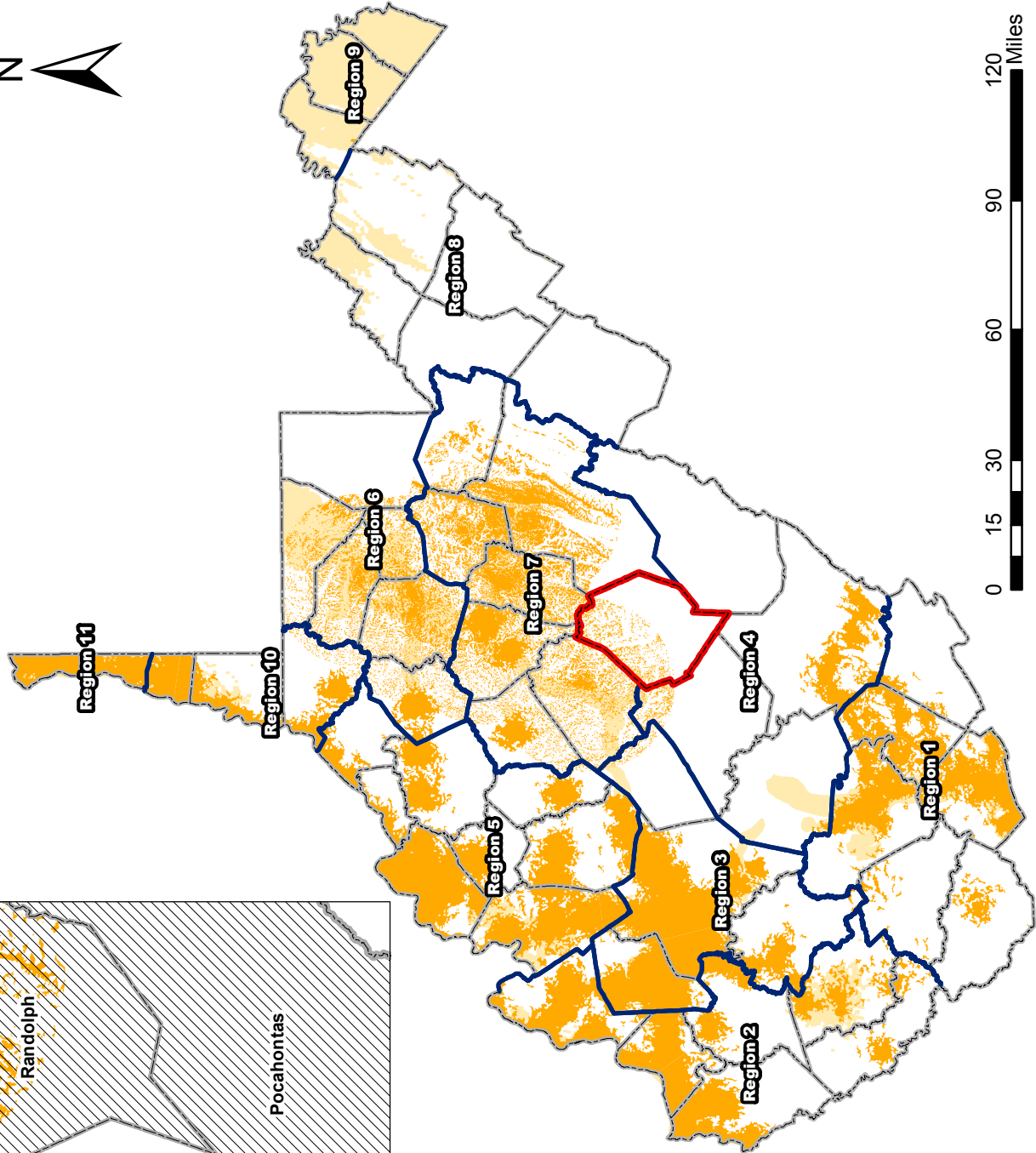
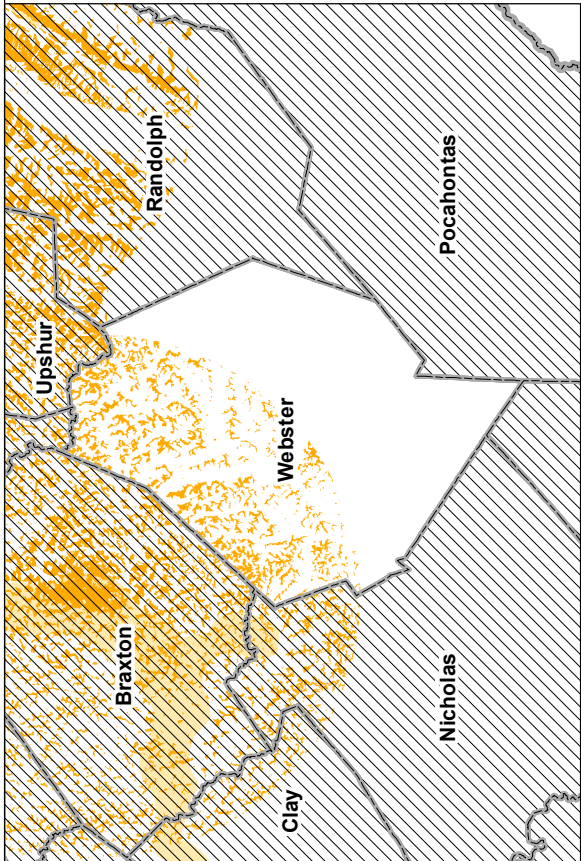
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# Broadband - Internet MaxDown Speed Wireless

Webster County



-  Planning Regions Line
-  768 kbps - 3 mbps
-  3 - 10 mbps
-  County Boundaries



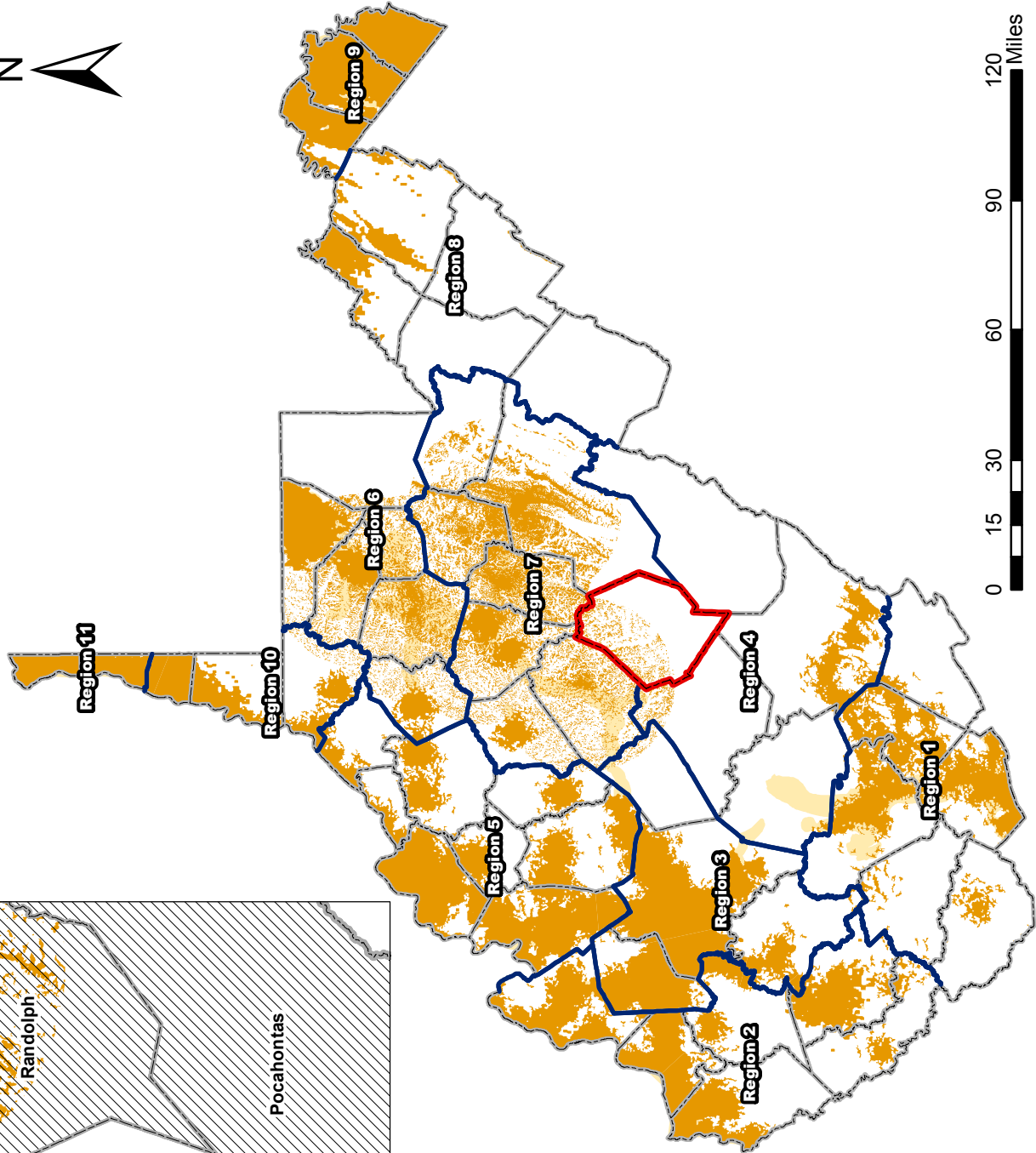
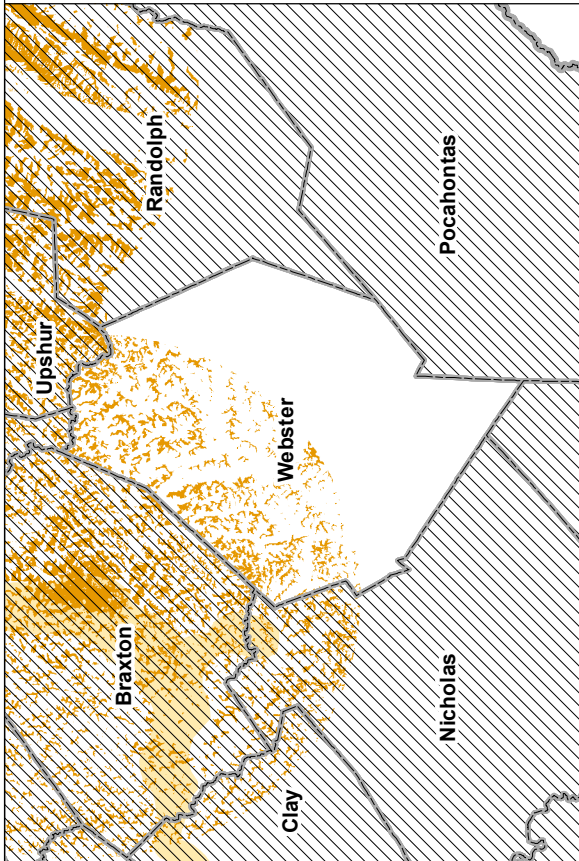
Source: West Virginia Broadband Mapping Program 2012





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# Broadband - Internet MaxUp Speed Wireless

## Webster County



-  Planning Regions Line
-  200 - 768 kbps
-  768 kbps - 3 mbps
-  County Boundaries

Source: West Virginia Broadband Mapping Program 2012

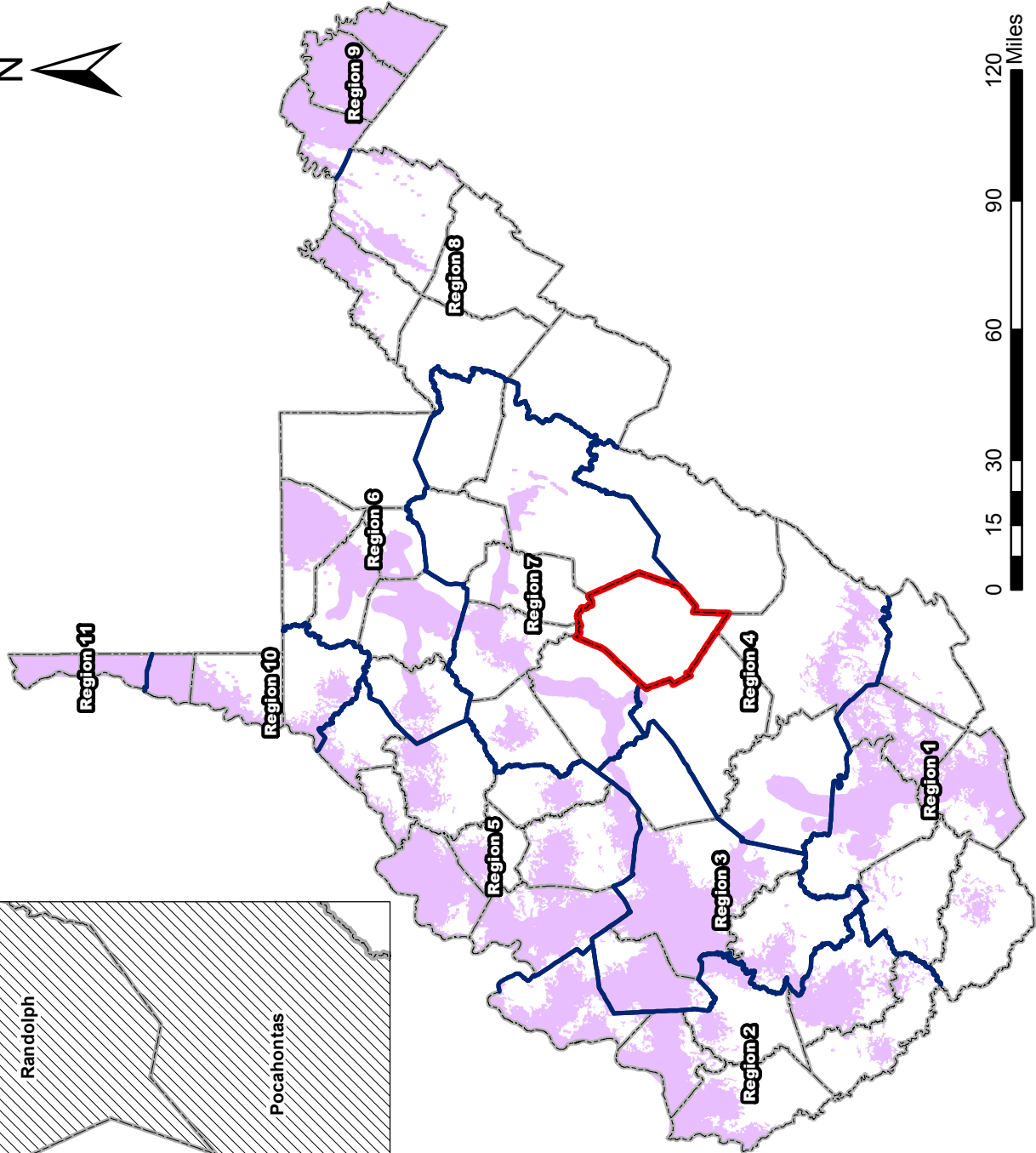
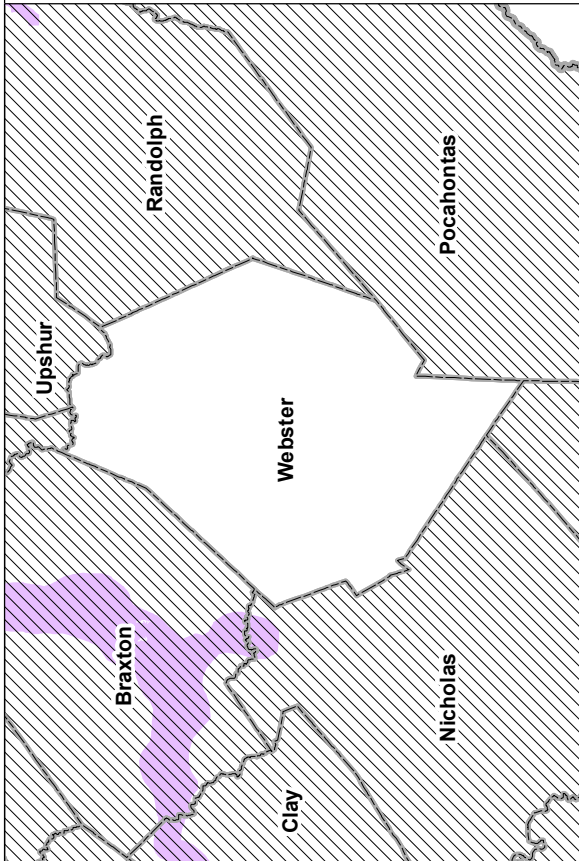
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# Broadband - Internet Mobile Wireless Coverage

## Webster County



-  Planning Regions Line
-  Mobile Wireless
-  County Boundaries



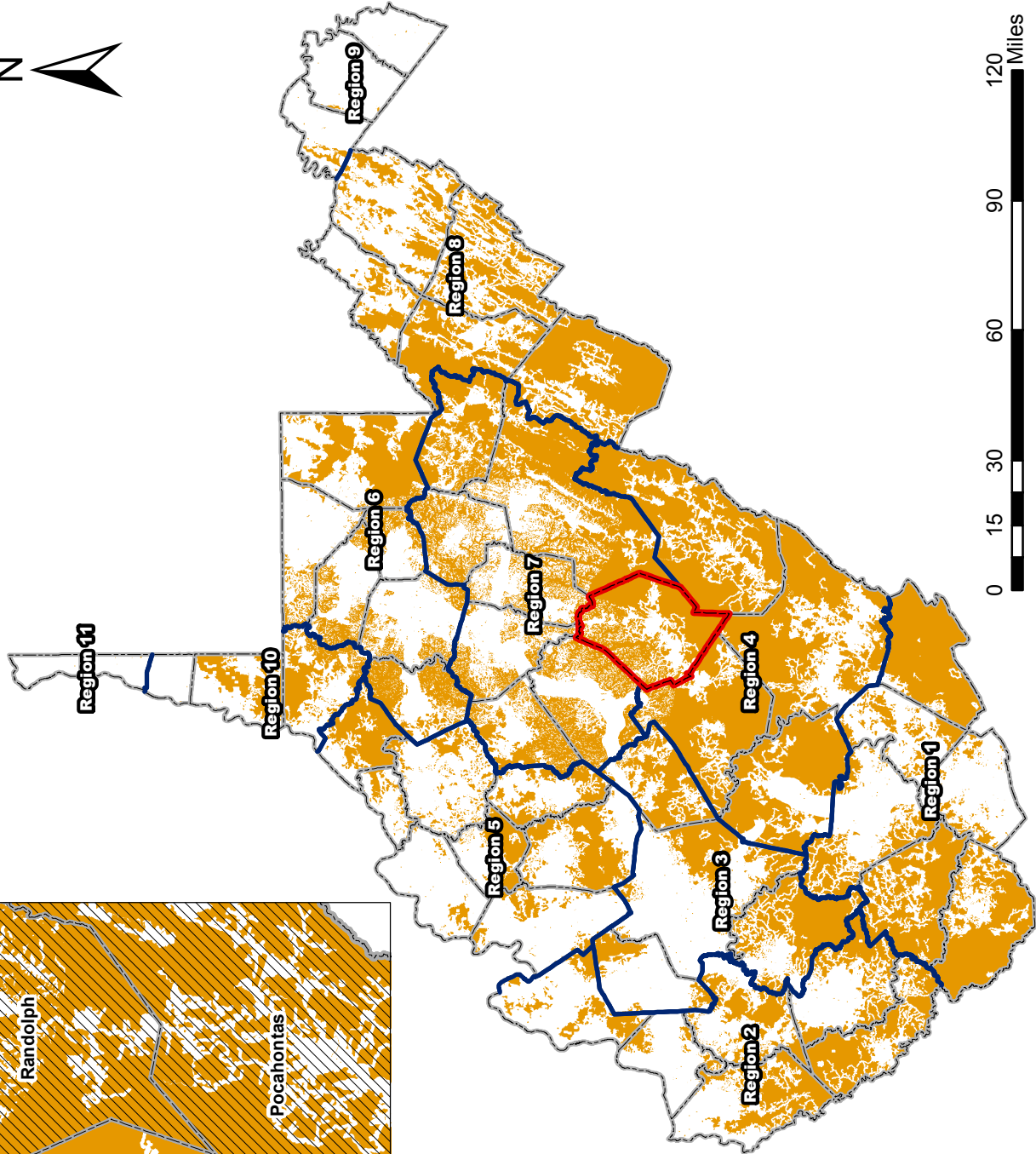
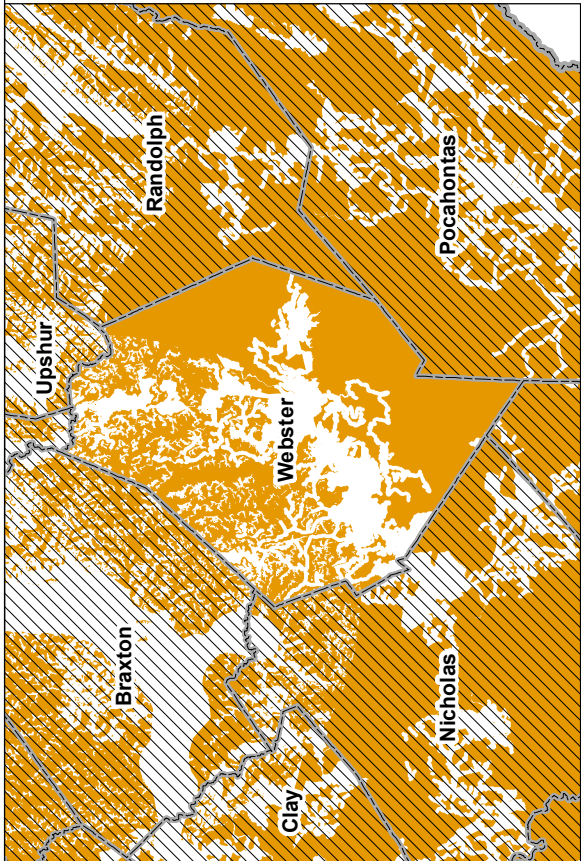
Source: West Virginia Broadband Mapping Program 2012




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# Broadband - No Broadband Coverage

Webster County



-  Planning Regions Line
-  No Coverage Reported
-  County Boundaries

Source: West Virginia Broadband Mapping Program 2012

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## **Transportation**

### *Highways*

Webster County has no interstate or US Routes but contains State Routes 15, 20, and 82 (Map 26).

### *Rail*

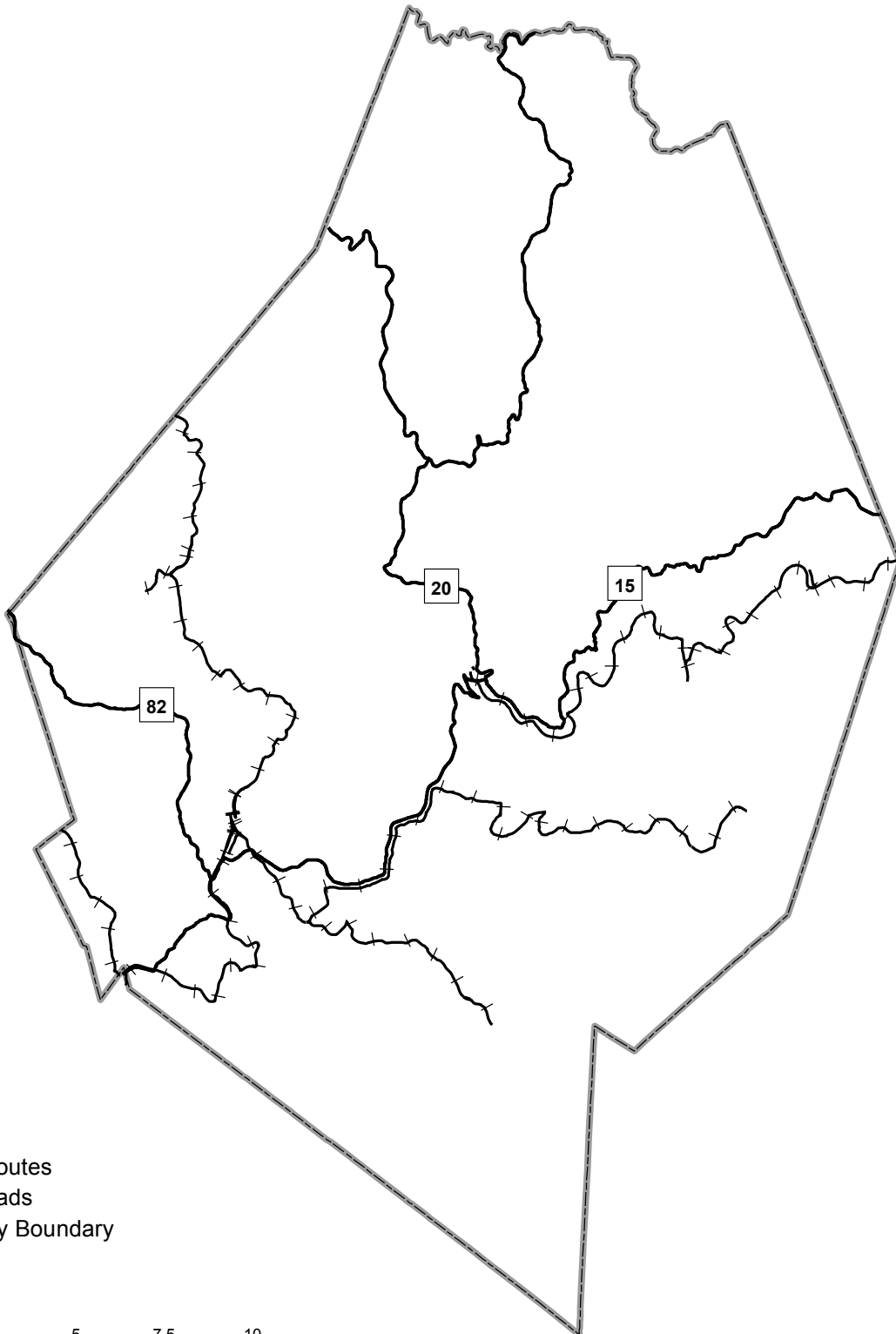
Webster County has an extensive rail system to complement its natural resource activities.

### *Air*

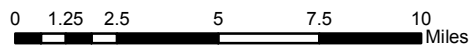
Webster County has no airports.

# Transportation

## Webster County



- WV Routes
- ⊕ Railroads
- ▭ County Boundary



Source: Airports; United States Department of Transportation 2012, West Virginia GIS Technical Center; US Routes, West Virginia Routes, I66 Pikeville, King Coal Highway; West Virginia Department of Transportation 2012; Railroads; Rahall Transportation Institute 2012

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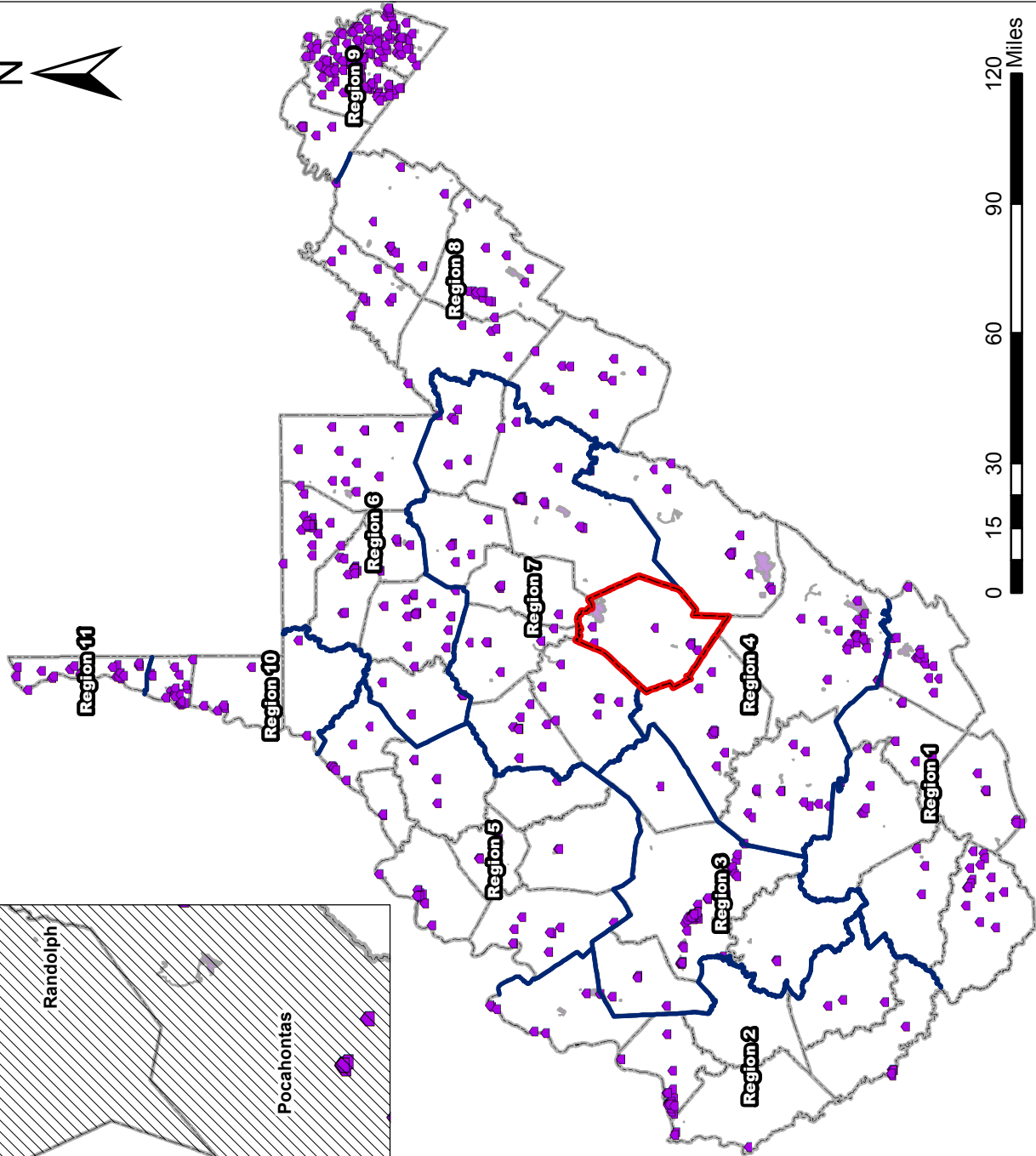
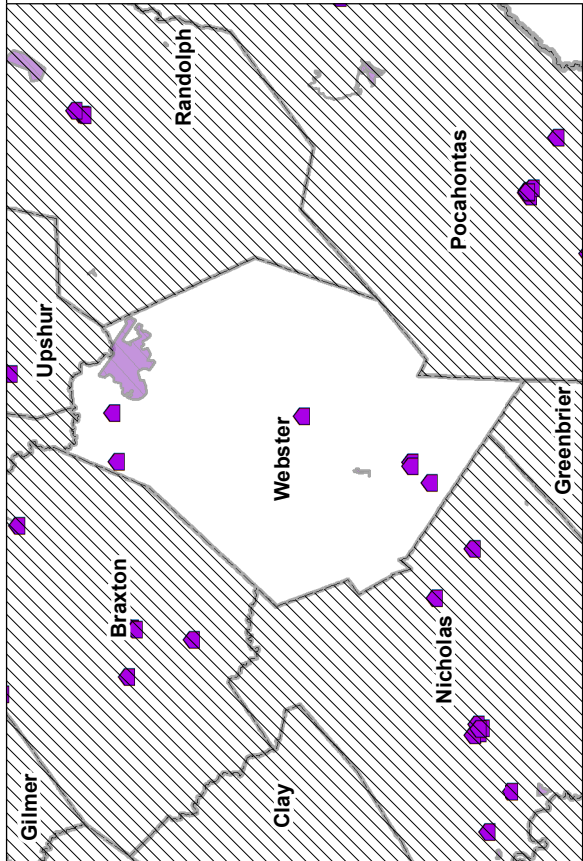


## **Historic Preservation**

Historic preservation will be essential in a county steeped in coal mining history. Webster County has seven listings in the National Register of Historic Places. There are a number of historic buildings in the County that harken back to Webster County's frontier and coal mining past (Map 27). Other historic areas have been designated by West Virginia. Map 28 gives a spatial position to each designated State historic piece of architecture.

# National Register of Historic Place

## Webster County



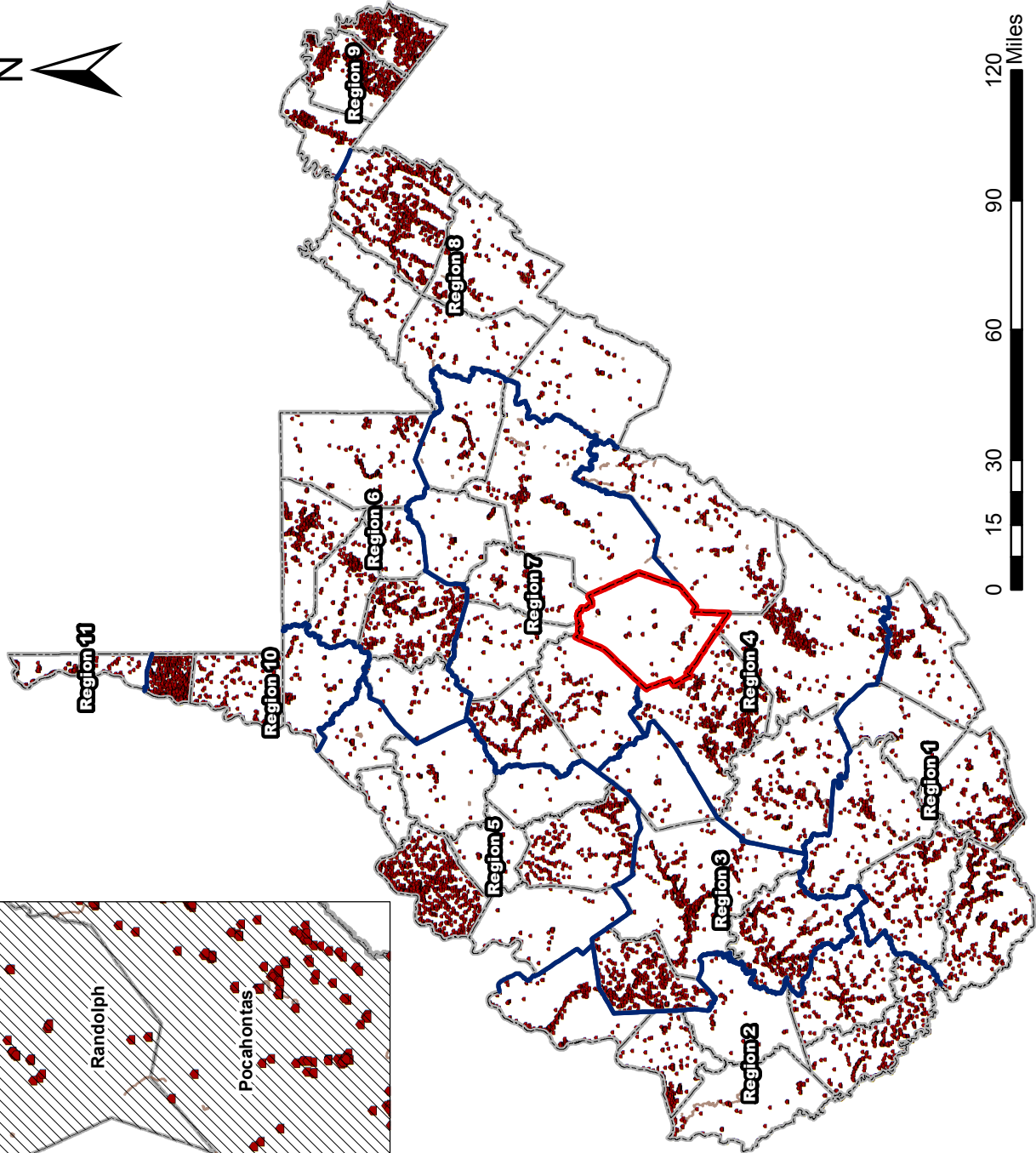
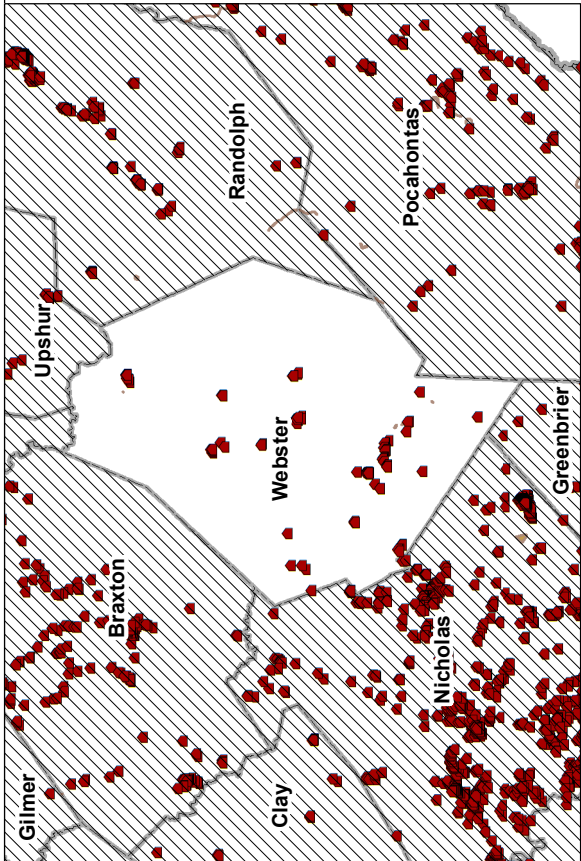
- National Register of Historic Place
- Planning Regions Line
- National Register of Historic Place (Area)
- County Boundaries



Source: West Virginia State Historic Preservation Office 2012

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# State Historic Architecture Webster County



- State Historic Architecture
- Planning Regions Line
- State Historic Architecture (Area)
- County Boundaries



Source: West Virginia State Historic Preservation Office 2012

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## **Natural Resources, Environment, and Energy**

Particular importance should be given to the spatial positions of natural resource areas, geographic environments, and potential energy sources in a county. This serves to inform potential investors about what possibilities the land provides for production of resources and energy. Webster County has several advantages in these areas that can be utilized to the advantage of the citizens.

West Virginia has an extensive wetlands inventory, because of its extensive system of lakes, streams, and rivers. Wetlands provide many environmental benefits, including housing fish, replenishing groundwater, and relaying nutrients. Webster County's system is not very extensive, but does have two major lines of wetlands (Map 29).

The State also possesses a respectable amount of park and forest land. Most of this land is located in the eastern portion of the State, the area that contains the main part of the Appalachian Mountain range. Webster contains parts of the Monongahela National Forest, a state park, and several wildlife management areas (Map 30).

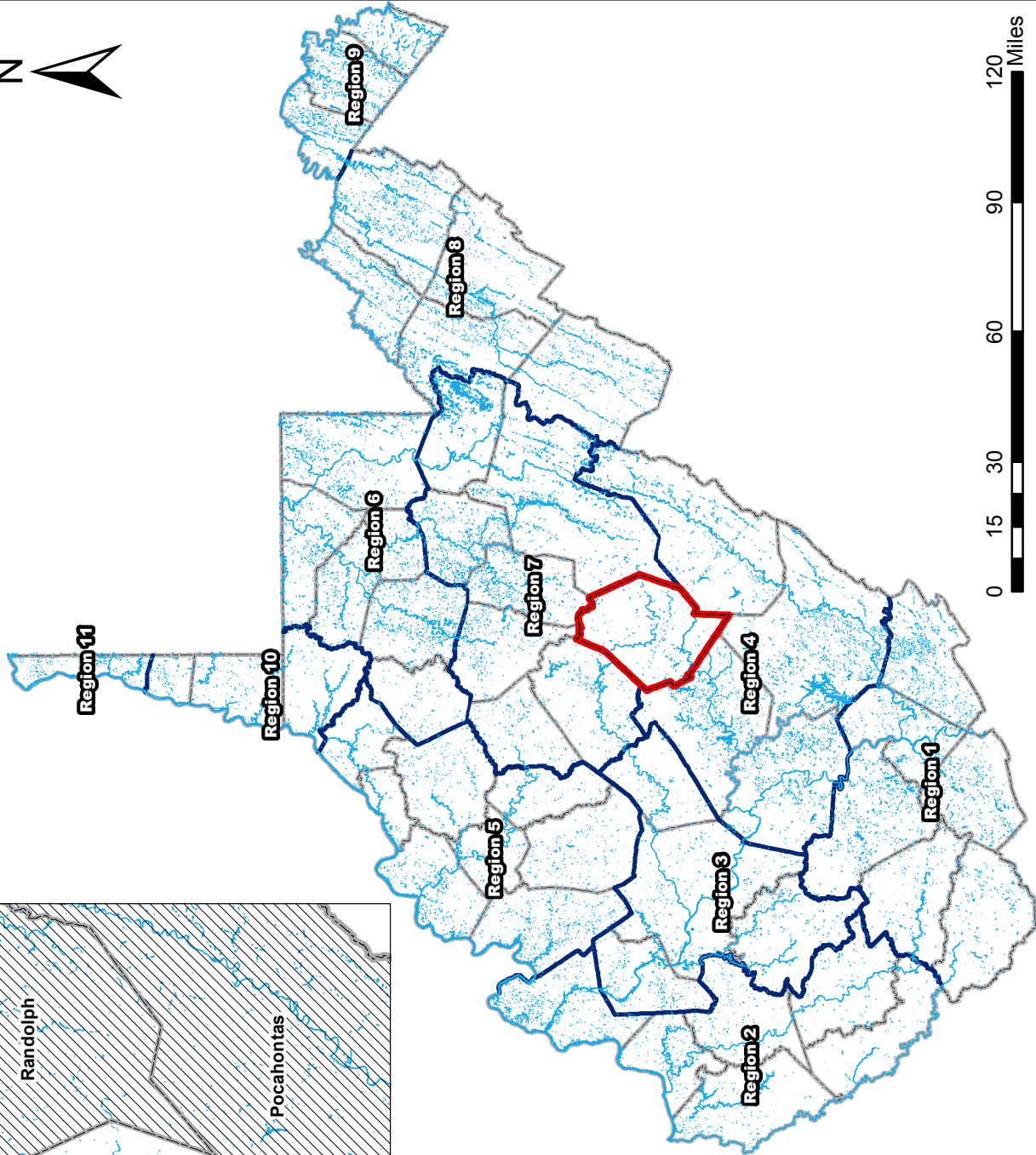
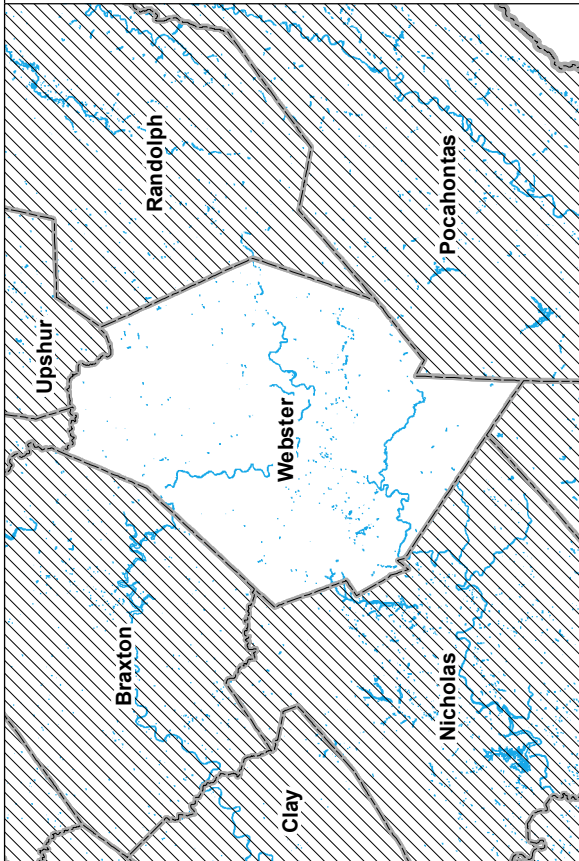
Air quality is a necessary environmental health benchmark that can determine the health and vitality of an area's residents. The air pollution non-attainment areas are "areas of the country where air pollution levels persistently exceed the national ambient air quality standards."<sup>7</sup> There are six full counties in West Virginia that are designated air pollution non-attainment areas, either in annual or 2006 24-hour standards as of the publication of this plan; Webster County is not among them (Map 31).




---

<sup>7</sup> "The Green Book Nonattainment Areas for Criteria Pollutants," Environmental Protection Agency, Accessed March 1, 2013, <http://www.epa.gov/oaqps001/greenbk/>.

# Hydrology - National Wetlands Inventory

Webster County



-  Planning Regions Line
-  National Wetlands Inventory
-  County Boundaries



Source: United States Fish and Wildlife Service 1996

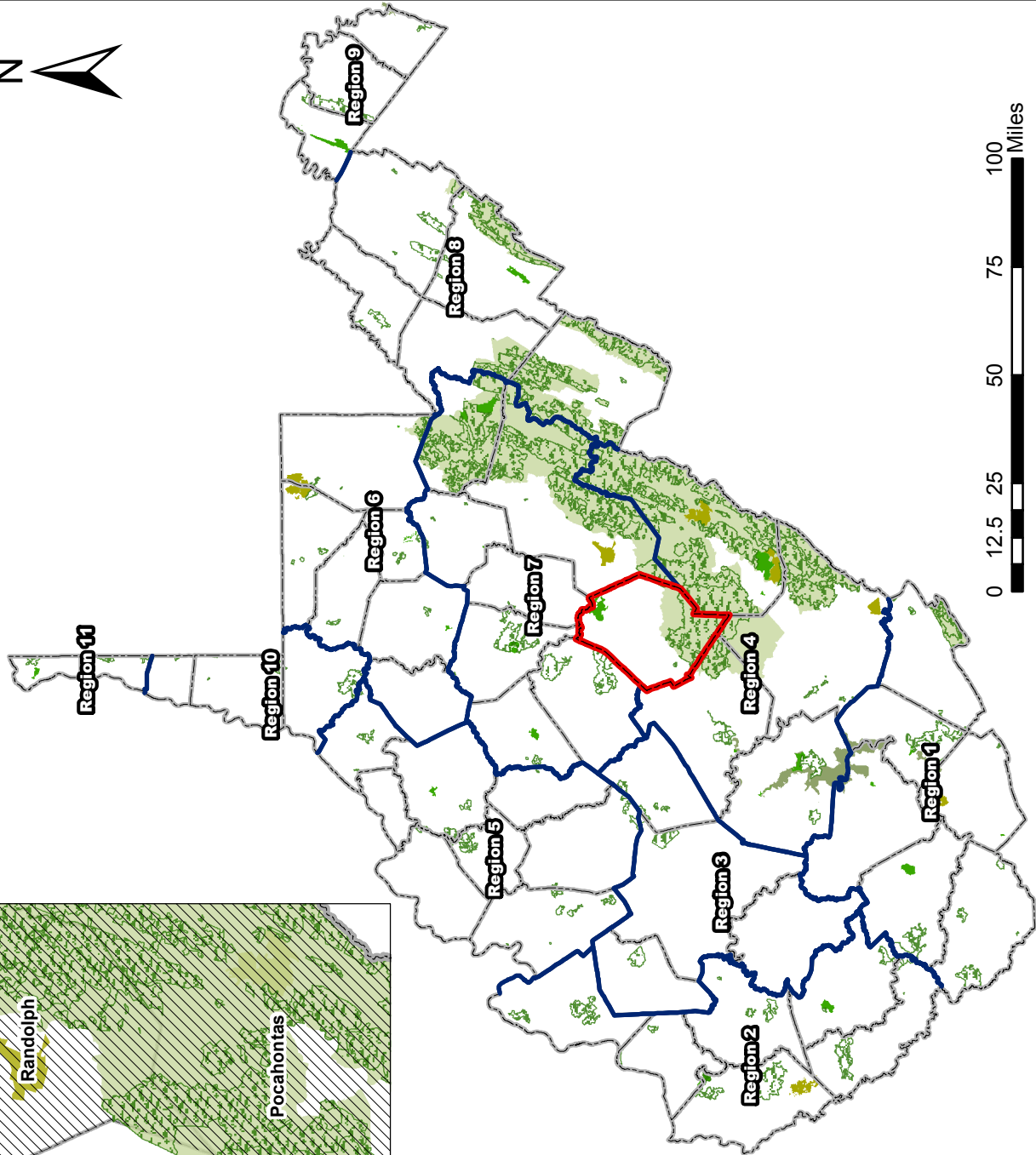
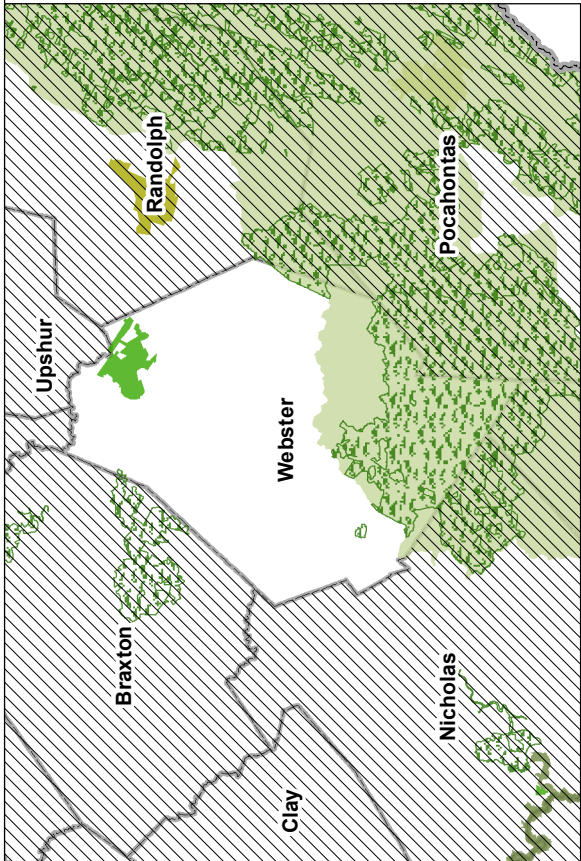
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# Public Land - Parks and Forests

## Webster County



-  Planning Regions Line
-  Wildlife Management Areas
-  State Forest
-  State Park
-  National Forest
-  National Park
-  County Boundaries



Source: Wildlife Management Areas; West Virginia Division of Natural Resources 2002; State Forest; West Virginia Division of Forestry 2004; State Park; West Virginia Division of Natural Resources; National Resource Analysis Center 2000; National Forest; United States Forest Service 2003; National Park; United States National Park Service 2003

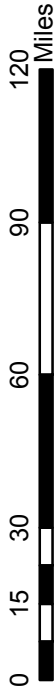
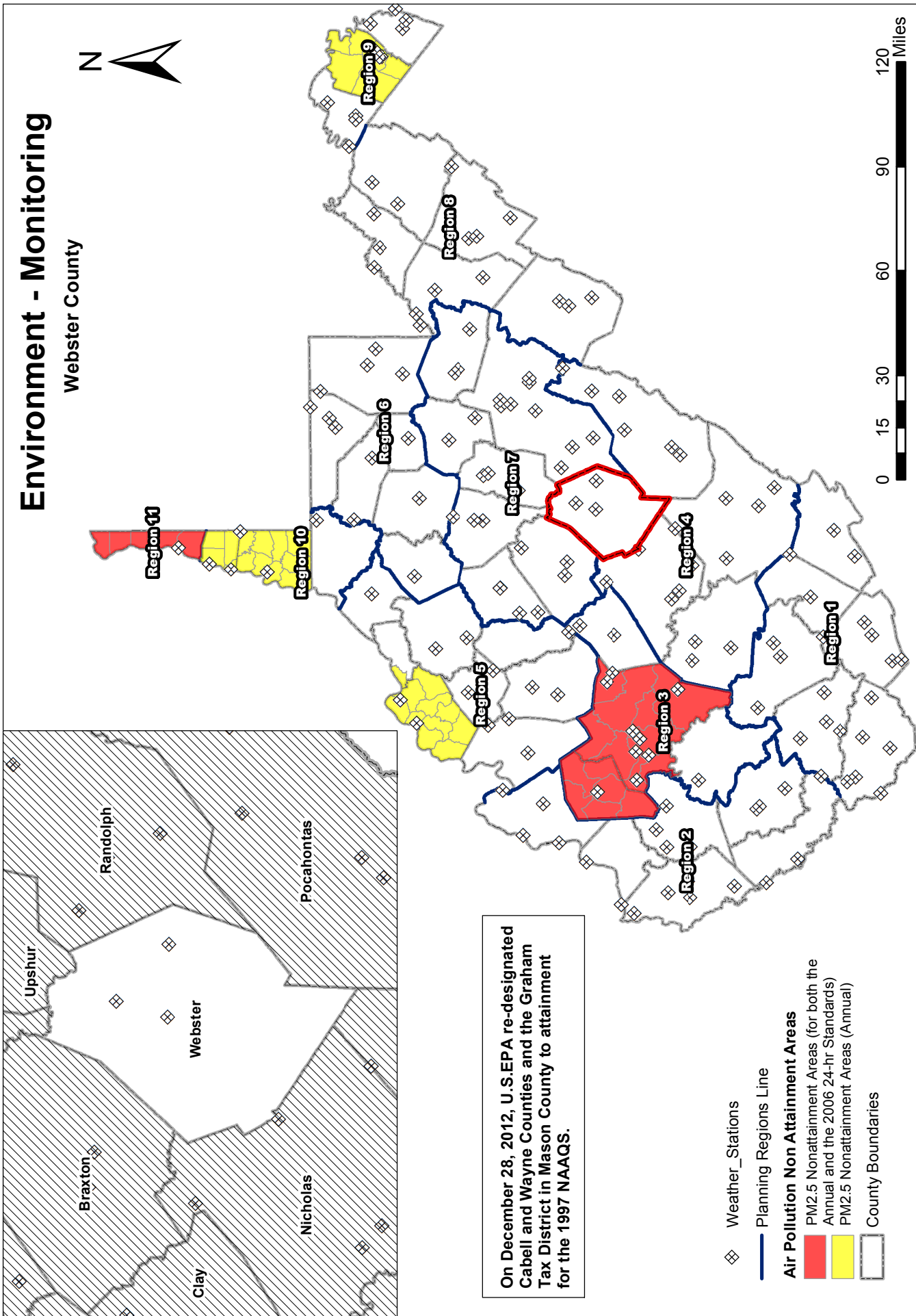
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# Environment - Monitoring

Webster County



On December 28, 2012, U.S.EPA re-designated Cabell and Wayne Counties and the Graham Tax District in Mason County to attainment for the 1997 NAAQS.

- ◇ Weather\_ Stations
- Planning Regions Line
- Air Pollution Non Attainment Areas**
  - PM2.5 Nonattainment Areas (for both the Annual and the 2006 24-hr Standards)
  - PM2.5 Nonattainment Areas (Annual)
- County Boundaries

Source: Weather Stations; National Oceanic and Atmospheric Administration 1999; Air Pollution Non Attainment Areas; West Virginia Department of Environmental Protection and United States Environmental Protection Agency.

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West Virginia's past and most likely its future are defined by energy. Besides coal, other options for energy have been investigated in the State. Gas and oil are of course the main energy staples in the nation, and West Virginia has access to this sort of energy in a number of ways. Webster County however has no play in either of these energy staples (Map 32). Webster County does have play in the Marcellus shale, with extensive thickness in about half the county, and a number of completed and permitted wells (Map 33). The Marcellus Shale will continue to be a major player in West Virginia's energy layout for the foreseeable future, and as technology improves recoverability may also. Webster County has developed its current system to meet current energy needs.

Potential renewable energy sources were also examined. Wood byproducts are a potential energy source classified as biomass energy. Naturally it is most useful in areas with a great deal of wood products. West Virginia is one of the most forested States in the country. Webster County appears to be one of the most forested counties in West Virginia (Map 34). As the maps show, Webster is one of the major players in energy production of wood byproducts (Maps 35 and 36). This indicates a developed market with potential for further investment. Other potential renewable energy sources include geothermal (Map 37), solar (Map 38), and wind (Map 39). Each of these resources was examined in a recent report from the Center of Business and Economic Research at Marshall University.<sup>8</sup> None of these sources was "likely to provide fuel or electricity at a lower cost" than coal and oil. Subsidizing these resources appears to be the only way to encourage faster growth in consumption, and in some cases they still have very limited potential in West Virginia. Geothermal energy, however, appears to have great potential in certain parts of the State, as shown in Map 37, and about half of Webster appears to be very favorable for development. Webster County does not appear to be a favorable location for solar development, but it does have several good and one excellent area for wind resources that may be available for energy production. Still, technology is not predictable, and improvements could occur in each of these resource areas that will make generation more feasible. Efforts to monitor research in all these areas should be undertaken to make use of any potential developments.<sup>9</sup>

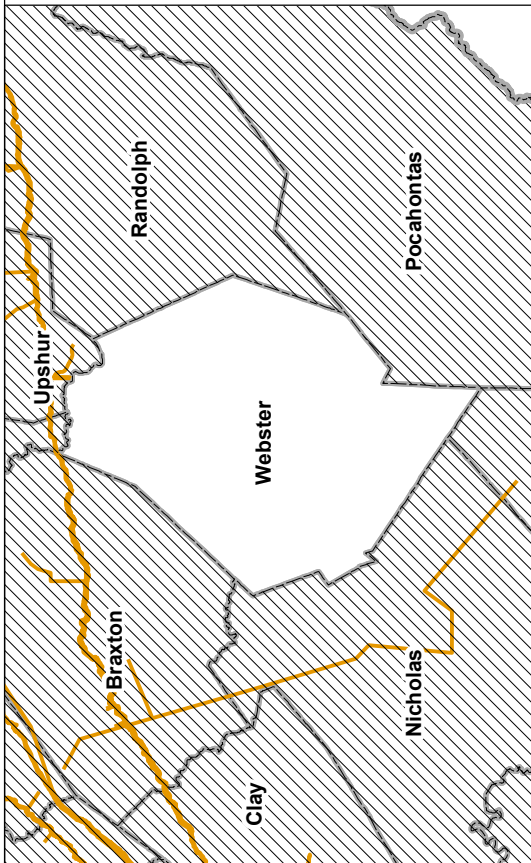
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<sup>8</sup> Kent, Calvin, Risch, Christine, and Pardue, Elizabeth. *Renewable Energy Policy: Opportunities for West Virginia*. Center for Business and Economic Research, Huntington, WV (2012).

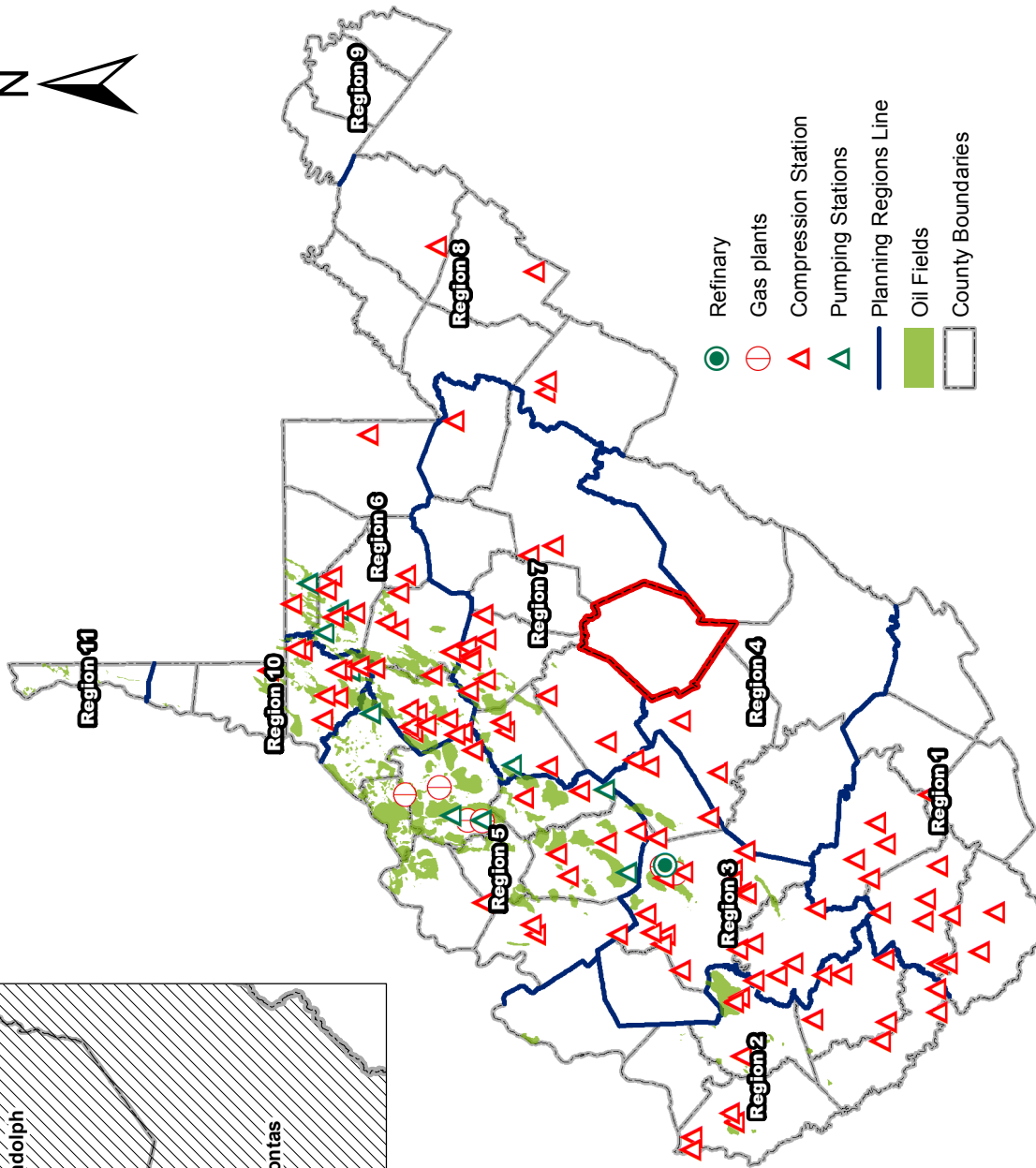
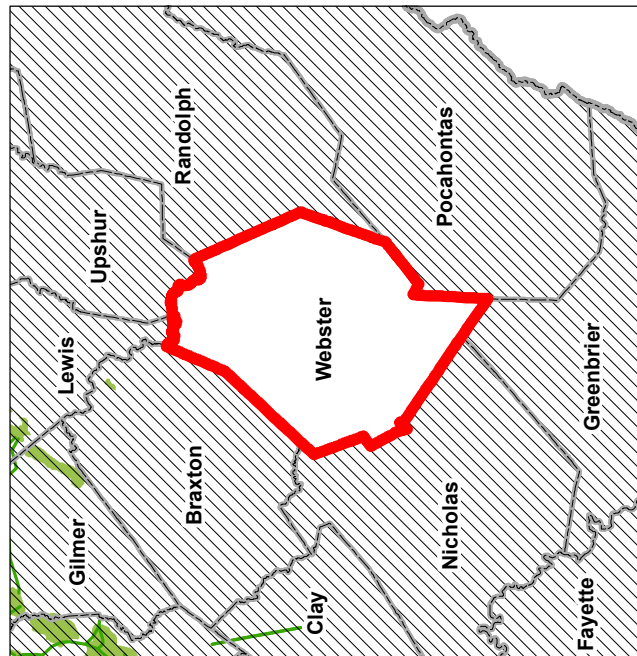
<sup>9</sup> Ibid.

# Energy - Gas and Oil

## Webster County



Gas Pipe



- Refinery
- Gas plants
- Compression Station
- Pumping Stations
- Planning Regions Line
- Oil Fields
- County Boundaries

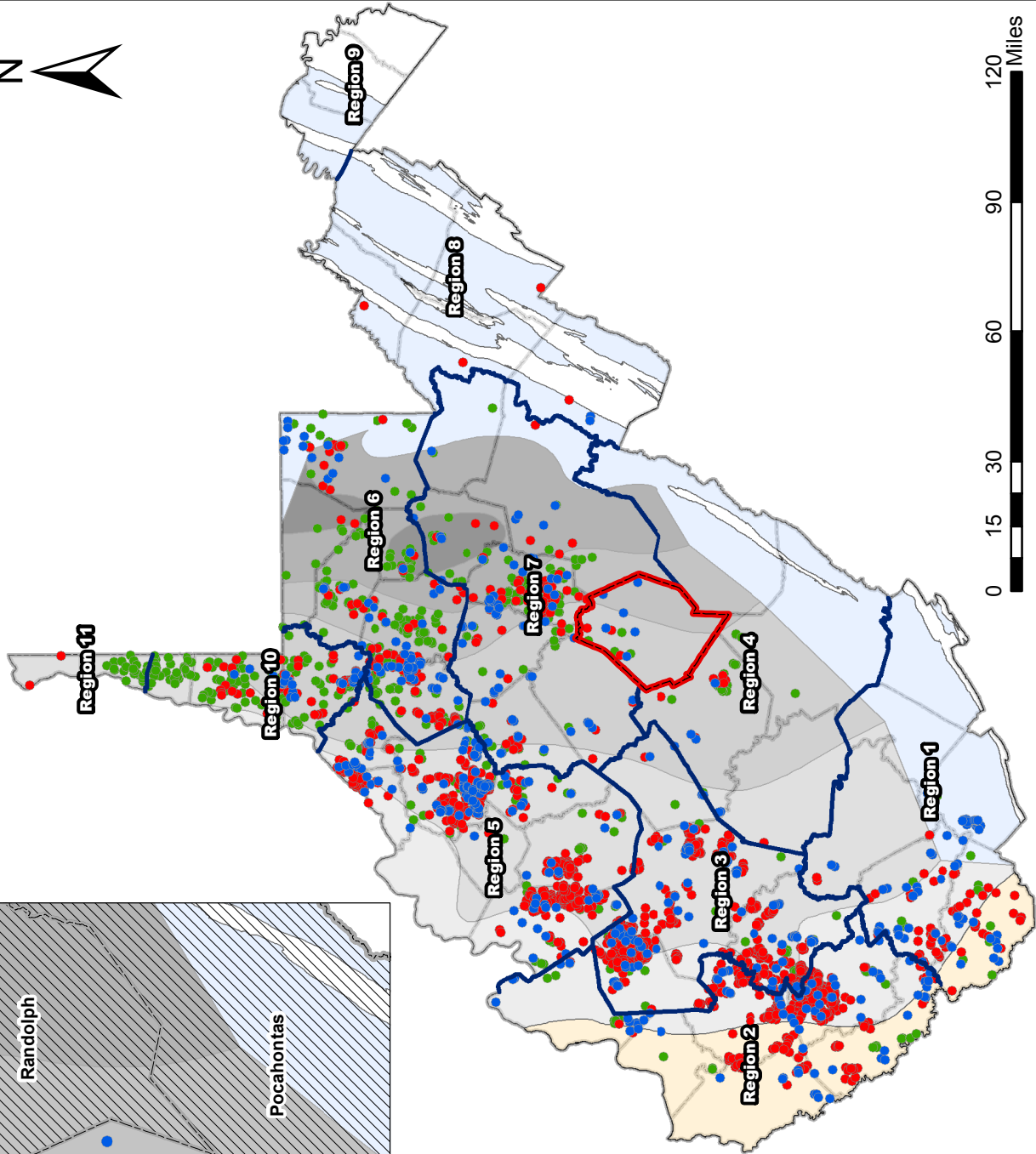
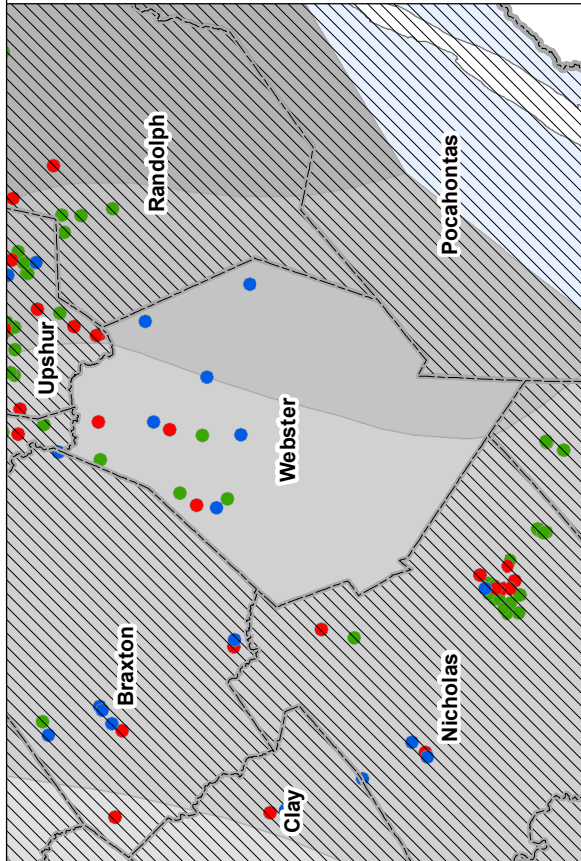


Source: West Virginia Geological and Economic Survey 2007

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# Energy - Marcellus Wells

## Webster County



- Cancelled Marcellus Wells
- Completed Marcellus Wells
- Permitted Marcellus Wells
- Planning Regions Line
- 0 ft. - 20 ft.
- 21 ft. - 40 ft.
- 41 ft. - 60 ft.
- 61 ft. - 80 ft.
- 81 ft. - 100 ft.
- Over 100 ft.
- Possible/Uncertain Marcellus
- Uncertain thickness
- Marcellus assumed to be absent
- County Boundaries

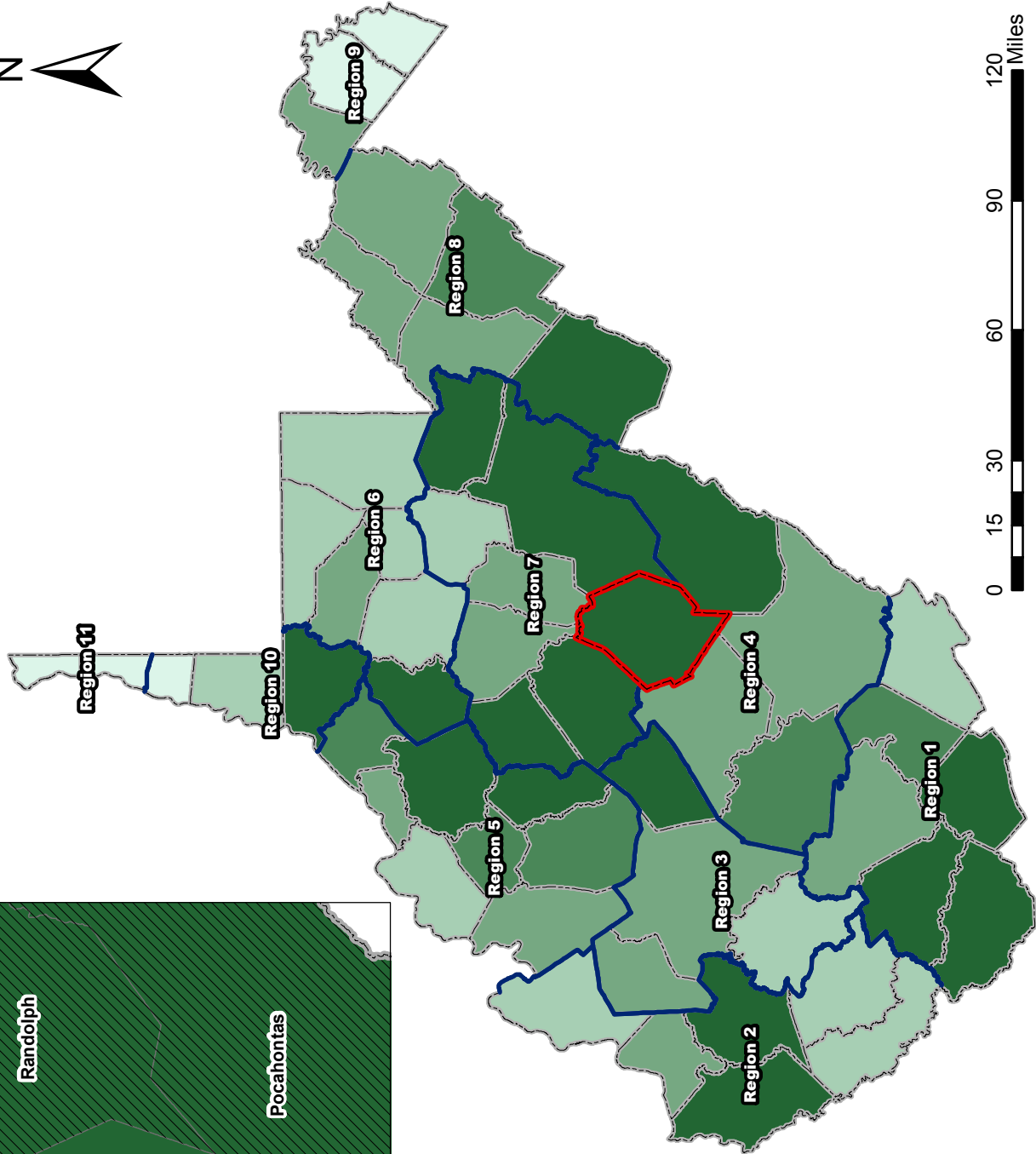
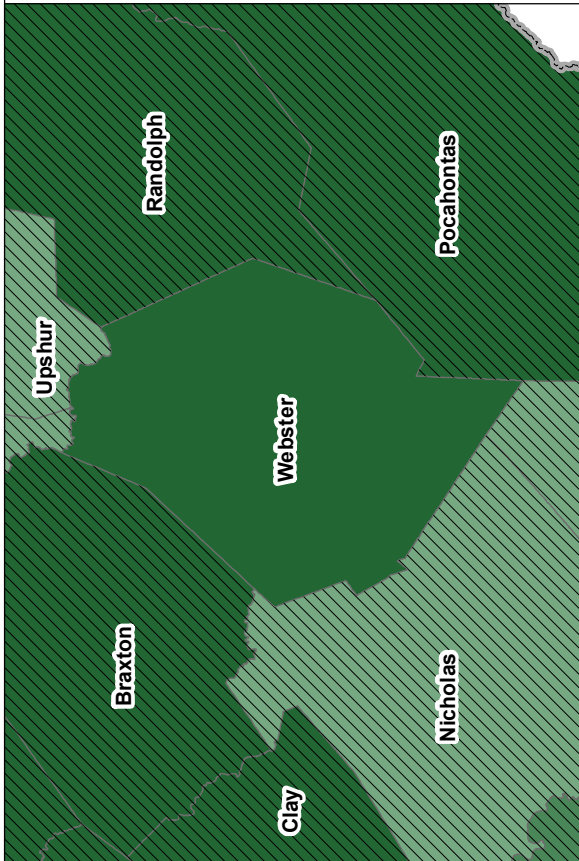
Source: West Virginia Geological and Economic Survey 2012

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# Energy - Percent Forest Coverage

Webster County



- Planning Regions Line
- 45.87% - 65%
- 65.01% - 75%
- 75.01% - 82%
- 82.01% - 85%
- 85.01% - 100%
- County Boundaries

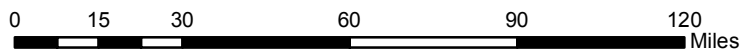
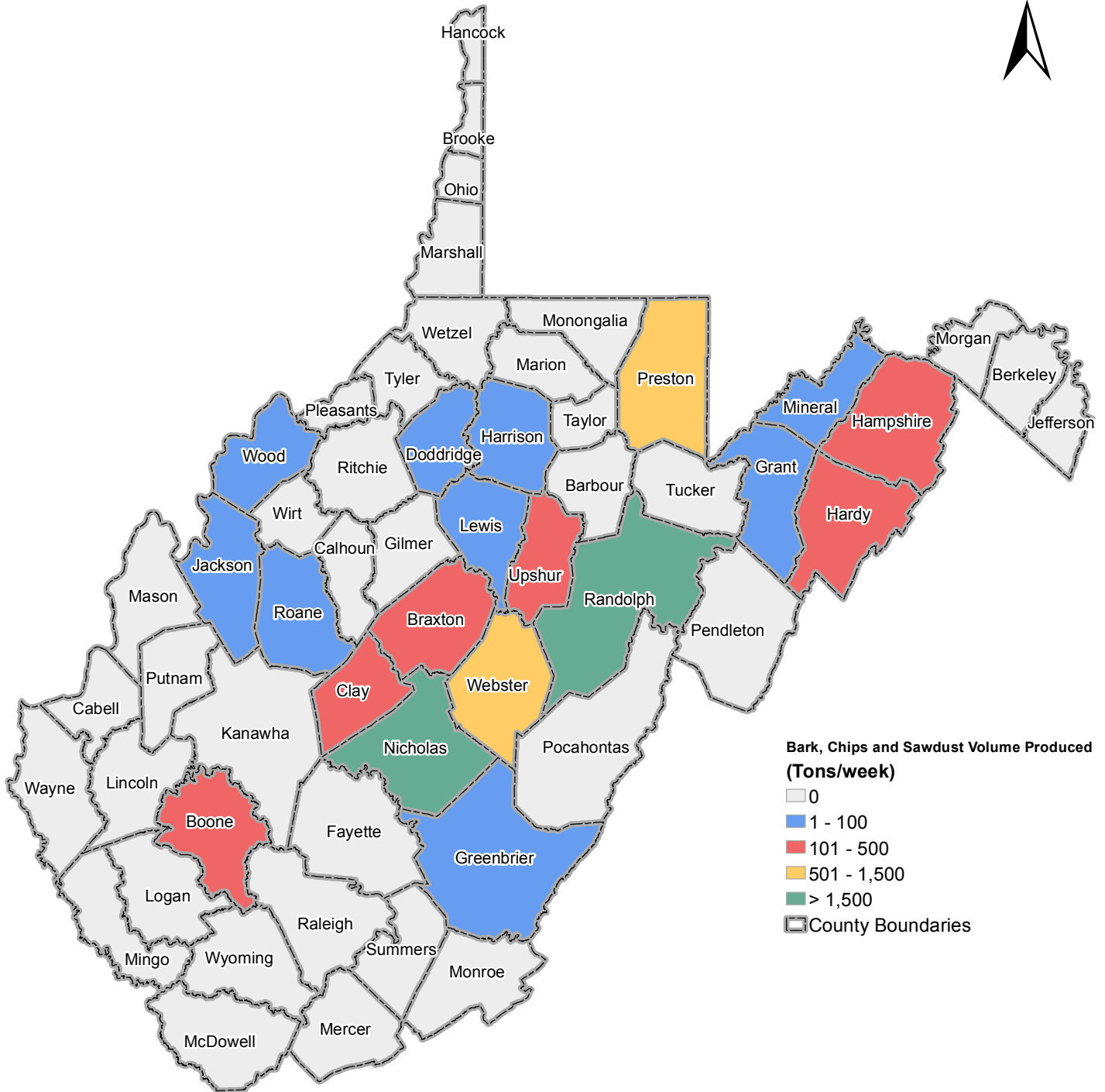
Source: Rahaal Transportation Institute 2013

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# Renewable Energy - Wood By Products

## Bark, Chip and Sawdust Volume Produced - Webster County



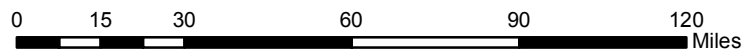
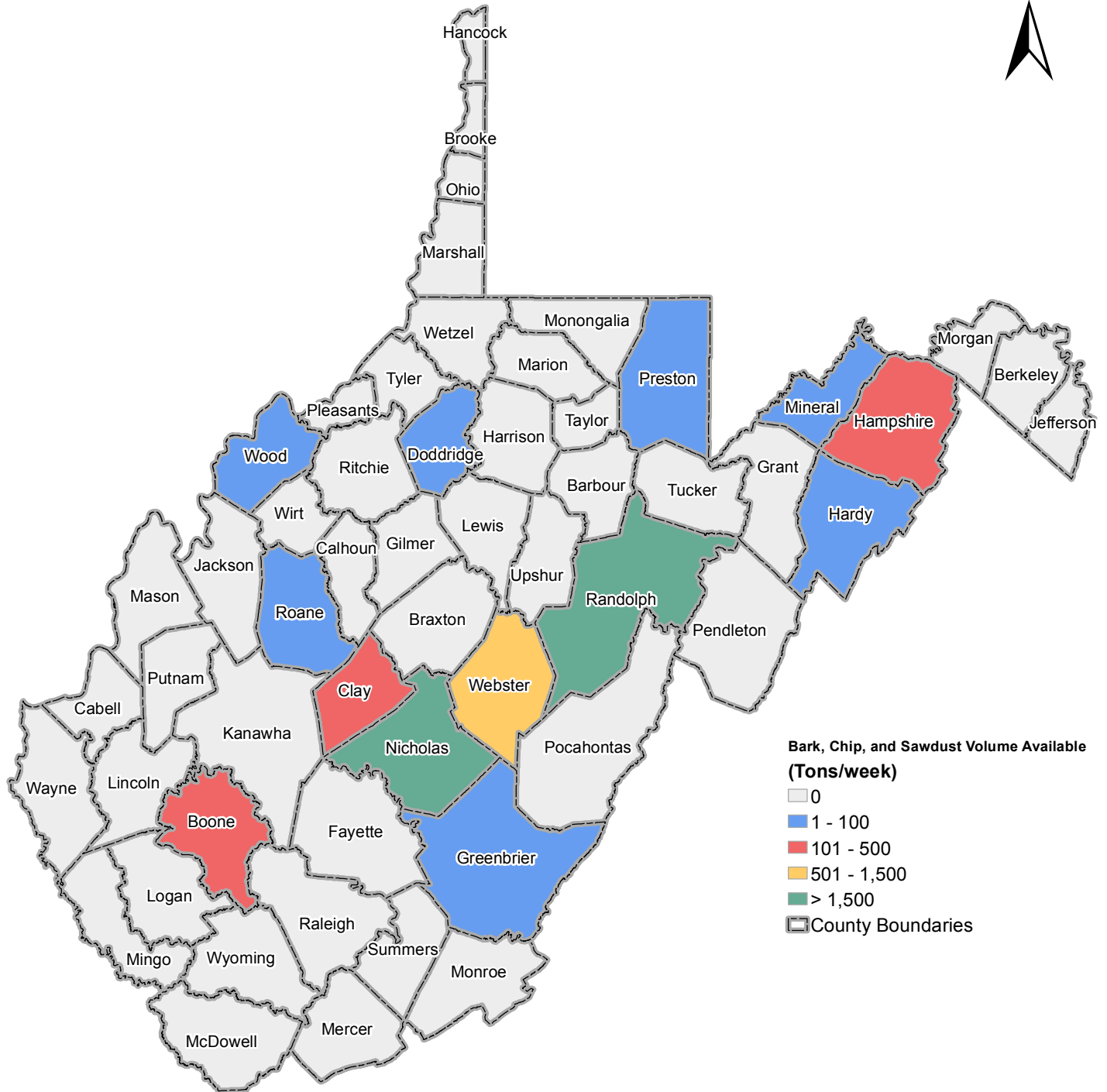
Source: Appalachian Hardwood Center 2011

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# Renewable Energy - Wood By Products

## Bark, Chip, and Sawdust Volume Available - Webster County



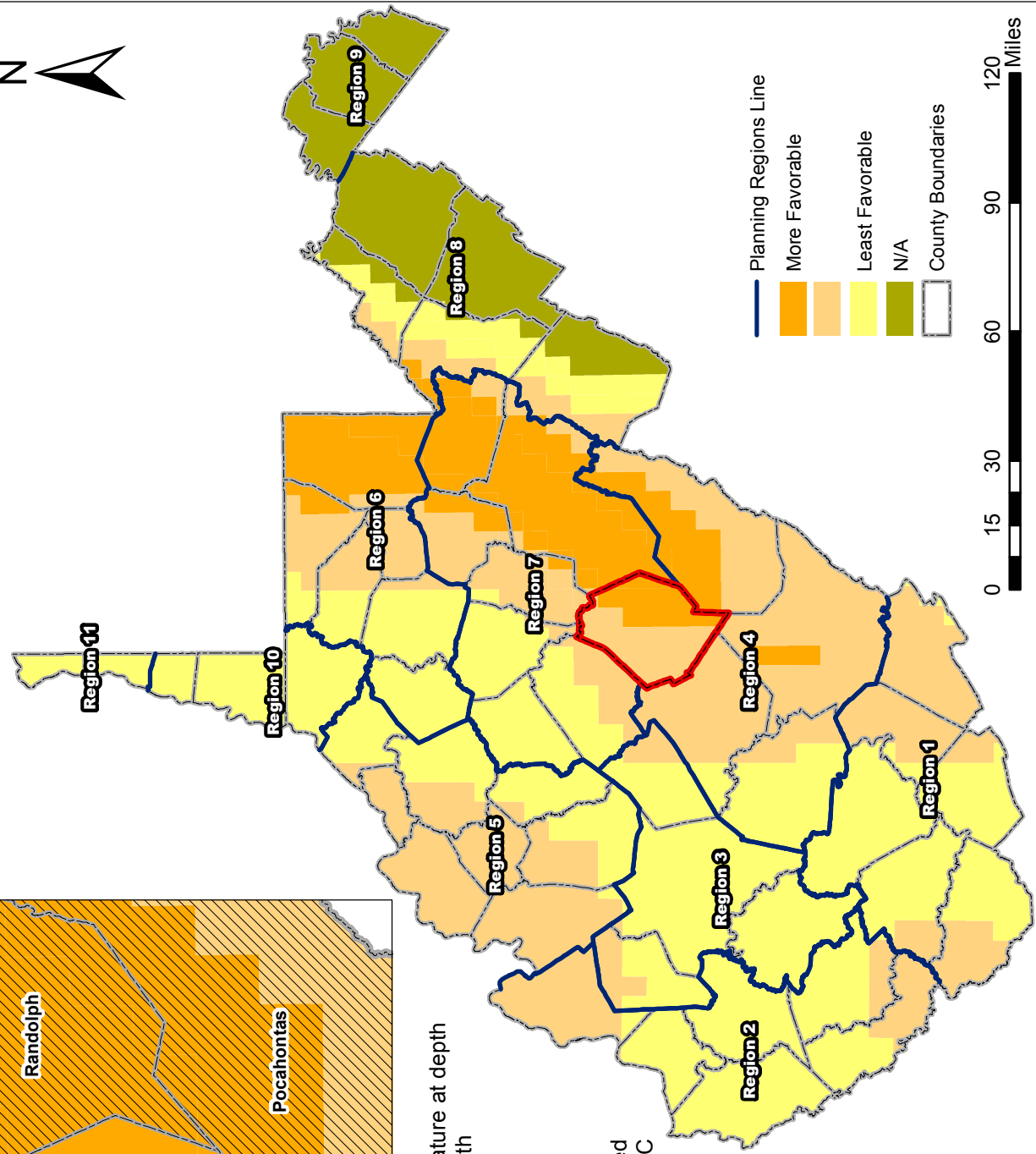
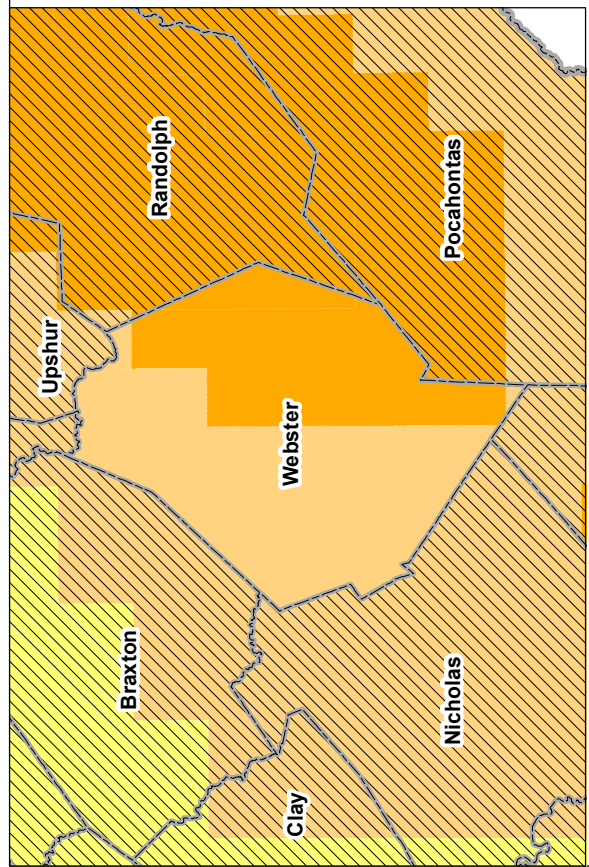
Source: Appalachian Hardwood Center 2011

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# Energy - Geothermal Resource of Webster County

## Favorability of Deep Enhanced Geothermal Systems



- Planning Regions Line
- More Favorable
- Least Favorable
- N/A
- County Boundaries

- Source data for deep EGS includes temperature at depth from 3 to 10 km and analyses (for regions with temperatures  $\geq 150$  degrees C).
- Class values reflect relative favorability, with 1 being more favorable, 3 being least favorable, and "N/A" regions not having been assessed due to temperatures less than 150 degrees C at 10 km depth.



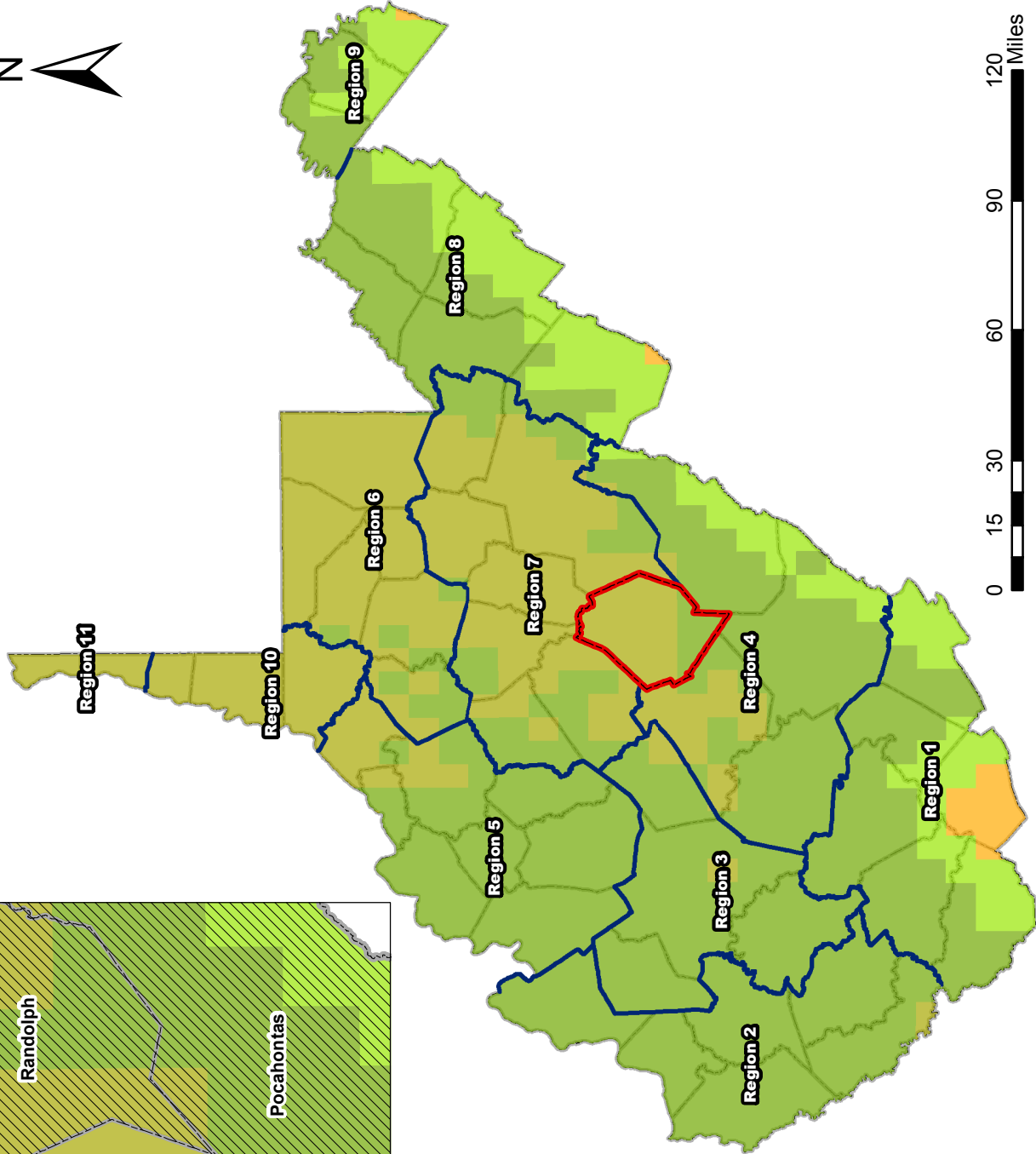
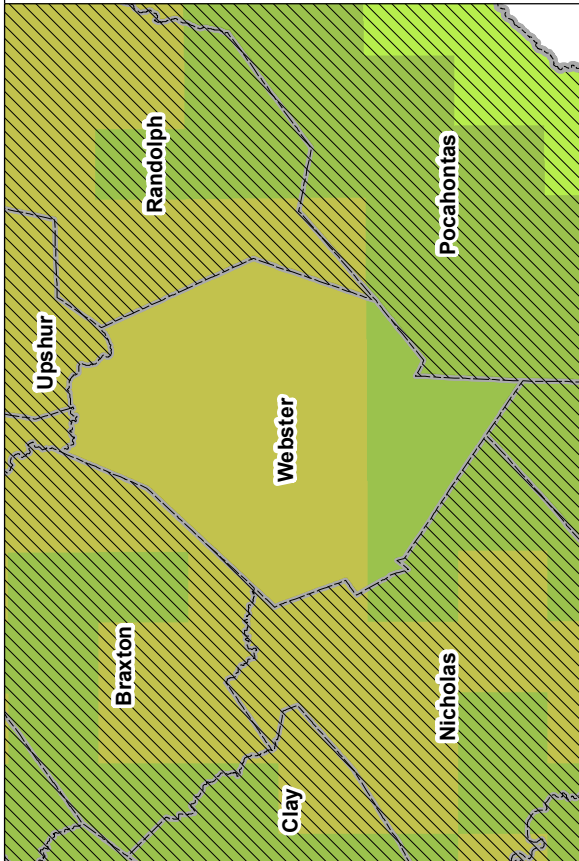
Source: National Renewable Energy Laboratory 2009

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# Solar - Renewable Energy

Webster County



— Planning Regions Line

(kWh/m<sup>2</sup>/day)

4.2 - 4.4

4.0 - 4.1

3.7 - 3.9

3.4 - 3.6

□ County Boundaries



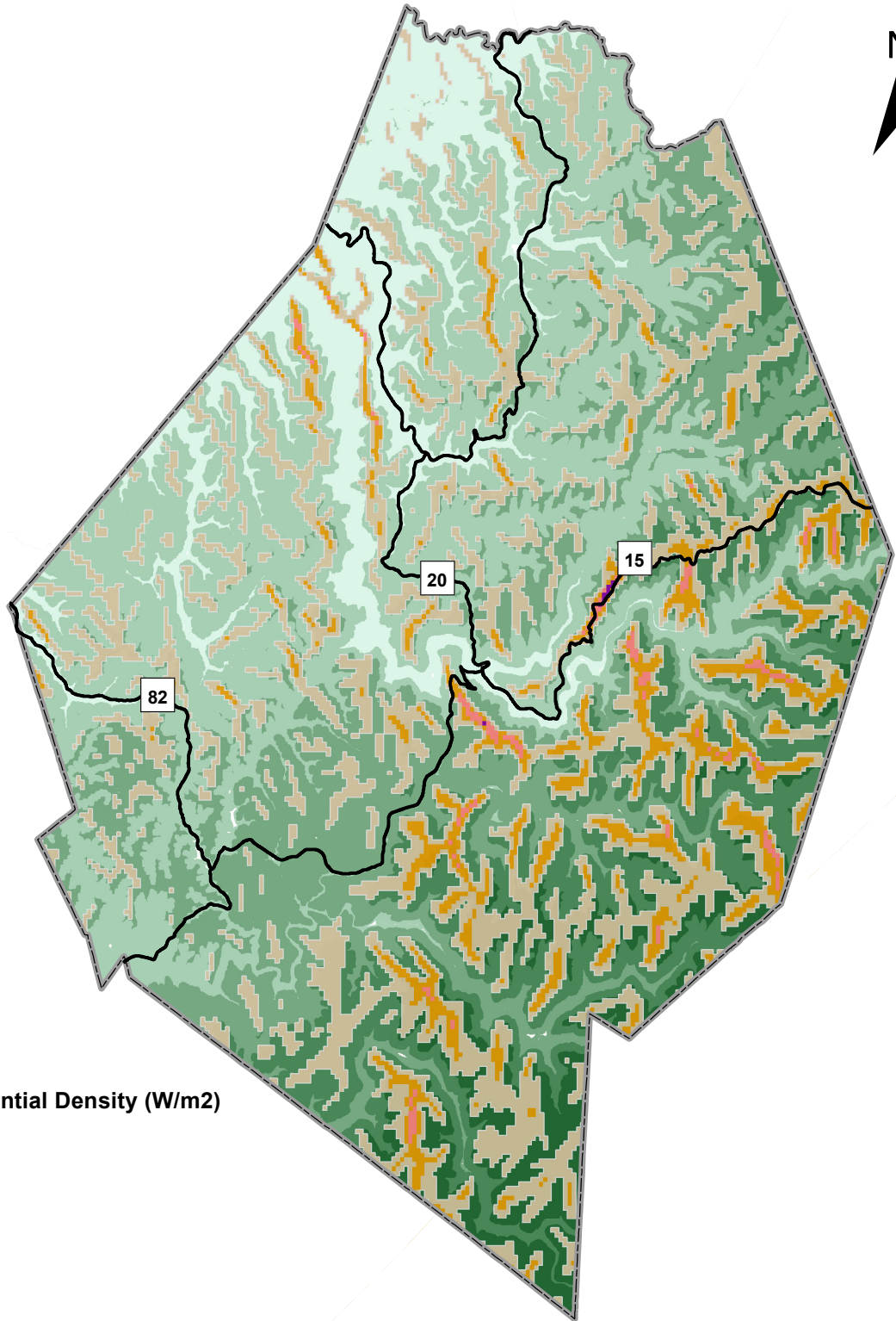
Source: National Renewable Energy Laboratory 2012

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# Renewable Energy-Wind

## Webster County



**Elevation (Feet)**

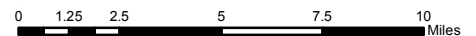
- 960 - 1780
- 1781 - 2280
- 2281 - 2720
- 2721 - 3240
- 3241 - 3960

— WV Routes

**Wind Power Class Potential Density (W/m<sup>2</sup>)**

- 0 - 200 Poor
- 200 - 300 Marginal
- 300 - 400 Fair
- 400 - 500 Good
- 500 - 600 Excellent
- 600 - 800 Outstanding
- > 800 Superb

▭ County Boundary



Source: National Renewable Energy Laboratory 2006, United States Geological Survey n.d., ESRI, 2013

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#### IV. Land Use Smart Planning

The research team constructed a smart planning criterion that would apply to each mine site in Webster. Tax Districts were utilized and labeled based on a particular land use practice that has previously been incorporated into the site. This criterion allows researchers and policymakers to determine suitability after weighing all the factors mentioned in the plan. A range of potential utilizations is given to give optimal control to policymakers and investors.

The table below (Table 2) provides the categories and their areas. The Smart Planning Map (Map 40) showcases the geographies separated by utilization.

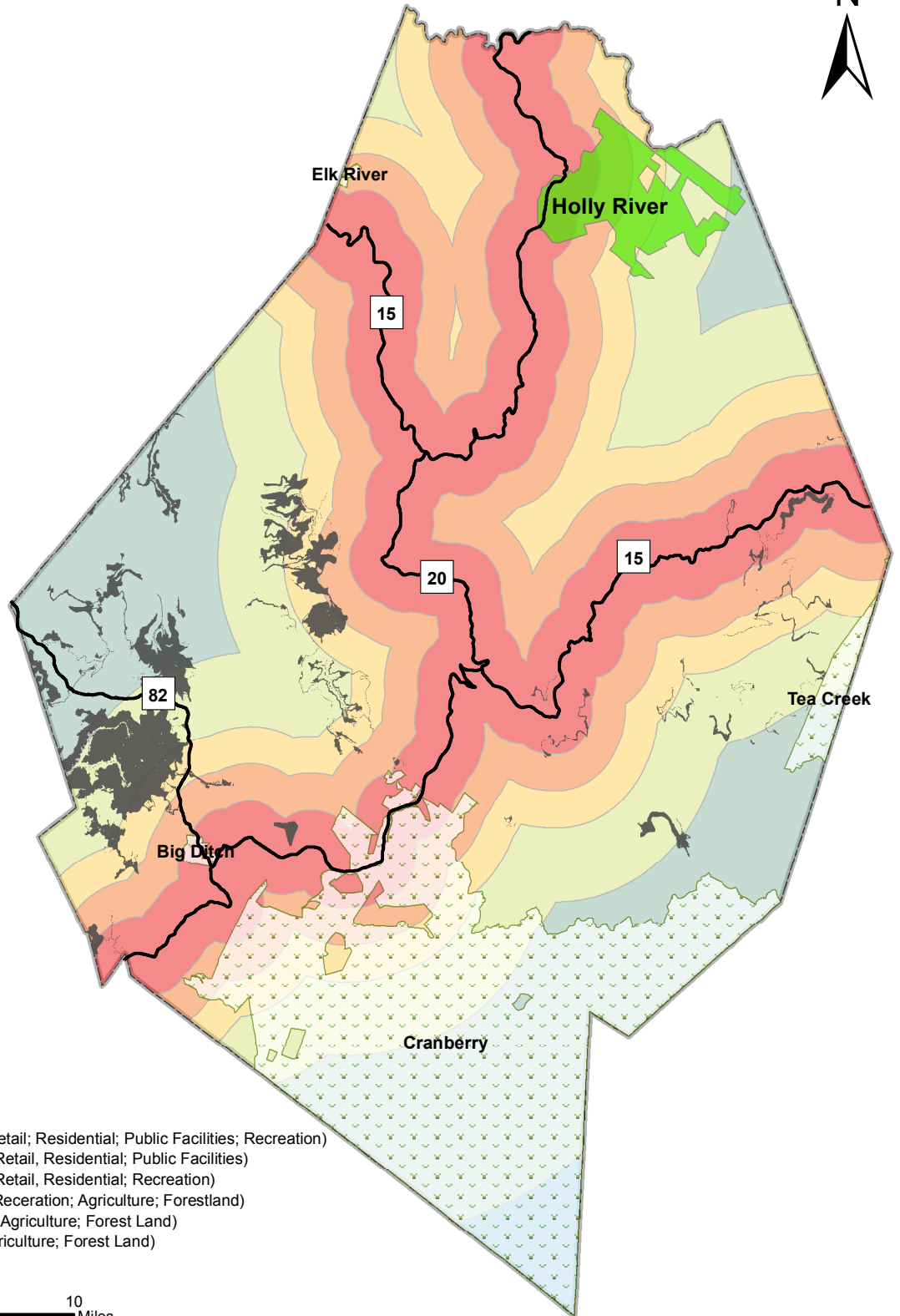
**Table 2: Smart Planning Utilizations**

<b>Name</b>	<b>Smart Planning Criteria</b>
Utilization Area 0-1 mile	Industrial, Commercial/Retail, Residential, Public Facility, Recreational
Utilization Area 1-2 miles	Industrial, Commercial/Retail, Residential, Public Facilities
Utilization Area 2-3 miles	Industrial, Commercial/Retail, Residential, Recreation
Utilization Area 3-5 miles	Industrial, Residential, Recreation, Agriculture, Forestland
Utilization Area 5-10 miles	Industrial, Residential, Agriculture, Forest Land
Utilization Area 10 miles +	Industrial, Residential, Agriculture, Forest Land

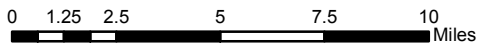
Land development or redevelopment options are determined through a review of the redevelopment authority's anticipated needs. The required infrastructure component standards are determined on a site by site basis by the county economic development authority as designated by West Virginia Code Chapter 05B Article 2A.

# Landuse Criteria

## Webster County



- Interstate
- US Routes
- WV Routes
- Mining Permit Boundaries
- Wild Life Management
- State Park Boundaries
- State Forest Boundaries
- 0 to 1 Mile (Industrial; Commercial/Retail; Residential; Public Facilities; Recreation)
- 1 to 2 Miles (Industrial; Commercial/Retail, Residential; Public Facilities)
- 2 to 3 Miles (Industrial; Commercial/Retail, Residential; Recreation)
- 3 to 5 Miles (Industrial; Residential; Receration; Agriculture; Forestland)
- 5 to 10 Miles (Industrial; Residential; Agriculture; Forest Land)
- 10+ Miles (Industrial; Residential; Agriculture; Forest Land)
- County Boundary



Source: Rahall Transportation Institute 2013

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## V. Site Evaluation

Once the smart planning buffers have been created, the sites available for analysis are confirmed. This evaluation provides the county with an inventory of post mine sites that are suitable for development. The evaluation consists of existing infrastructure availability, which gives the most accurate assessment of a site’s physical capabilities for investment purposes. This will encourage strategic development and evaluation.

### **Initial Data Collection:**

The consulting team collected all available data on surface mines sites located in Webster County to produce an inventory of sites for analysis. The source for site information was primarily the West Virginia Department of Environment Protection (WV DEP) website, which allows permit searches by geographic location and mining type. The information provided by this source was used to develop a preliminary property database of all surface mines as well as general mapping.

The initial data collection revealed all the mine sites in the county. Some of them are active sites where mining is currently going on and other sites are in various phases of bond. The potential mining site for development is the one that is not complete released or still active. There are 15 potential mining sites for development in Webster County, which are included in the following table.

**Table 3: Webster County Potential Surface Mine Sites for Development**

Site No.	Permittee	Permit_ID	Facility Name	Acres	Expiration Date	Nearest Post Office
1	Brooks Run Mining Company, Llc	S007185	Brooks Creek No. 1 Strip	149.4	8/2/00	Erbacon
2	Brooks Run Mining Company, Llc	S102690	Unknown	133	1/30/16	Erbacon
3	Brooks Run Mining Company, Llc	S200205	Brandy Station Mine	121.14	6/8/16	Erbacon
4	Brooks Run Mining Company, Llc	S201002	Seven Pines Mine	1625.05	4/16/14	Erbacon
5	Icg Eastern, Llc	S003576	Unknown	605	1/4/18	Unknown
6	Icg Eastern, Llc	S023576	Unknown	390.76	1/5/13	Cowen

<b>Site No.</b>	<b>Permittee</b>	<b>Permit_ID</b>	<b>Facility Name</b>	<b>Acres</b>	<b>Expiration Date</b>	<b>Nearest Post Office</b>
7	Icg Eastern, Llc	S023876	Unknown	404.48	1/4/13	Cowen
8	Icg Eastern, Llc	S024076	Unknown	588	1/4/13	Cowen
9	Icg Eastern, Llc	S200204	O'Brien Fork #2A Surface Mine	28.37	10/7/14	Tioga
10	Icg Eastern, Llc	S200302	O'Brien Fork #1 Surface Mine	593.3	12/17/13	Tioga
11	Icg Eastern, Llc	S200498	Knight-Ink No. 2 Surface Mine	89	7/29/08	Cowen
12	Icg Eastern, Llc	S200603	O'Brien Fork #2 Surface Mine	486	1/13/16	Tioga
13	Icg Eastern, Llc	S201492	Jacks Run Valley Fills No. 2 &	179.8	10/14/17	Cowen
14	Juliana Mining Company Inc	S200294	Camp Creek Surface Mine	960	8/17/14	Erbacon
15	Juliana Mining Company Inc	S200896	Lower Laurel Surface Mine	67.5	5/7/12	Erbacon

**Site Analysis (Distance Analysis)**

Once the surface mining sites in the county were identified each of the sites were evaluated by estimating the shortest distance from the site to a specified criteria (features which are important to development). There are two types of distance calculation in this analysis: road-path and Euclidean distance. Road-path distance is the distance when travelling on an actual roadway from the site to the feature; Euclidean distance is when the distance is a straight line from the site to the feature, without the necessity of following a roadway. Following are lists of criteria used in the analysis:

- Road-path Distances:
  - Distance to nearest roadway (Interstate, Existing Highway, Proposed Highway...)
  - Distance to major airports (Tri-State, Yeager)
  - Distance to Intermodal Terminal Facility and Huntington Port
  - Distance to nearest Sewer/ Solid Waste Treatment Facility
  
- Euclidean Distances:
  - Distance to Water Lines, Sewer Lines, Power Lines and Broadband
  - Distance to Gas Pipe and Oil Pipe
  - Distance to Railroad, National Waterway Network

The following tables illustrate the results of these assessments for all of the identified sites. All distances were recorded in miles.

**Table 4: Assessment of Distances**

Site No.	Permit_ID	Interstate (IS)	Name - IS	Existing Highway (EH)	Name - EH	Paved Road	Paved Road Name	Coal Express Highway
1	S007185	14.70	I79	11.55	US-19	0.51	Laurel Creek Road	65.33
2	S102690	20.04	I79	10.69	S20	1.22	Whiteoak Road & Bragg Road	61.28
3	S200205	18.35	I79	7.92	US-19	0.79	WV 82	60.39
4	S201002	16.90	I79	10.09	US-19	0.27	Whiteoak Road & Bragg Road	63.03
5	S003576	25.96	I79	3.80	S20	1.16	WV 82	58.77
6	S023576	18.67	I79	8.12	S20	0.21	Laurel Creek Road	62.69
7	S023876	22.92	I79	8.55	S20	0.90	Barnette Run Road	58.49
8	S024076	24.45	I79	4.47	S20	0.80	WV 82	59.31

Rank	Permit_ID	Interstate (IS)	Name - IS	Existing Highway (EH)	Name - EH	Paved Road	Paved Road Name	Coal Express Highway
9	S200204	21.19	I79	7.53	S20	0.70	WV 82	59.37
10	S200302	21.56	I79	9.32	S20	0.61	Barnette Run Road	58.66
11	S200498	23.54	I79	8.49	S20	1.15	Barnette Run Road	58.30
12	S200603	20.67	I79	9.23	S20	0.11	Barnette Run Road	58.75
13	S201492	25.21	I79	3.05	S20	0.45	WV 82	58.77
14	S200294	23.83	I79	11.44	S20	0.92	Camp Creek Branch Road	65.75
15	S200896	24.56	I79	12.17	S20	0.16	Camp Creek Road	66.76

**Table 5 Distances from Sites to Major Airports**

Site No.	Permit_ID	Permittee	Tri-State	Yeager
1	S007185	Brooks Run Mining Company, Llc	107.15	73.78
2	S102690	Brooks Run Mining Company, Llc	104.79	78.61
3	S200205	Brooks Run Mining Company, Llc	104.31	74.28
4	S201002	Brooks Run Mining Company, Llc	107.11	75.96
5	S003576	Icg Eastern, Llc	106.30	81.89
6	S023576	Icg Eastern, Llc	107.49	77.72
7	S023876	Icg Eastern, Llc	105.49	78.85
8	S024076	Icg Eastern, Llc	106.79	80.38
9	S200204	Icg Eastern, Llc	105.80	77.11
10	S200302	Icg Eastern, Llc	105.21	77.49
11	S200498	Icg Eastern, Llc	105.71	79.46



Site No.	Permit ID	Permittee	Tri-State	Yeager
12	S200603	Icg Eastern, Llc	104.44	76.56
13	S201492	Icg Eastern, Llc	106.87	81.13
14	S200294	Juliana Mining Company Inc	111.52	82.90
15	S200896	Juliana Mining Company Inc	110.32	83.60

**Table 6: Shortest Distances from Sites to Other Transportation Methods**

Site No.	Permit_ID	Railroad (RR)	Owner (RR)	Intermodal Terminal Facility (Cyprus Kanawha Corp Eagle Dock)	National Waterway Network (Kanawha Rivers)	Huntington Port
1	S007185	1.05	CSXT	70.96	45.20	99.19
2	S102690	2.72	CSXT	69.29	41.39	96.96
3	S200205	3.26	CSXT	64.97	40.58	96.51
4	S201002	0.37	CSXT	69.38	43.60	99.26
5	S003576	2.67	CSXT	66.36	40.45	98.64
6	S023576	0.05	CSXT	71.14	43.54	99.67
7	S023876	3.51	CSXT	63.26	39.87	97.83
8	S024076	2.31	CSXT	67.03	41.03	99.12
9	S200204	2.97	CSXT	67.79	40.59	98.10
10	S200302	3.71	CSXT	64.03	39.85	97.53
11	S200498	3.21	CSXT	63.20	39.86	98.05
12	S200603	3.88	CSXT	63.96	39.53	96.73
13	S201492	2.01	CSXT	65.61	40.73	99.23
14	S200294	3.17	CSXT	74.70	47.37	103.67
15	S200896	2.03	CSXT	75.40	47.51	102.39

**Table 7: Shortest Distances from Sites to Sewer Lines (SL) and Water Lines (WL)**

<b>Site No.</b>	<b>Permit ID</b>	<b>Sewer Lines</b>	<b>Public Utility - SL</b>	<b>Water Lines</b>	<b>Public Utility - WL</b>
1	S007185	9.11	Cowen Public Service District	3.43	Flatwoods-Canoe Run Public Service District
2	S102690	6.78	Cowen Public Service District	3.85	Birch River Public Service District
3	S200205	6.47	Cowen Public Service District	4.04	Birch River Public Service District
4	S201002	6.33	Cowen Public Service District	5.26	Cowen Public Service District
5	S003576	2.71	Cowen Public Service District	1.16	Cowen Public Service District
6	S023576	5.57	Cowen Public Service District	4.56	Cowen Public Service District
7	S023876	3.48	Cowen Public Service District	1.96	Cowen Public Service District
8	S024076	2.53	Cowen Public Service District	1.02	Cowen Public Service District
9	S200204	3.79	Cowen Public Service District	2.25	Cowen Public Service District
10	S200302	3.95	Cowen Public Service District	2.42	Cowen Public Service District
11	S200498	3.10	Cowen Public Service District	1.62	Cowen Public Service District
12	S200603	4.95	Cowen Public Service District	3.41	Cowen Public Service District
13	S201492	2.00	Cowen Public Service District	0.45	Cowen Public Service District
14	S200294	4.58	Webster Springs Public Service District	5.01	West Virginia-American Water Company
15	S200896	6.81	Webster Springs Public Service District	5.76	Flatwoods-Canoe Run Public Service District

**Table 8: Shortest Distances from Sites to Broadband and Power Lines**

Site No.	Permit_ID	Broadband	Provider	Power Lines	Type	Size_kV
1	S007185	0.57	Citizens Telecommunications Company of West Virginia	6.35	Transmission	115-138
2	S102690	1.81	Citizens Telecommunications Company of West Virginia	5.09	Transmission	115-138
3	S200205	0.93	Citizens Telecommunications Company of West Virginia	5.01	Transmission	115-138
4	S201002	0.44	Citizens Telecommunications Company of West Virginia	7.05	Transmission	115-138
5	S003576	1.15	Citizens Telecommunications Company of West Virginia	3.18	Sub-Transmission	Unknown
6	S023576	0.09	Citizens Telecommunications Company of West Virginia	6.58	Sub-Transmission	Unknown
7	S023876	1.04	Citizens Telecommunications Company of West Virginia	3.88	Sub-Transmission	Unknown
8	S024076	0.90	Citizens Telecommunications Company of West Virginia	3.18	Sub-Transmission	Unknown
9	S200204	0.79	Citizens Telecommunications Company of West Virginia	4.36	Sub-Transmission	Unknown

Site No.	Permit_ID	Broadband	Provider	Power Lines	Type	Size_kV
10	S200302	0.61	Citizens Telecommunications Company of West Virginia	4.38	Sub-Transmission	Unknown
11	S200498	1.36	Citizens Telecommunications Company of West Virginia	3.47	Sub-Transmission	Unknown
12	S200603	0.11	Citizens Telecommunications Company of West Virginia	5.36	Sub-Transmission	Unknown
13	S201492	0.44	Citizens Telecommunications Company of West Virginia	2.50	Sub-Transmission	Unknown
14	S200294	2.01	Citizens Telecommunications Company of West Virginia	5.56	Transmission	115-138
15	S200896	1.45	Citizens Telecommunications Company of West Virginia	8.12	Transmission	115-138

**Table 9: Shortest Distances from Sites to Sewer and Solid Waste Treatment Facilities**

Site No.	Permit_ID	Sewer Treatment (ST)	Facility Name (ST)	Solid Waste Treatment (SWT)	Facility Name (SWT)
1	S007185	15.97	Nicholas Co. Landfill	24.13	Baker'S Run/Sutton Lake
2	S102690	16.74	Nicholas Co. Landfill	18.63	Cowen Psd
3	S200205	16.82	Nicholas Co. Landfill	16.78	Go Mart Inc. Birch River
4	S201002	13.60	Nicholas Co. Landfill	19.79	Cowen Psd
5	S003576	11.49	Nicholas Co. Landfill	15.35	Cowen Psd

Site No.	Permit_ID	Sewer Treatment (ST)	Facility Name (ST)	Solid Waste Treatment (SWT)	Facility Name (SWT)
6	S023576	10.81	Nicholas Co. Landfill	20.38	Cowen Psd
7	S023876	12.35	Nicholas Co. Landfill	12.33	Craigsville Psd
8	S024076	12.16	Nicholas Co. Landfill	16.04	Cowen Psd
9	S200204	15.22	Nicholas Co. Landfill	17.13	Cowen Psd
10	S200302	13.12	Nicholas Co. Landfill	13.09	Craigsville Psd
11	S200498	12.29	Nicholas Co. Landfill	12.26	Craigsville Psd
12	S200603	13.03	Nicholas Co. Landfill	13.02	Craigsville Psd
13	S201492	10.74	Nicholas Co. Landfill	14.60	Cowen Psd
14	S200294	14.09	Nicholas Co. Landfill	23.70	Cowen Psd
15	S200896	14.83	Nicholas Co. Landfill	24.40	Cowen Psd

**Table 10: Shortest Distances from Sites to Gas Pipe and Oil Pipe**

Site No.	Permit_ID	Gas Pipe (GP)	Company Name (GP)	Oil Pipe (OP)	Company Name (OP)
1	S007185	10.69	Columbia Gas Transmission Corp.	10.48	CN
2	S102690	9.71	Hope Gas, Inc.	8.68	CN
3	S200205	9.08	Hope Gas, Inc.	8.29	CN
4	S201002	12.08	Hope Gas, Inc.	10.85	CN
5	S003576	9.87	Hope Gas, Inc.	7.19	CN
6	S023576	12.31	Hope Gas, Inc.	10.90	CN
7	S023876	9.31	Hope Gas, Inc.	6.77	CN
8	S024076	10.45	Hope Gas, Inc.	7.76	CN

<b>Site No.</b>	<b>Permit_ID</b>	<b>Gas Pipe (GP)</b>	<b>Company Name (GP)</b>	<b>Oil Pipe (OP)</b>	<b>Company Name (OP)</b>
9	S200204	10.04	Hope Gas, Inc.	7.62	CN
10	S200302	9.32	Hope Gas, Inc.	6.89	CN
11	S200498	9.28	Hope Gas, Inc.	6.65	CN
12	S200603	8.76	Hope Gas, Inc.	6.96	CN
13	S201492	10.17	Hope Gas, Inc.	7.32	CN
14	S200294	14.24	Columbia Gas Transmission Corp.	14.24	CL
15	S200896	11.96	Columbia Gas Transmission Corp.	12.04	CL

## **Suitability Model**

The suitability model for Webster County is created with a weighted scoring method. The method scores options against a prioritized requirements list to determine which option best fits the selection criteria. Using a consistent list of criteria, weighted according to the importance or priority of the criteria to the researcher, a comparison of similar “products” can be completed. If numerical values are assigned to the criteria priorities (**weighting**) and the ability of the product to meet a specific criterion (**scoring**), a “score” can be derived. By summing the score (**total score**), the product most closely meeting the criteria can be determined.

Criteria are chosen and weighted based on published Land Use Master Plans (LUMPs) for several counties in West Virginia, our own research on the existing conditions in Webster County and expert advice about important factors to site development.<sup>10</sup> Then, scores for each site are given by comparing the closest distance from the site to all factors within given distance thresholds. There are three sets of scores in this suitability model: **absolute scores**, **relative scores** and the **total score**.

*Absolute scores* are given by comparing certain distance thresholds with the results of GIS Distance Analysis. Thresholds are determined mainly based on the researcher’s experience, characteristics of the considered criteria and the priority given to the criteria. For example, if the closest distance from a site to an interstate ranges from 5 to 10 miles, the site will be given 7 points for the Interstate Criteria. Absolute scores will directly affect the site selection. Different score categories may result in significant change in the cost of investment, and will thus impact the county’s decisions.

*Relative scores*, on the other hand, depend solely on the closest distances of sites to relative criteria features. Initially, statistical values will be computed according to distance values from all sites to a certain factor (criteria), including min, quartile 1 – Q1, quartile 2 – Q2, quartile 3 – Q3, and max. Then, distance values will be classified into four groups and given the scores shown in Table 13 (below). This score set is used to sharpen difference between all sites in a certain category and therefore aid the decision maker. For example, two sites may have the same absolute score (in the same range of miles) but may fall in different statistical groups. Then the two sites will have different relative scores.

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<sup>10</sup> Joseph, M. (2006). A Decision-Support Model of Land Suitability Analysis for the Ohio Lake Erie Balanced Growth Program. EcoCity Cleveland.

The total score is a combination of weights, absolute scores, and relative scores. The following equation is used to calculate the total score of a certain studied site:

$$\text{Total score of site A} = \sum (\text{absolute score} \times \text{relative score} \times \text{weight})_{ci} / 10 \quad (\text{ci: criteria i})$$

Sites with higher total scores reveal a higher chance of being developed. Total scores will vary according to a combination of three components: weights, absolute scores, and relative scores. In this report, total scores are calculated by the linear equation indicating that all components are treated equally.

### 1. Weighting

Table 11 prioritizes post-mining land-use criteria for surface coal mining site selection in Webster County. Criteria weights are assigned on a one-to-ten scale. According to Joseph, utilities (power, water, and sewer) and road networks are considered more important factors to development. Therefore, those factors receive higher weights (7-10) in the suitability model. On the other hand, decision-makers are less affected by factors such as airports, national waterways, and ports. Those factors may be good supplements but do not critically change the investments.

**Table 11: Weighting Sites Selection Criteria**

No	Criteria	Weight
1	Interstate	8
2	Existing Highway	8
3	Proposed Highway	9
4	Yeager Airport	3
5	Tri-state Airport	3
6	National Waterway Network Ports	5
7	Sewer Treatment Facilities	7
8	Solid Waste Treatment Facilities	8
9	National Waterway Network	4
10	Intermodal Terminal Facilities	6
11	Sewer Lines	8
12	Railroads	5
13	Water Lines	10
14	Power Lines	10
15	Gas Pipes	6
16	Pipe Lines	6
17	Broadband	9



## 2. Scoring

### 2.1 Absolute Scores:

The shorter the distance to a feature from a site, the higher absolute score the site receives. Table 12 describes the thresholds and score categories for each criterion, ranging from 1 to 10. In order to achieve a better comparison between sites, the score scale is evenly distributed between five distance groups (1-3-5-7-10).

As mentioned above, thresholds are mainly defined based on researcher experience, traveling method from a site to the features (road-path vs. Euclidean), and characteristic of criteria (type of feature, priority, and density). For example, distance thresholds for “Solid Waste Treatment Facilities” are much smaller than ones for “Intermodal Terminal Facilities”. This is because treatment facilities are much denser than intermodal terminal facilities. In addition, solid waste facilities are considered more important in site selection (weight: 8 vs. 6).

**Table 12: Absolute Scoring System**

Absolute Score		10	7	5	3	1
Criteria (Distances in miles)	Existing Highway	0 - 5	5 - 10	10 - 15	15 - 20	> 20
	Proposed Highway	0 - 5	5 - 10	10 - 15	15 - 20	> 20
	Intermodal Terminal Facilities	0 - 10	10 - 20	20 - 30	30 - 40	> 40
	Interstate	0 - 5	5 - 14	14 - 22	22 - 30	> 30
	National Waterway Network Ports	0 - 30	30 - 50	50 - 70	70 - 90	> 90
	Sewer Treatment Facilities	0 - 2.5	2.5 - 5	5 - 7.5	7.5 - 10	> 10
	Solid Waste Treatment Facilities	0 - 5	5 - 14	14 - 22	22 - 30	> 30
	Tri-State Airport	0 - 30	30 - 50	50 - 70	70 - 90	> 90
	Yeager Airport	0 - 30	30 - 50	50 - 70	01 - 90	> 90
	Broadband	0 - 0.5	0.5 - 2	2 - 3	3 - 4	> 4
	Gas Pipe (Natural Gas)	0 - 0.5	0.5 - 1.5	1.5 - 2	2 - 2.5	> 2.5
	National Network Waterway	0 - 2.5	2.5 - 5	5 - 7.5	7.5 - 10	> 10
	Power Lines	0 - 0.5	0.5 - 1.5	1.5 - 2	2 - 2.5	> 2.5
	Pipe Lines (Oil)	0 - 0.25	0.25 - 0.5	0.5 - 0.75	0.75 - 1	> 1
	Railroads	0 - 1	1 - 3	3 - 4	4 - 5	> 5
Sewer Lines	0 - 1	1 - 3	3 - 4	4 - 5	> 5	
Water Lines	0 - 0.25	0.25 - 0.5	0.5 - 0.75	0.75 - 1	> 1	

## 2.2 Relative Scores:

Table 13 shows four statistical groups and their relative scores in the Webster County land suitability model. The total number of coal mining sites will be equally distributed in each group. The relative score differs from the absolute score in two ways. First, thresholds for relative scores are derived only from real distances from the sites to the features (criteria). It is not affected by personal opinion and does not consider either traveling method or nature of criteria.

**Table 13: Relative Scoring System**

		<b>Threshold (Distances in miles)</b>				
		<b>Min - Q1</b>	<b>Q1 - Q2</b>	<b>Q2 - Q3</b>	<b>Q3 – Max</b>	
		10	7.5	5	2.5	
<b>No.</b>	<b>Criteria</b>	<b>Min</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Max</b>
1	Interstate	14.70	25.96	18.67	21.56	24.45
2	Existing Highway	3.05	12.17	7.53	8.55	10.69
3	Proposed Highway	58.30	66.76	58.75	59.37	63.03
4	Yeager Airport	73.78	83.60	76.56	78.61	81.13
5	Tri-State Airport	104.31	111.52	105.21	106.30	107.15
6	National Waterway Network Ports	96.51	103.67	97.53	98.64	99.26
7	Sewer Treatment Facilities	10.74	16.82	12.16	13.12	15.22
8	Solid Waste Treatment Facilities	12.26	24.40	13.09	16.78	20.38
9	National Waterway Network	39.53	47.51	39.87	40.73	43.60
10	Intermodal Terminal Facilities	63.20	75.40	64.03	67.03	70.96
11	Sewer Lines	2.00	9.11	3.10	4.58	6.47
12	Railroads	0.05	3.87	2.01	2.71	3.25
13	Water Lines	0.45	5.76	1.62	3.41	4.56
14	Power Lines	2.50	8.12	3.47	5.01	6.35
15	Gas Pipes	8.76	14.24	9.31	10.04	11.96
16	Pipe Lines	6.65	14.24	6.96	7.76	10.85
17	Broadband	0.09	2.01	0.44	0.90	1.36

### 3. Webster County’s Suitability Model:

Table 14 shows the total scores of all studied sites in Webster County. Site No-13 (Permit ID = S201492) has the highest score of 633.25. The sites with higher total scores suggest better opportunities for development. Results in Table 14 are also plotted in the bar chart (Figure 15) for better visualization. Among 15 potential development sites of Webster County, it is easy to notice the top 5 sites and determine the most suitable sites for investment.

Certainly, any change in weight values or the scoring system will result in different output and may change the decision. For better analysis and decision-making, the dynamic suitability model, which allows modification in criteria’s weights, thresholds and scores is available for distribution through RTI’s Geospatial Program.

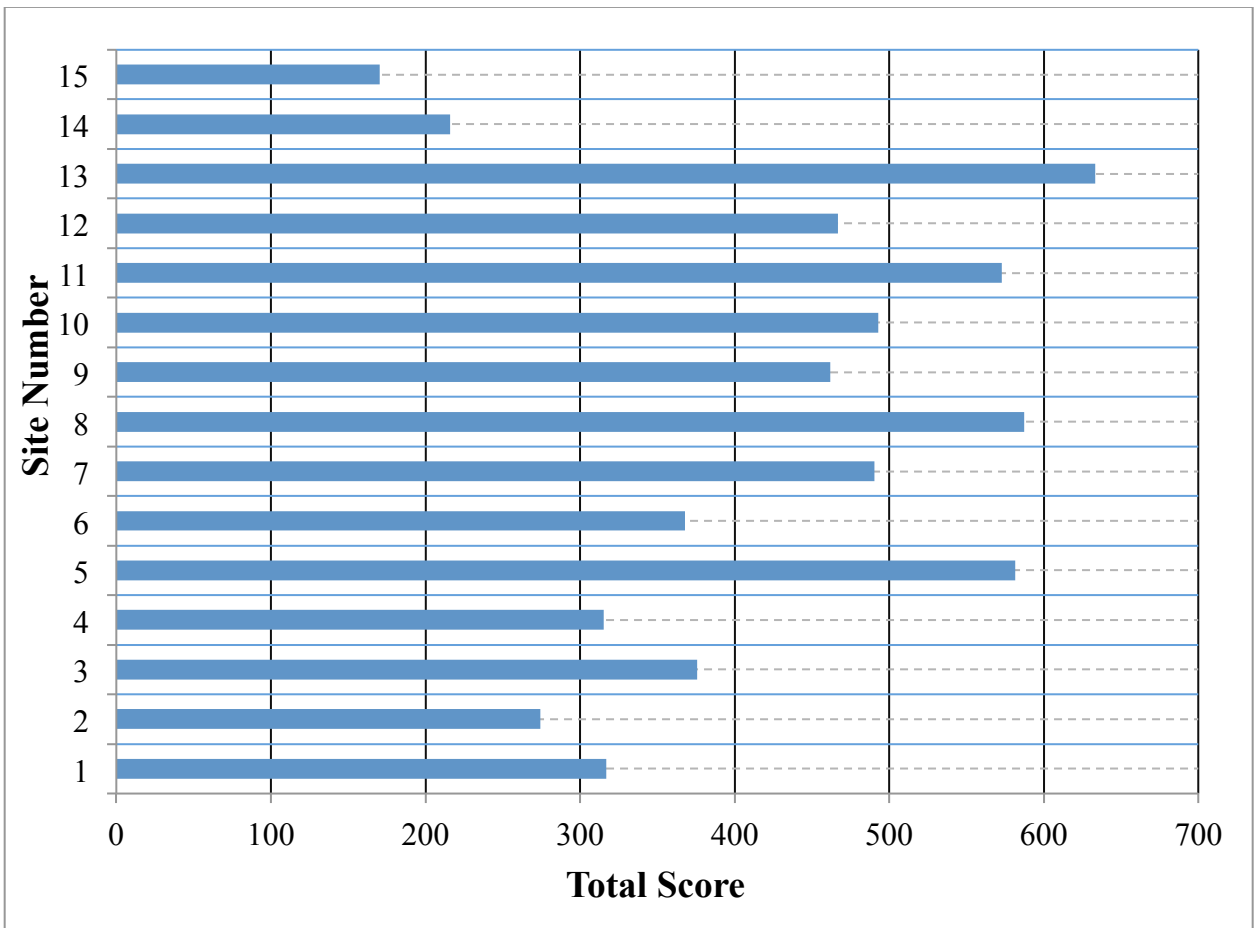
Besides a distance analysis, a suitability model for Webster is supported by demographic data as well as two additional analyses, which are retail location density and workforce analysis (shown on Table 15 and Map 41 below). The best decision will be made with careful consideration of the suitability analysis as well as the demographic and economic information.

**Table 14: Total score of all surface coal mining sites in Webster County**

Site No.	Permittee	Permit_ID	Score
1	Brooks Run Mining Company, Llc	S007185	317
2	Brooks Run Mining Company, Llc	S102690	274.5
3	Brooks Run Mining Company, Llc	S200205	375.75
4	Brooks Run Mining Company, Llc	S201002	315.5
5	Icg Eastern, Llc	S003576	581.5
6	Icg Eastern, Llc	S023576	367.75
7	Icg Eastern, Llc	S023876	490.25
8	Icg Eastern, Llc	S024076	587.25
9	Icg Eastern, Llc	S200204	462

Site No.	Permittee	Permit_ID	Score
10	Icg Eastern, Llc	S200302	493
11	Icg Eastern, Llc	S200498	572.75
12	Icg Eastern, Llc	S200603	466.75
13	Icg Eastern, Llc	S201492	633.25
14	Juliana Mining Company Inc	S200294	216
15	Juliana Mining Company Inc	S200896	170.5

**Figure 15: Webster County’s Suitability Model (Total Score of Each Surface Coal Mining Site)**



### **Work Force Analysis**

A work force analysis estimates total employment and unemployment within a certain distance, providing potential labor sources if an investment is made on the site. According to Gary Langer, the average one-way commute time is 26 minutes or 16 miles.<sup>1</sup> It is reasonable to consider unemployment within 15 miles of the site as an upper limit for a potential employer. This data set does not provide a skill set analysis however; therefore employers may not find the labor skills they need. This dataset provides the pool of labor resources from which to choose.

**Table 15: Number of employment and unemployment within radius of 5, 10 and 15 miles from the site**

<b>Rank</b>	<b>Permit_ID</b>	<b>Emp_05</b>	<b>Unemp_05</b>	<b>Emp_10</b>	<b>Unemp_10</b>	<b>Emp_15</b>	<b>Unemp_15</b>
1	S007185	259	59	862	195	2142	480
2	S102690	250	57	866	187	1901	410
3	S200205	239	55	850	181	1836	393
4	S201002	350	80	1097	239	2379	524
5	S003576	415	85	1194	245	2347	497
6	S023576	382	87	1213	263	2511	551
7	S023876	371	77	1077	221	2166	457
8	S024076	432	90	1265	260	2458	523
9	S200204	375	80	1105	228	2227	474
10	S200302	350	74	1033	212	2101	444
11	S200498	387	79	1109	226	2213	466
12	S200603	293	64	927	193	1927	406
13	S201492	447	92	1281	262	2471	523
14	S200294	409	93	1692	389	3433	774
15	S200896	374	85	1265	295	2901	661

### **Retail Location Analysis**

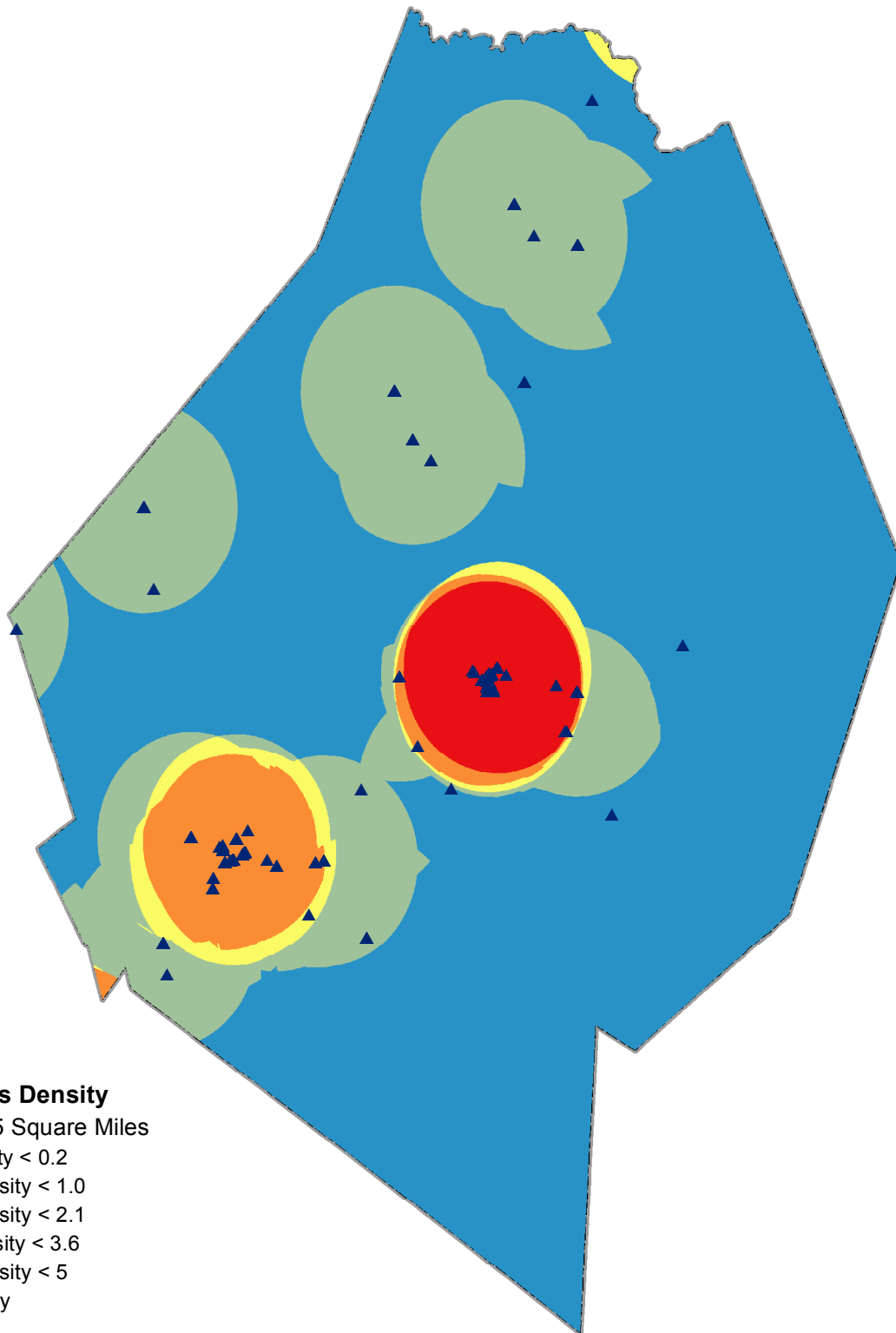
A retail location analysis is a hot spot analysis that depicts a number of retailers within 25 square miles of any certain location in the county (Map 41). The result, as shown on the map, is displayed in blue-to-red color for retail's density from low to high. Normally, the area with a high density of retailers indicates an already developed and populated community, which possibly has the highest opportunity as well as the heaviest

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<sup>1</sup> Gary Langer, "Poll: Traffic in the United States," ABC News Online, February 13, 2005, Accessed March 1, 2013, <http://abcnews.go.com/Technology/Traffic/story?id=485098&page=1>.

# Retail Location Density

## Webster County



▲ Retails Location

### Retail Locations Density

Search Area = 25 Square Miles

■ 0 < Retail Density < 0.2

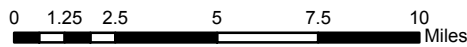
■ 0.2 < Retail Density < 1.0

■ 1.0 < Retail Density < 2.1

■ 2.1 < Retail Density < 3.6

■ 3.6 < Retail Density < 5

□ County Boundary



Source: ESRI 2011

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competition. The areas with low retail density showcase where population is lowest, but also where competition is lowest and which may provide retail opportunities.

## **V. Conclusion**

Webster County is one of the most rural counties in West Virginia. Due to government services and the growth of natural resource jobs, wages have been steadily growing in the county. Webster County is also using its natural resources to produce a major renewable energy resource: wood byproducts. However, government services and mining jobs may not continue to be stable, aging and educational issues persist, and post-mine land use has not been active. This plan could be useful in assisting Webster County in creating a development plan using their post-mine sites.

This plan has identified and displayed the five post-mine sites that are most suitable for development. These sites have the integral tools that researchers have shown can assist in spatial development. Though success is not guaranteed, this overview combined with careful strategic planning can bring about the changes in the trends that are necessary for Webster County to thrive.

Through a site distance analysis and complete demographic calculation, this plan provides the most comprehensive understanding of the economic state of Webster County and the potential of its land. By analyzing specific infrastructures and demographics, policymakers can begin attracting investors to post-mine sites, and continue the process of developing the economy. This plan provides strategic information; the choice as to how to utilize this information belongs with the administrators and people of the county.