

# Marion County

Land Use Master Plan 2014



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## **Executive Summary**

This Land Use Master Plan (LUMP) conveys information on Marion County's current demographic and geographic status. This plan will be used to evaluate the potential of post-mine sites for development, and evaluate Marion 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 Marion County's development goals. The Nick J. Rahall Appalachian Transportation Institute (RTI) coordinates with the Office of Coalfield Community Development to provide this essential information. Marion County has no post-mine development currently in place. This plan will help Marion take advantage of its post-mine sites in a varied and potentially lucrative manner.

Marion County has lost 14 percent of its population since 1980. The county's median age and age distribution are just above average for the state, and indicate a population capable of productivity in the labor force. The population is also projected to decrease slightly past 2030.

Employment consists mainly of Government; Trade, Transportation, and Utilities; Professional and Business Services; Education and Health Services; and Natural Resources and Mining. Natural Resources and Mining provides the highest wages in total, followed by the other four sectors in general order of their size in the County. Marion County maintains an above

average labor force participation rate, and a lower than average ratio of government transfers to income.

Marion County's total enrollment has been slowly declining with the decline in population. The dropout rate has fallen since 2008, as the county emphasizes education, and national economic struggles discourage dropping out. Thirteen percent of Marion County residents 25 and older have not graduated high school.

Utility prices are varied throughout the county, and this plan provides municipal and private rates for electricity, sewer, and water. Broadband infrastructure is much better than average in Marion County, indicating a strong commitment to development.

Transportation is an important issue in any development strategy. Interstate 79 traverses the eastern portion of Marion County. Marion County has approximately 49 miles of rail and a small airport, the Fairmont Municipal Airport.

Marion County has 20 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 Marion County. The environment of the county should be considered in an overall development strategy. Marion County is highly active in Marcellus Shale development, with a

network of pipelines and several wells. Marion County also has active oil fields. Marion County does not appear to be a favorable location for the most popular renewable energy sources.

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 Marion 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 top five sites within a view of the county.

The tables below are comprehensive comparisons between the top five post-mine lands for potential development. In table A, and table B, distances and total scores are compared, providing an idea of the more suitable site under a considered criterion. For example, if we want to look for a site which is located closest to water lines, the answer is site ranking #4, permit ID S103287. However, if we wanted the site closest to an intermodal terminal facility, the best site is site ranking #1, permit ID S000383.

Table C explains how each criterion contributes to the final total score and the importance of the weights. Because of the assumption that one criterion may be more important than others through differing weights, the site with higher absolute and relative scores is still able to receive a smaller total score than the others. Site ranking #5, permit ID S103087, is very close to many high-scoring attributes, but just far enough away to score low in the relative scoring, ranking it fifth.

**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>
Broadband	0.29	0.29	0.02	0.51	0.44	<b>9</b>
Gas Pipes	0.34	0.44	0.95	0.09	0.36	<b>6</b>
National Waterway Network	2.41	2.31	4.21	5.08	4.00	<b>4</b>
Oil Pipes	0.11	0.19	0.93	1.25	1.02	<b>6</b>
Power Lines	0.48	0.49	0.83	0.24	0.29	<b>10</b>
Railroad	2.35	2.25	2.28	3.16	4.02	<b>5</b>
Sewer Lines	1.32	1.17	0.06	0.23	0.12	<b>8</b>
Water Lines	0.07	0.22	0.06	0.01	0.11	<b>10</b>
Existing Highway	0.07	0.21	0.64	0.01	1.17	<b>8</b>
Intermodal Terminal Facilities	17.77	17.91	20.86	21.32	23.76	<b>6</b>
Interstate	3.89	4.03	3.14	3.99	5.85	<b>8</b>
Solid Waste Treatment Facilities	5.06	5.20	5.72	4.32	5.51	<b>8</b>
Sewer Treatment Facilities	1.54	1.69	0.60	1.13	0.93	<b>7</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>
Broadband	67.5	67.5	90	47.25	67.5	<b>9</b>
Gas Pipes	60	60	42	60	60	<b>6</b>
National Waterway Network	30	30	14	5	14	<b>4</b>
Oil Pipes	60	60	9	1.5	1.5	<b>6</b>
Power Lines	75	75	35	100	75	<b>10</b>
Railroad	17.5	17.5	17.5	6.25	3.75	<b>5</b>
Sewer Lines	42	42	80	80	80	<b>8</b>
Water Lines	100	75	100	100	100	<b>10</b>
Existing Highway	80	80	80	80	60	<b>8</b>
Intermodal Terminal Facilities	21	21	15	15	7.5	<b>6</b>
Interstate	40	40	60	40	28	<b>8</b>
Solid Waste Treatment Facilities	56	56	56	80	56	<b>8</b>
Sewer Treatment Facilities	52.5	52.5	70	52.5	70	<b>7</b>
<b>Total Weighted Score</b>	<b>701.5</b>	<b>676.5</b>	<b>668.5</b>	<b>667.5</b>	<b>623.25</b>	



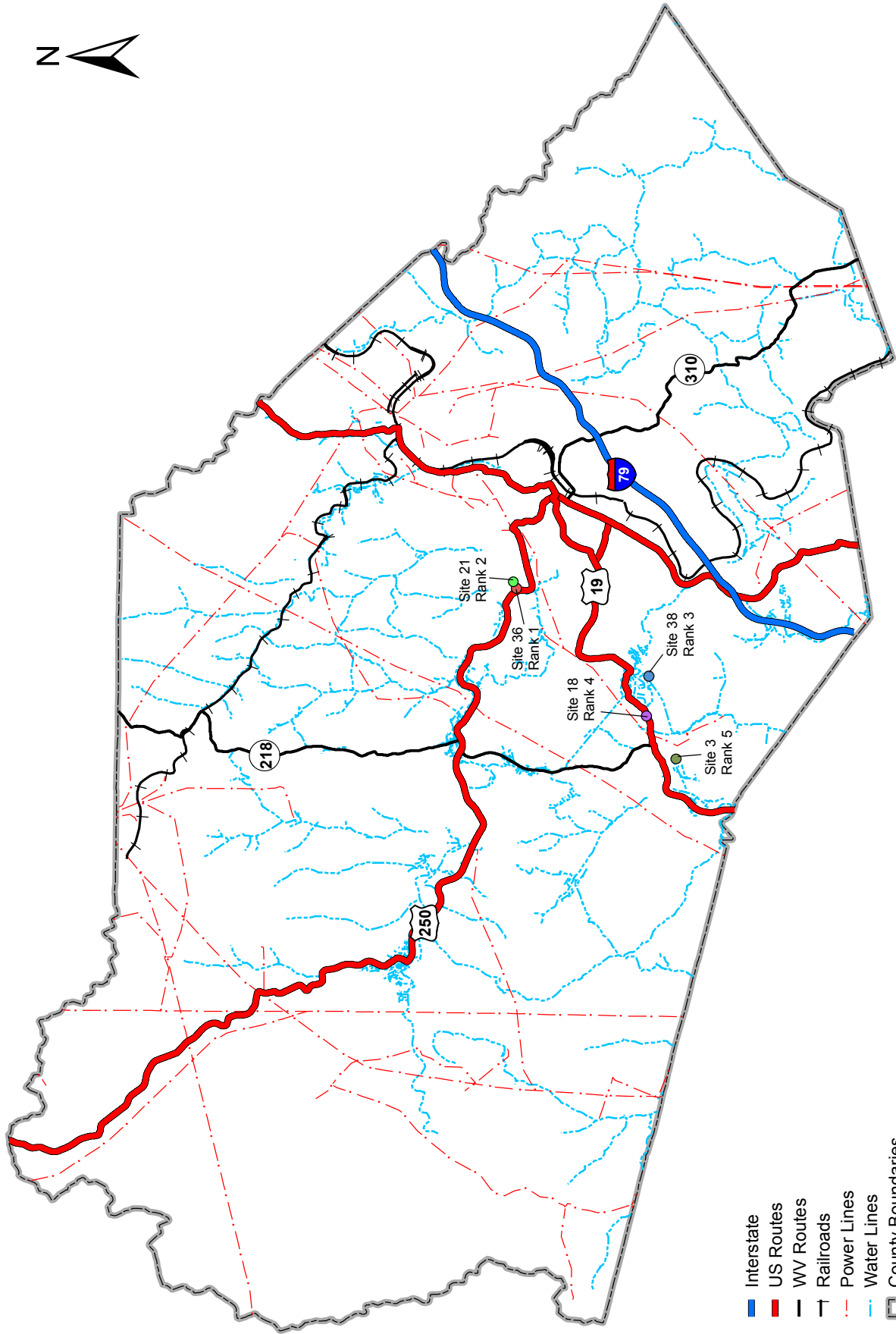
**Table C: Absolute/Relative score comparison between top five sites for potential development**

<b>Suitability Ranking</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Weight</b>
Broadband	10	10	10	7	10	<b>9</b>
Gas Pipes	10	10	7	10	10	<b>6</b>
National Waterway Network	10	10	7	5	7	<b>4</b>
Oil Pipes	10	10	3	1	1	<b>6</b>
Power Lines	10	10	7	10	10	<b>10</b>
Railroad	7	7	7	5	3	<b>5</b>
Sewer Lines	7	7	10	10	10	<b>8</b>
Water Lines	10	10	10	10	10	<b>10</b>
Existing Highway	10	10	10	10	10	<b>8</b>
Intermodal Terminal Facilities	7	7	5	5	5	<b>6</b>
Interstate	10	10	10	10	7	<b>8</b>
Solid Waste Treatment Facilities	7	7	7	10	7	<b>8</b>
Sewer Treatment Facilities	10	10	10	10	10	<b>7</b>
<b>Total Absolute Score</b>	118	118	103	103	100	

<b>Suitability Ranking</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Weight</b>
Broadband	7.5	7.5	10	7.5	7.5	<b>9</b>
Gas Pipes	10	10	10	10	10	<b>6</b>
National Waterway Network	7.5	7.5	5	2.5	5	<b>4</b>
Oil Pipes	10	10	5	2.5	2.5	<b>6</b>
Power Lines	7.5	7.5	5	10	7.5	<b>10</b>
Railroad	5	5	5	2.5	2.5	<b>5</b>
Sewer Lines	7.5	7.5	10	10	10	<b>8</b>
Water Lines	10	7.5	10	10	10	<b>10</b>
Existing Highway	10	10	10	10	7.5	<b>8</b>
Intermodal Terminal Facilities	5	5	5	5	2.5	<b>6</b>
Interstate	5	5	7.5	5	5	<b>8</b>
Solid Waste Treatment Facilities	10	10	10	10	10	<b>8</b>
Sewer Treatment Facilities	7.5	7.5	10	7.5	10	<b>7</b>
<b>Total Relative Score</b>	102.5	100	102.5	92.5	90	

# Top Five Sites for Potential Development

Marion County



Source: RaHall Transportation Institute Analysis 2014

**Site's General Info.**

Permittee	Stanya Sales Co
Facility Name	NA
Permit ID	S000383
Issue Date	1/7/1983
Expiration Date	1/7/1988
Current Acres	20
Lat	39° 29'43.0000"
Long	80° 11'4.0000"
Nearest Post Office	

Site Number	<b>36</b>
Suitability Ranking	<b>1</b>
Total Score	<b>701.5</b>

**Distance Analysis Results**

Broadband	0.29
Gas Pipes	0.34
National Waterway Network	2.41
Oil Pipes	0.11
Power Lines	0.48
Railroad	2.35
Sewer Lines	1.32
Water Lines	0.07
Existing Highway	0.07
Intermodal Terminal Facilities	17.77
Interstate	3.89
Solid Waste Treatment Facilities	5.06
Sewer Treatment Facilities	1.54

Site number 36 should be the first choice for potential development. Even though none of its distances are the closest to the features, the site still has a high total since it is located quite close to several major criteria such as broadband (0.29 miles), existing highways (.07 miles), and water lines (.07 miles).



**Site's General Info.**

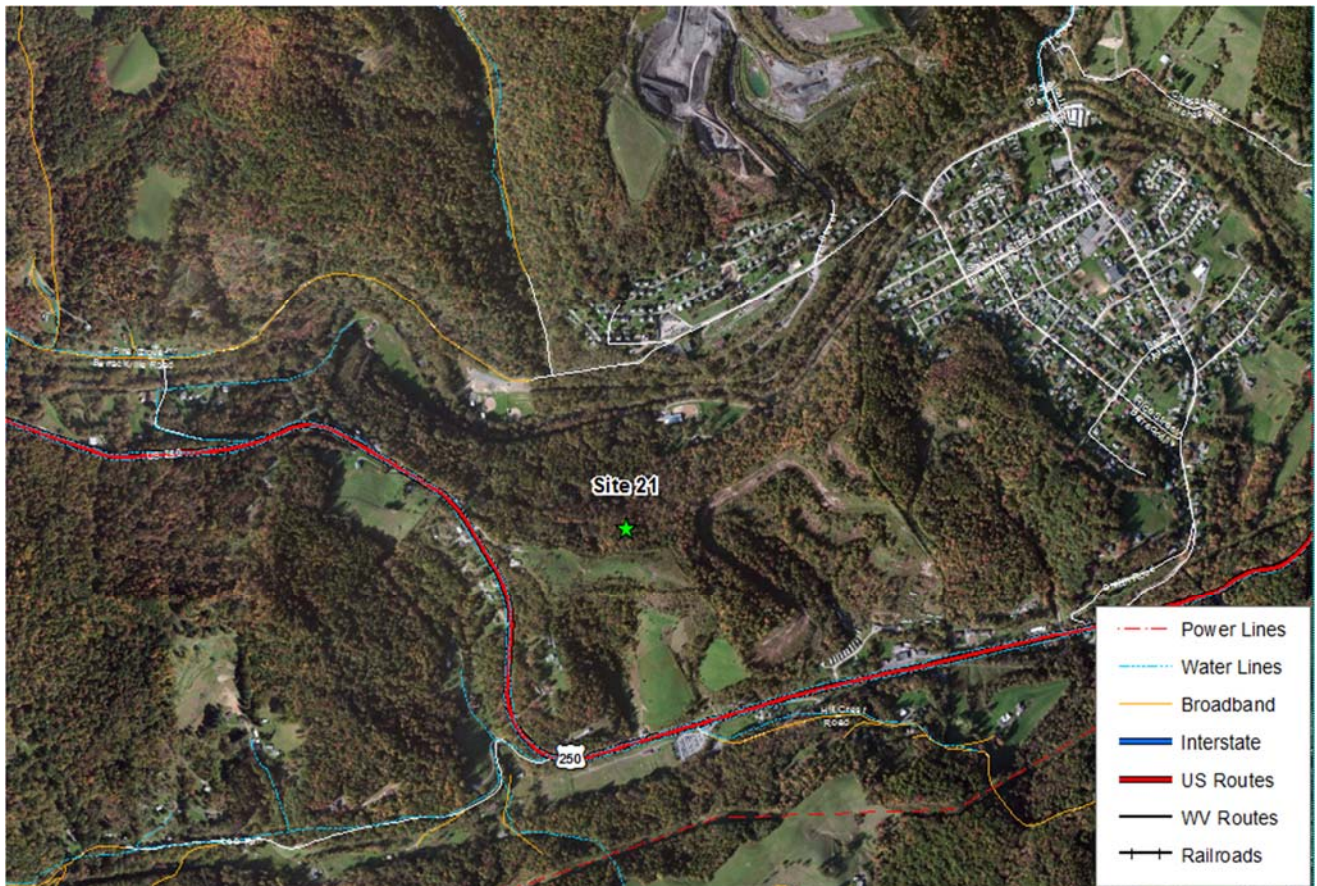
Permittee	Amerikohl Mining Inc
Facility Name	NA
Permit ID	S101788
Issue Date	8/15/1988
Expiration Date	8/15/1993
Current Acres	1.4
Lat	39° 29'46.0000"
Long	80° 10'54.0000"
Nearest Post Office	

Site Number	<b>21</b>
Suitability Ranking	<b>2</b>
Total Score	<b>676.5</b>

**Distance Analysis Results**

Broadband	0.29
Gas Pipes	0.44
National Waterway Network	2.31
Oil Pipes	0.19
Power Lines	0.49
Railroad	2.25
Sewer Lines	1.17
Water Lines	0.22
Existing Highway	0.21
Intermodal Terminal Facilities	17.91
Interstate	4.03
Solid Waste Treatment Facilities	5.20
Sewer Treatment Facilities	1.69

Site number 21 has the second highest score in the suitability model. The site is located closely to utility features such as power lines (.49 miles), water lines (0.22 miles) and broadband (0.29 miles), as well as transportation networks, which make the site a good place for a future residential area.



**Site's General Info.**

Permittee	Roger's Construction Co Inc
Facility Name	NA
Permit ID	S024376
Issue Date	10/29/1976
Expiration Date	10/29/1981
Current Acres	NA
Lat	39° 27'25.0000"
Long	80° 13'17.0000"
Nearest Post Office	

Site Number	<b>38</b>
Suitability Ranking	<b>3</b>
Total Score	<b>668.5</b>

**Distance Analysis Results**

Broadband	0.02
Gas Pipes	0.95
National Waterway Network	4.21
Oil Pipes	0.93
Power Lines	0.83
Railroad	2.28
Sewer Lines	0.06
Water Lines	0.06
Existing Highway	0.64
Intermodal Terminal Facilities	20.86
Interstate	3.14
Solid Waste Treatment Facilities	5.72
Sewer Treatment Facilities	0.60

Site number 38 is listed as the third suitable site for post-mine land development. The site is fairly close to several important criteria. It is only 0.83 miles from a power line (10 pts. in the suitability model) and .06 miles from water and sewer lines (8 and 10 pts. respectively). Distance scores to transportation options are also very good.



### Site's General Info.

Permittee	Ten-A Coal Co., Inc.
Facility Name	NA
Permit ID	S103287
Issue Date	2/28/1988
Expiration Date	2/28/2013
Current Acres	NA
Lat	39° 27'27.0000"
Long	80° 14'17.0000"
Nearest Post Office	MONONGAH

Site Number	<b>18</b>
Suitability Ranking	<b>4</b>
Total Score	<b>667.5</b>

### Distance Analysis Results

Broadband	0.51
Gas Pipes	0.09
National Waterway Network	5.08
Oil Pipes	1.25
Power Lines	0.24
Railroad	3.16
Sewer Lines	0.23
Water Lines	0.01
Existing Highway	0.01
Intermodal Terminal Facilities	21.32
Interstate	3.99
Solid Waste Treatment Facilities	4.32
Sewer Treatment Facilities	1.13

Site number 18 has the fourth highest score in the suitability model. There are a few advantages to this site, most notably having the closest distances to sewer lines (.23 miles), water lines (.01 miles), and the existing highway (.01 miles). It is also the closest site to power lines (.24 miles), although the differences between sites for this criteria are all less than one mile.



**Site's General Info.**

Permittee	Bell Mining Company
Facility Name	NA
Permit ID	S103087
Issue Date	8/13/1987
Expiration Date	8/13/1992
Current Acres	NA
Lat	39° 26'56.0000"
Long	80° 15'22.0000"
Nearest Post Office	

Site Number	<b>3</b>
Suitability Ranking	<b>5</b>
Total Score	<b>623.25</b>

**Distance Analysis Results**

Broadband	0.44
Gas Pipes	0.36
National Waterway Network	4.00
Oil Pipes	1.02
Power Lines	0.29
Railroad	4.02
Sewer Lines	0.12
Water Lines	0.11
Existing Highway	1.17
Intermodal Terminal Facilities	23.76
Interstate	5.85
Solid Waste Treatment Facilities	5.51
Sewer Treatment Facilities	0.93

Site number 3 has the fifth highest score in the suitability model for its relatively close distances to water lines (.11 miles), sewer lines (.12 miles), and power lines (.29 miles). All of these criteria receive high absolute points. Most of this site's distances are above the average of all the mine sites in the inventory.



## **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. This 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 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 Marion County. Marion County has been developing fairly well, with constantly increasing wages, high broadband coverage, and several positive educational achievements. More can be done utilizing post-mine sites however, since the population has still been decreasing and several areas lack infrastructure. By utilizing post-mine sites, Marion County can improve its outlook further.

This plan, including both the demographic and post-mine site analysis, requires data gathered from professional, secondary sources. Every attempt has been made to verify the accuracy of this data. However, the datasets are subject to differing methodologies, third-party error, and changes in time. Any and all information should be verified for accuracy.

## **II. Planning Area**

Marion County was formed in 1842, 21 years before West Virginia became a state. It was formed from parts of Monongahela and Harrison Counties, and was named after Francis Marion, a Revolutionary War hero. As with many 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 companies and the decline of manufacturing industries, Marion began to decline. Several indications show that Marion County has developed more than most of the other counties in West Virginia, especially with the investments in technology, but population decline is still a major concern.<sup>1</sup>

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<sup>1</sup> Koon, Thomas J., "Marion County," *The West Virginia Encyclopedia*, Accessed March 24, 2014, <http://www.wvencyclopedia.org/articles/1504>.

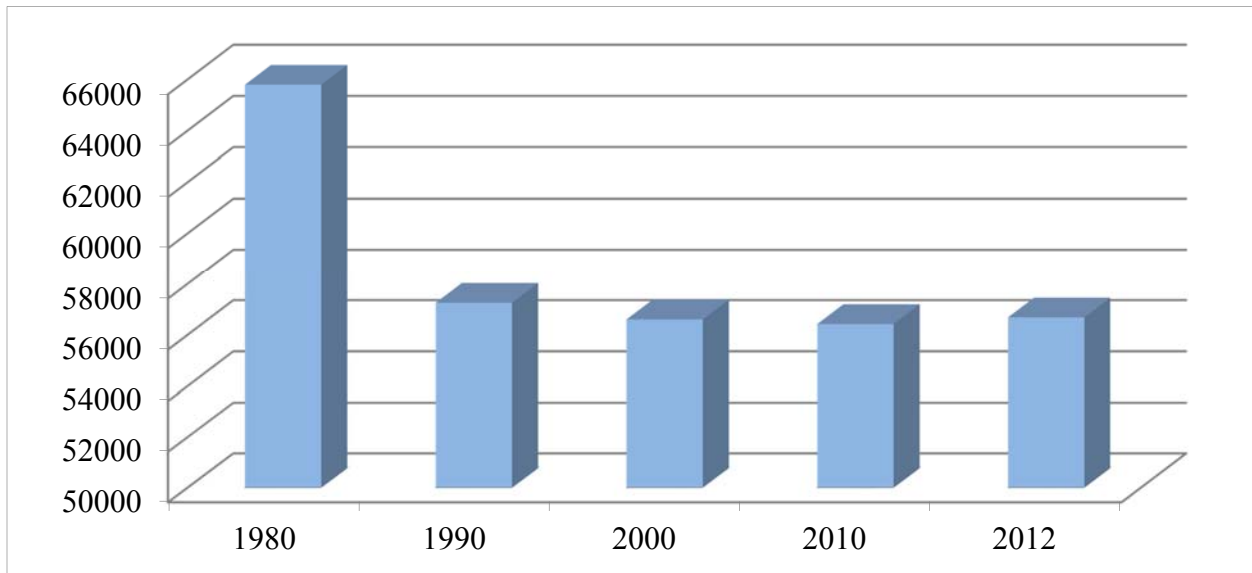
### III. Existing Conditions

This information will provide a background understanding of the demographic trends in the county. This base information is meant to provide overall detail on Marion 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 Marion County in 2012 was 61,984 according to the 2012 American Community Survey (ACS) 5-year estimates, ranking it ninth in county population among the 55 counties in West Virginia.<sup>2</sup> The decennial censuses show that Marion County has slowly but steadily lost population over the past 20 years. In total, Marion County has lost about 14 percent of its 1980 population, but there has been a slight increase since the 2010 Census. It is too early to tell whether that is a statistical anomaly or a trend.

**Figure 1: Census Populations for Marion County**

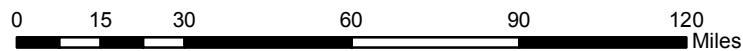
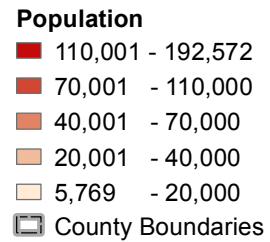
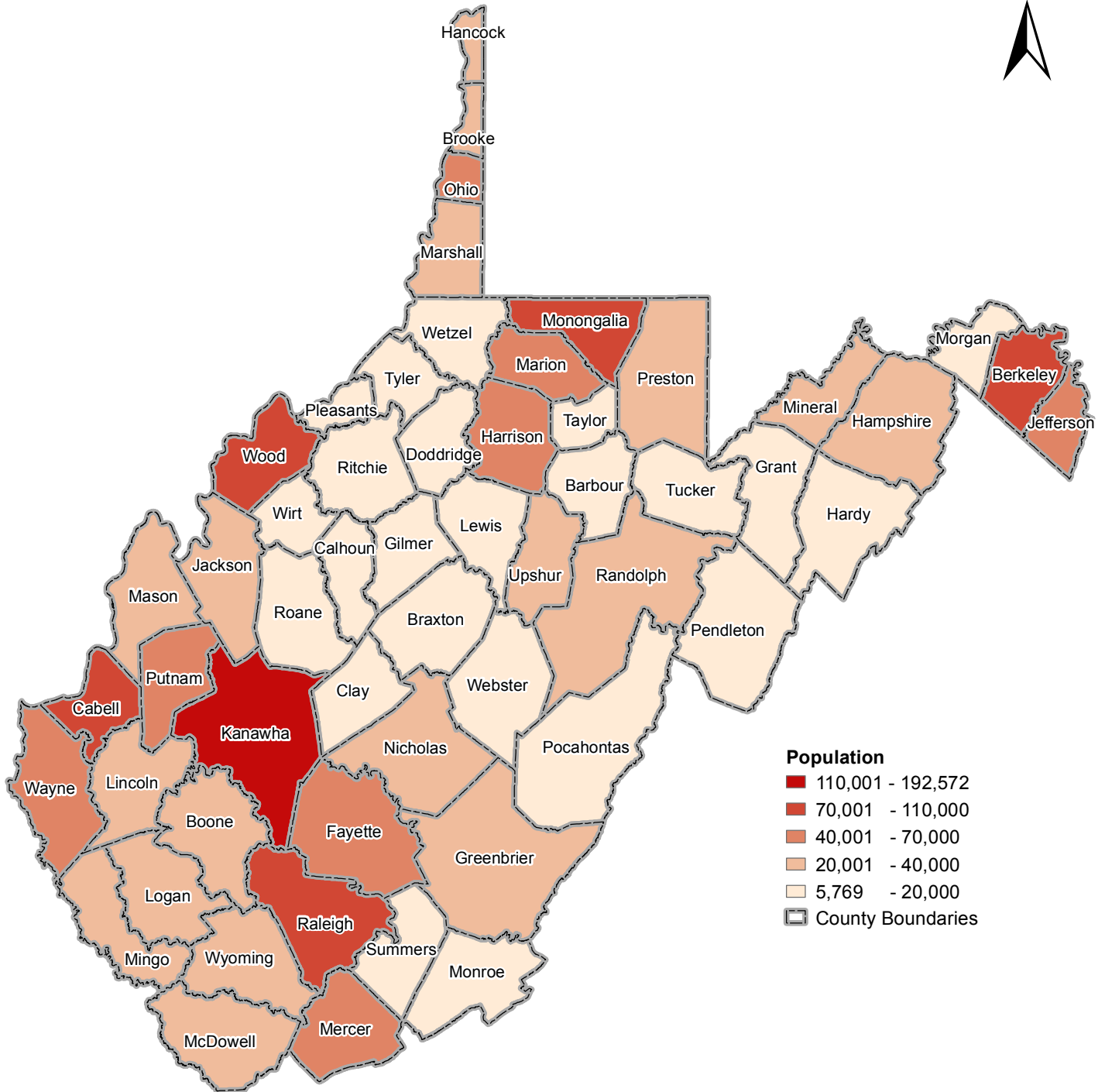


Source: Stats Indiana, USA Counties in Profile

Map 1 illustrates the Marion County population compared to West Virginia overall. Marion is at the higher end of the spectrum, being the ninth largest county by population. The population is boosted by critical transportation links including the interstate and major US highways.

<sup>2</sup> United States Census Bureau, "2012 American Community Survey 5-year Estimates," Accessed April 20, 2013, [www.factfinder2.census.gov](http://www.factfinder2.census.gov)

# Demographic Population



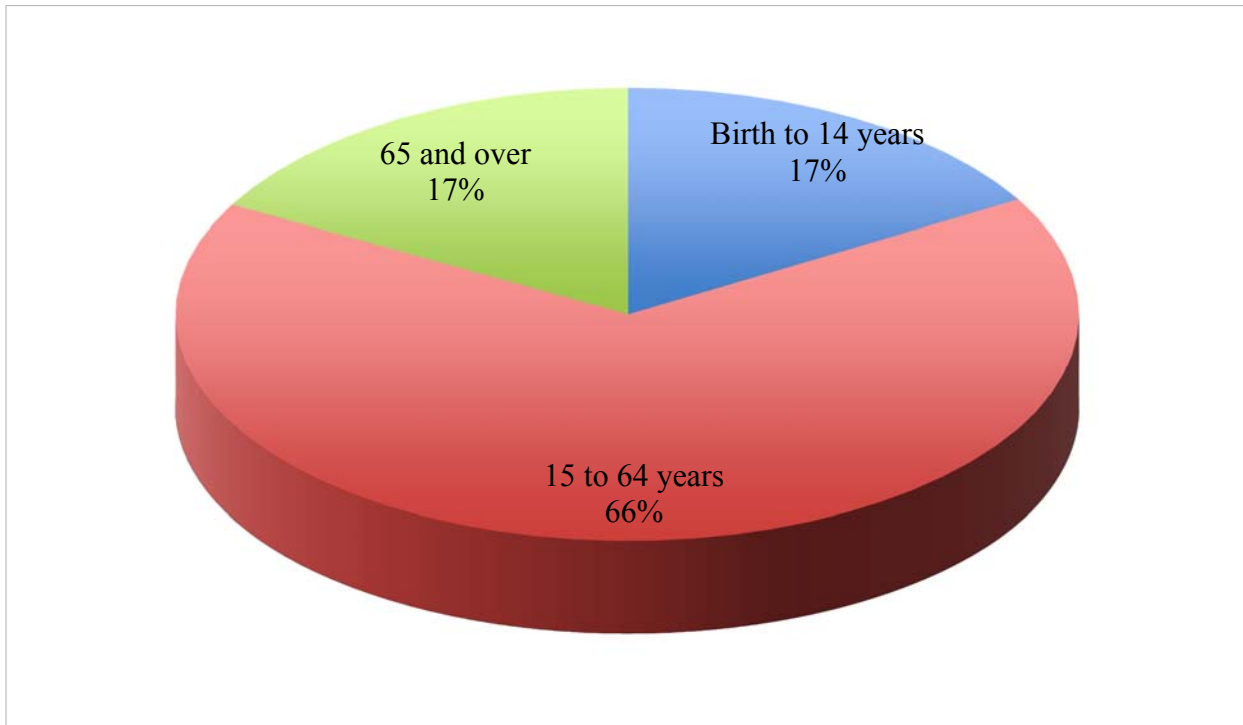
Source: U.S. Census Bureau, 2008-2012 American Community Survey

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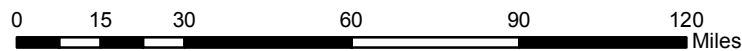
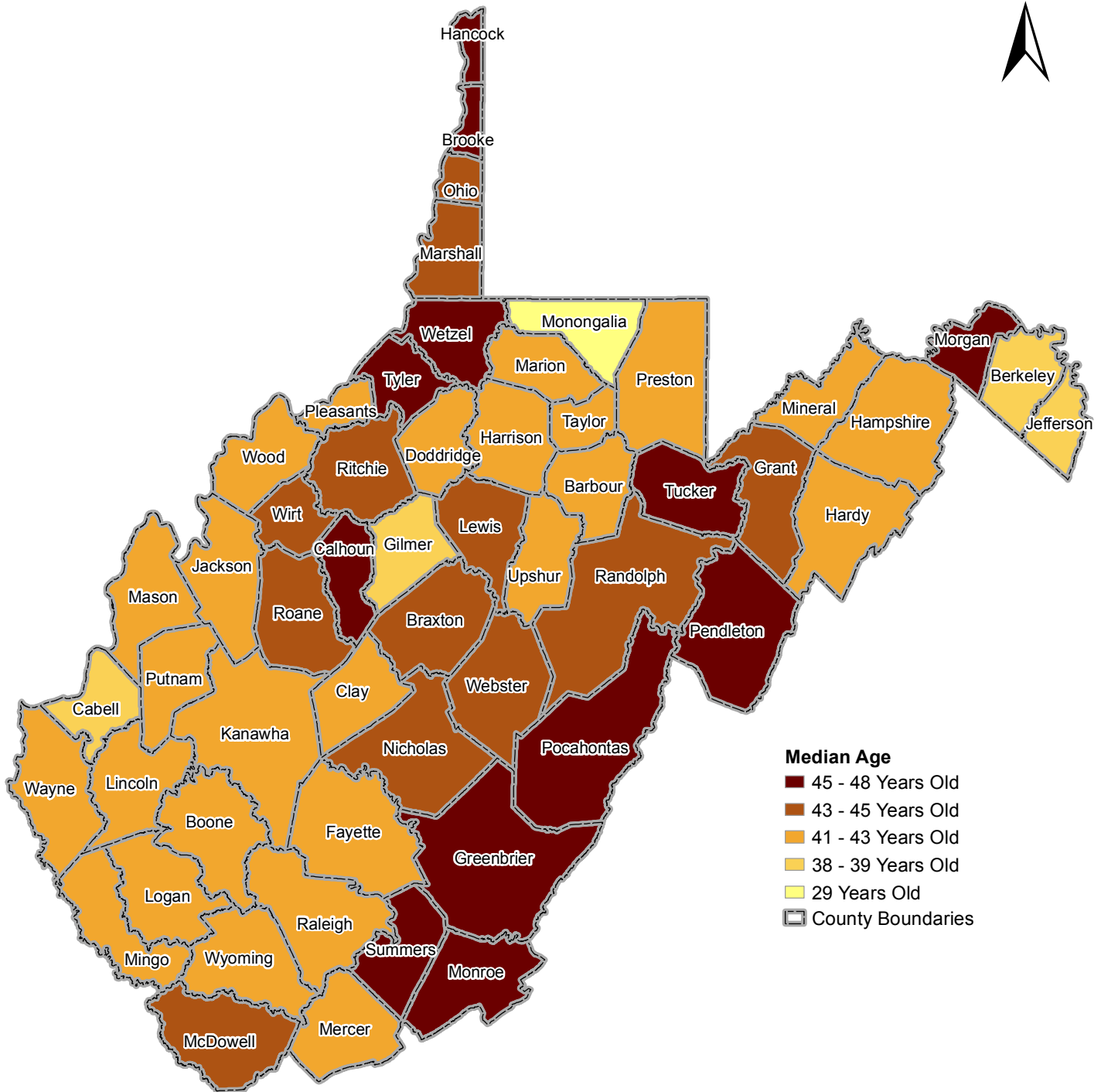
According to the ACS, almost 23 percent of Marion County residents are 62 years of age and over, while almost 15 percent are between 5 and 17 years of age and just under six percent are below the age of 5. Approximately 12,000 people are of retirement age. The median age in Marion is 41.3, which is very near the median age of the State (Map 2). The majority of the population is around working age, as denoted in Figure 2.

**Figure 2: Marion County Age Breakdown**



Source: 2012 American Community Survey 5-Year Estimate Calculation

# Demographic Median Age



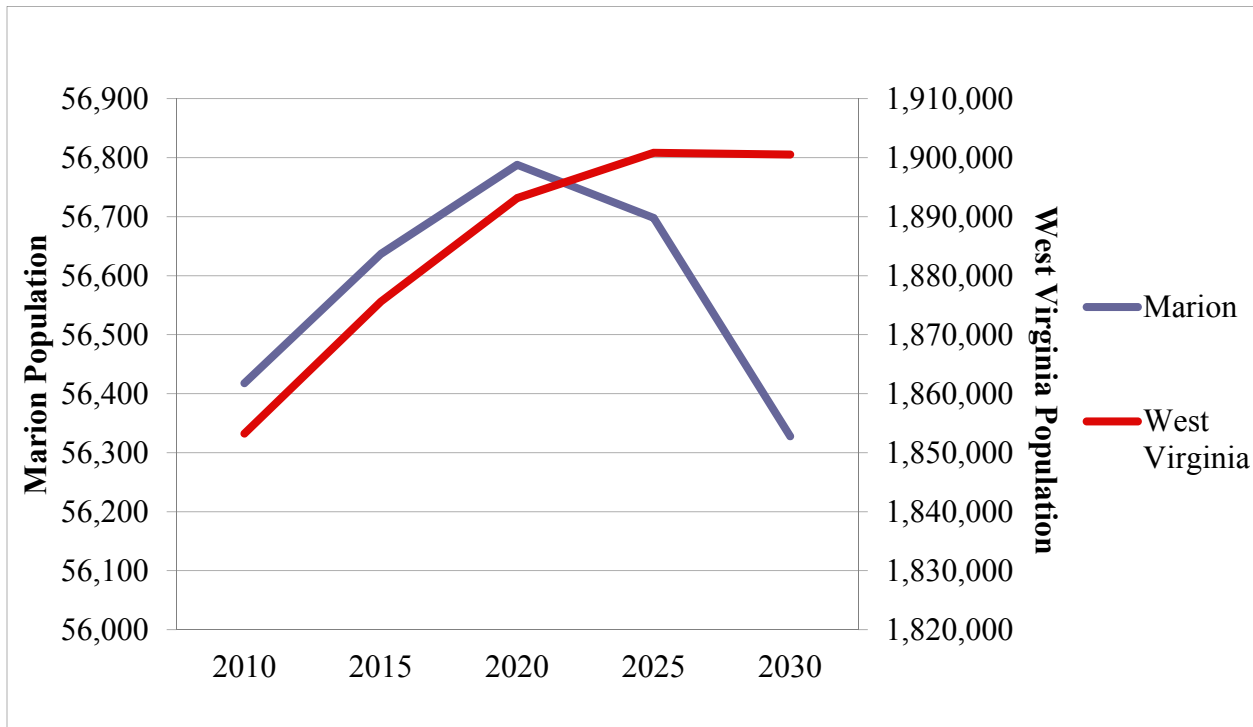
Source: U.S. Census Bureau, 2008-2012 American Community Survey

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The Bureau of Business and Economic Research at West Virginia University projects a 0.2 percent decrease in the Marion County population between 2010 and 2030, which is 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 decrease is derived from a steady decrease in population over the past 20 years. The “kink” in the middle is due to the appearance that the overall trend of population decline may be changing, but without further evidence this appears to be a graphical anomaly.

**Figure 3: Population Projections**



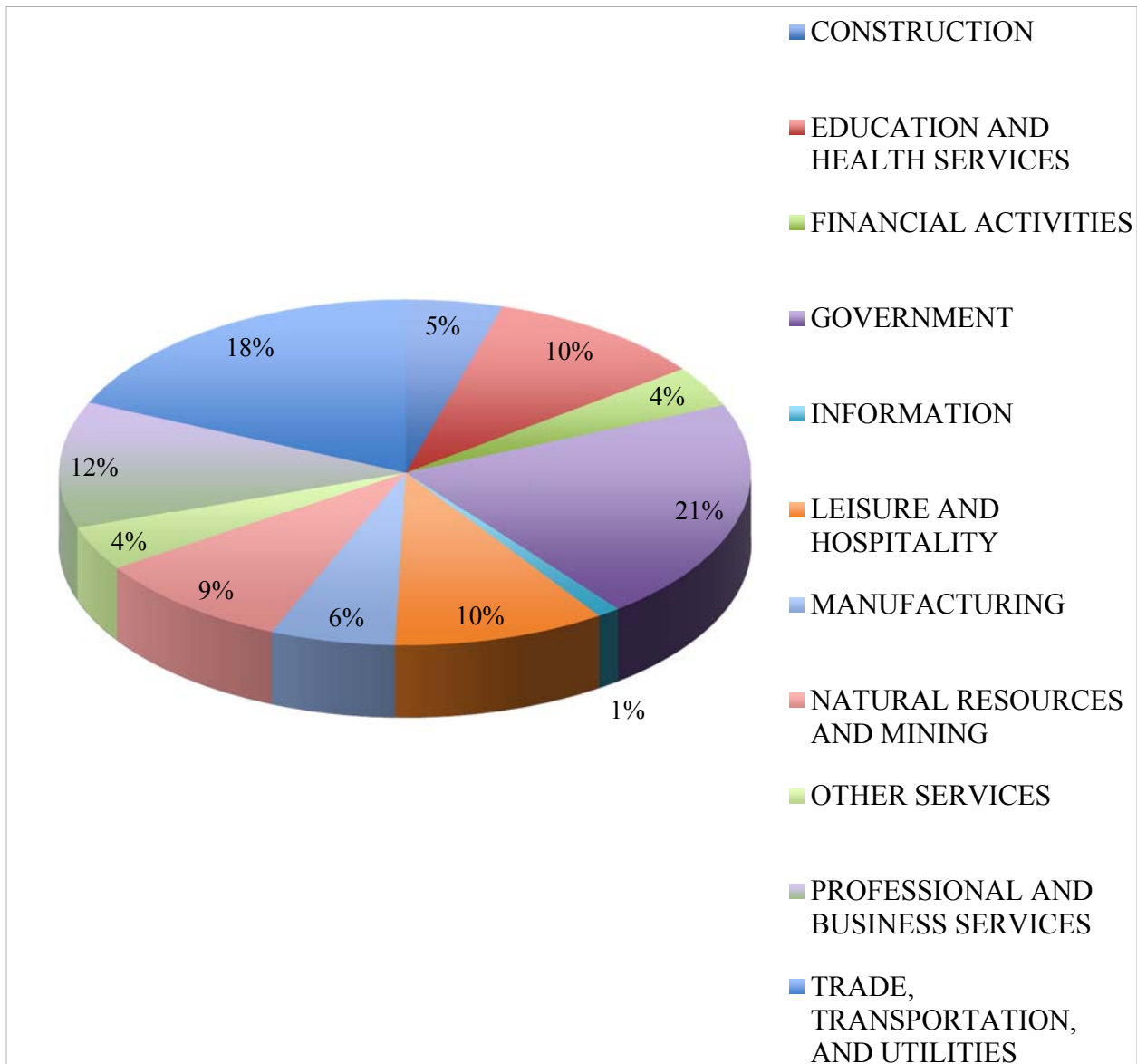
Source: WVU Bureau of Business and Economic Research

### Employment

Workforce WV has a complete dataset on employment numbers and wages. The total number of employed in 2012 was 20,563. Approximately 21 percent of wage earners in Marion County worked in Government, nearly a fifth worked in Trade, Transportation, and Utilities, and another fifth worked in Professional and Business Services and Education and Health Services. Marion County’s employment mix is consistent with several other coalfield counties, minus Natural Resources and Mining employment, though that employment is pretty close to the ten percent mark. The mix is fairly diversified, though it may still be at risk to political will and recessions.

<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).

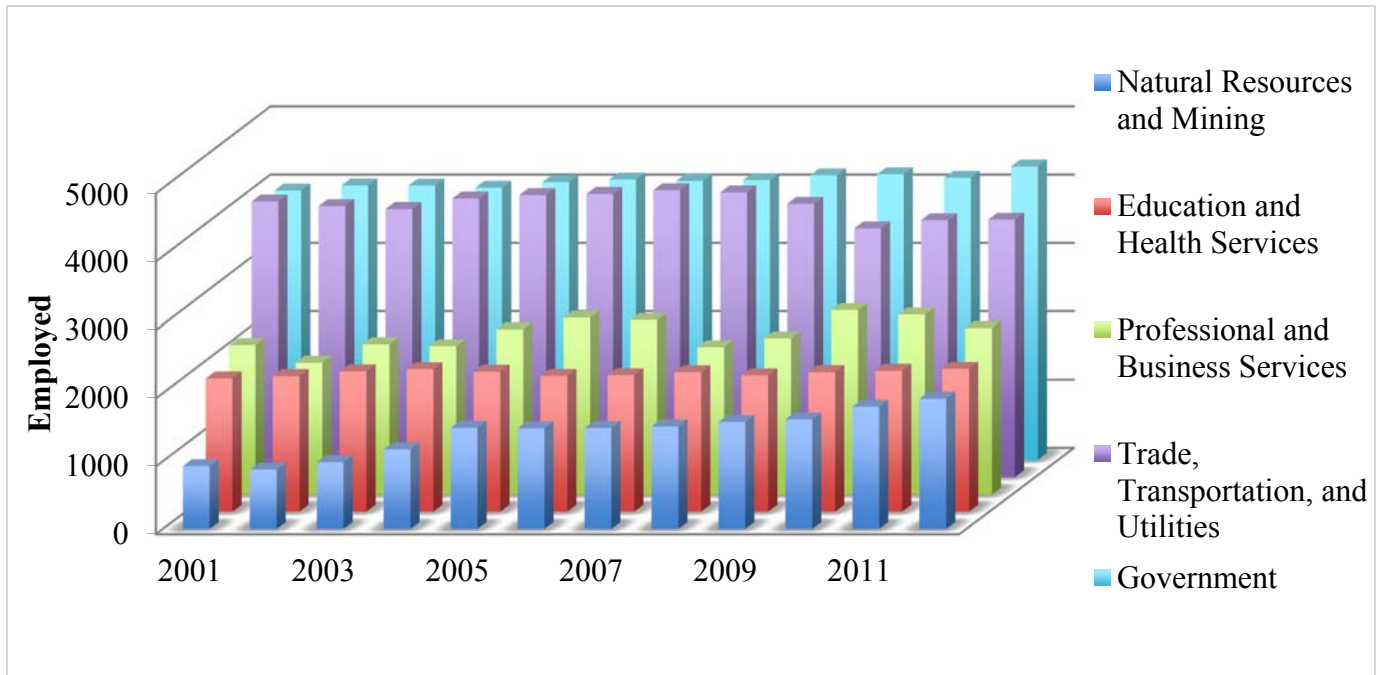
**Figure 4: 2012 Marion County Employment**



Source: Workforce WV

The four sectors identified above have been the major contributors to employment throughout the past decade. Natural Resources and Mining is added because of its major contribution to wages. Government and Trade, Transportation, and Utilities have traded spots often, and only during the recession did Government employment surpass Trade, Transportation, and Utilities. Education and Health Services employment has remained fairly consistent, boosted by the presence of Fairmont State University. The most volatile employers have been Professional and Business Services, while the fastest growing sector was Natural Resources and Mining, doubling its share of employment over the decade.

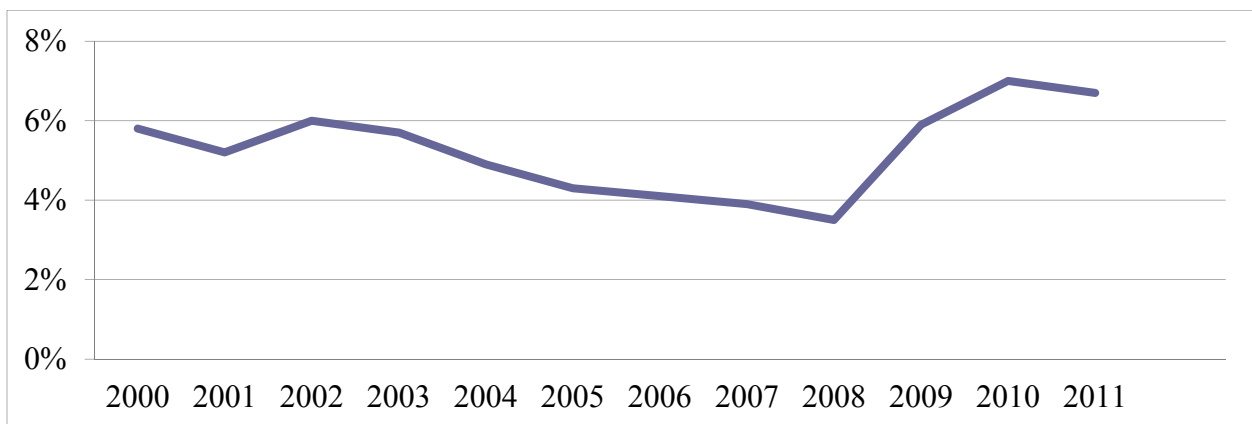
**Figure 5: Marion County Employment by 5 Sectors 2001-2012**



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, Marion’s participation rate is above average for the state. Despite a small rise from the national economic contraction in the early 2000s, unemployment was decreasing until the recession in 2008 when businesses and governments across the spectrum began cutting. (Figure 6). Map 4 shows that Marion’s unemployment rate remained one of the lowest in the state. Note that the data for both the figure and the map is for 2011, as statistics for the figure have not yet been seasonally adjusted.

**Figure 6: Marion County Unemployment Rate**

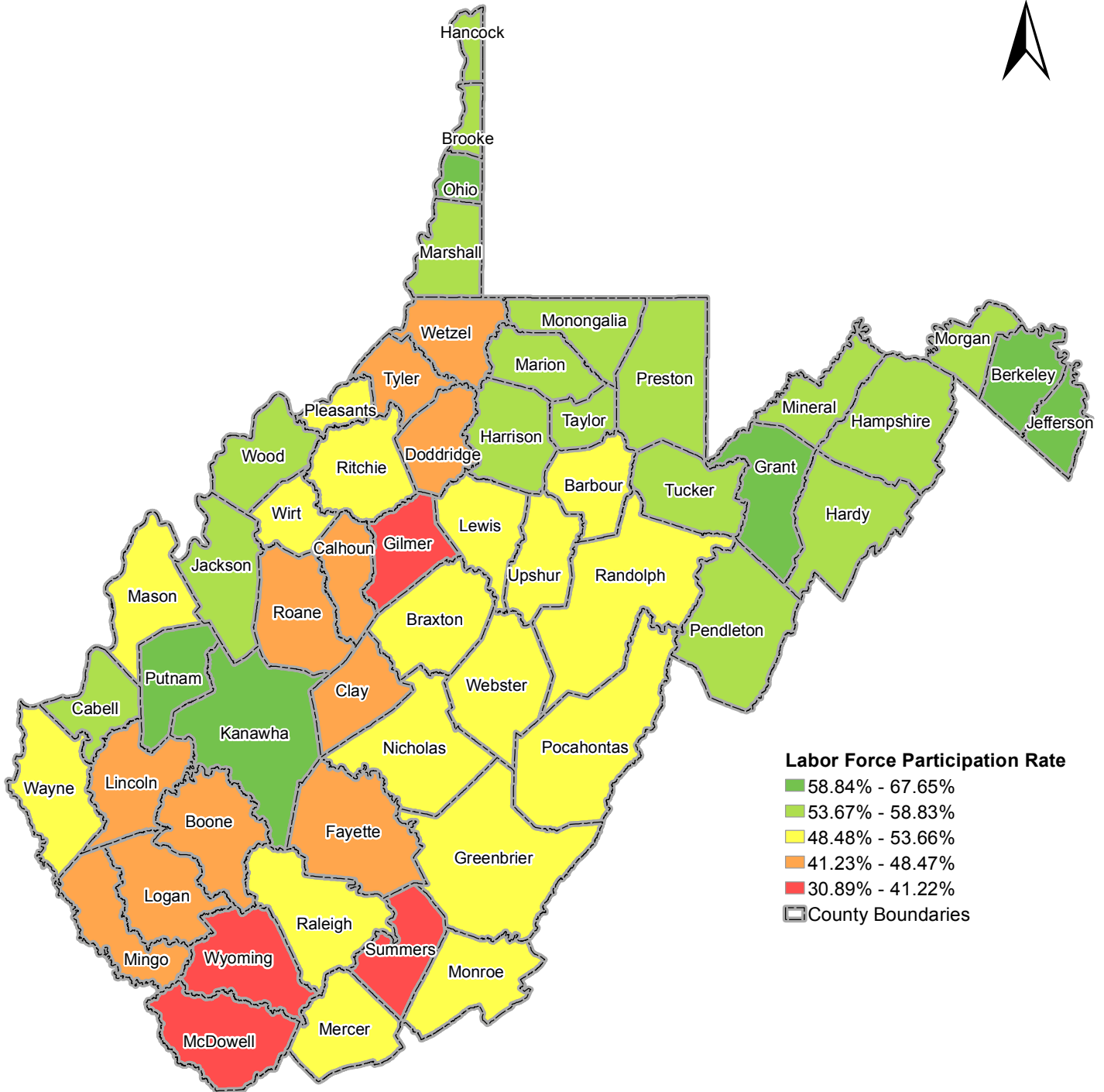


Source: Workforce WV



# Demographic

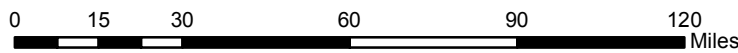
## Labor Force Participation Rate



**Labor Force Participation Rate**

- 58.84% - 67.65%
- 53.67% - 58.83%
- 48.48% - 53.66%
- 41.23% - 48.47%
- 30.89% - 41.22%

□ County Boundaries

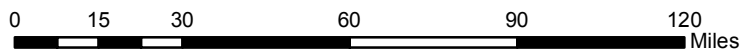
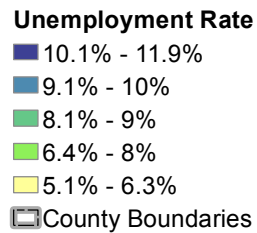
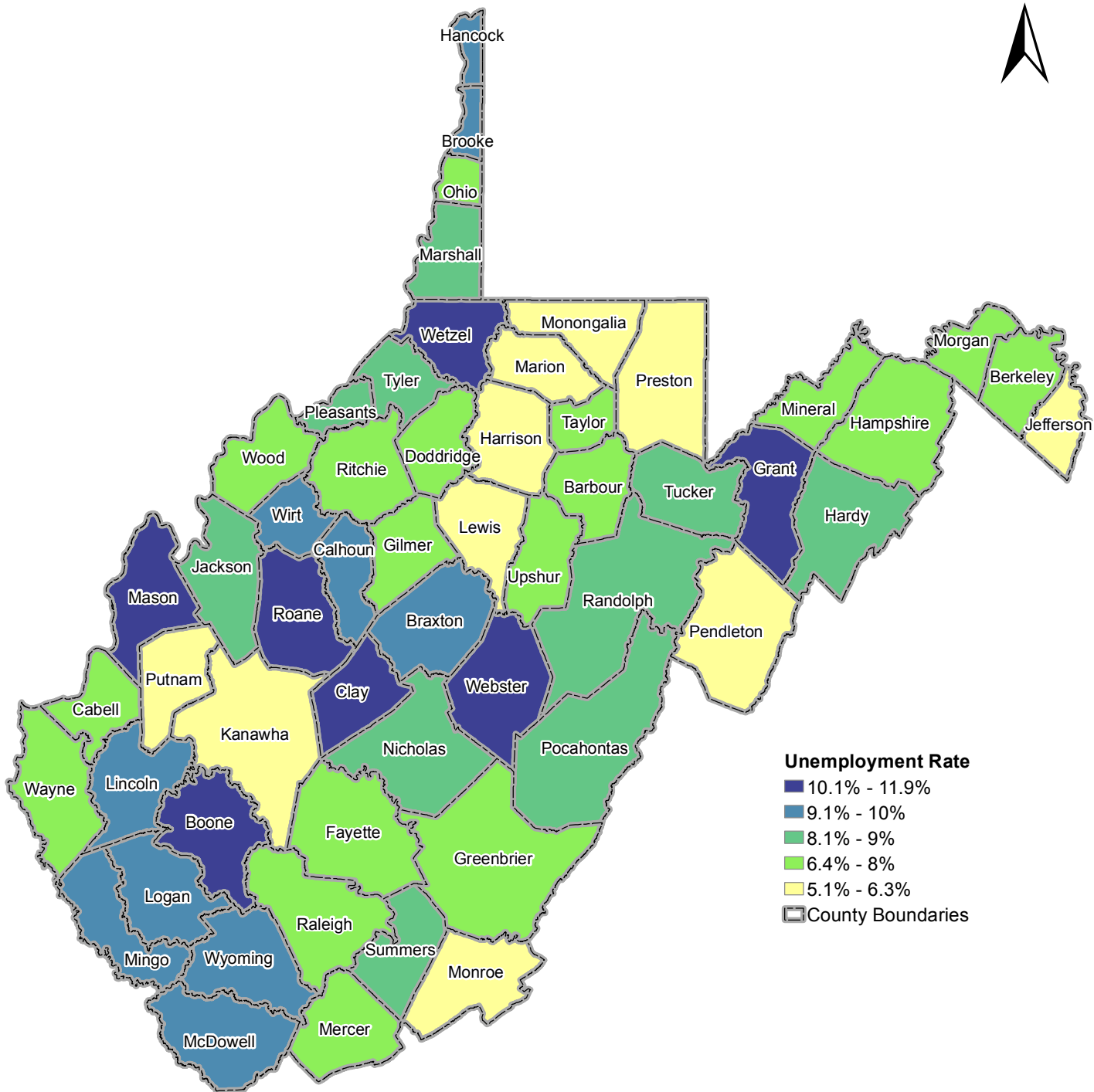


Source: U.S. Census Bureau, 2008-2012 American Community Survey

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# Demographic Unemployment Rate



Source: United States Census Bureau 2011

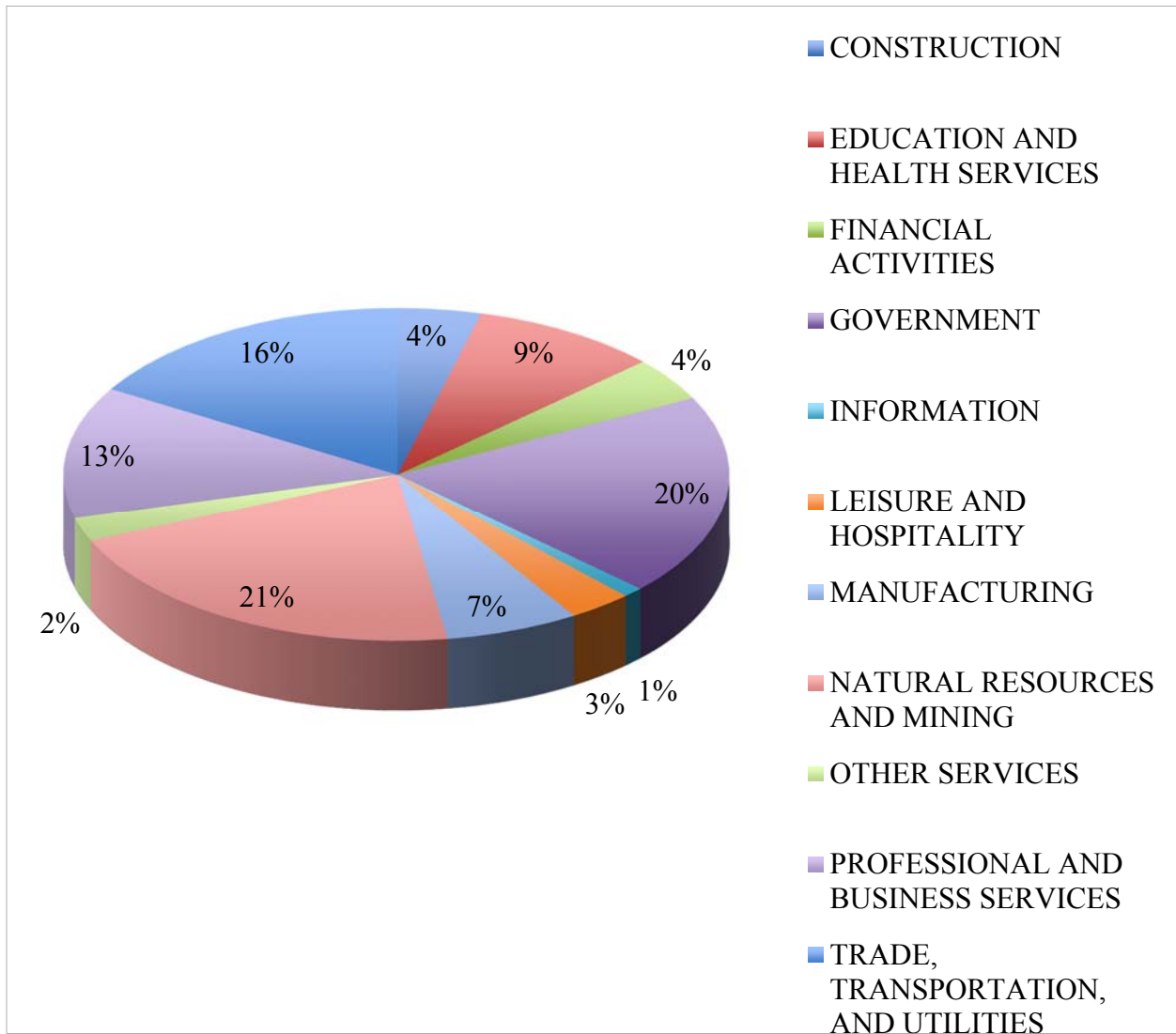
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## Wages and Income

The only difference between Marion County's largest employers and largest wage contributors is the Natural Resources and Mining sector. Because of the relatively high wages in that sector, Natural Resources and Mining's small employment still makes up a fifth of total wages. This shows that this sector has a great deal of influence on county stats, not to mention the lives of the County's population. Otherwise, the top wage contributors provide about the same percentage as they do in employment.

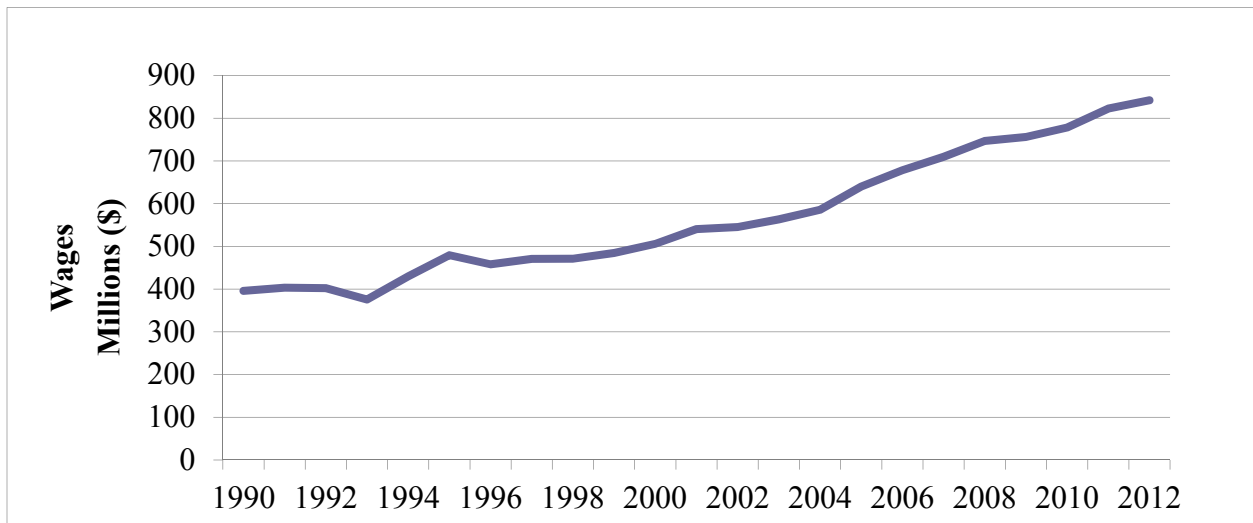
**Figure 7: 2012 Marion County Total Wages**



Source: Workforce WV

Historically, wages for Marion County have shown a tendency to rise. Over the past two decades total wages have more than doubled, without regard for economic downturns or the loss in population. Indeed, since the population has fallen over this time span, it is reasonable to assume that the people who work in Marion County have been increasing their pay over time.

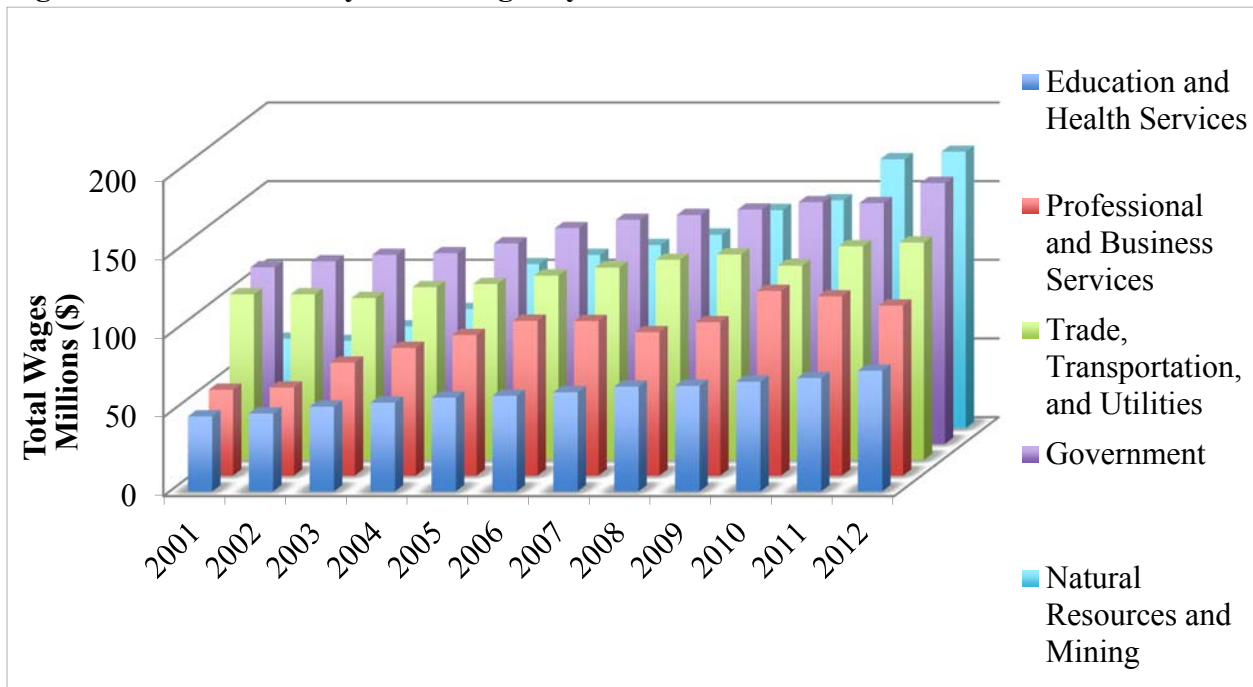
**Figure 8: Marion County Total Wages 1990-2012**



Source: Workforce WV

Figure 9 confirms the general trend in wages, particularly the extraordinary growth in Natural Resources and Mining. Wages in that sector have tripled since 2001. Professional and Business Services wages have nearly doubled over the same time period. Despite volatility, every one of the top five wage sectors has increased wages over the past decade.

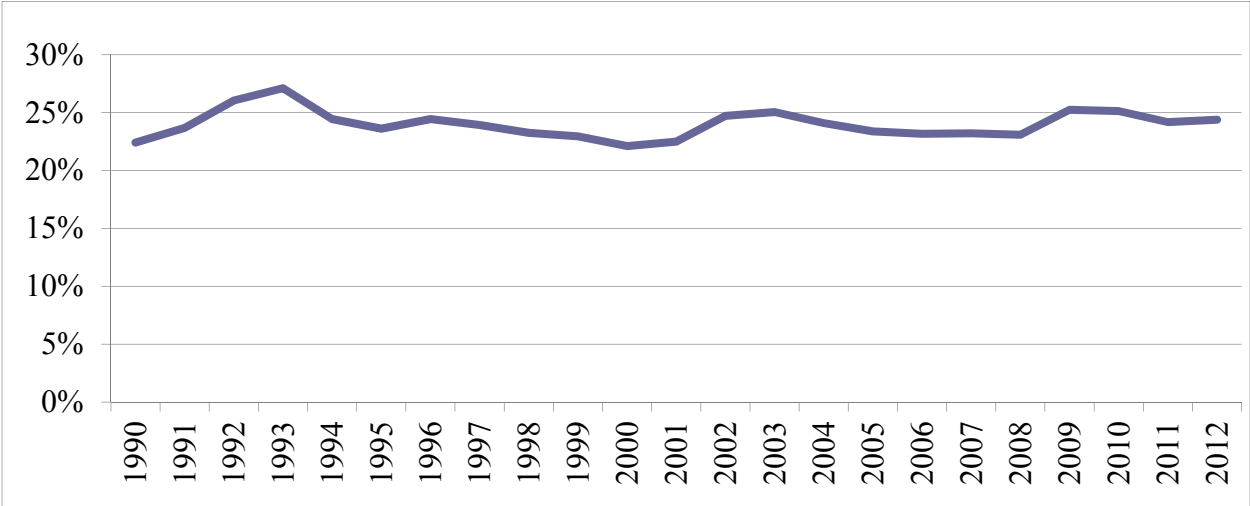
**Figure 9: Marion County Total Wages by 5 Sectors 2001-2012**



Source: Workforce WV

In most American counties, one would find that the majority of income for people stems from wages. In West Virginia, 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 Marion County because in 2012, Marion County wages were \$841 million for all industries.<sup>4</sup> Income for the County was larger (around \$2 billion). Though there are many components to income other than work earnings, 24 percent of total Marion County income is derived from government transfers.<sup>5</sup> Government transfers accounted for about 95 percent of total transfers to Marion County, dwarfing transfers from private institutions such as charities. Government transfers have consistently contributed between a fifth and a quarter of income over the past 20 years. This does not count the wages for government workers. This percentage is below average for the state, however.

**Figure 10: Government Transfers as a Percentage of Income for Marion County**



Source: United States Bureau of Economic Analysis

The total personal income of Marion County is therefore made up of 24 percent government transfers and 60 percent earnings from work. According to the BEA, per capita income was \$38,608 for Marion County in 2012. Annual net earnings, or income from work, is displayed in Map 5, and Marion is above average in earned income in West Virginia.

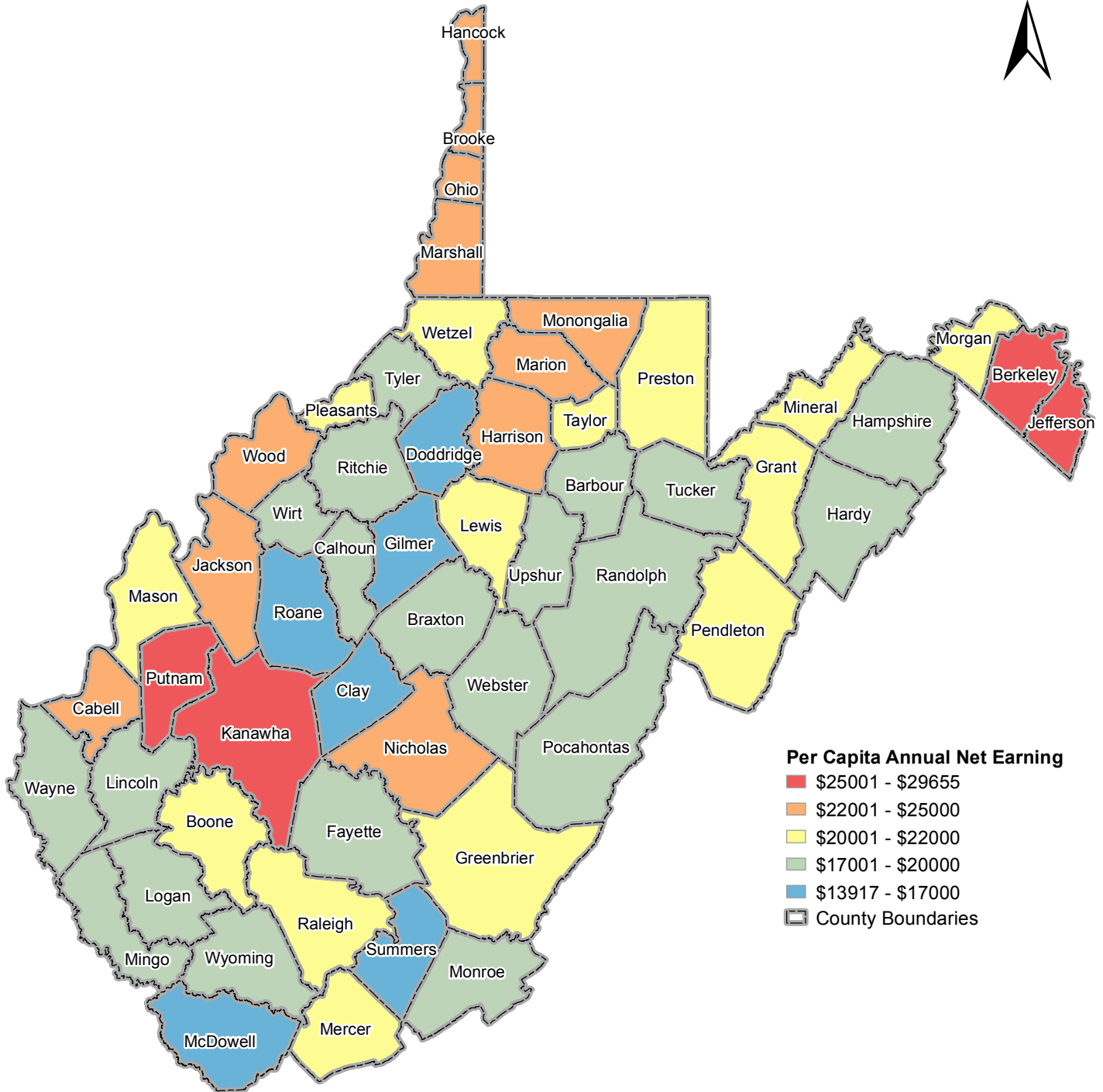
<sup>4</sup> “Employment and Wages – 2012, Marion County,” Workforce WV, Accessed February 13, 2014, <http://www.workforcewv.org/lmi/EW2011/ew11x059.htm>

<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, 2014, <http://www.bea.gov/regional/index.htm>.

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. Marion County appears to be at the lower end of the spectrum, though it has a higher number of establishments than average. Though Government and Education and Health Services are characterized by low numbers of establishments, Professional and Business Services and Trade, Transportation, and Utilities may have enough to bring that number up. This showcases healthy competition and development in Marion County.

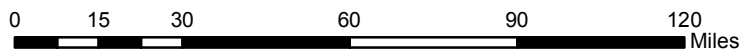
# Demographic

## Per Capita Annual Net Earning



**Per Capita Annual Net Earning**

- \$25001 - \$29655
- \$22001 - \$25000
- \$20001 - \$22000
- \$17001 - \$20000
- \$13917 - \$17000
- County Boundaries



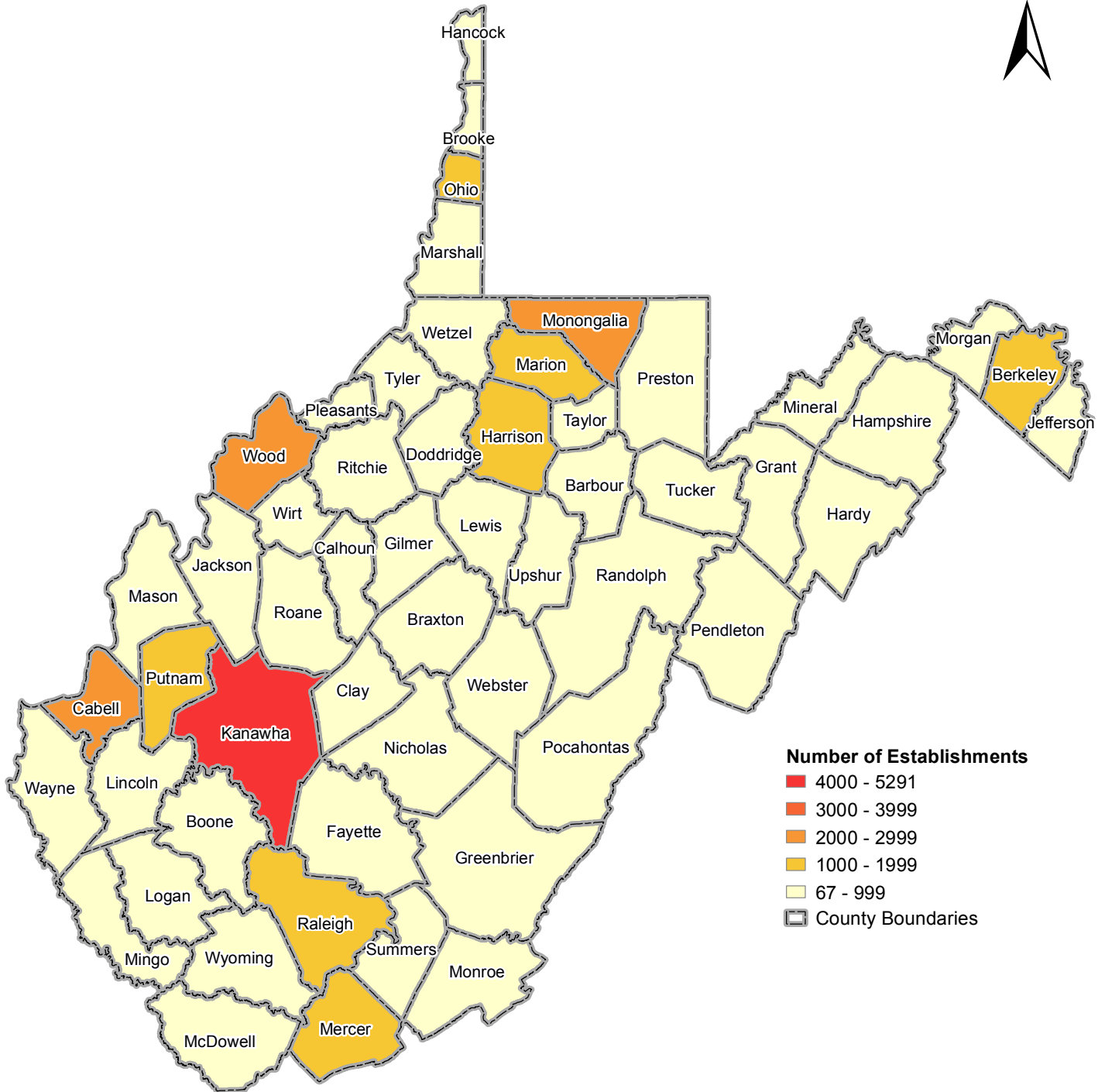
Source: U.S. Census Bureau, 2008-2012 American Community Survey

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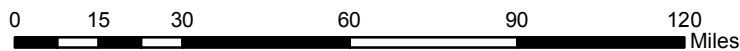
# Demographic

## Number of Establishments



**Number of Establishments**

- 4000 - 5291
- 3000 - 3999
- 2000 - 2999
- 1000 - 1999
- 67 - 999
- County Boundaries



Source: U.S. Census Bureau, 2011

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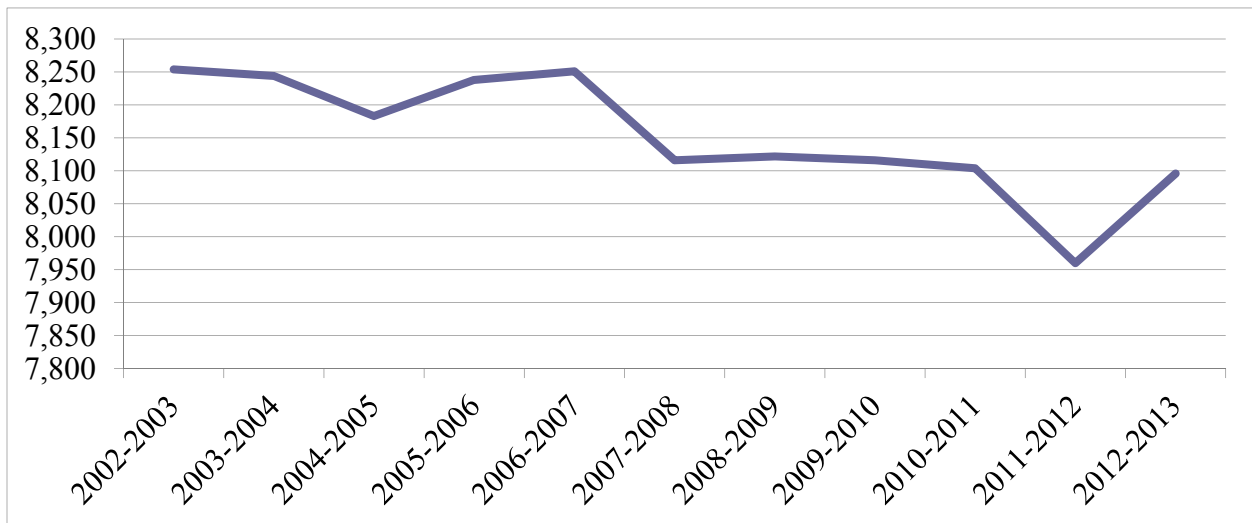


## Education

Marion County has two combined elementary/middle schools, nine elementary schools, five middle schools, and three high schools as of the 2012-2013 school year.<sup>6</sup>

Marion County 2<sup>nd</sup> month school enrollment has shown a slow decrease in the number of students following the overall trend of population decline. The decrease has been small, about a two percent loss from the 2002-2003 school year (Figure 11). Marion County 2<sup>nd</sup> month enrollment is about average for the state, despite its large population (Map 7).

**Figure 11: Marion County School Enrollment**



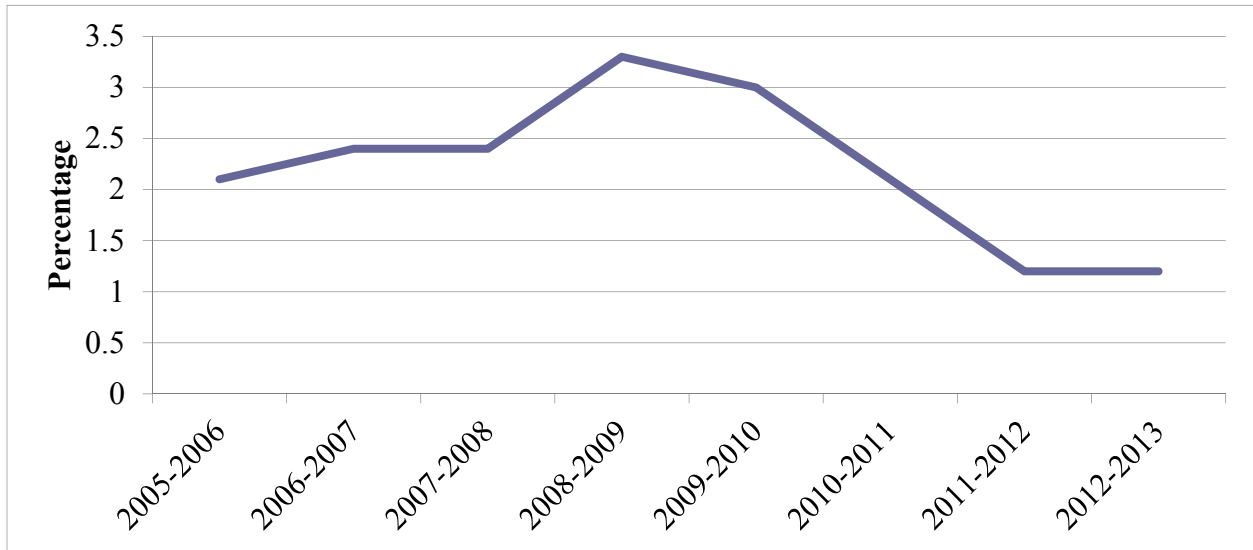
Source: WVEIS

The West Virginia Education Information System (WVEIS) also has dropout rates for the school years from 2005 to 2013. 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 have been falling since the start of the 2008-2009 school year, as increased focuses on education, and the economic consequences for dropping out, began to take hold (Figure 12).

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<sup>6</sup> “School Profiles,” West Virginia Education Information System, West Virginia Department of Education, Accessed February 13, 2014, [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: Marion County Dropout Rate**

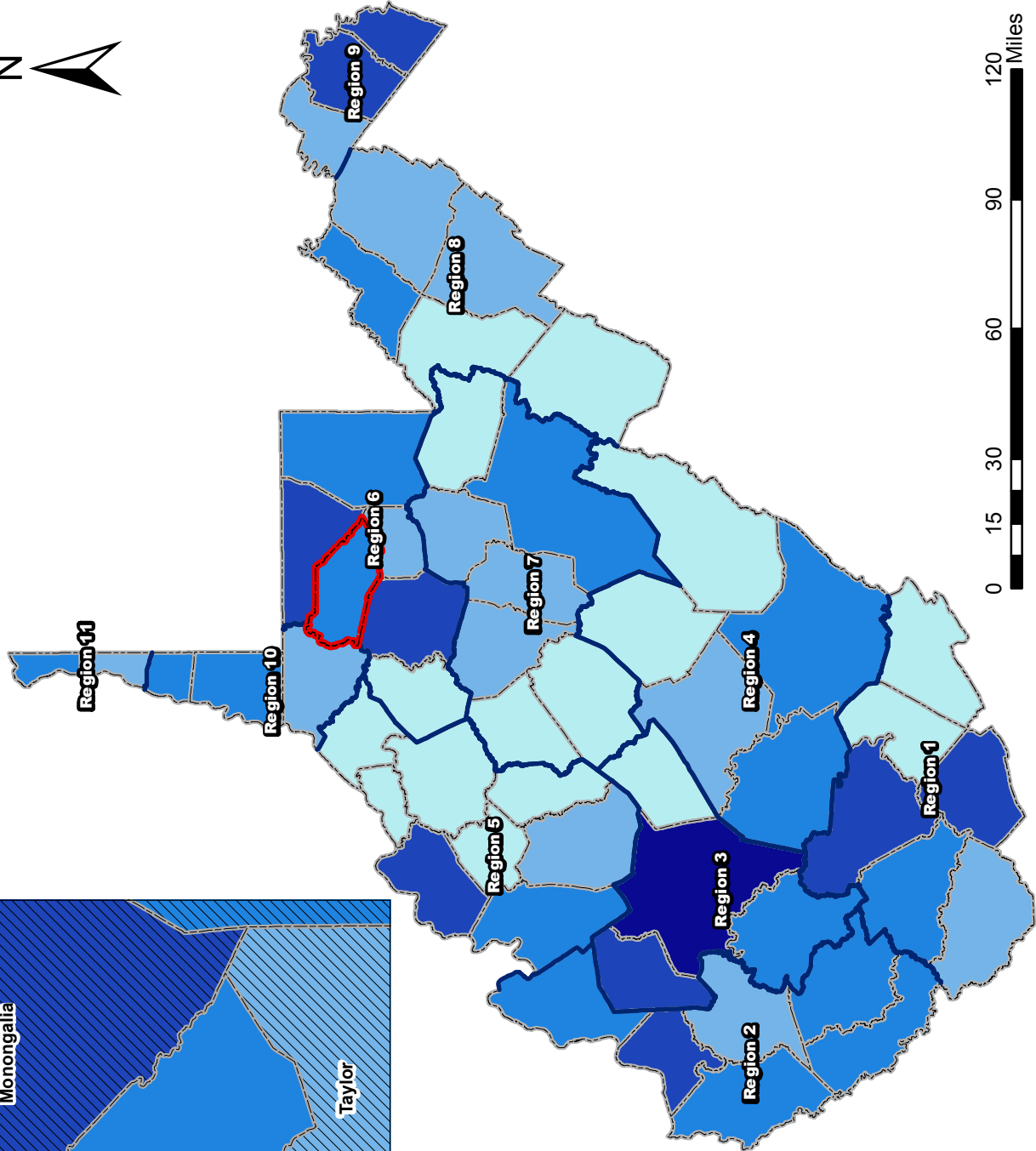
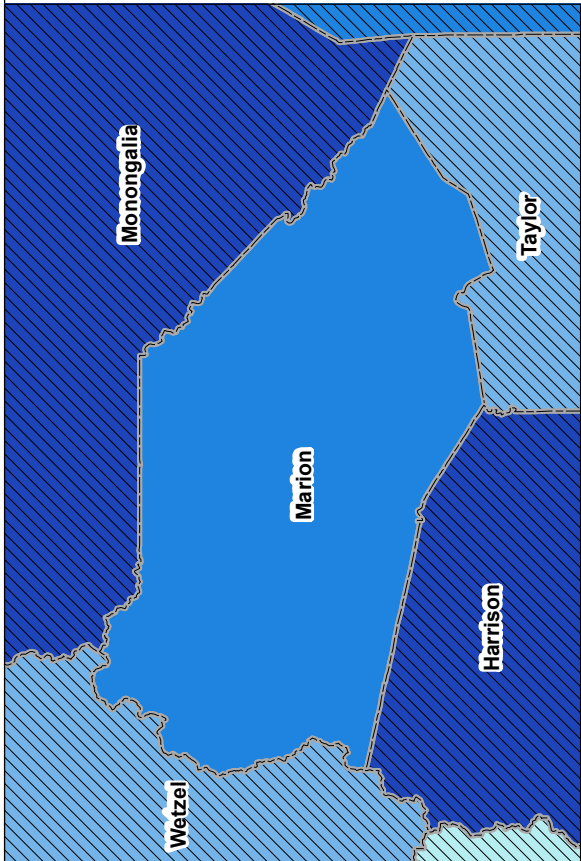


Source: WVEIS

Map 8 shows each county's dropout rate. Marion County currently has an average dropout rate, resulting from a combination of education services and the lack of value in dropping out of high school. Maps 9 and 10 show the total graduates and the graduation rate by county, which are average and below average respectively for the State. Marion County's school 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 is East Fairmont 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

Marion County



- Planning Regions Line
- 903.00 - 2128.00
- 2128.01 - 3956.00
- 3956.01 - 8036.00
- 8036.01 - 18221.00
- 18221.01 - 28378.00
- County Boundaries



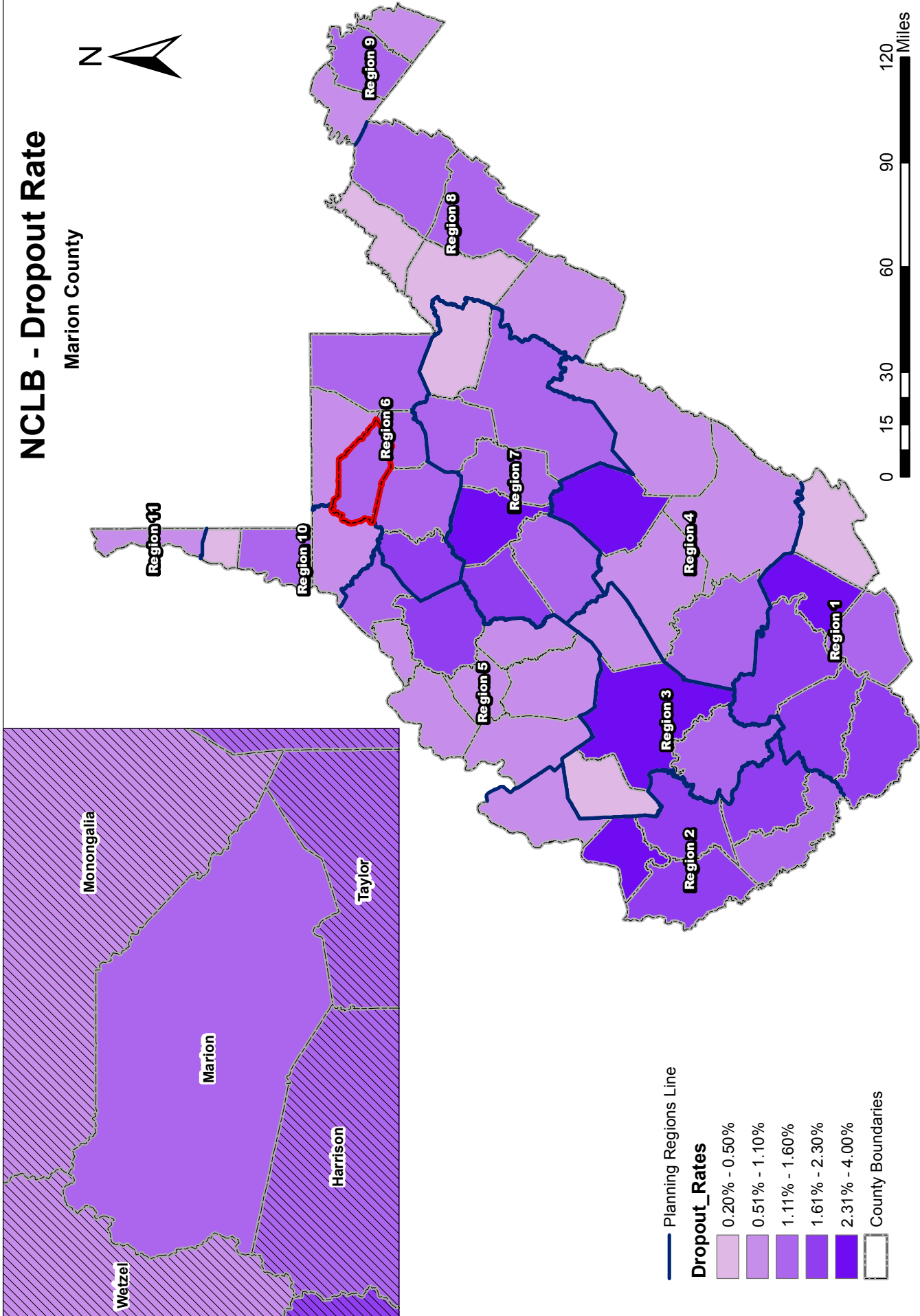
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Source: West Virginia Department of Education 2014

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# NCLB - Dropout Rate

## Marion County



- Planning Regions Line
- Dropout\_Rates**
- 0.20% - 0.50%
- 0.51% - 1.10%
- 1.11% - 1.60%
- 1.61% - 2.30%
- 2.31% - 4.00%
- County Boundaries

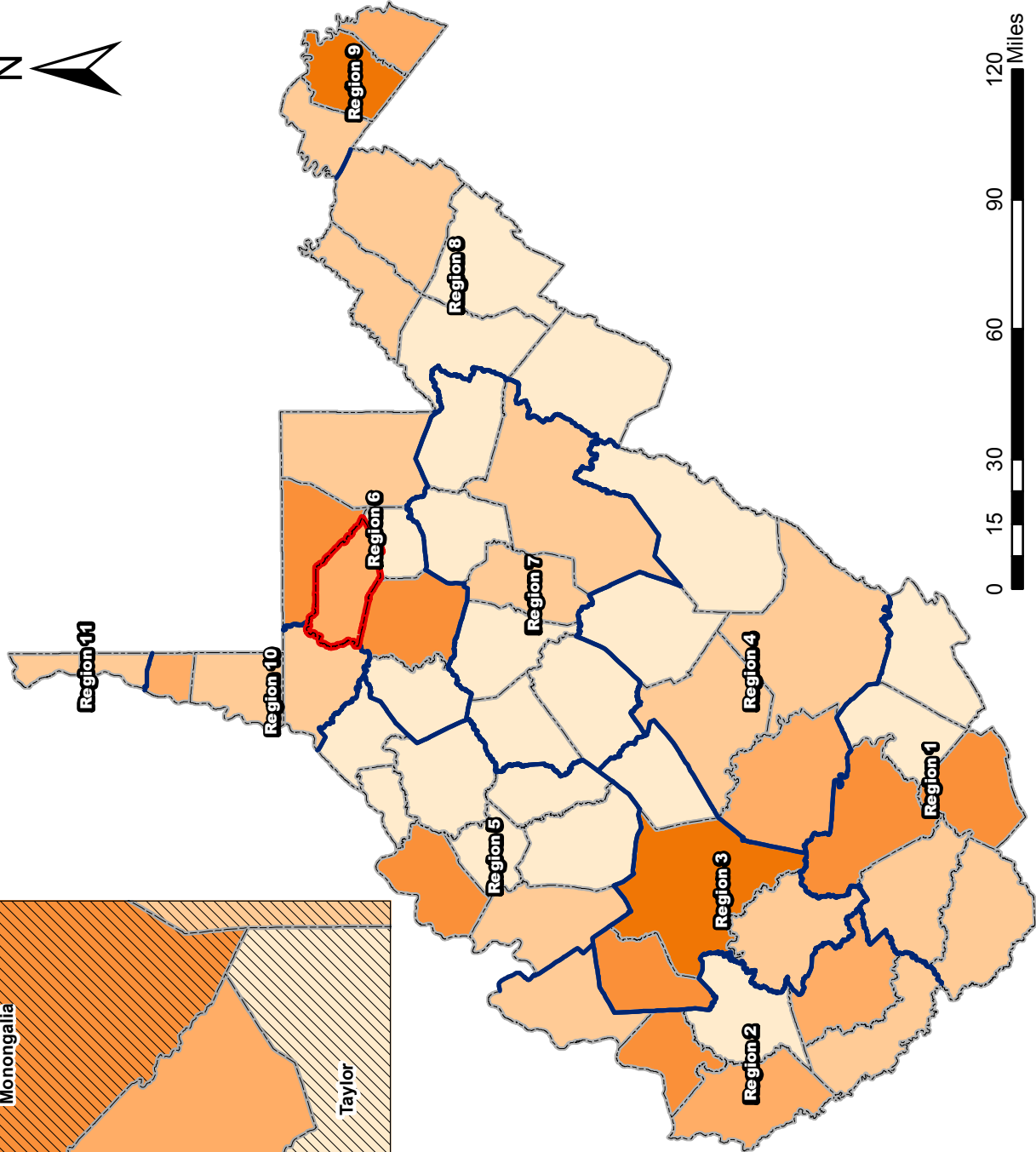
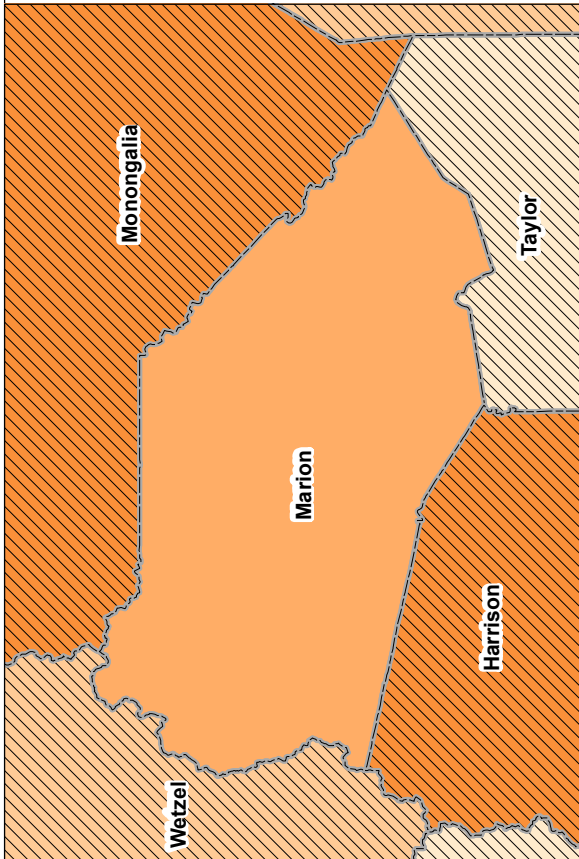
Source: West Virginia Department of Education 2014

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# NCLB - Total Graduates

Marion County



Planning Regions Line

- 71 - 181
- 182 - 357
- 358 - 536
- 537 - 821
- 822 - 1615

County Boundaries



Source: West Virginia Department of Education 2013

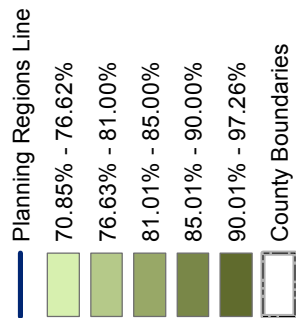
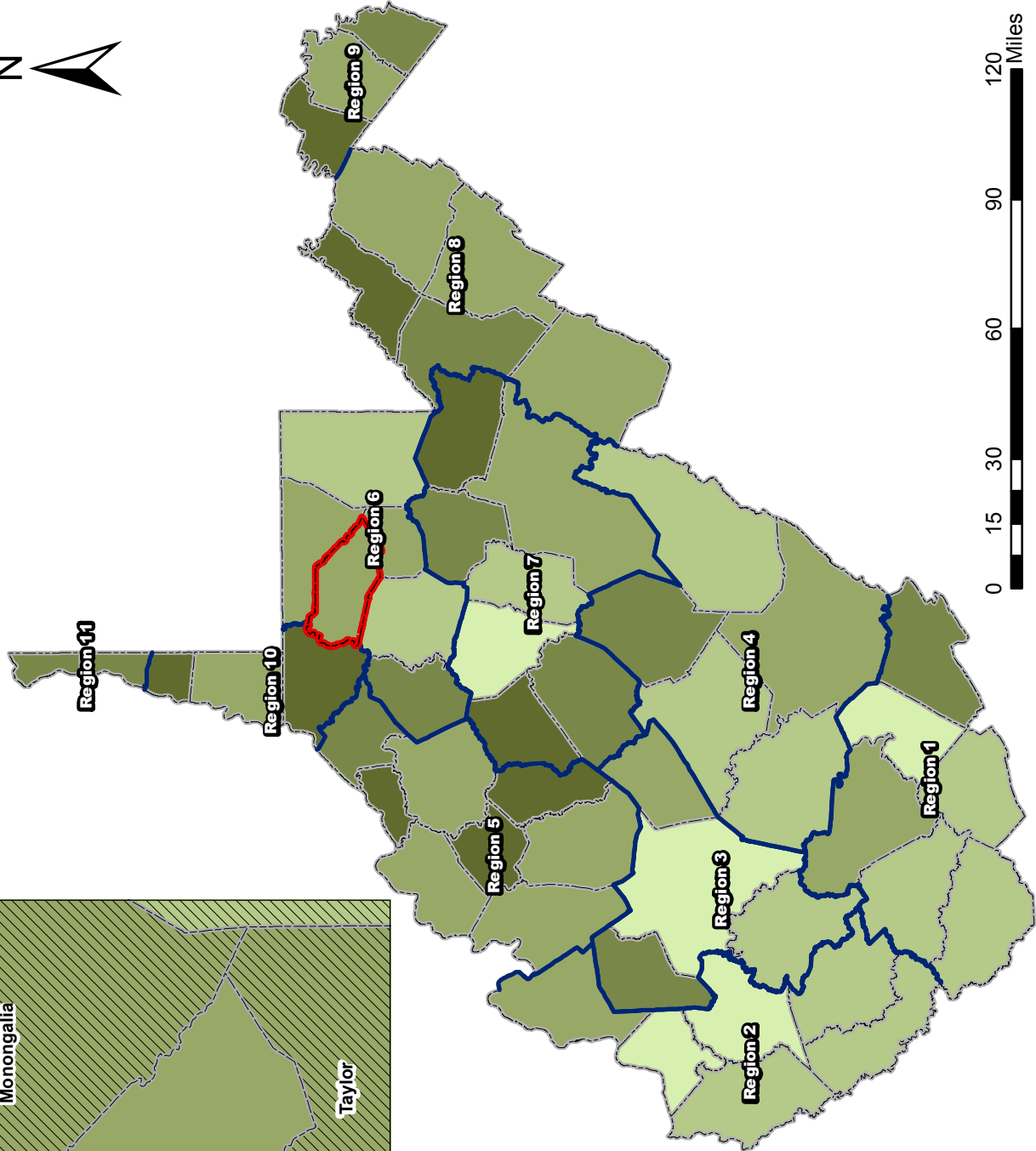
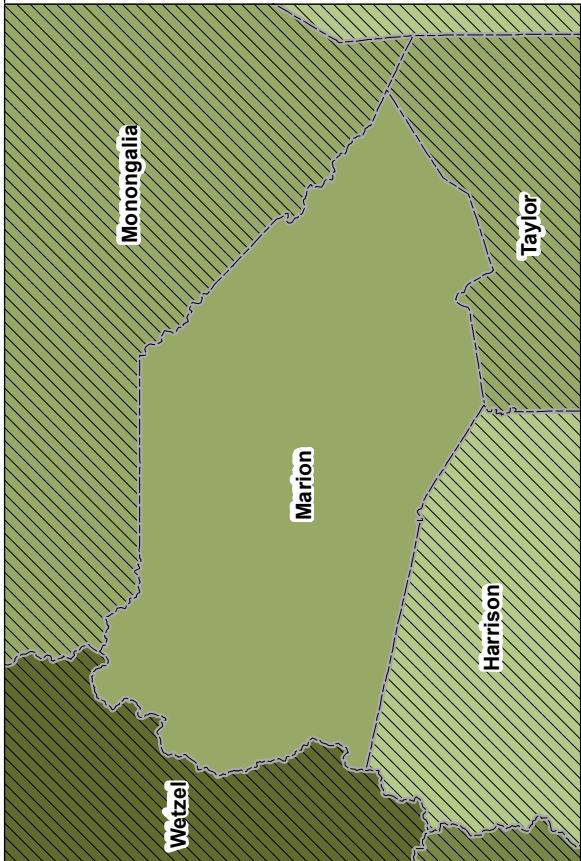
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# NCLB - Graduates Rate

Marion County

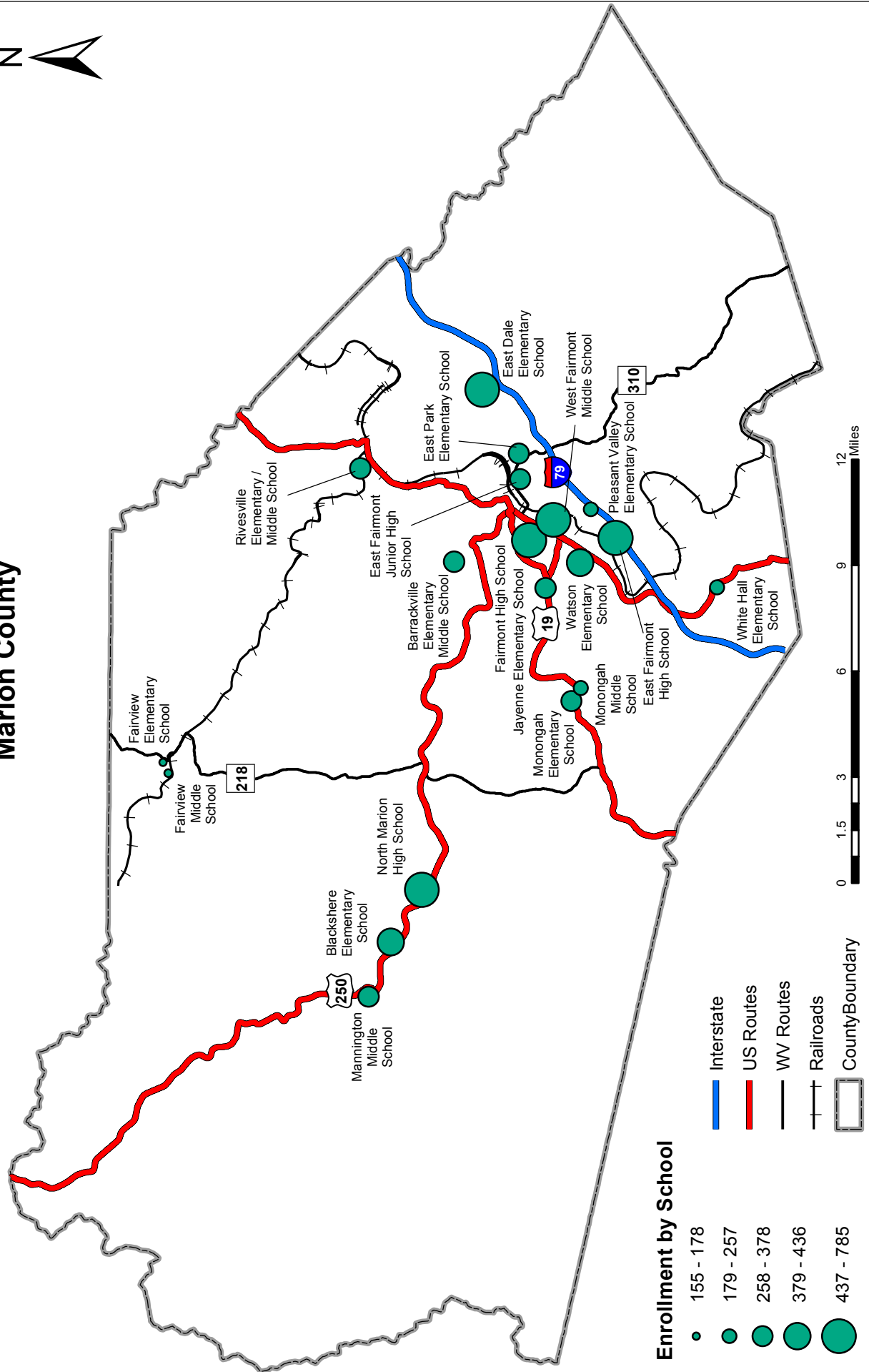


Source: West Virginia Department of Education 2014

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# Total Attendance by School - 2014

## Marion County



### Enrollment by School

- 155 - 178
- 179 - 257
- 258 - 378
- 379 - 436
- 437 - 785

- Interstate
- US Routes
- WV Routes
- Railroads
- County Boundary



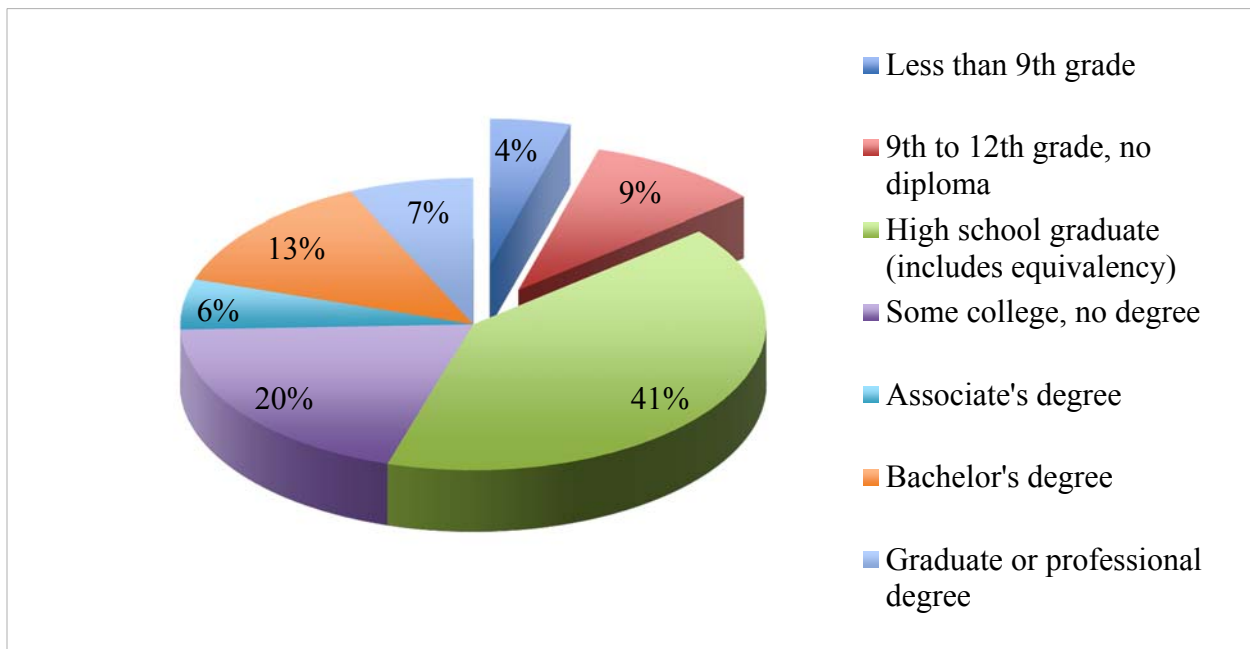
Source: West Virginia Department of Education 2014

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The ACS also maintains data on the educational attainment of the population that is 25 years and over. Forty-one percent of these residents have terminated at a high school diploma or equivalent. Thirteen percent have less than a high school diploma. This number is better than many others in the state, and conveys the importance of education in the County. Almost a quarter of the population has a bachelor's or higher degree.

**Figure 13: Marion County Educational Attainment**



Source: 2012 American Community Survey 5-Year Estimates

### Utilities and Infrastructure

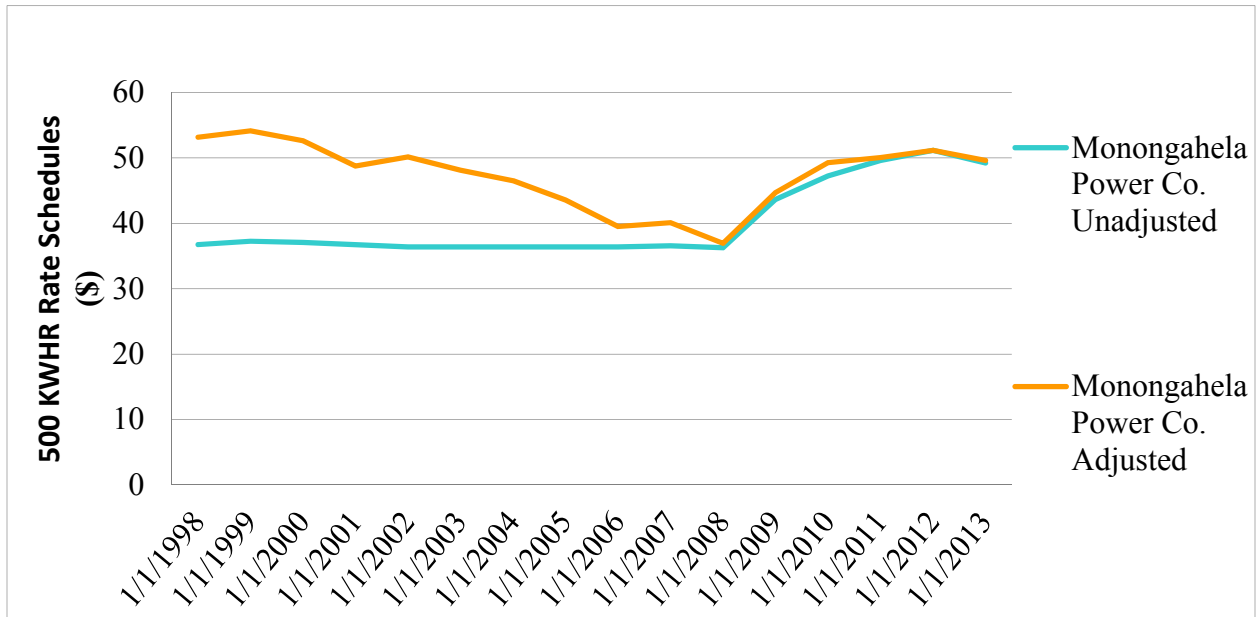
Marion County has 49 utility companies according to the West Virginia Public Service Commission (PSC). Economic development depends on infrastructure, and Marion County has two electricity providers and one wholesale electricity provider. Monongahela Power Company and Harrison Rural Electrification Association, Inc. provide industrial, commercial, and residential electricity to Marion 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 for Monongahela Power Company. 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 from 1998 to 2012. The adjusted and unadjusted prices are provided in Figure 14.

**Figure 14: Power Company Prices**



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 Marion 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. Marion County has 19 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, of which Marion County has one non-operational facility.

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

<b>Colfax Public Service District</b>	
<b>Sewer Rates</b>	
All amounts used per month	9.15 per 1,000 gallons
<b>Greater Marion Public Service District</b>	
<b>Sewer Rates</b>	
First 5,000 gallons used per month	12.05 per 1,000 gallons

Next 15,000 gallons used per month	11.18 per 1,000 gallons
Next 30,000 gallons used per month	10.31 per 1,000 gallons
All Over 50,000 gallons used per month	9.43 per 1,000 gallons
<b>Greater Paw Paw Sanitary District</b>	
<b>Sewer Rates</b>	
All amounts used per month	10.44 per 1,000 gallons
<b>Kingmill Valley Public Service District</b>	
<b>Sewer Rates</b>	
First 50,000 gallons used per month	7.95 per 1,000 gallons
All Over 50,000 gallons used per month	6.57 per 1,000 gallons
<b>Whitehall Public Service District</b>	
<b>Sewer Rates</b>	
First 3,000 gallons used per month	4.75 per 1,000 gallons
Next 5,000 gallons used per month	4.27 per 1,000 gallons
Next 12,000 gallons used per month	3.67 per 1,000 gallons
Next 30,000 gallons used per month	3.32 per 1,000 gallons
All Over 50,000 gallons used per month	2.60 per 1,000 gallons
<b>Downs Public Service District</b>	
<b>Water Rates</b>	
First 3,000 gallons used per month	13.80 per 1,000 gallons
Next 2,000 gallons used per month	11.02 per 1,000 gallons
Next 5,000 gallons used per month	10.80 per 1,000 gallons
Next 10,000 gallons used per month	9.33 per 1,000 gallons
All Over 20,000 gallons used per month	9.07 per 1,000 gallons
<b>Ice's Run Route 250 Public Service District</b>	
<b>Water Rates</b>	
First 1,000 gallons used per month	14.87 per 1,000 gallons
Next 2,000 gallons used per month	8.58 per 1,000 gallons
Next 5,000 gallons used per month	8.00 per 1,000 gallons
Next 12,000 gallons used per month	7.50 per 1,000 gallons
All Over 20,000 gallons used per month	7.15 per 1,000 gallons
<b>Little Creek Public Service District</b>	
<b>Water Rates</b>	
First 3,000 gallons used per month	7.58 per 1,000 gallons
Next 3,000 gallons used per month	6.37 per 1,000 gallons
Next 4,000 gallons used per month	5.91 per 1,000 gallons
All Over 10,000 gallons used per month	5.37 per 1,000 gallons
<b>Mannington Public Service District</b>	
<b>Water Rates</b>	

First 5,000 gallons used per month	11.73 per 1,000 gallons
Next 5,000 gallons used per month	10.58 per 1,000 gallons
Next 10,000 gallons used per month	10.11 per 1,000 gallons
Next 10,000 gallons used per month	9.37 per 1,000 gallons
All Over 30,000 gallons used per month	8.47 per 1,000 gallons
<b>Monumental Public Service District</b>	
<b>Water Rates</b>	
First 5,000 gallons used per month	9.21 per 1,000 gallons
Next 5,000 gallons used per month	8.76 per 1,000 gallons
Next 10,000 gallons used per month	8.33 per 1,000 gallons
All Over 20,000 gallons used per month	7.88 per 1,000 gallons
<b>Valley Falls Public Service District</b>	
<b>Water Rates</b>	
First 3,000 gallons used per month	10.02 per 1,000 gallons
Next 2,000 gallons used per month	9.36 per 1,000 gallons
Next 2,000 gallons used per month	8.79 per 1,000 gallons
Next 3,000 gallons used per month	8.22 per 1,000 gallons
All over 10,000 gallons used per month	6.83 per 1,000 gallons
<b>City of Fairmont</b>	
<b>Water Rates</b>	
First 25,000 gallons used per month	8.87 per 1,000 gallons
Next 25,000 gallons used per month	4.68 per 1,000 gallons
Next 25,000 gallons used per month	3.82 per 1,000 gallons
All Over 75,000 gallons used per month	3.77 per 1,000 gallons
<b>Sewer Rates (Sanitary Board)-Residential</b>	
First 50,000 gallons used per month	5.76 per 1,000 gallons
Next 25,000 gallons used per month	5.53 per 1,000 gallons
Next 25,000 gallons used per month	5.22 per 1,000 gallons
Next 25,000 gallons used per month	4.91 per 1,000 gallons
All Over 125,000 gallons used per month	4.61 per 1,000 gallons
<b>Sewer Rates (Sanitary Board)-Commercial and Industrial</b>	
First 50,000 gallons used per month	5.26 per 1,000 gallons
Next 25,000 gallons used per month	5.06 per 1,000 gallons
Next 25,000 gallons used per month	4.77 per 1,000 gallons
Next 25,000 gallons used per month	4.49 per 1,000 gallons
All Over 125,000 gallons used per month	4.22 per 1,000 gallons
<b>City of Mannington</b>	
<b>Water Rates (Municipal Water Department)</b>	

First 2,000 gallons used per month	10.68 per 1,000 gallons
Next 8,000 gallons used per month	8.96 per 1,000 gallons
Next 10,000 gallons used per month	6.36 per 1,000 gallons
Next 32,000 gallons used per month	5.06 per 1,000 gallons
All Over 52,000 gallons used per month	4.11 per 1,000 gallons
<b>Sewer Rates</b>	
First 2,000 gallons used per month	9.16 per 1,000 gallon
Next 8,000 gallons used per month	7.76 per 1,000 gallon
Next 30,000 gallons used per month	6.22 per 1,000 gallon
All Over 40,000 gallons used per month	4.78 per 1,000 gallon
<b>City of Shinnston</b>	
<b>Water Rates</b>	
First 2,000 gallons used per month	7.41 per 1,000 gallons
Next 3,000 gallons used per month	6.13 per 1,000 gallons
Next 5,000 gallons used per month	4.84 per 1,000 gallons
Next 90,000 gallons used per month	3.55 per 1,000 gallons
All Over 100,000 gallons used per month	3.30 per 1,000 gallons
<b>Town of Barrackville</b>	
<b>Sewer Rates</b>	
All amounts used per month	12.15 per 1,000 gallons
<b>Town of Farmington</b>	
<b>Water Rates (Municipal Water Department)</b>	
First 1,000 gallons used per month	19.29 per 1,000 gallons
Next 3,000 gallons used per month	8.61 per 1,000 gallons
Next 6,000 gallons used per month	8.22 per 1,000 gallons
Next 20,000 gallons used per month	7.71 per 1,000 gallons
Next 30,000 gallons used per month	6.88 per 1,000 gallons
All Over 60,000 gallons used per month	6.17 per 1,000 gallons
<b>Sewer Rates (Sewer System)</b>	
First 3,000 gallons used per month	29.40 per month
Over 3,000 gallons used per month	9.80 per 1,000 gallons
<b>Town of Monongah</b>	
<b>Water Rates</b>	
First 2,000 gallons used per month	11.42 per 1,000 gallons
Next 13,000 gallons used per month	8.01 per 1,000 gallons
Next 35,000 gallons used per month	5.24 per 1,000 gallons
All Over 50,000 gallons used per month	3.35 per 1,000 gallons
<b>Sewer Rates</b>	
First 2,500 gallons used per month	9.08 per 1,000 gallons

Next 12,500 gallons used per month	8.70 per 1,000 gallons
Next 35,000 gallons used per month	6.73 per 1,000 gallons
All Over 50,000 gallons used per month	5.58 per 1,000 gallons
<b>Town of Fairview Municipal Water Department</b>	
First 5,000 gallons used per month	12.55 per 1,000 gallons
All Over 5,000 gallons used per month	6.06 per 1,000 gallons
<b>Town of Rivesville</b>	
<b>Water Rates</b>	
MINIMUM 2,000 EQUIVALENT GALLON	19.88 per month
Next 3,000 gallons used per month	9.94 per 1,000 gallons
Next 10,000 gallons used per month	9.50 per 1,000 gallons
Next 10,000 gallons used per month	9.07 per 1,000 gallons
Next 10,000 gallons used per month	8.39 per 1,000 gallons
Next 25,000 gallons used per month	7.96 per 1,000 gallons
Next 25,000 gallons used per month	7.52 per 1,000 gallons
All Over 85,000 gallons used per month	6.67 per 1,000 gallons
<b>Town of Worthington</b>	
<b>Water Rates (Water Department)</b>	
First 2,000 gallons used per month	7.87 per 1,000 gallons
Next 6,000 gallons used per month	7.13 per 1,000 gallons
Next 17,000 gallons used per month	5.50 per 1,000 gallons
All Over 100,000 gallons used per month	4.29 per 1,000 gallons
<b>Sewer Rates (Sanitary System)</b>	
First 5,000 gallons used per month	11.30 per 1,000 gallons
Next 15,000 gallons used per month	10.43 per 1,000 gallons
Next 30,000 gallons used per month	9.55 per 1,000 gallons
All Over 50,000 gallons used per month	8.68 per 1,000 gallons

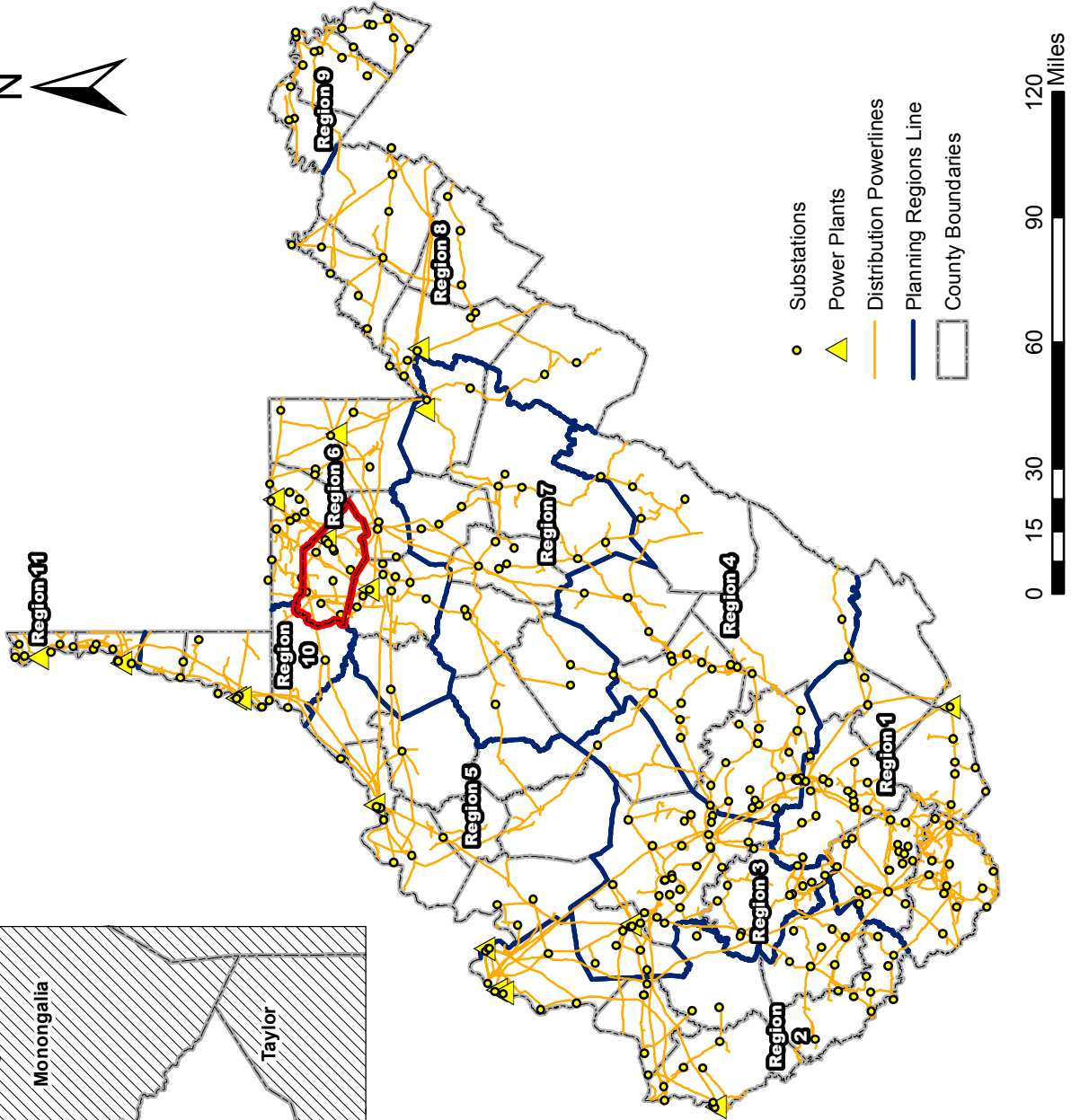
The PSC lists seven water associations and one private water company in the records. Tariff rate data was available for five of the water associations. The names and rates are listed below.

<b>Water Associations</b>	
<b>Hutchinson Community Water Association</b>	
First 2,000 gallons used per month	5.53 per 1,000 gallons
Next 5,000 gallons used per month	4.82 per 1,000 gallons
Next 13,000 gallons used per month	4.64 per 1,000 gallons
Next 20,000 gallons used per month	4.40 per 1,000 gallons
All Over 40,000 gallons used per month	4.28 per 1,000 gallons
<b>Lincoln Heights Improvement Association</b>	

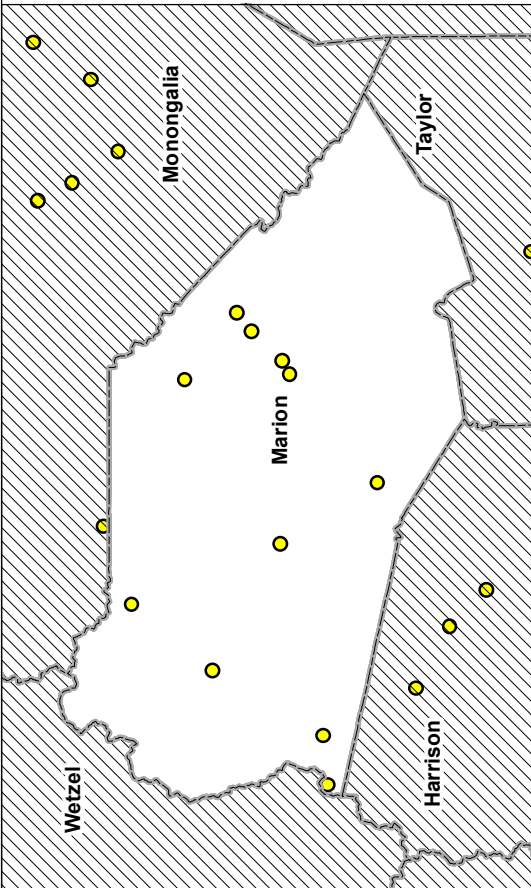
First 1,000 gallons used per month	16.54 per 1,000 gallons
All Over 1,000 gallons used per month	16.54 per 1,000 gallons
<b>Little Laurel Run Improvement Association</b>	
First 1,000 gallons used per month	8.97 per 1,000 gallons
All Over 1,000 gallons used per month	8.97 per 1,000 gallons
<b>Sugar Lane Water Association Inc</b>	
Minimum Bill	22.89
<b>Tri-County Water Association</b>	
First 2,000 gallons used per month	8.91 per 1,000 gallons
All Over 2,000 gallons used per month	6.85 per 1,000 gallons
<b>Private Water</b>	
<b>Sunny View Acres Water Project</b>	
All amounts used per month	6.50 per 1,000 gallons

# Utilities - Electricity

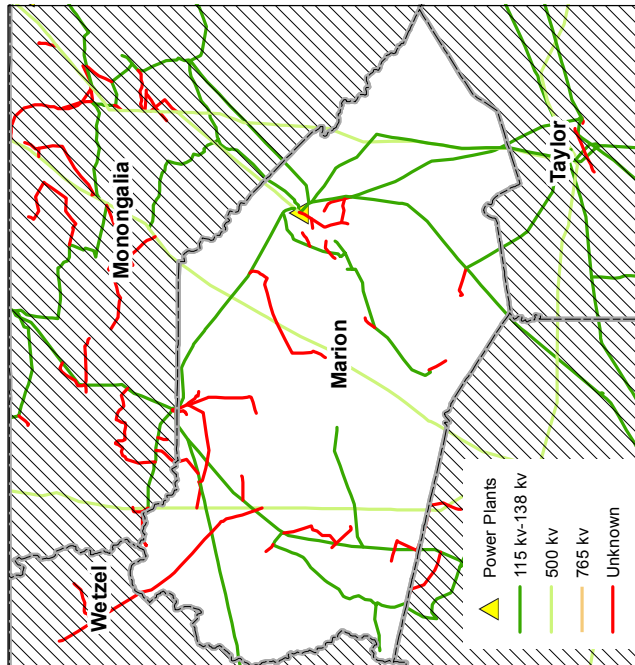
Marion County



- Substations
- ▲ Power Plants
- Distribution Powerlines
- Planning Regions Line
- County Boundaries



● Electricity Substations



- ▲ Power Plants
- 115 kv-138 kv
- 500 kv
- 765 kv
- Unknown

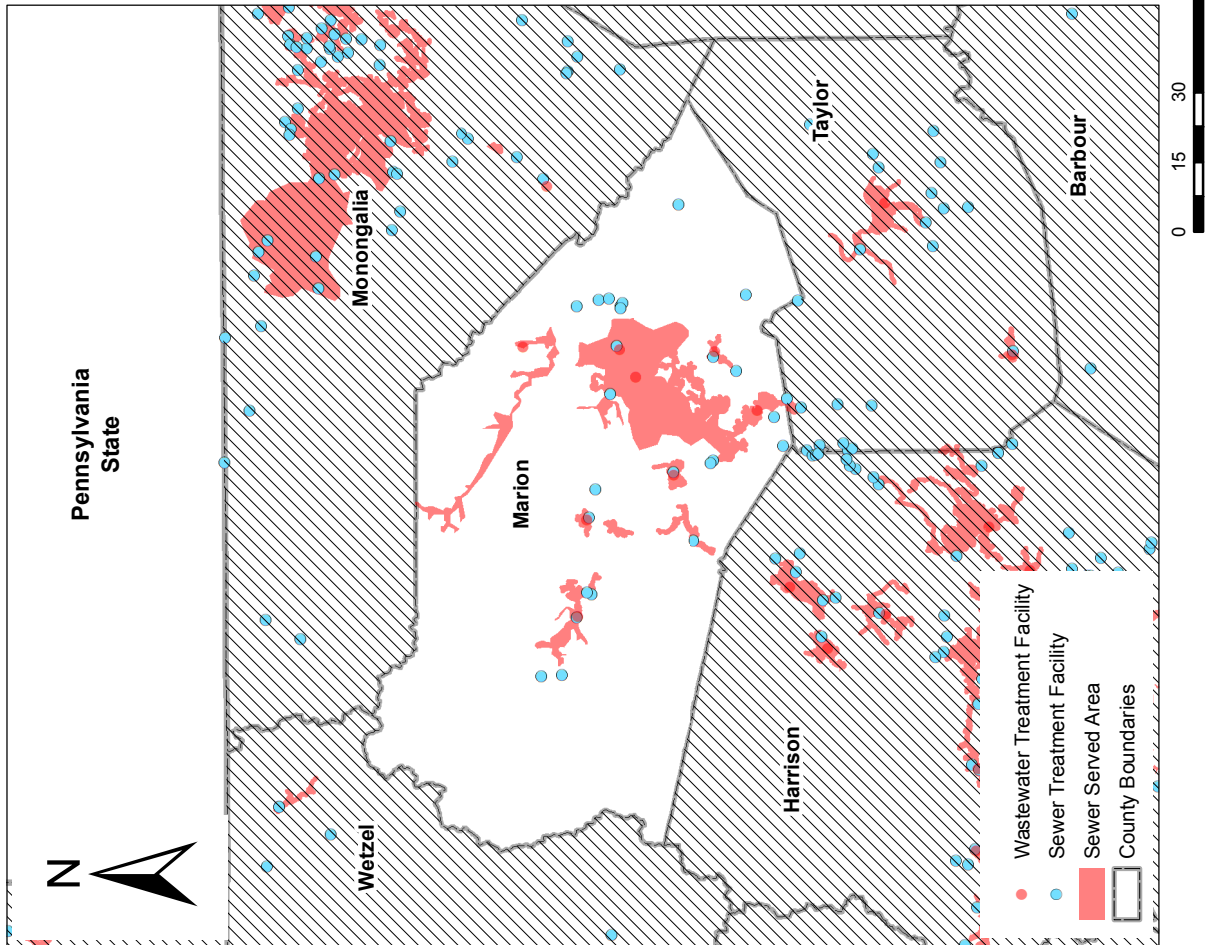
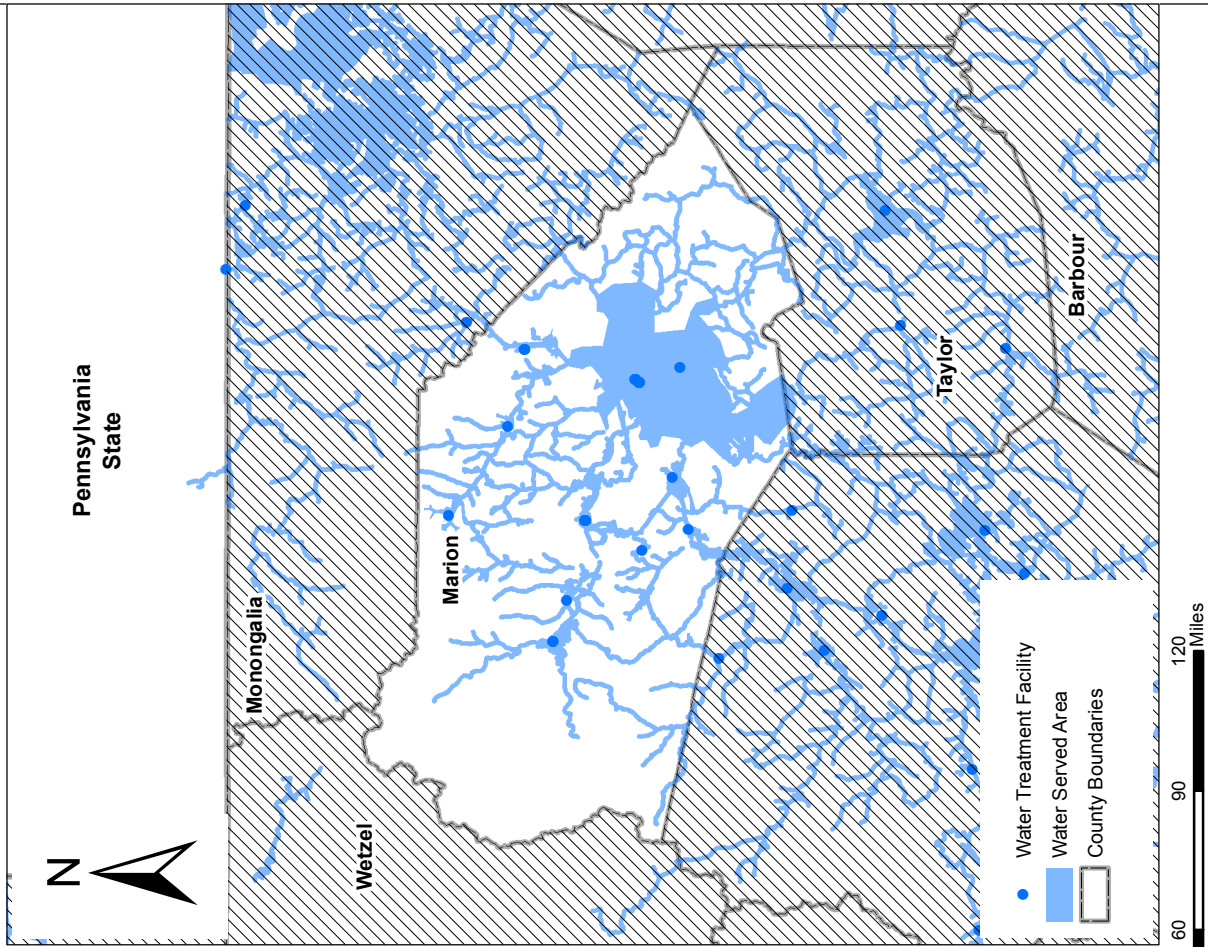
Source: West Virginia Division of Natural Resources, Statewide Addressing and Mapping 2008

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# Utilities - Water and Sewer

## Marion County



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

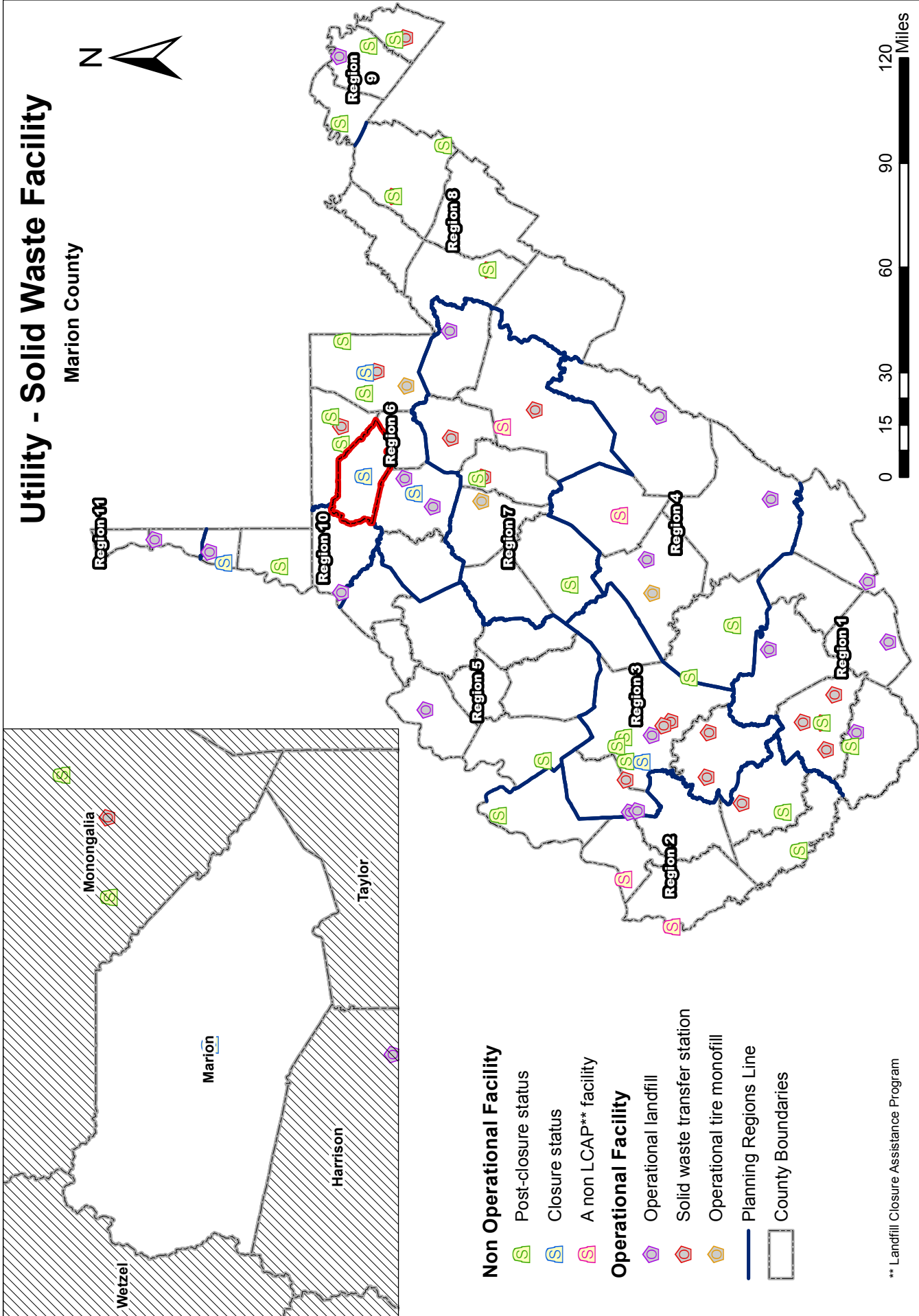
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# Utility - Solid Waste Facility

Marion County



### Non Operational Facility

- Post-closure status
- Closure status
- A non LCAP\*\* facility

### Operational Facility

- Operational landfill
- Solid waste transfer station
- Operational tire monofill
- Planning Regions Line
- County Boundaries

\*\* Landfill Closure Assistance Program

Source: West Virginia Solid Waste Management Board 2012

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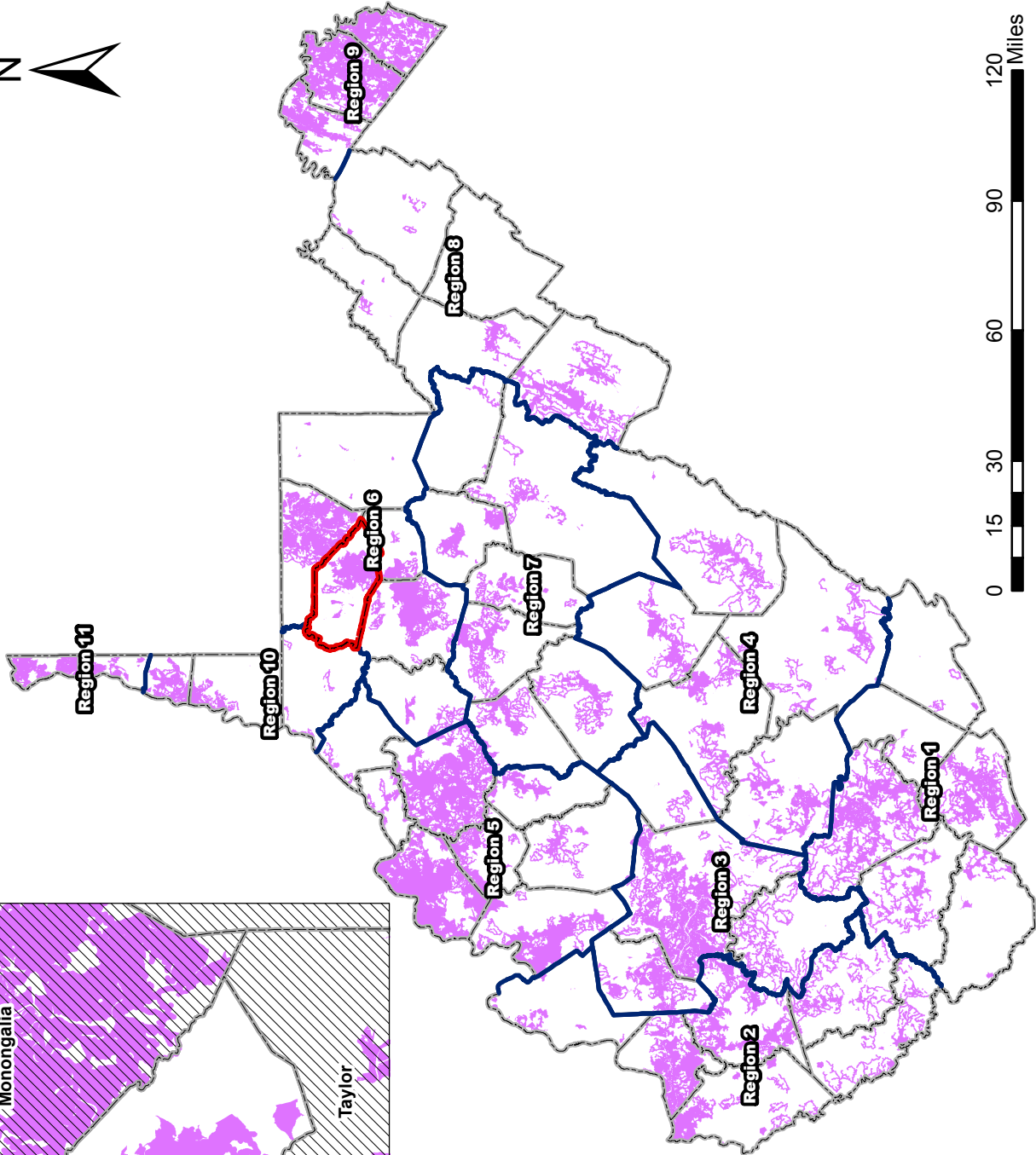
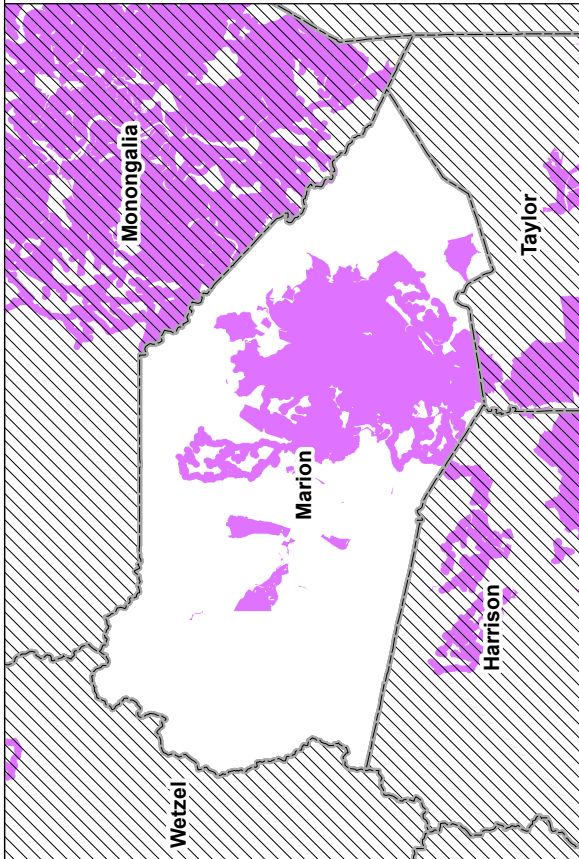
One essential modern convenience, now widely understood as an essential utility in a globalized world, is broadband access. The following 11 maps demonstrate Marion County's broadband infrastructure in relation to the State's. The largest number of providers in Marion County is five. Marion County broadband infrastructure is better than the state average, but rural areas of the county still lack access. However, Marion is one of the few counties with fixed wireless connection, the connection of two fixed points wirelessly by radio or other links.




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.

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. Marion County has an advanced broadband network, but rural areas are still mostly without. Note also that the map data is for 2012, the most recent map available. Changes have been made since that time, thanks to broadband expansion programs encouraged by the state.

# Broadband - Internet Cable and FTTP Coverage

Marion County



-  Planning Regions Line
-  Cable and FTTP
-  County Boundaries



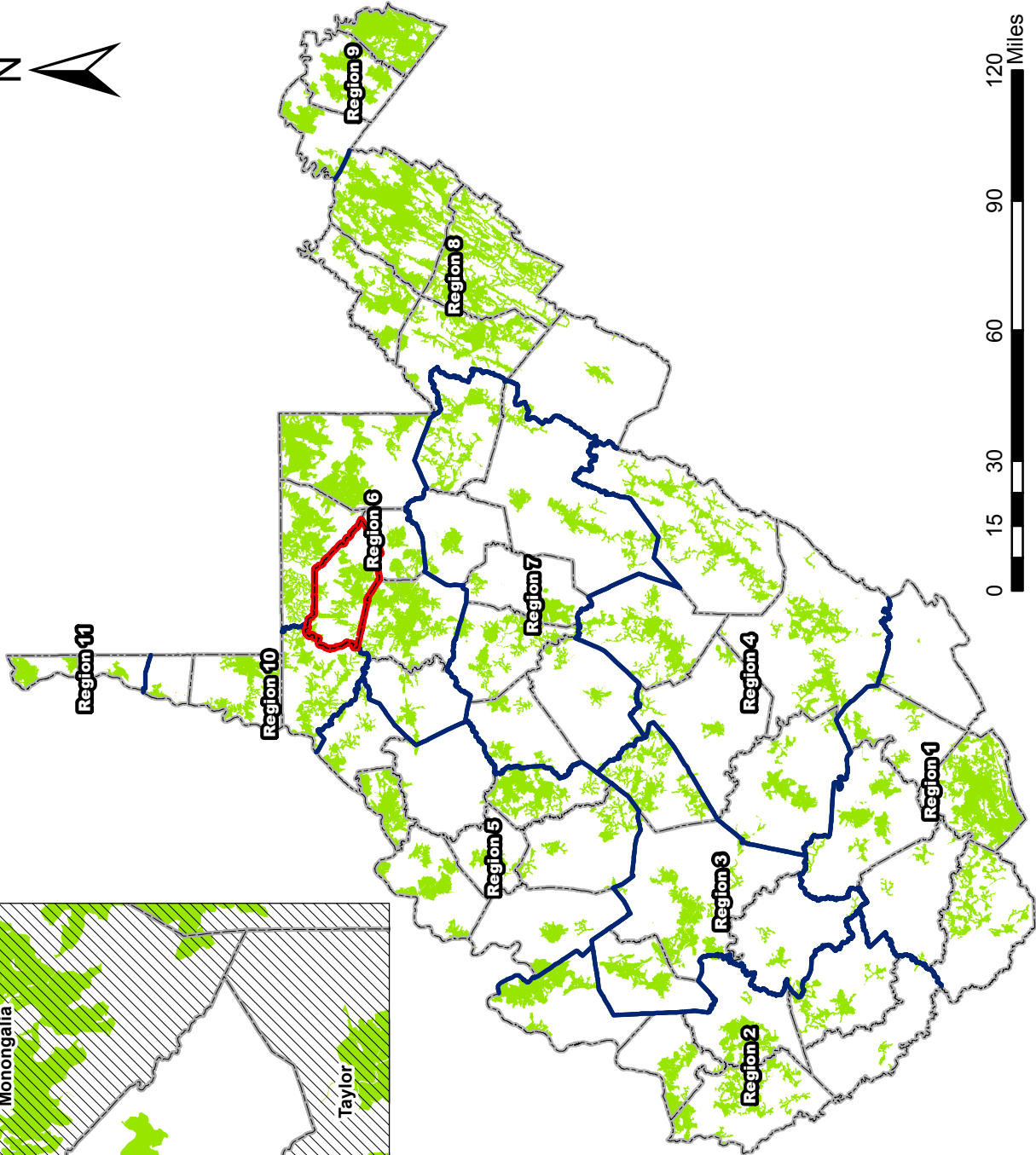
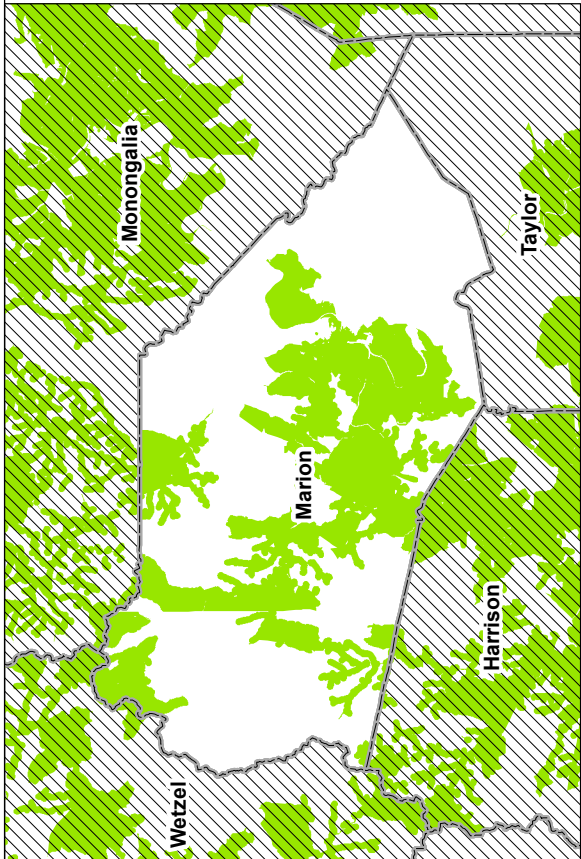
Source: West Virginia Broadband Mapping Program 2012




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# Broadband - Internet DSL, BPL, Other Copper

Marion County



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



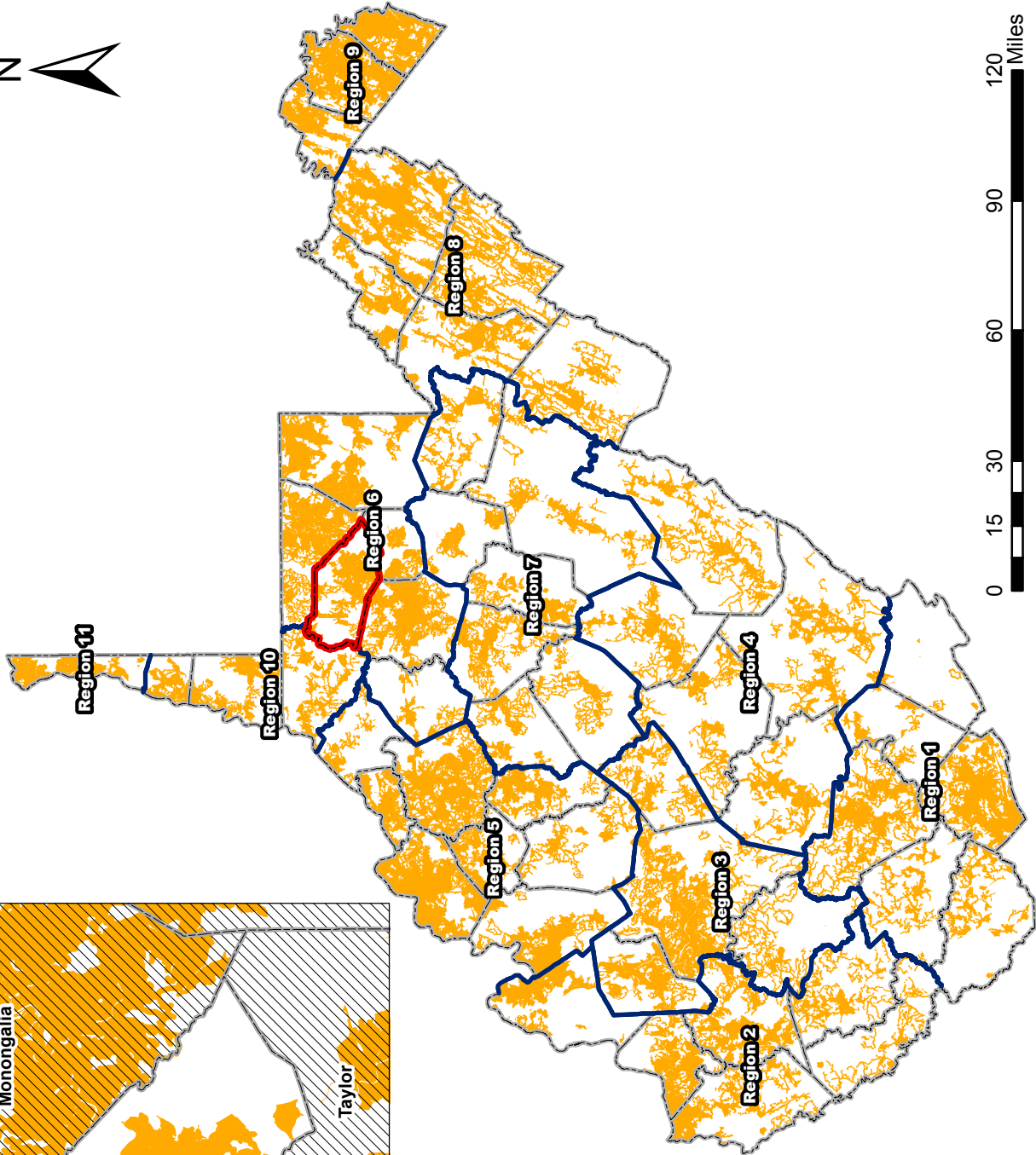
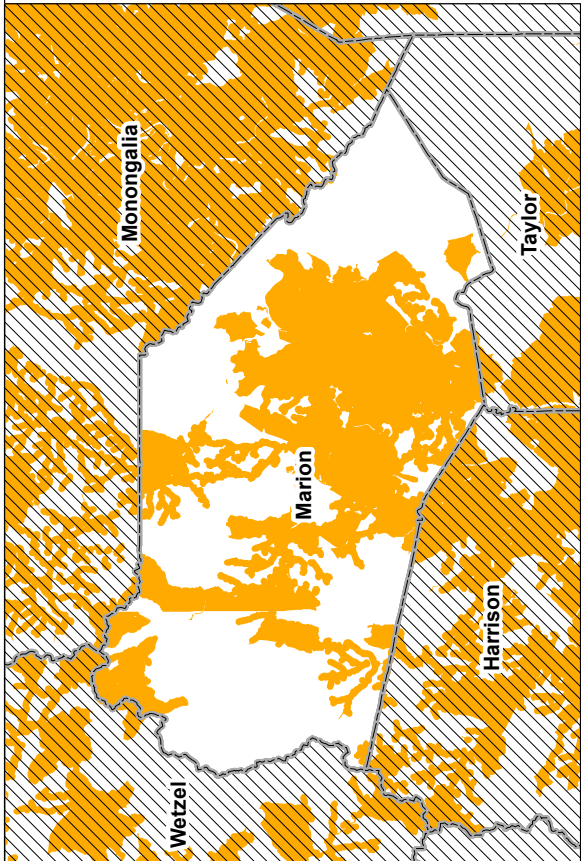
Source: West Virginia Broadband Mapping Program 2012

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# Broadband - Internet Wireline Coverage

Marion County



- Planning Regions Line
- Wireline Coverage
- County Boundaries

Source: West Virginia Broadband Mapping Program 2012

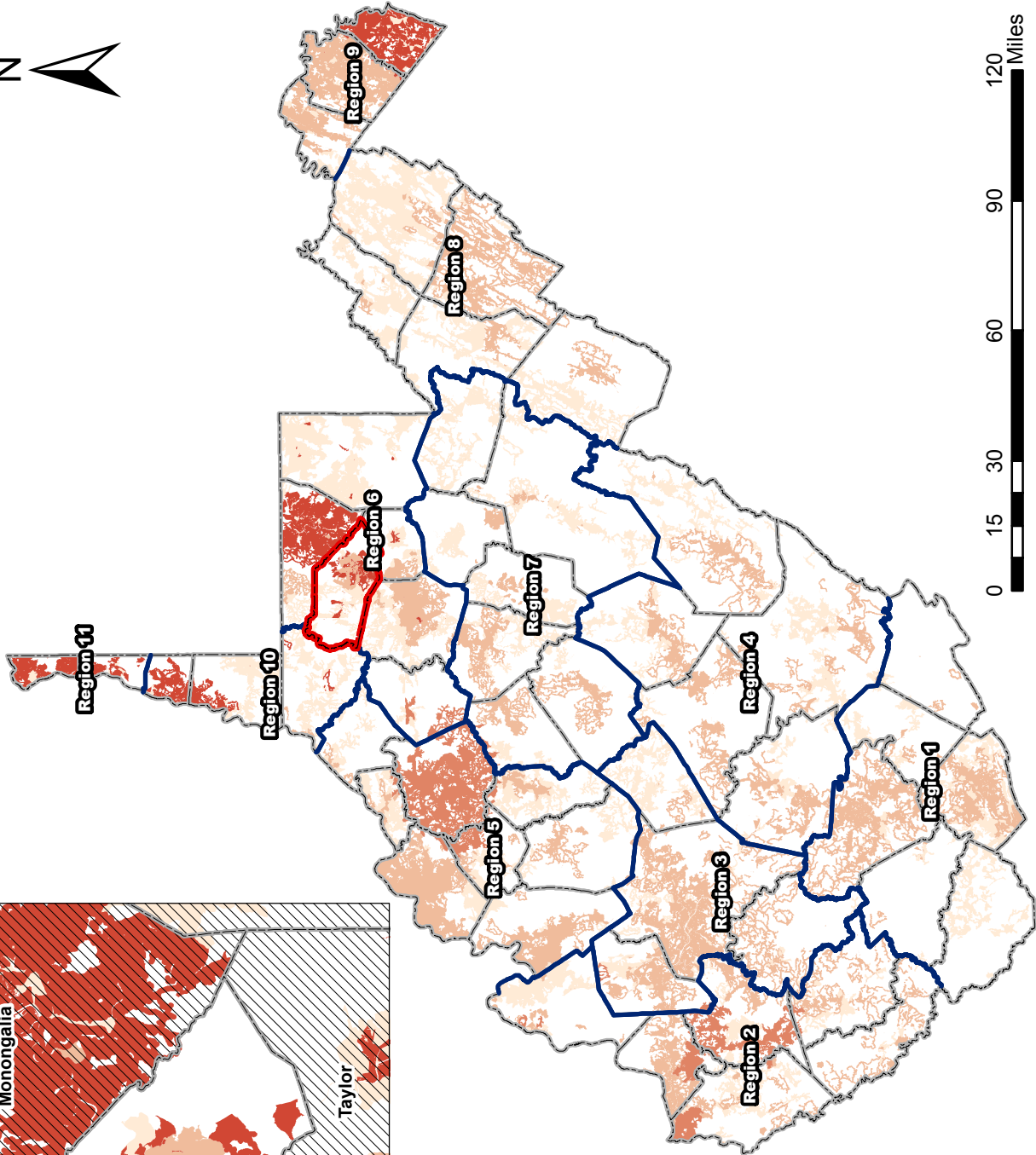
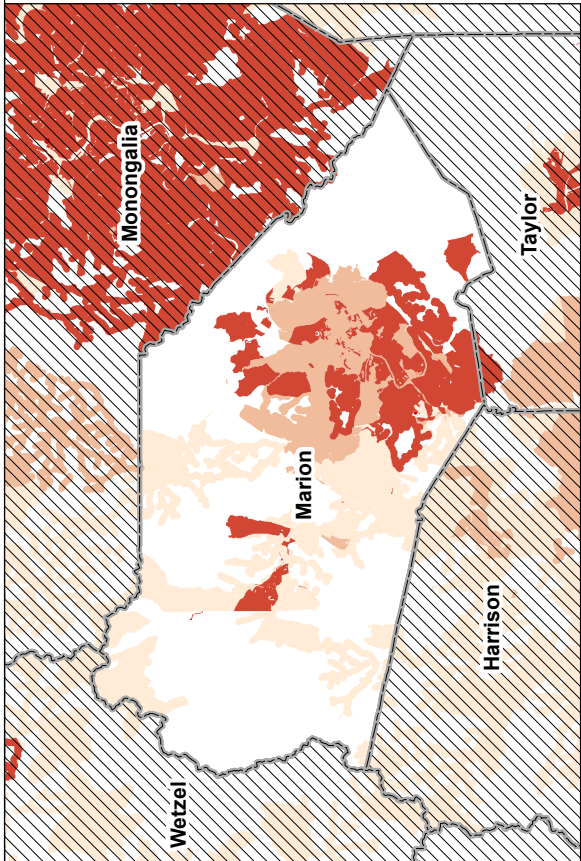
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www.rtiappalachian.org

# Broadband - Internet MaxUp Speed Wireline

Marion 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

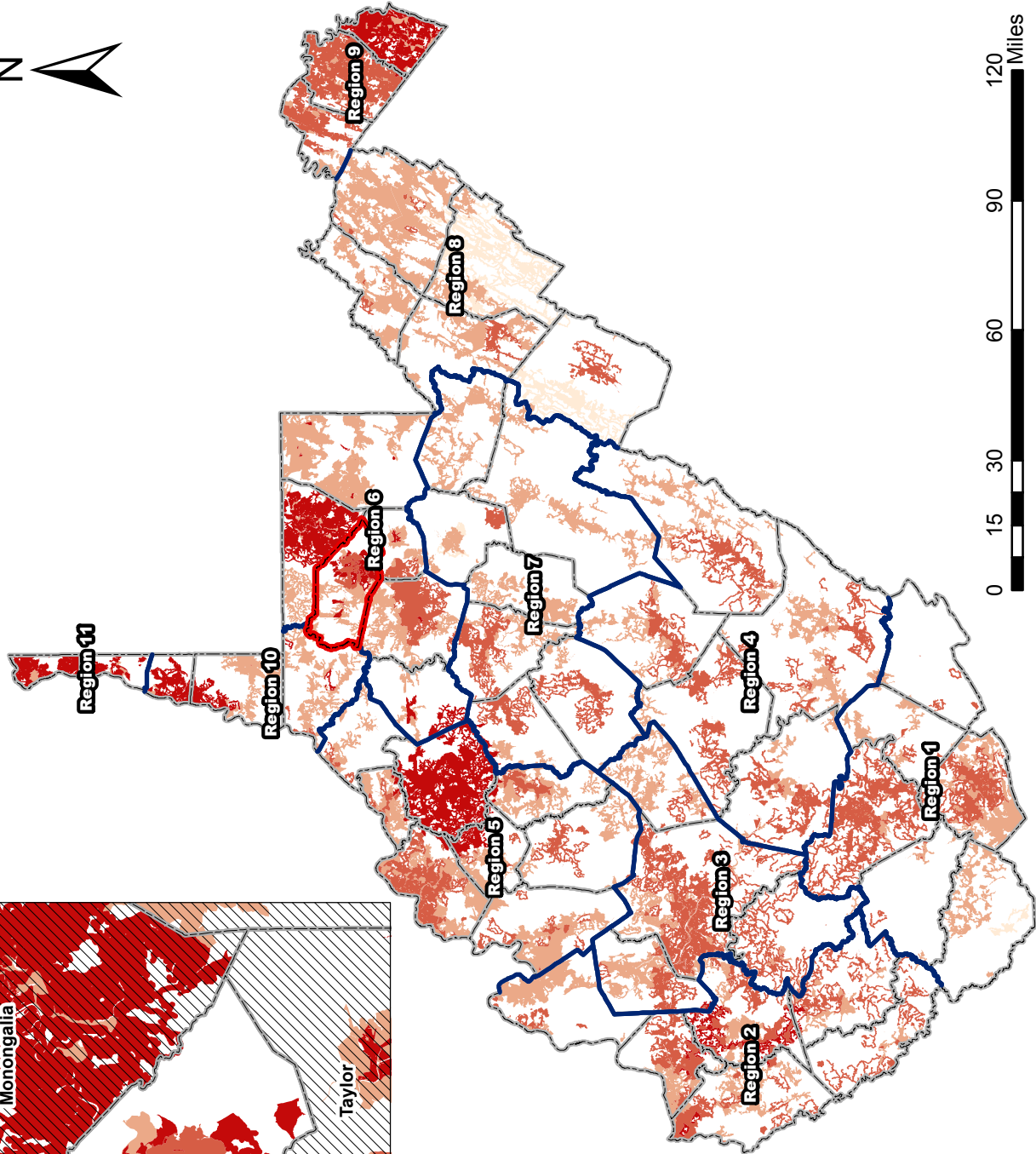
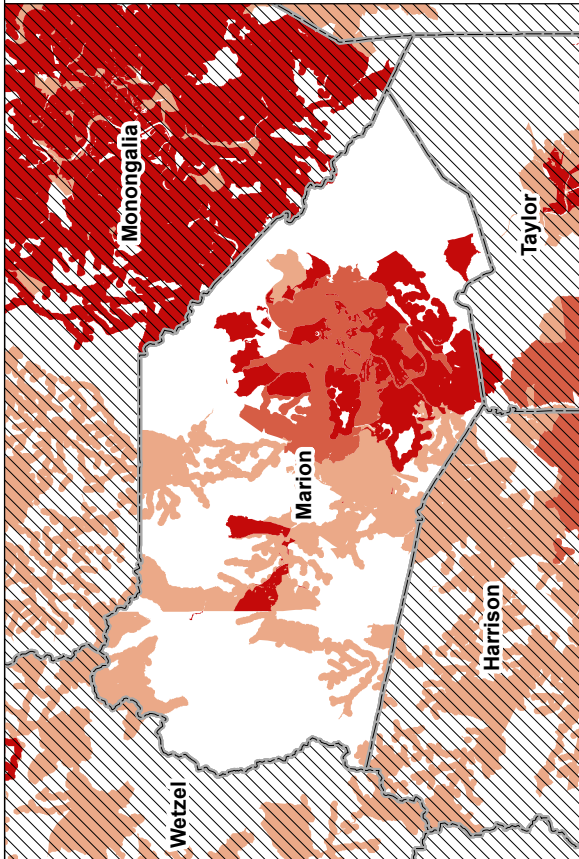
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www.rjtati.org

# Broadband - Internet MaxDown Speed Wireline

Marion 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

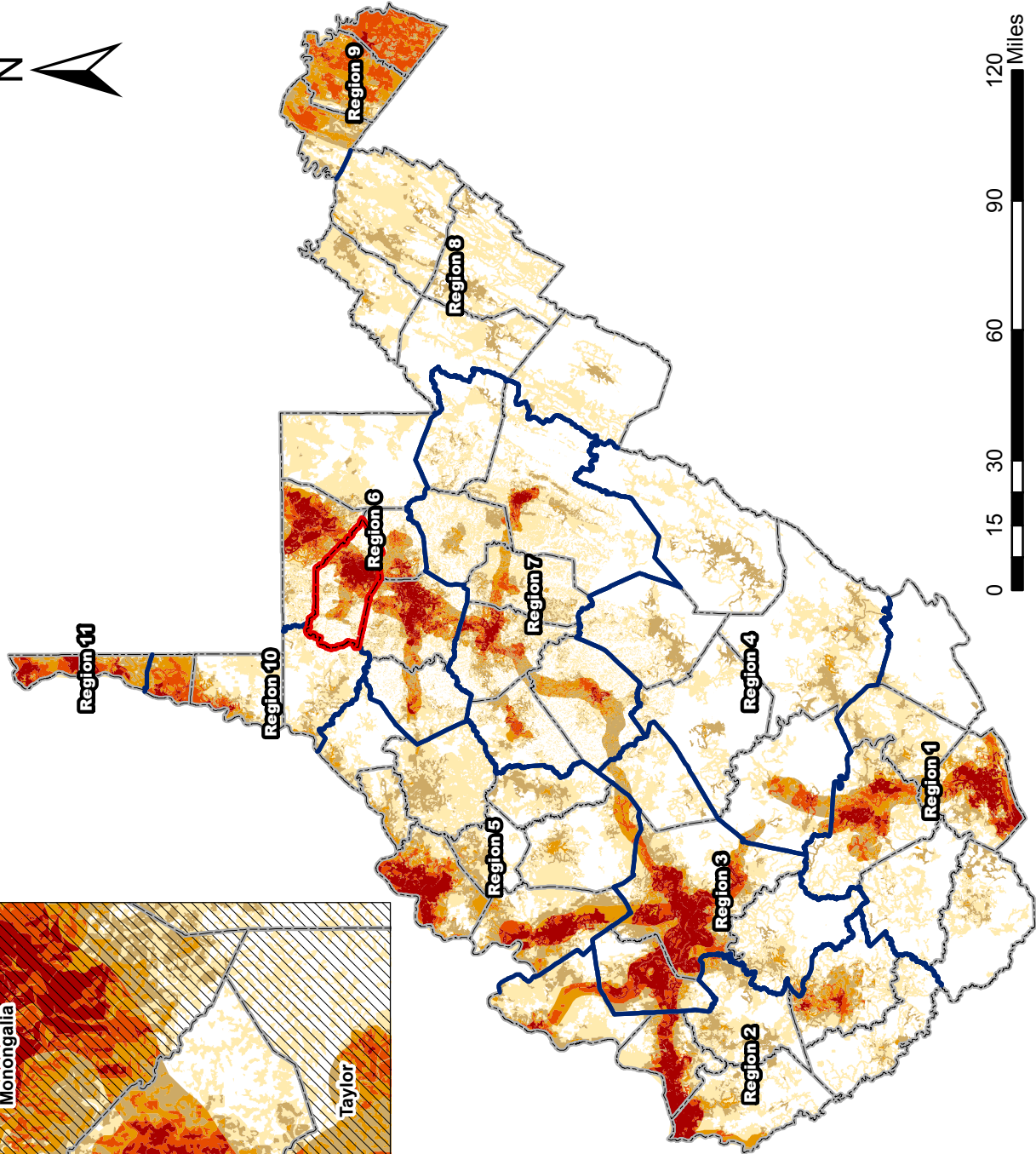
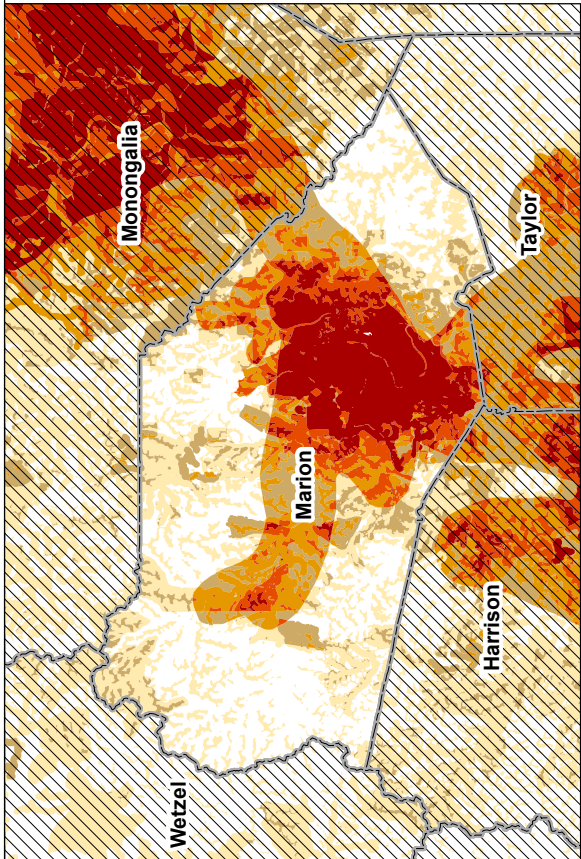
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# Broadband - Internet Total Number of Providers

Marion County



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



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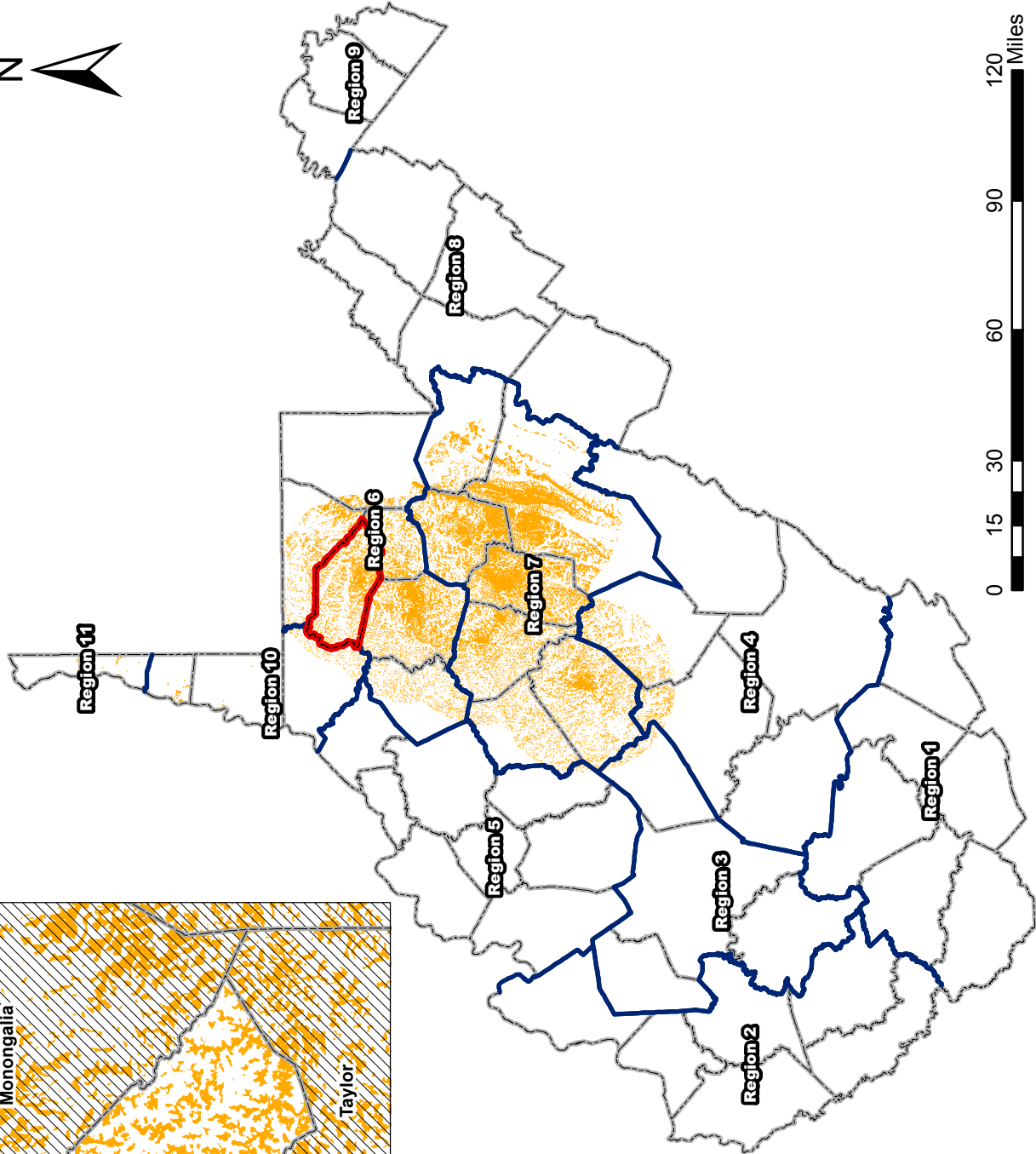
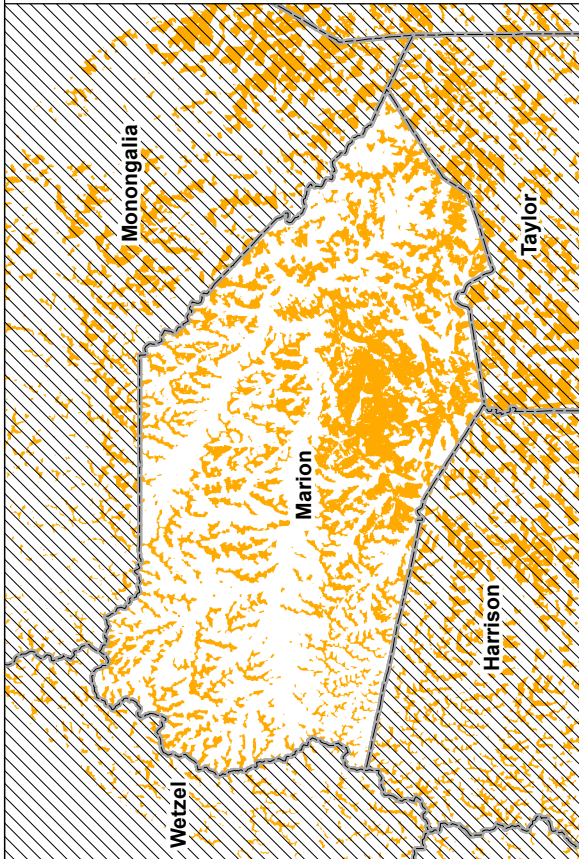
Source: West Virginia Broadband Mapping Program 2012

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# Broadband - Internet Fixed Wireless Coverage

Marion County



- Planning Regions Line
- Fixed Wireless
- County Boundaries

Source: West Virginia Broadband Mapping Program 2012

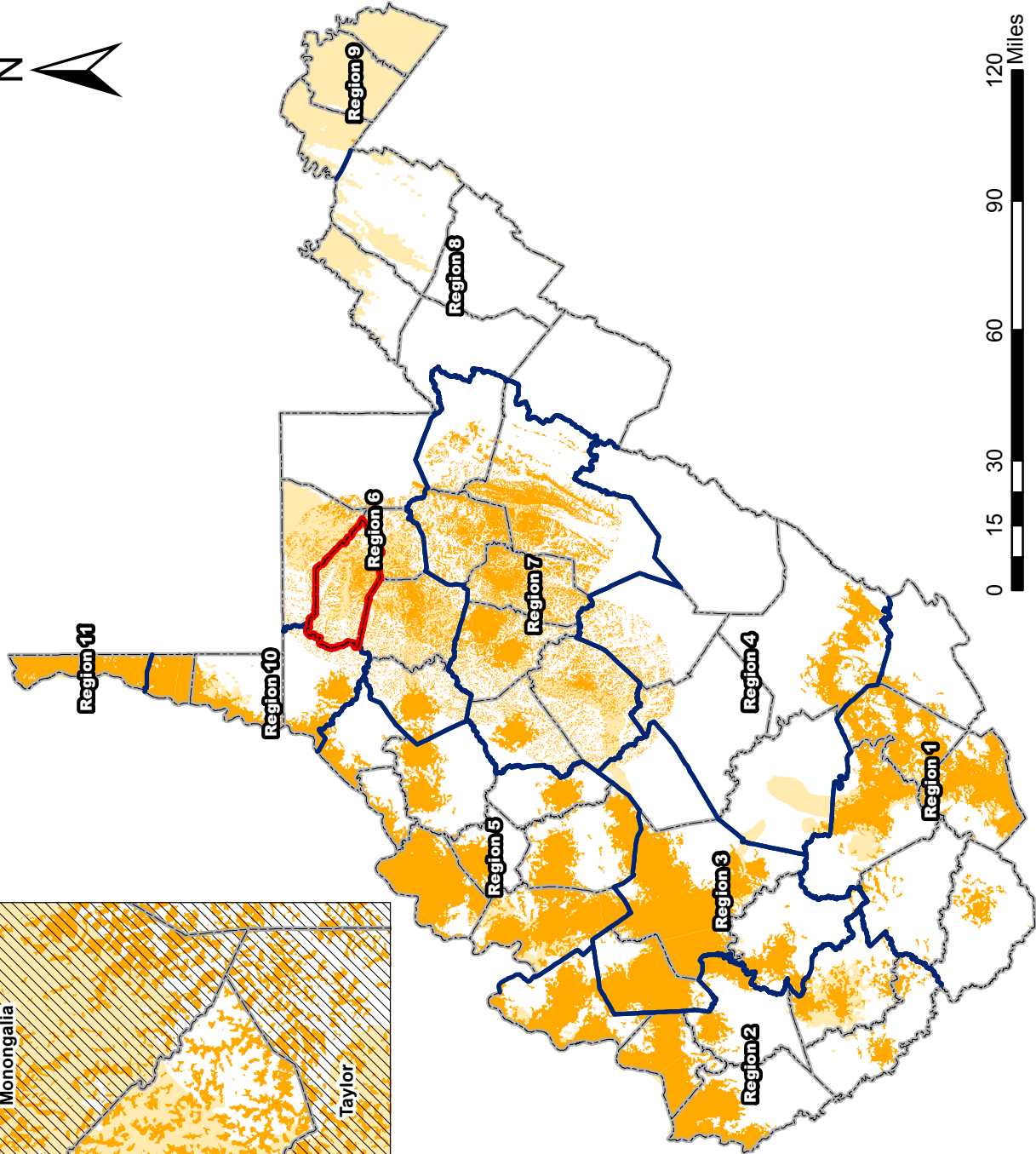
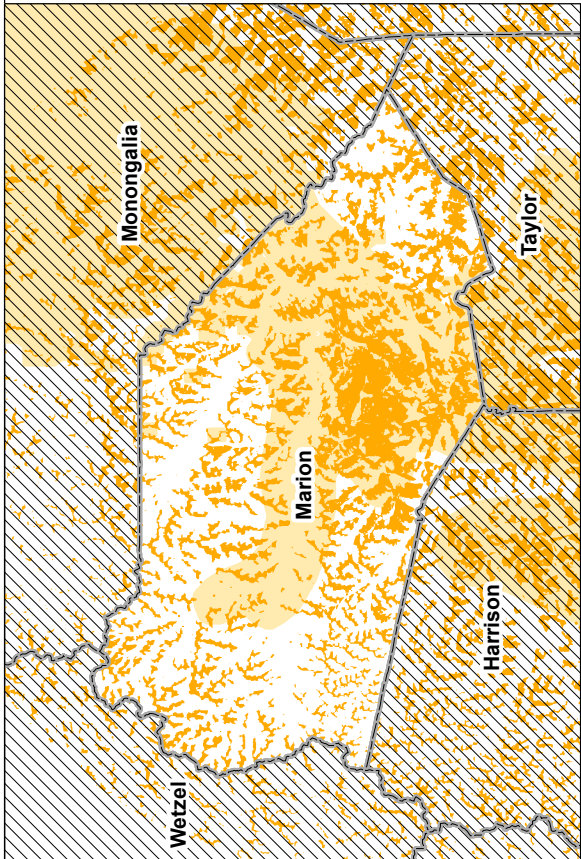
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# Broadband - Internet MaxDown Speed Wireless

Marion County



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



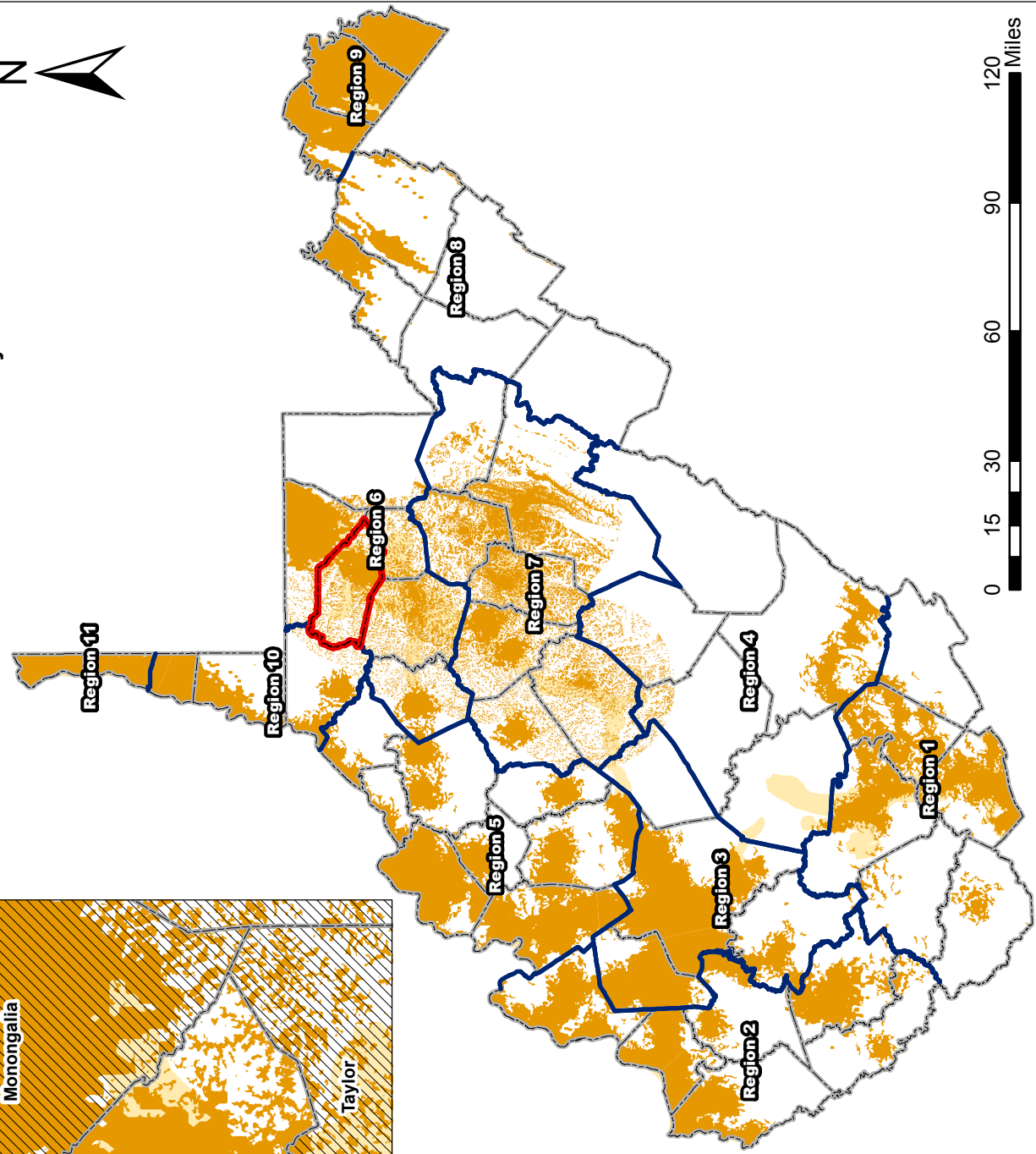
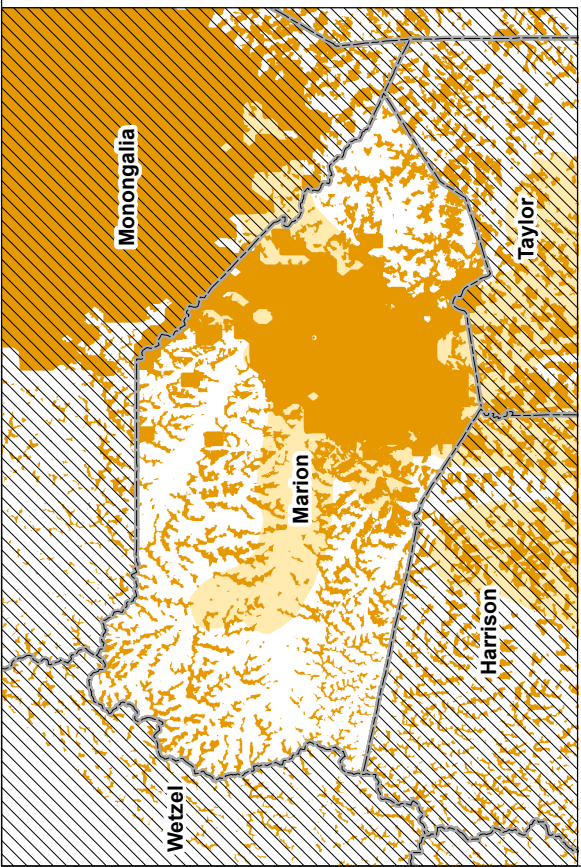
Source: West Virginia Broadband Mapping Program 2012





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# Broadband - Internet MaxUp Speed Wireless

Marion County



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

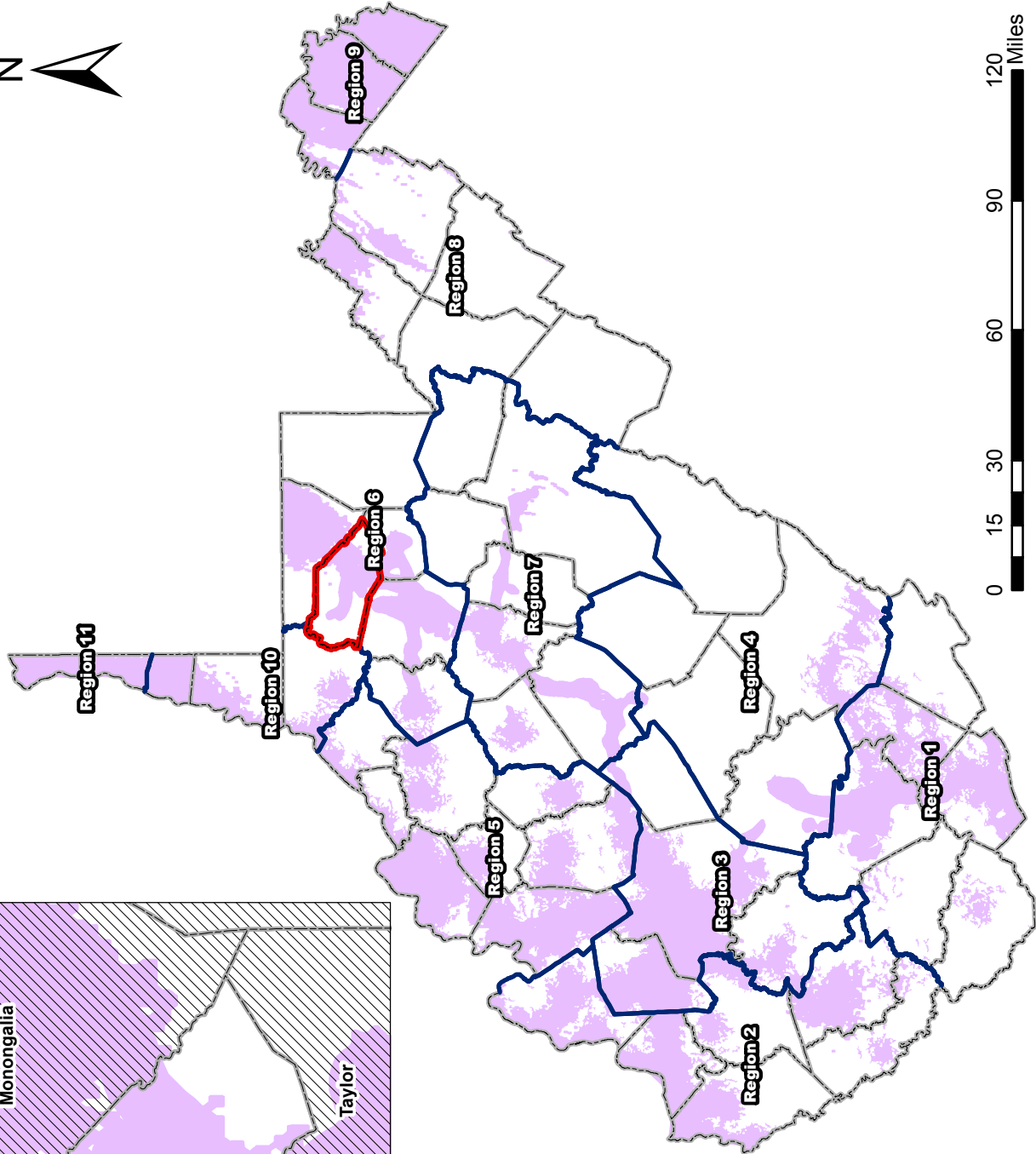
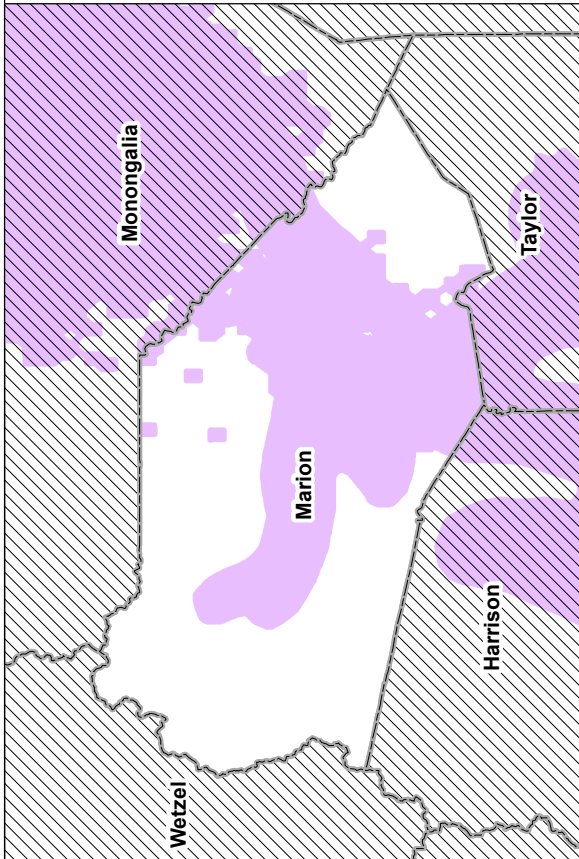
Source: West Virginia Broadband Mapping Program 2012




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# Broadband - Internet Mobile Wireless Coverage

Marion County



-  Planning Regions Line
-  Mobile Wireless
-  County Boundaries



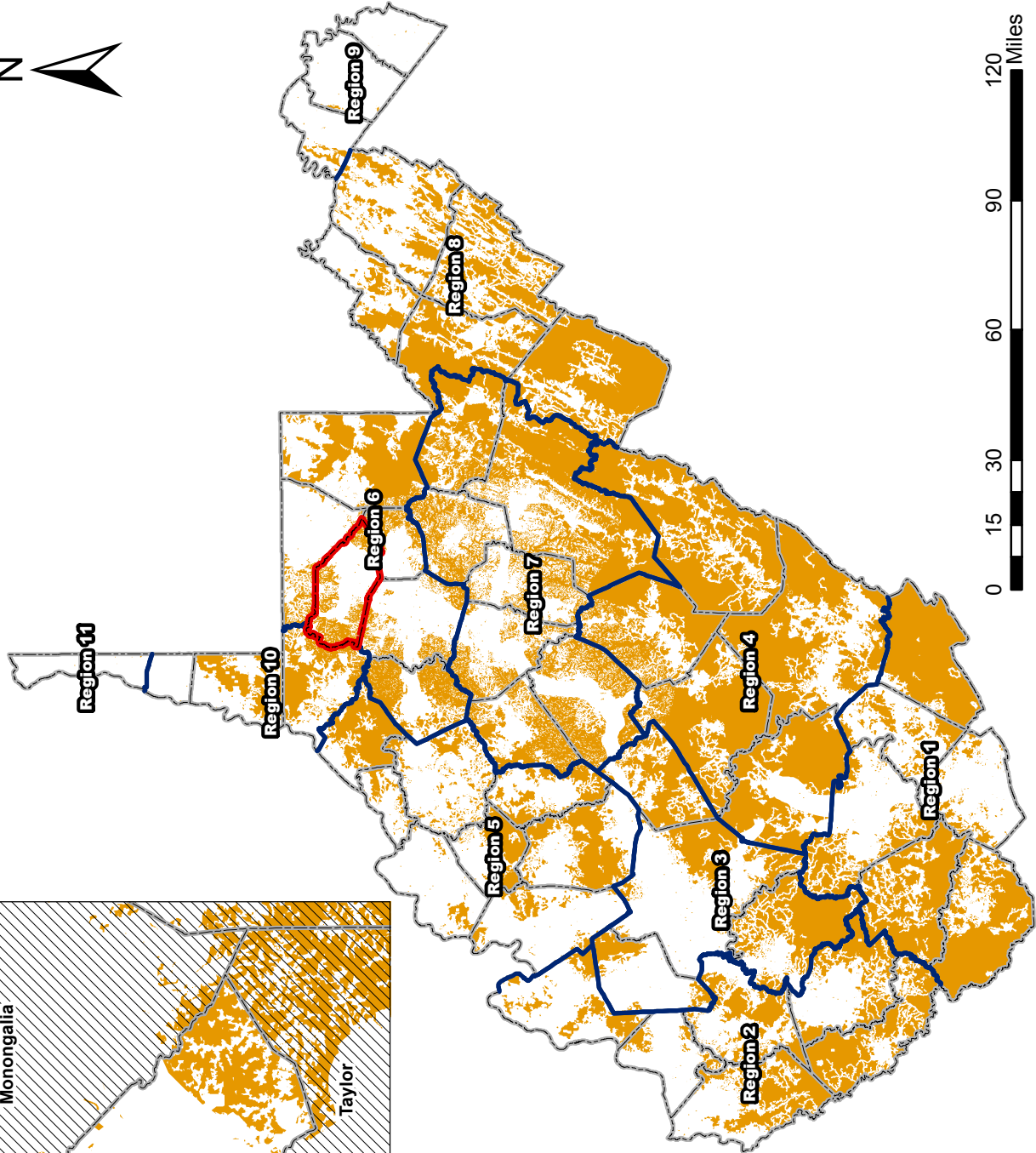
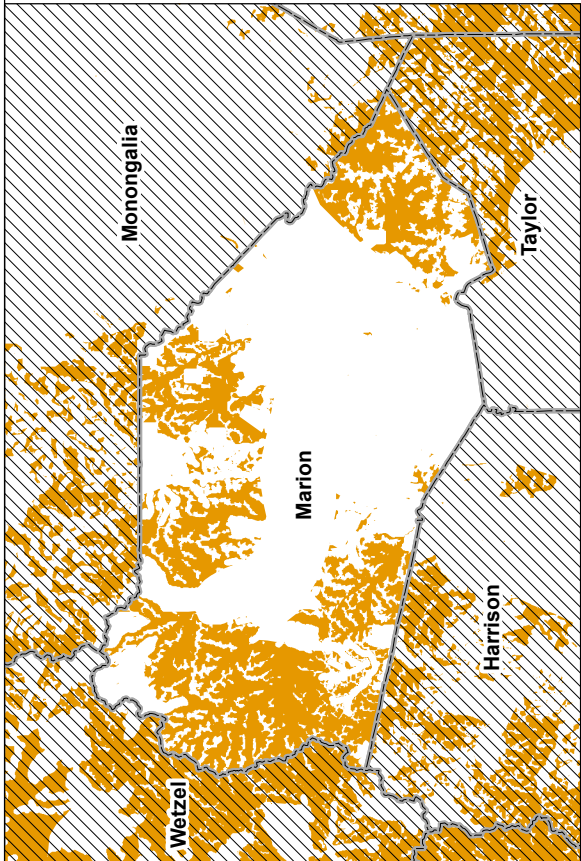
Source: West Virginia Broadband Mapping Program 2012

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# Broadband - No Broadband Coverage

Marion County



- Planning Regions Line
- No Coverage Reported
- County Boundaries



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Source: West Virginia Broadband Mapping Program 2012

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## **Transportation**

### *Highways*

Marion County is traversed by Interstate 79, contains US Routes 19 and 250, and State Routes 218 and 310. The transportation networks are concentrated mainly in the eastern portion of the County, near Fairmont and the Interstate (Map 26).

### *Rail*

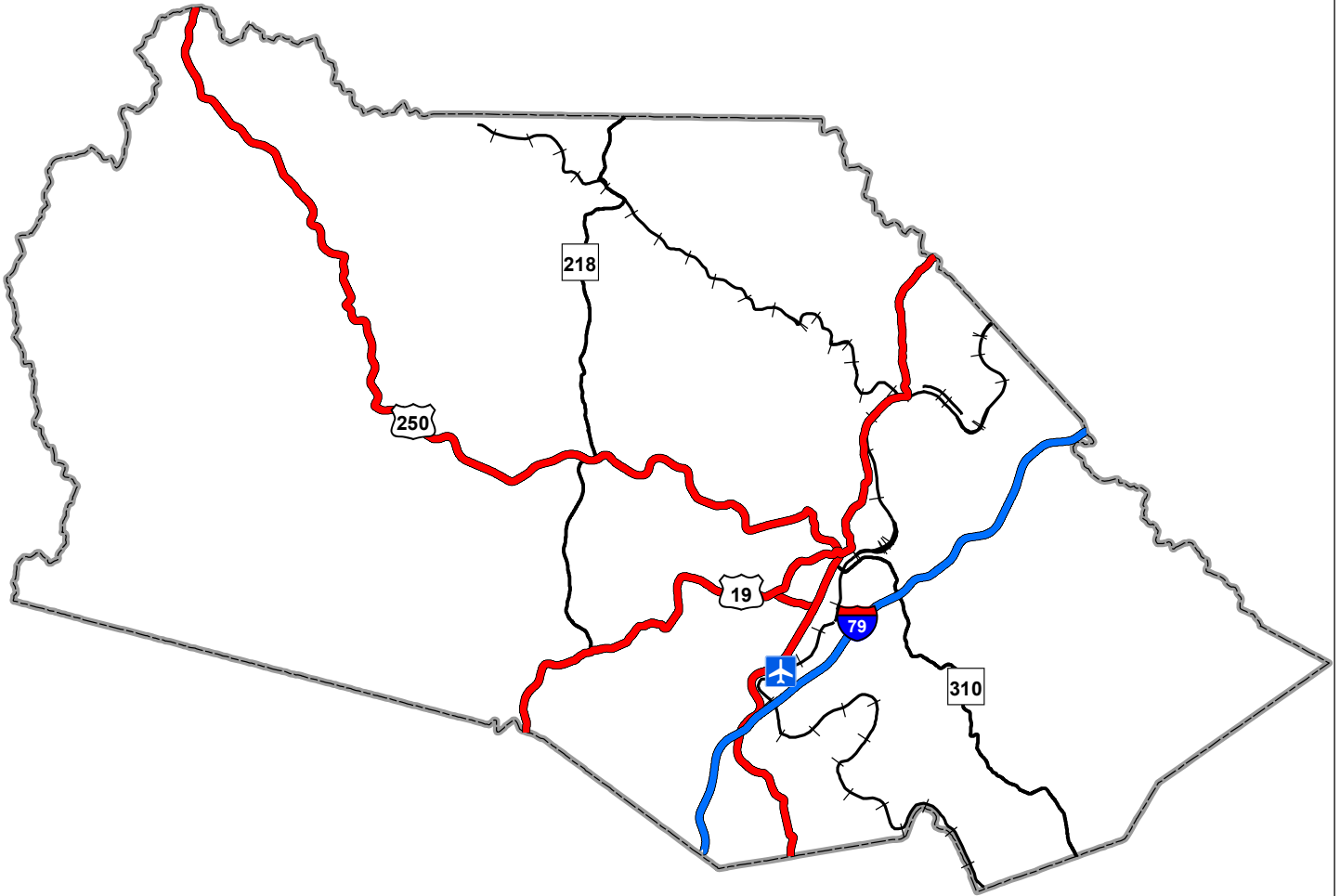
Marion County 49 miles of rail track owned mainly by CSX and Norfolk Southern, most as part of the joint venture between the two companies that bought out Conrail.







### *Ai*

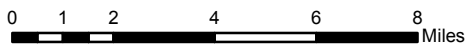
Fairmont Municipal Airport is a small public airport located about two miles from Fairmont. It is owned by the city of Fairmont, and has 30 aircraft based at the airport. The airport was activated in 1970.

# Transportation

## Marion County



-  Airports
-  Interstate
-  US Routes
-  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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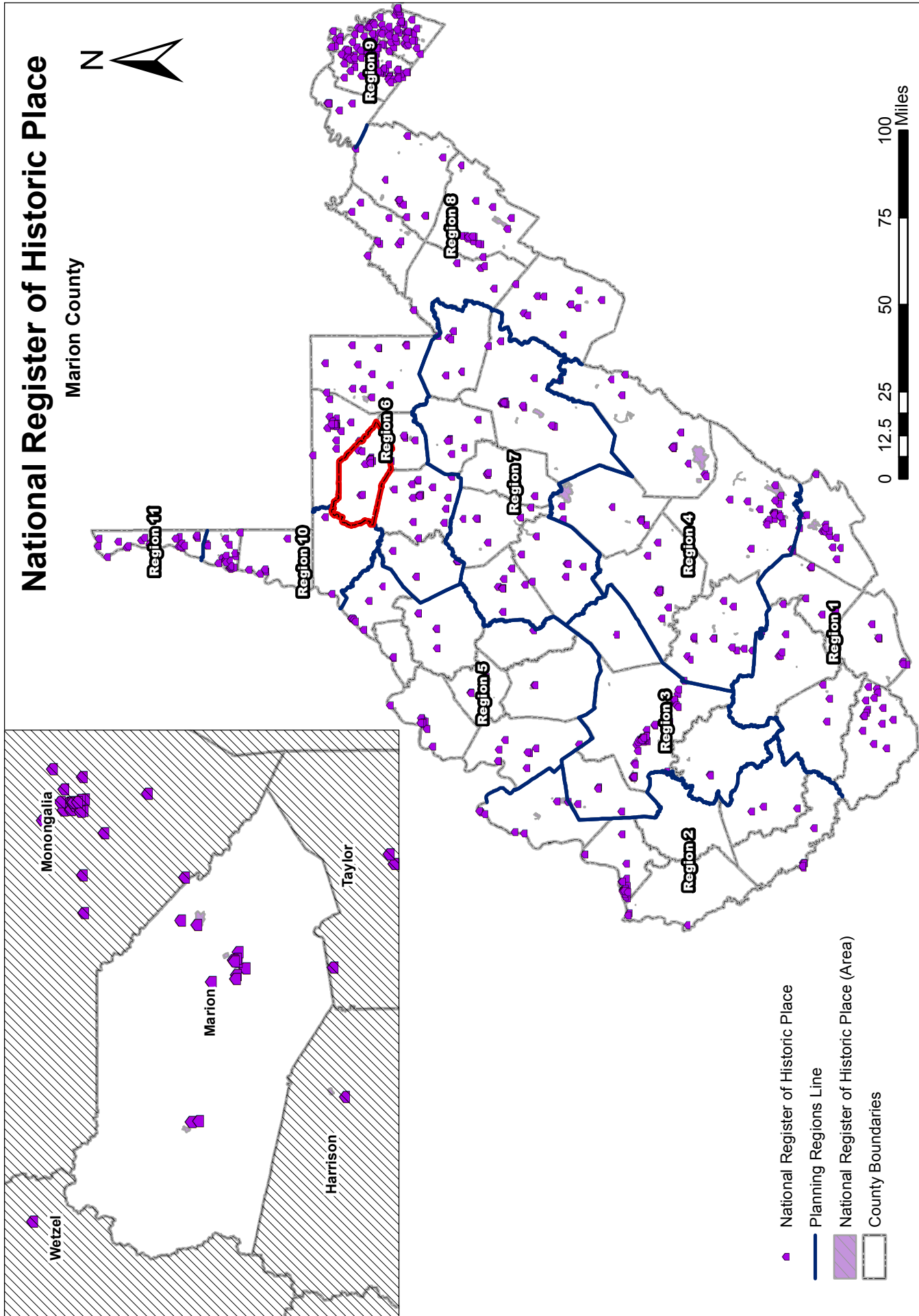
## **Historic Preservation**

Historic preservation is essential in a state that is as steeped in coal mining, industrial, and colonial history as West Virginia. Marion County has 20 listings in the National Register of Historic Places. These include three historic districts and buildings that harken to Marion County's colonial and post-colonial 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

Marion County



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

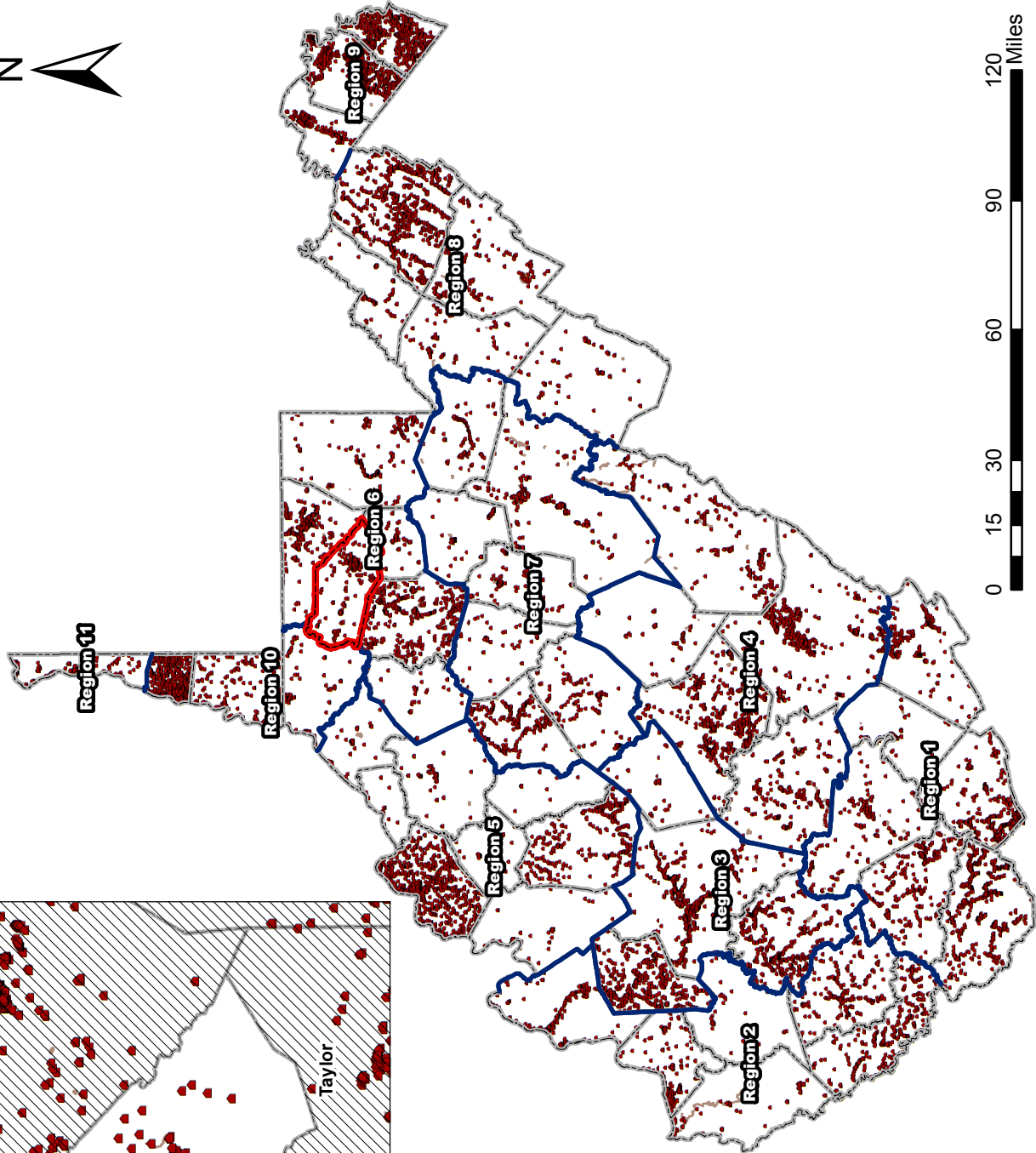
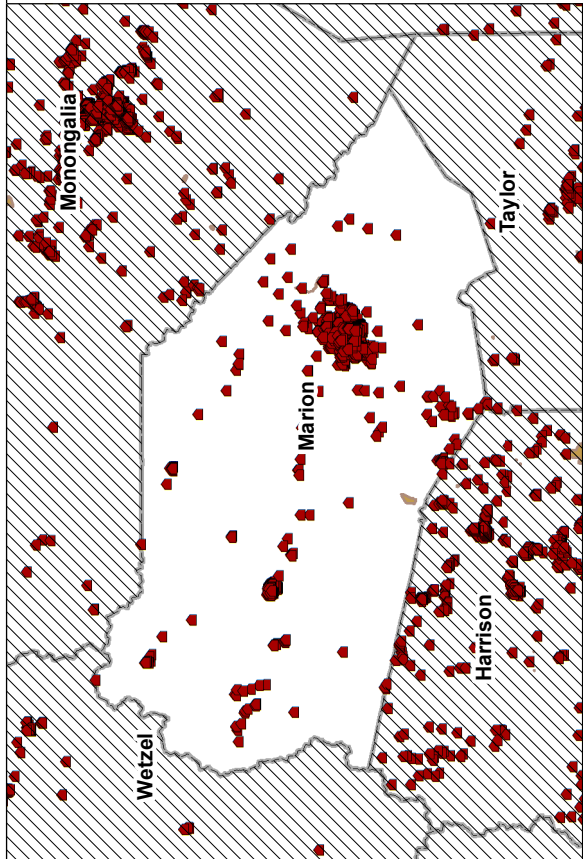


Source: West Virginia State Historic Preservation Office 2012

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# State Historic Architecture

Marion 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 resources in a county. This serves to inform potential investors about what possibilities the land provides for production of resources and energy. Marion 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. Marion County has an average wetlands inventory (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. Marion County contains a state park and some wildlife management areas (Map 30).

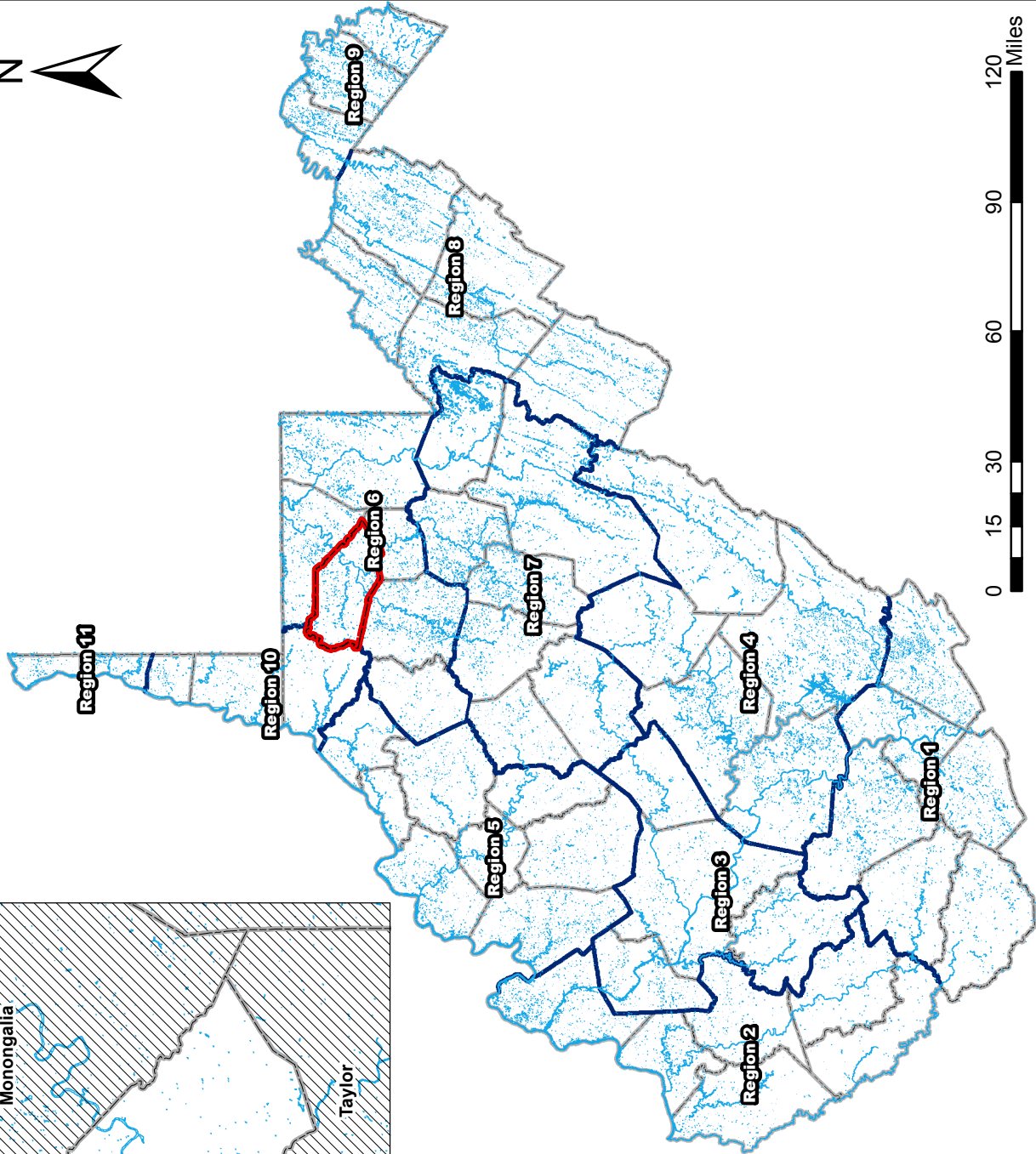
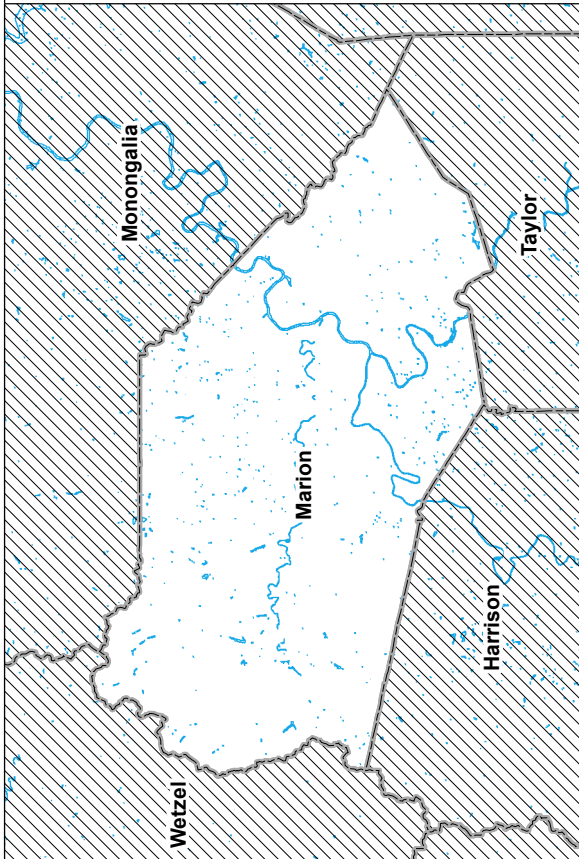
Air quality is a necessary environmental health benchmark that can determine the health and vitality of an area's residents. The air pollution non-attainment areas are "areas of the country where air pollution levels persistently exceed the national ambient air quality standards."<sup>7</sup> There are 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; Marion County is not among them (Map 31).




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<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

Marion County



-  Planning Regions Line
-  National Wetlands Inventory
-  County Boundaries



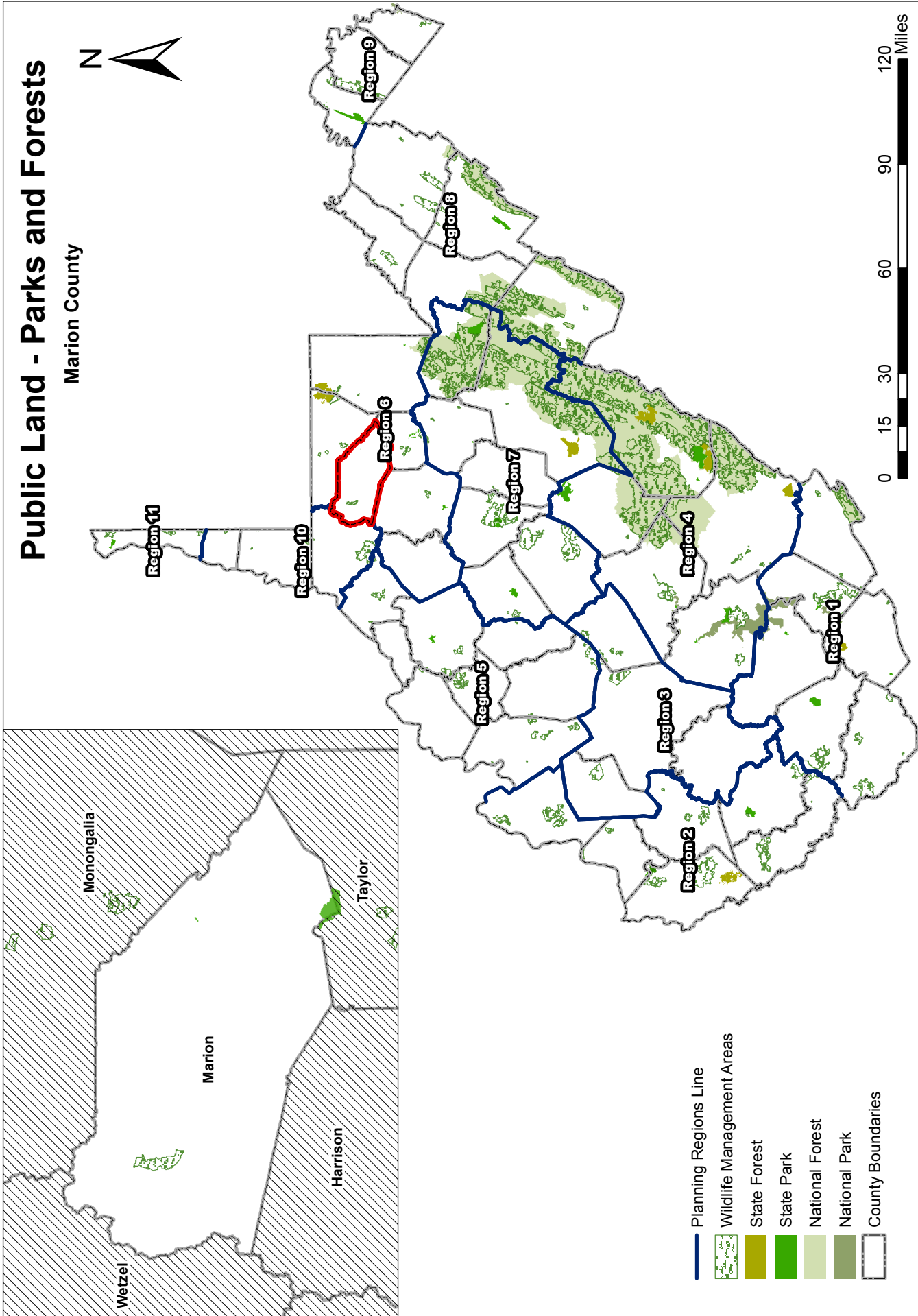
Source: United States Fish and Wildlife Service 1996








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# Public Land - Parks and Forests

Marion County



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



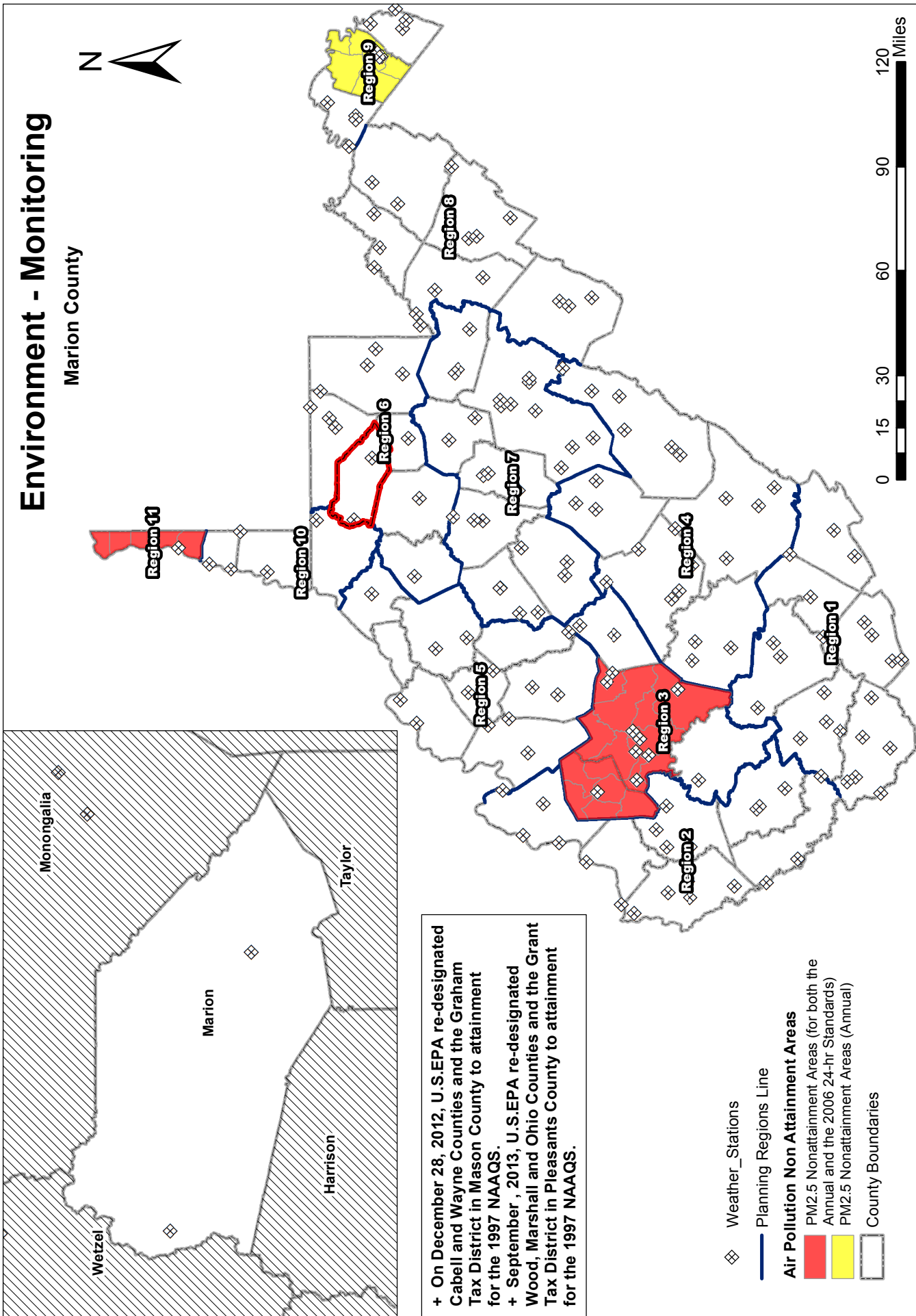
Source: Wildlife Management Areas; West Virginia Division of Natural Resources 2002; State Forest; West Virginia Division of Forestry 2004; State Park; West Virginia Division of Natural Resources; National Resource Analysis Center 2000; National Forest; United States Forest Service 2003; National Park;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

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# Environment - Monitoring

Marion 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.

+ September, 2013, U.S.EPA re-designated Wood, Marshall and Ohio Counties and the Grant Tax District in Pleasants 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, 2013

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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 energy in a number of ways. Marion County has a large network of oil fields, oil pipes, and gas pipes, making it a major nexus for energy (Map 32). Marion County also has extensive play in the Marcellus Shale, due to its location in the prime thickness area (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. Marion 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. Marion County appears to be about average in forestation in West Virginia (Map 34). However, there is no activity in the wood byproducts industry, indicating a potentially untapped renewable resource (Maps 35 and 36). 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 appears to have great potential in certain parts of the State, as shown in Map 37, but Marion appears to be one of the counties least favorable for development. The County also does not appear to be favorable for solar and wind development. 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>

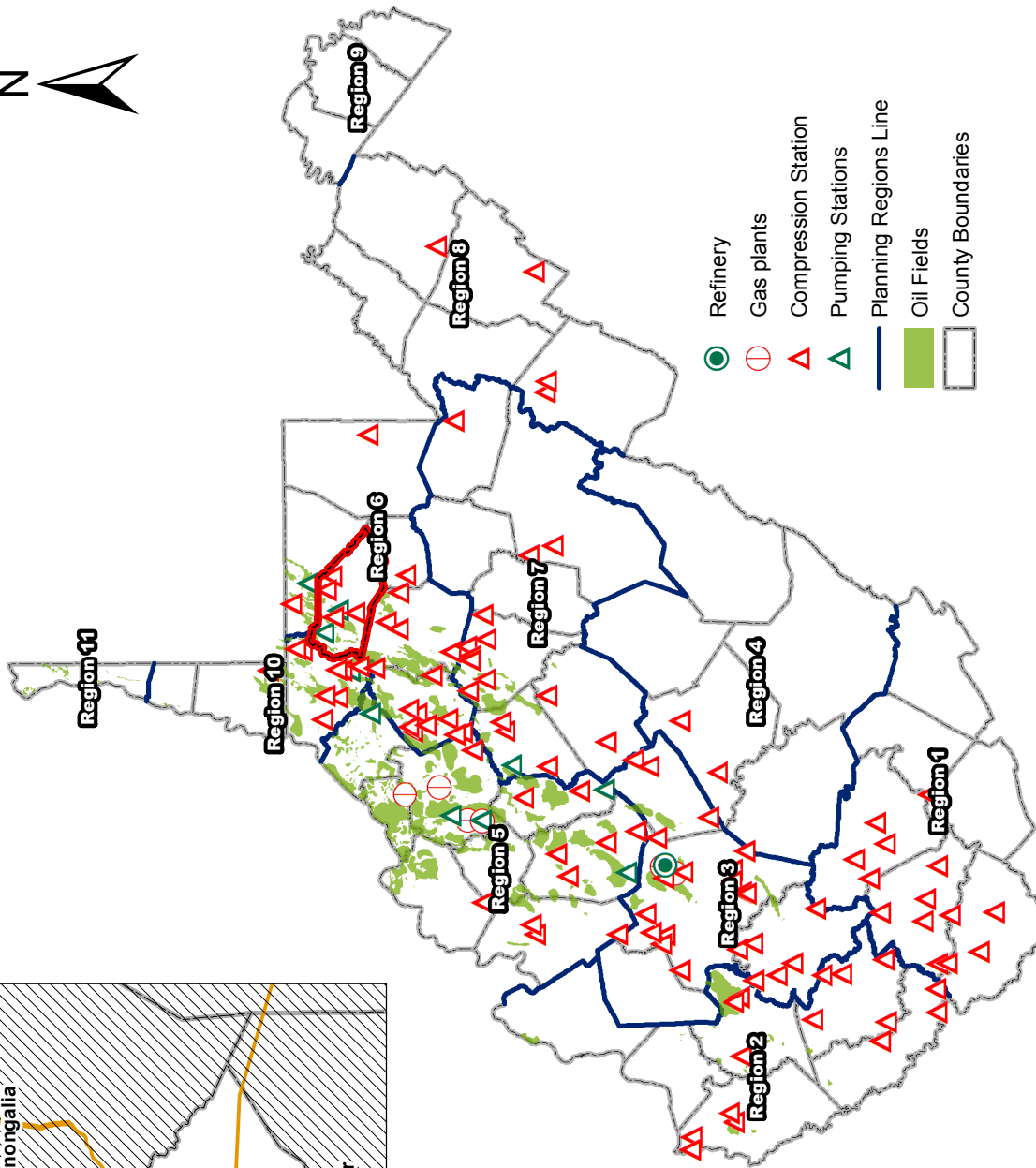
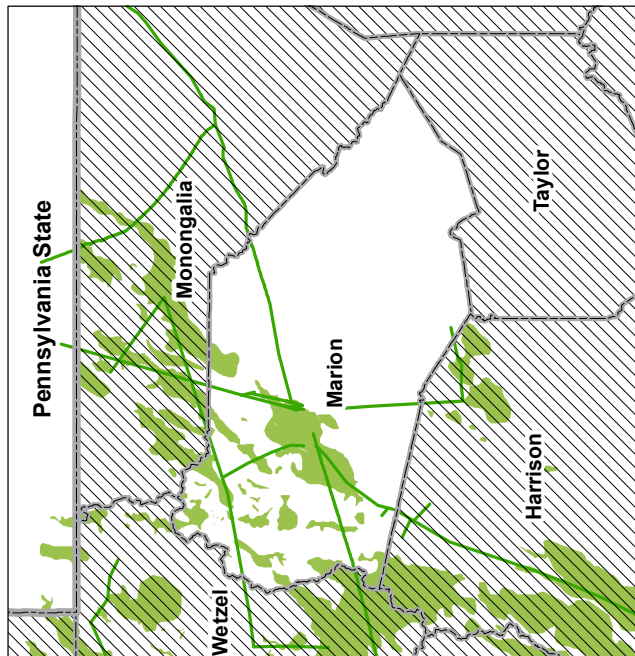
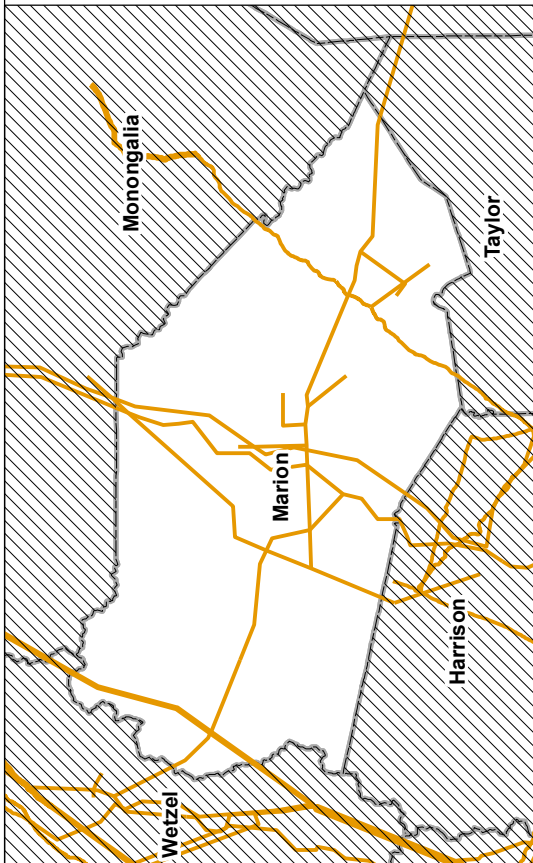
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<sup>8</sup> Kent, Calvin, Risch, Christine, and Pardue, Elizabeth. *Renewable Energy Policy: Opportunities for West Virginia*. Center for Business and Economic Research, Huntington, WV (2012).

<sup>9</sup> Ibid.

# Energy - Gas and Oil

## Marion County



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



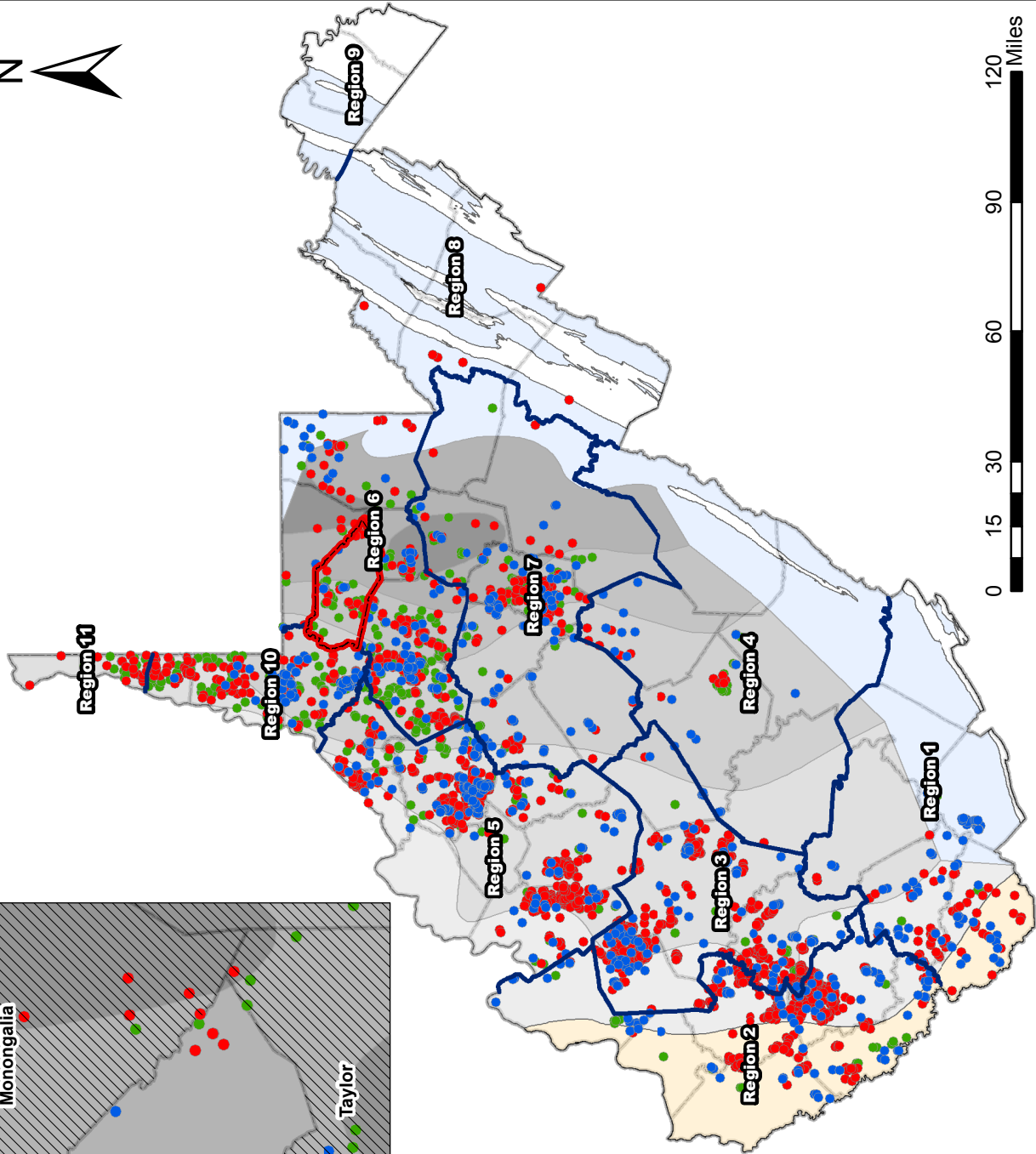
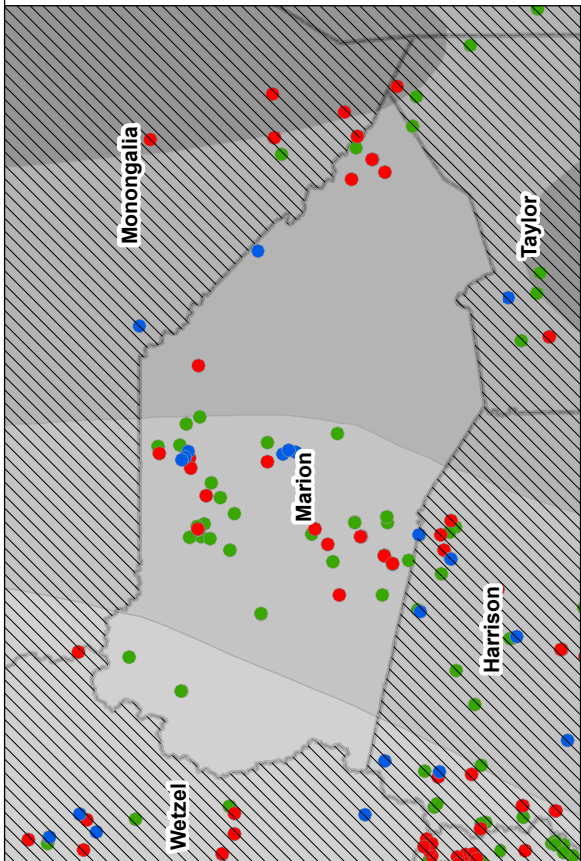
Source: West Virginia Geological and Economic Survey 2007

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# Energy - Marcellus Wells

## Marion 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

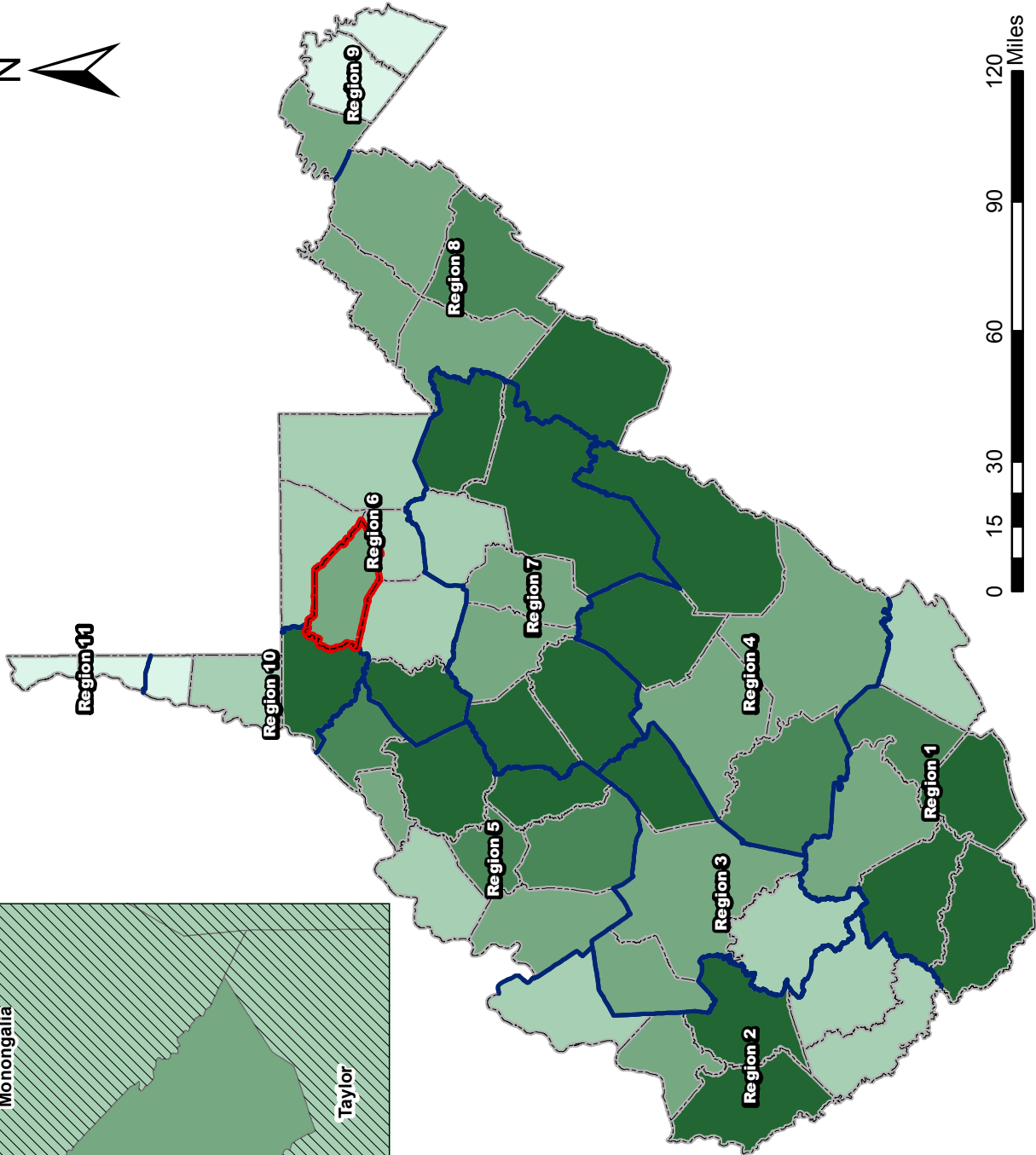
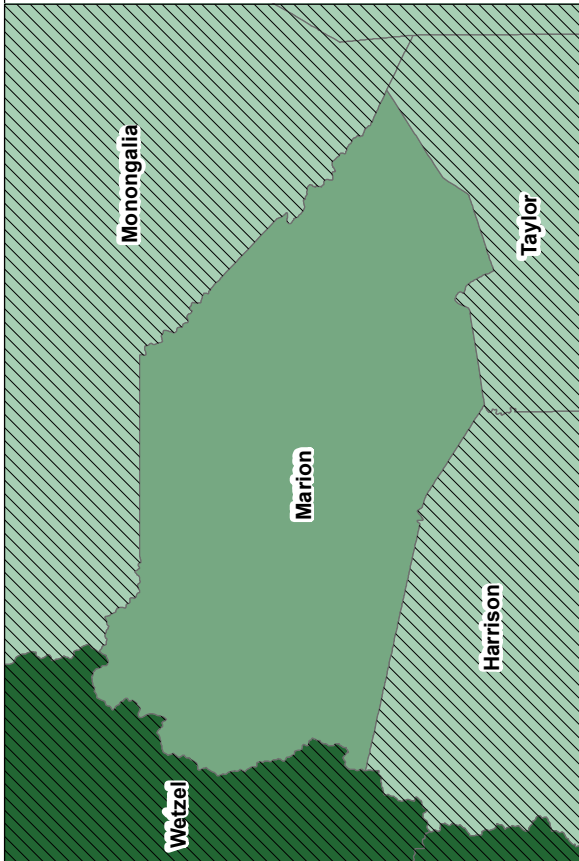
Source: West Virginia Geological and Economic Survey 2013

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# Energy - Percent Forest Coverage

Marion County



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



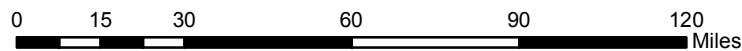
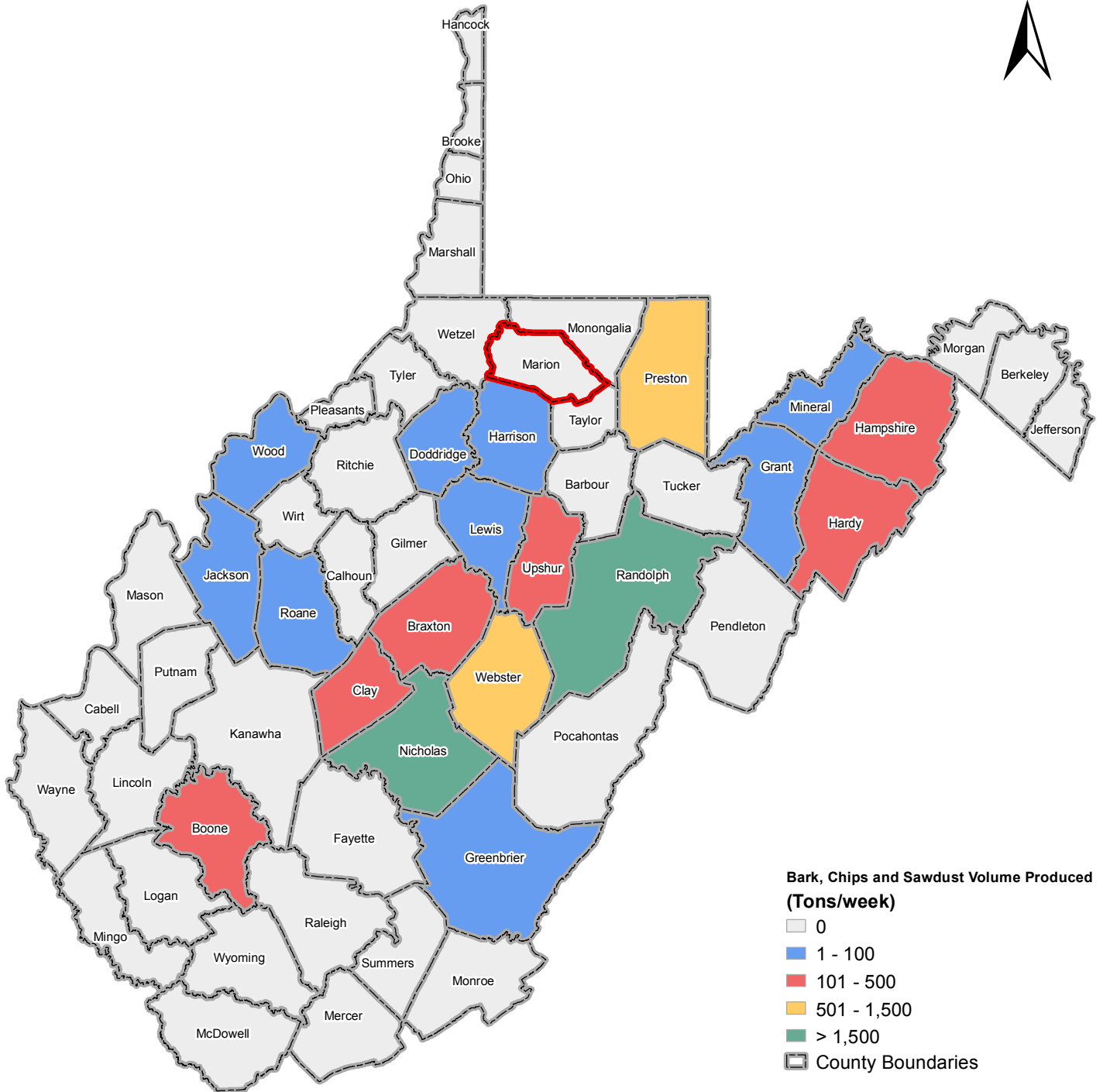
Source: Rahaal Transportation Institute 2013

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# Renewable Energy - Wood By Products

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



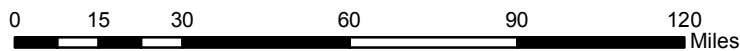
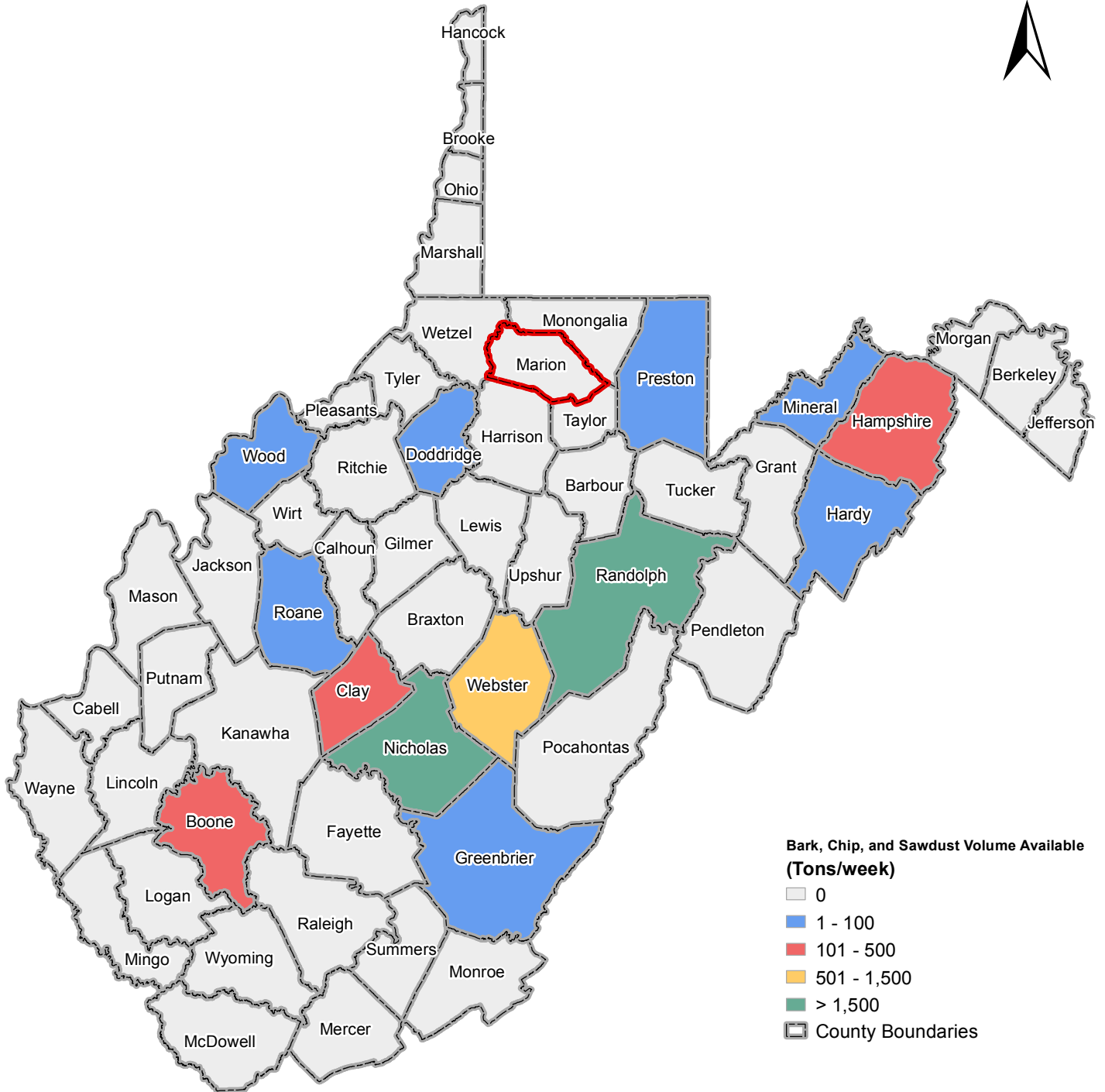
Source: Appalachian Hardwood Center 2011

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# Renewable Energy - Wood By Products

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



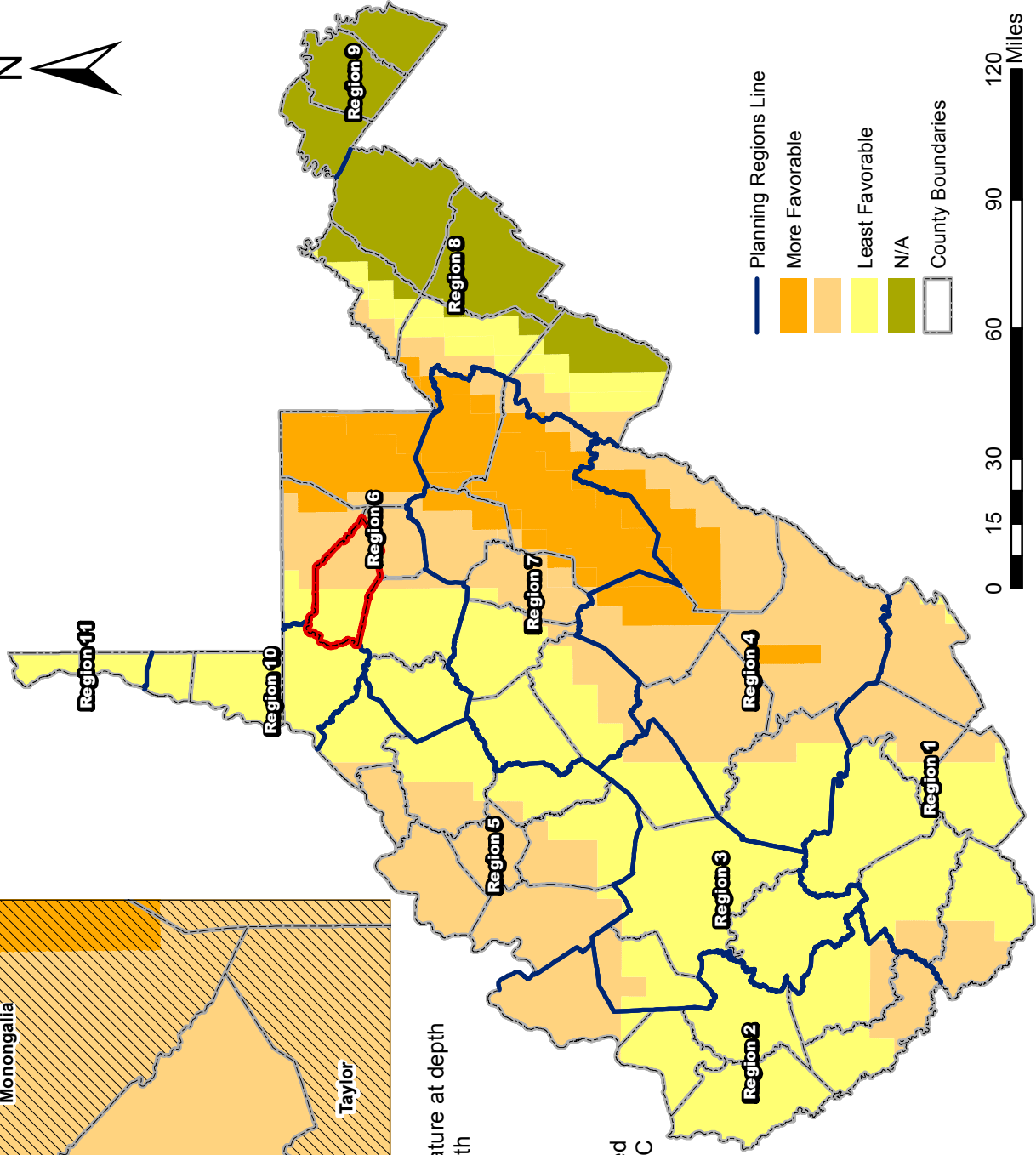
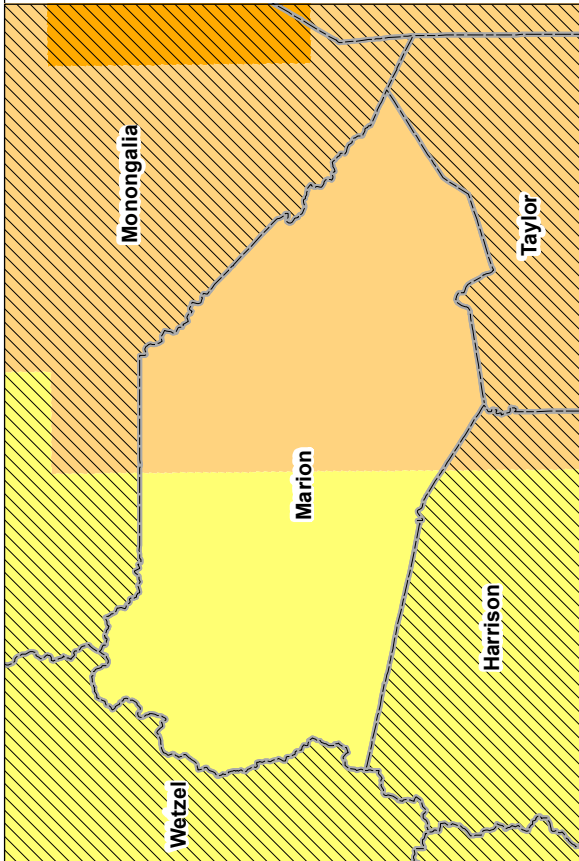
Source: Appalachian Hardwood Center 2011

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# Energy - Geothermal Resource of Marion County

## Favorability of Deep Enhanced Geothermal Systems



— 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.

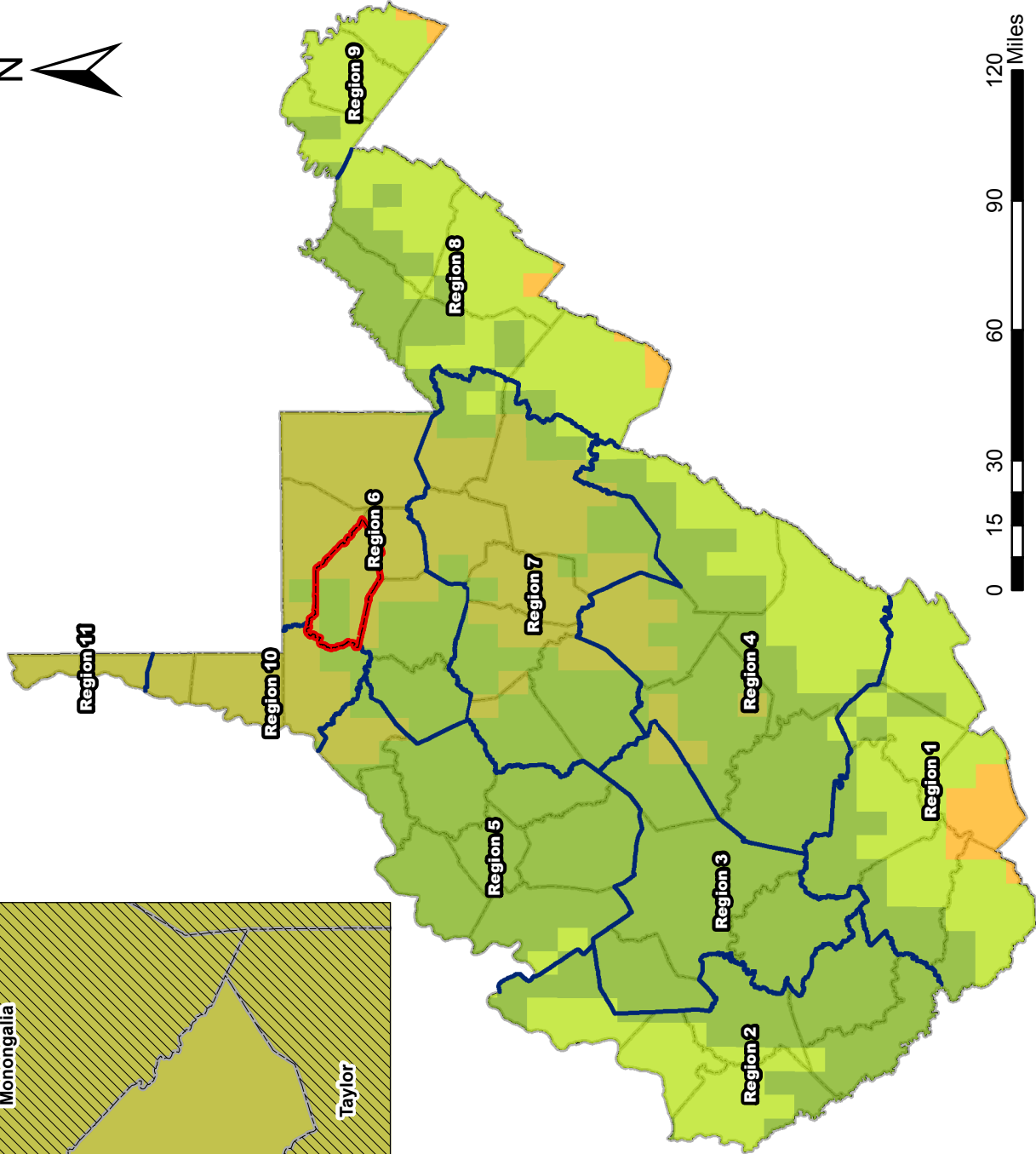
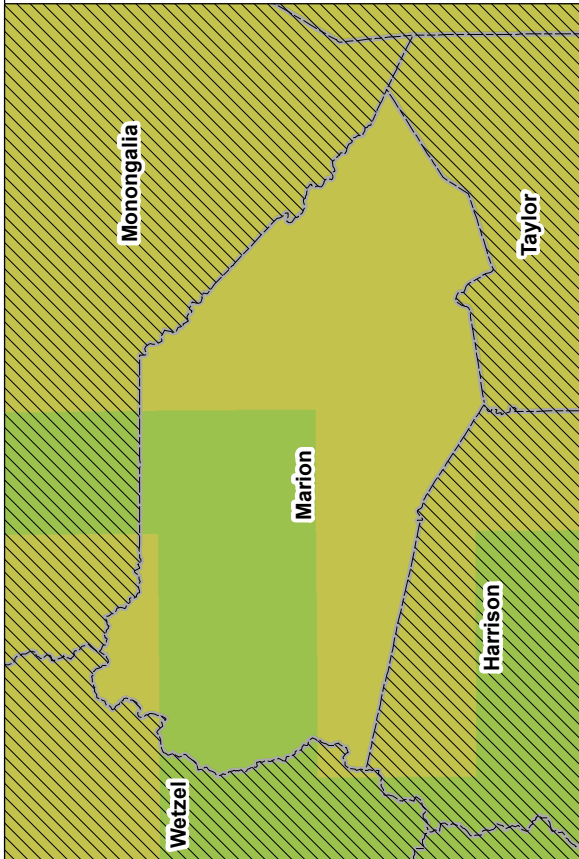
Source: National Renewable Energy Laboratory 2009

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# Solar - Renewable Energy

Marion County



— Planning Regions Line

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

4.2 - 4.4

3.9 - 4.1

3.7 - 3.8

3.4 - 3.6

□ County Boundaries

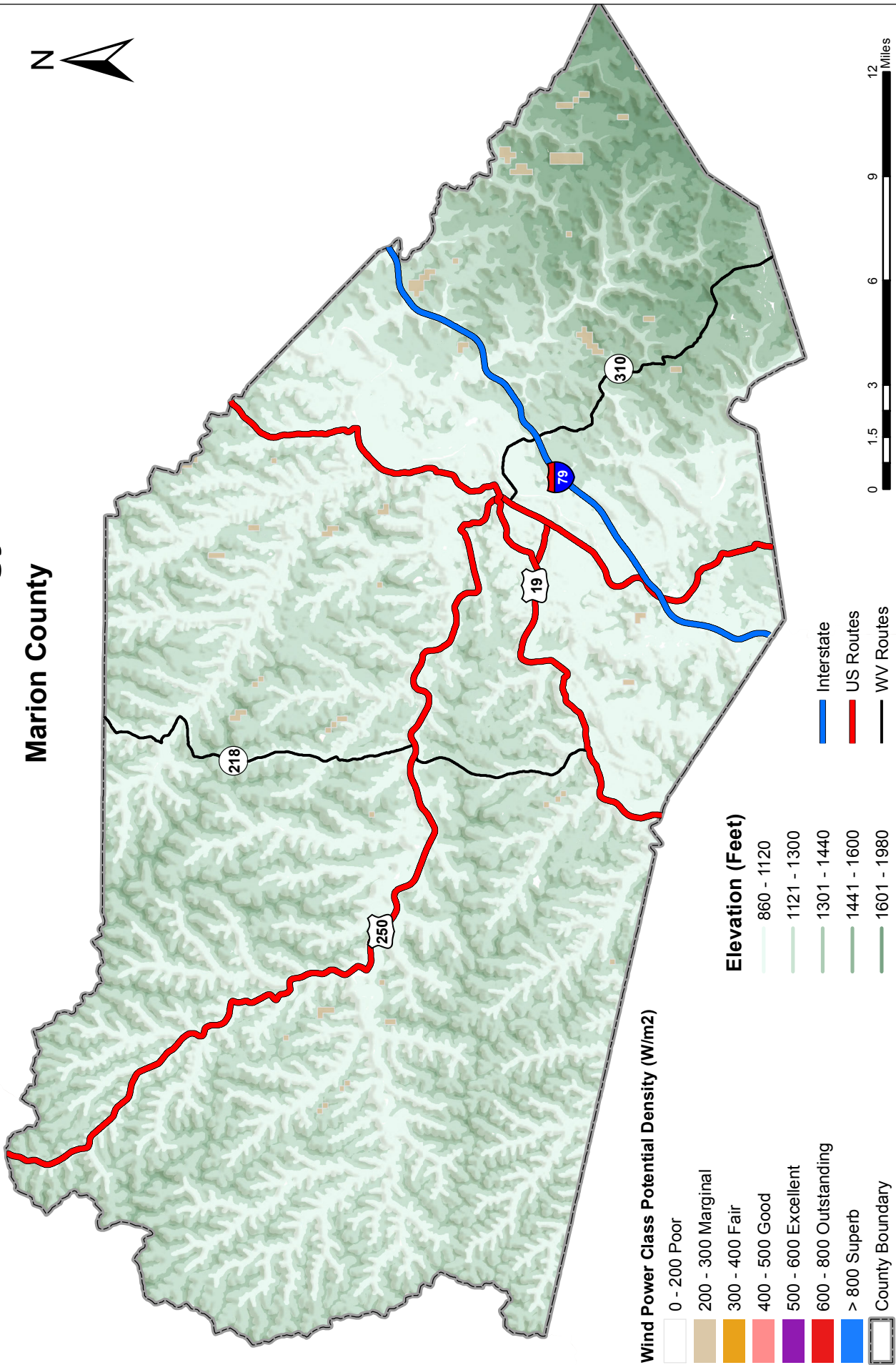
Source: National Renewable Energy Laboratory 2012

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# Renewable Energy-Wind

## Marion County



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 Marion. 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**

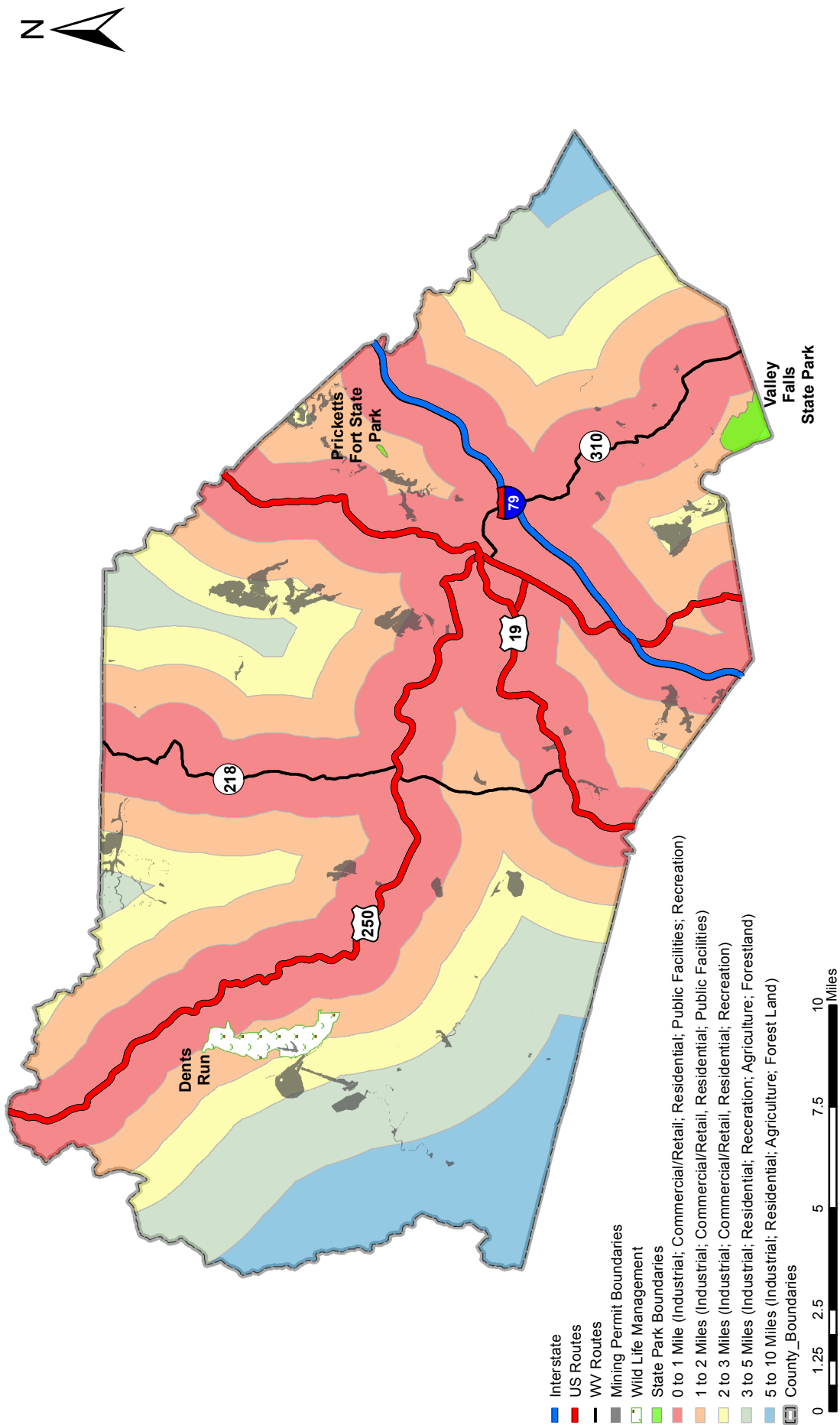
<b>Name</b>	<b>Smart Planning Criteria</b>
Utilization Area 0-1 mile	Industrial, Commercial/Retail, Residential, Public Facility, Recreational
Utilization Area 1-2 miles	Industrial, Commercial/Retail, Residential, Public Facilities, Recreational
Utilization Area 2-3 miles	Industrial, Commercial/Retail,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

## Marion County



Source: Rahall Transportation Institute 2014

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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 Marion 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 WV DEP permit database acts as a general clearinghouse for information, but is not infallible. The data is often updated by third-party sources, which increases the margin of error for site location. Because of this, the actual attributes being measured may not be at the distance stated because the mine site is not actually in the location given. The WV DEP has sought to minimize those errors, and RTI attempts to maintain the reliability of the measurements by observing their locations when mapping. RTI does not ensure the reliability of the site location or distances to the attributes. Any and all information should be verified for accuracy.

The initial data collection revealed all the mine sites in the county. Together, the team put together 42 sites for analysis. All of the sites and their distance attributes are listed below.

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

Site_No	Permit_ID	Permittee	Facility Name	Issue Date	Expiration Date	Acres
1	S003282	THOMPSON COAL & CONST INC	NA	8/5/1983	8/5/1988	45.14
2	S104886	W. C. TONKERY COAL CO	NA	8/14/1986	8/14/1991	43.2
3	S103087	BELL MINING COMPANY	NA	8/13/1987	8/13/1992	33.4
4	S025574	W & S, INC	NA	12/26/1974	12/26/1978	32
5	S002583	BELL MINING COMPANY	NA	3/16/1983	3/16/1993	14
6	S105186	LAROSA FUEL COMPANY INC	NA	8/12/1986	8/12/1991	231.47
7	C000782	BERRY TRUCKING INC	NA	4/23/1982	4/23/1987	5
8	C000781	USE COAL, INC	NA	10/2/1981	10/2/1986	5
9	S102988	ANTCO INC	NA	11/18/1988	11/18/1998	25.25

Site_No	Permit_ID	Permittee	Facility Name	Issue Date	Expiration Date	Acres
10	S101989	UNITED INTERNATIONAL, INC	NA	10/19/1989	10/19/1994	9.8
11	S008182	BELL MINING COMPANY	NA	8/24/1982	8/24/1992	7
12	S101392	J & B COAL COMPANY	POOR FARM SURFACE MINE	9/30/1992	9/30/1997	40.99
13	C000982	ANTCO INC	NA	6/7/1982	6/7/1987	5
14	I106486	THOMPSON COAL & CONST INC	NA	8/12/1986	8/12/1991	2
15	S200810	LP MINERAL LLC	Ralph Six Surface Mine	10/15/2012	10/15/2017	137
16	S016876	WEST VIRGINIA FUELS, INC	NA	8/3/1976	8/3/1981	41
17	S101095	STANLEY INDUSTRIES INC	HOULT SURFACE MINE	7/3/1996	7/3/2001	64
18	S103287	TEN-A COAL CO., INC.	NA	2/28/1988	2/28/2013	25.5
19	S101192	ANGEL COAL COMPANY INC	NA	8/31/1993	8/31/1998	5
20	S101786	BL & S COAL CO INC	NA	1/14/1986	1/14/1991	27.8
21	S101788	AMERIKOHL MINING INC	NA	8/15/1988	8/15/1993	72
22	S103589	STANYA COAL CO	NA	12/6/1989	12/6/1994	80
23	S007783	USE COAL, INC	NA	9/23/1983	9/23/1988	75.82
24	S007785	THOMPSON COAL & CONST INC	NA	8/16/1985	8/16/1990	115.42
25	S104686	THREE-C MINING, INC	NA	7/13/1987	7/13/1992	47.96
26	S000585	BELL MINING COMPANY	NA	1/23/1985	1/23/1995	54
27	S101290	BRIDGEPORT MINING CO	NA	7/24/1990	7/24/1995	30
28	S100398	HIDDEN VALLEY ESTATES GOLF COURSE INC.	EAST RUN SURFACE MINE NO. 1	5/11/2000	5/11/2010	58.96
29	S200106	LP MINERAL LLC	Wilson Mine Site	4/10/2007	4/10/2017	182
30	S100288	J & B COAL COMPANY	NA	3/25/1988	3/25/1993	20.37
31	S006884	B & G COAL CO	NA	9/19/1984	9/19/1989	13.4

Site_No	Permit_ID	Permittee	Facility Name	Issue Date	Expiration Date	Acres
32	S200904	AMERICAN BITUMINOUS POWER PARTNERS, L.P.	BARRACKVILLE SURFACE MINE	4/12/2005	4/12/2015	169
33	S011979	S.R.J. ENERGY INC	NA	9/15/1982	9/15/1987	18
34	S003584	PATRIOT MINING COMPANY INC	NA	6/11/1984	6/11/1989	30
35	I101187	E & S COAL CO INC	NA	5/4/1987	5/4/1992	1.97
36	S000383	STANYA SALES CO	NA	1/7/1983	1/7/1988	13
37	C001182	GREEN HILLS ENTERPRISES	NA	7/7/1982	7/7/1987	5
38	S024376	ROGER'S CONSTRUCTION CO INC	NA	10/29/1976	10/29/1981	19
39	S102589	W. C. TONKERY COAL CO	NA	8/23/1989	8/23/1994	60
40	S100897	GRACE ENTERPRISES INC	SWEEPS RUN #2 MINE	7/22/1998	7/22/2003	32
41	C000483	ANTCO INC	NA	8/12/1983	8/12/1988	2
42	S200501	PATRIOT MINING COMPANY INC	GRANT TOWN SURFACE MINE	3/22/2002	3/22/2007	207.95

### 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, and 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 road-path and Euclidean distance assessments for all of the identified sites. Several attributes were not analyzed, such as ports, as they were not applicable to Marion County. All distances were recorded in miles.

**Table 4: Assessment of Distances**

Site No	PermitID	Interstate (IS)	Sign-IS	Existing Highway (EH)	Sign-EH	Paved Road (RD)	Name-RD
1	S003282	2.71	I79	2.71	I79	0.23	Prickett's Creek To Montana
2	S104886	1.62	I79	1.62	I79	0.28	Sweep Run out of Marion County
3	S103087	5.85	I79	1.17	U19	0.10	Third Ave- Off Co 90/1 (Chiefton Area)
4	S025574	3.38	I79	0.47	U250	0.03	Rice Street- Barrackville
5	S002583	2.05	I79	1.82	U19	0.06	Eldora Business Park Drive
6	S105186	2.68	I79	2.68	I79	0.03	Jordan Catawba Road
7	C000782	7.00	I79	1.80	U19	0.01	No 93 Road
8	C000781	6.57	I79	3.35	U19	0.04	Watson Drive
9	S102988	2.82	I79	2.11	U19	0.13	Hoglick Branch
10	S101989	0.72	I79	0.72	I79	0.00	At Eldora
11	S008182	0.77	I79	0.36	U250	0.27	US 250

Site No	PermitID	Interstate (IS)	Sign-IS	Existing Highway (EH)	Sign-EH	Paved Road (RD)	Name-RD
12	S101392	2.35	I79	2.29	S310	0.24	Poor Farm Road
13	C000982	0.70	I79	0.70	I79	0.12	John R. Manley Road
14	I106486	2.10	I79	2.04	S310	0.10	Poor Farm Road
15	S200810	7.49	I79	3.26	U19	0.20	
16	S016876	0.65	I79	0.65	I79	0.01	Stoney Road
17	S101095	2.48	I79	2.38	S310	0.02	Five Forks To Westinghouse
18	S103287	3.99	I79	0.01	U19	0.00	US 19
19	S101192	1.76	I79	1.76	I79	0.52	Hoglick Branch
20	S101786	6.43	I79	1.57	U19	0.07	Radcliffe Road (Riversville)
21	S101788	4.03	I79	0.21	U250	0.23	US 250
22	S103589	9.81	I79	4.74	U19	0.01	Hoodsville To Grantown
23	S007783	6.57	I79	3.35	U19	0.04	Watson Drive
24	S007785	2.40	I79	2.40	I79	0.11	
25	S104686	6.16	I79	2.94	U19	0.04	Watson Drive
26	S000585	1.48	I79	1.48	I79	0.06	Manley Chapel Road
27	S101290	6.23	I79	2.18	U19	0.12	Thompson Dairy Road
28	S100398	9.32	I79	1.14	U250	0.18	250 To 19 Via Four States
29	S200106	5.91	I79	2.69	U19	0.07	Watson Drive
30	S100288	3.26	I79	3.26	I79	0.30	Spring St.-Fourth St.-High St.
31	S006884	6.47	I79	0.08	U19	0.11	W.M Smith
32	S200904	5.84	I79	2.52	U250	0.48	Moody Run Branch
33	S011979	9.01	I79	4.16	U19	0.16	Mccurdysville Road
34	S003584	1.39	I79	1.39	I79	0.05	Hoglick Branch
35	I101187	0.05	I79	0.05	I79	0.06	I 79
36	S000383	3.89	I79	0.07	U250	0.07	US 250
37	C001182	5.91	I79	1.05	U19	0.18	No 93 Road
38	S024376	3.14	I79	0.64	U19	0.01	Everson To Monongah
39	S102589	1.42	I79	1.42	I79	0.03	Hoglick Branch
40	S100897	1.02	I79	1.02	I79	0.19	Sweeps Run Road
41	C000483	1.34	I79	1.34	I79	0.05	At Eldora
42	S200501	8.61	I79	4.13	U19	0.08	Chunks Run Branch

**Table 5: Shortest Distances from Sites to Other Transportation Methods**

Site No	PermitID	Railroad (RR)	Owner (RR)	Intermodal Terminal Facility (IF)	Name - IF	National Waterway (NW)	Name-NW
1	S003282	0.37	CR	15.79	Anker Energy Scott's Run Dock	0.31	MONONGAHELA RIVER
2	S104886	3.33	CSXT	22.73	Anker Energy Scott's Run Dock	6.13	MONONGAHELA RIVER
3	S103087	4.02	CSXT	23.76	Anker Energy Scott's Run Dock	4.00	MONONGAHELA RIVER
4	S025574	3.05	CSXT	17.01	Anker Energy Scott's Run Dock	2.70	MONONGAHELA RIVER
5	S002583	1.58	CSXT	21.22	Anker Energy Scott's Run Dock	4.00	MONONGAHELA RIVER
6	S105186	0.50	CR	13.58	Anker Energy Scott's Run Dock	0.46	MONONGAHELA RIVER
7	C000782	0.58	CR	10.98	Anker Energy Scott's Run Dock	0.67	MONONGAHELA RIVER
8	C000781	0.31	CSXT	14.90	Anker Energy Scott's Run Dock	2.65	MONONGAHELA RIVER
9	S102988	3.18	CSXT	23.59	Anker Energy Scott's Run Dock	5.78	MONONGAHELA RIVER
10	S101989	1.74	CSXT	20.73	Anker Energy Scott's Run Dock	4.40	MONONGAHELA RIVER
11	S008182	1.26	CSXT	20.53	Anker Energy Scott's Run Dock	4.26	MONONGAHELA RIVER
12	S101392	0.73	CSXT	16.25	Anker Energy Scott's Run Dock	0.68	MONONGAHELA RIVER
13	C000982	2.13	CSXT	21.25	Anker Energy Scott's Run Dock	4.80	MONONGAHELA RIVER
14	I106486	1.05	CSXT	16.00	Anker Energy Scott's Run Dock	1.00	MONONGAHELA RIVER
15	S200810	0.19	CSXT	14.12	Anker Energy Scott's Run Dock	2.60	MONONGAHELA RIVER
16	S016876	1.07	CSXT	16.85	Anker Energy Scott's Run Dock	1.02	MONONGAHELA RIVER
17	S101095	0.23	CSXT	16.38	Anker Energy Scott's Run Dock	0.18	MONONGAHELA RIVER
18	S103287	3.16	CSXT	21.32	Anker Energy Scott's Run Dock	5.08	MONONGAHELA RIVER
19	S101192	2.83	CSXT	22.53	Anker Energy Scott's Run Dock	5.47	MONONGAHELA RIVER

Site No	PermitID	Railroad (RR)	Owner (RR)	Intermodal Terminal Facility (IF)	Name - IF	National Waterway (NW)	Name-NW
20	S101786	0.23	CR	13.17	Anker Energy Scott's Run Dock	0.30	MONONGAHELA RIVER
21	S101788	2.25	CSXT	17.91	Anker Energy Scott's Run Dock	2.31	MONONGAHELA RIVER
22	S103589	2.73	CR	13.20	Anker Energy Scott's Run Dock	5.05	MONONGAHELA RIVER
23	S007783	0.31	CSXT	14.90	Anker Energy Scott's Run Dock	2.65	MONONGAHELA RIVER
24	S007785	1.09	CR	15.55	Anker Energy Scott's Run Dock	1.05	MONONGAHELA RIVER
25	S104686	0.58	CSXT	15.32	Anker Energy Scott's Run Dock	2.29	MONONGAHELA RIVER
26	S000585	1.84	CSXT	21.70	Anker Energy Scott's Run Dock	4.40	MONONGAHELA RIVER
27	S101290	4.72	CSXT	22.08	Anker Energy Scott's Run Dock	5.86	MONONGAHELA RIVER
28	S100398	7.12	CR	24.74	Anker Energy Scott's Run Dock	9.02	MONONGAHELA RIVER
29	S200106	0.85	CSXT	15.19	Anker Energy Scott's Run Dock	2.06	MONONGAHELA RIVER
30	S100288	0.32	CR	16.34	Anker Energy Scott's Run Dock	0.26	MONONGAHELA RIVER
31	S006884	1.50	CSXT	11.13	Anker Energy Scott's Run Dock	1.84	MONONGAHELA RIVER
32	S200904	2.35	CSXT	17.69	Anker Energy Scott's Run Dock	2.42	MONONGAHELA RIVER
33	S011979	1.81	CR	13.61	Anker Energy Scott's Run Dock	4.26	MONONGAHELA RIVER
34	S003584	3.12	CSXT	22.16	Anker Energy Scott's Run Dock	5.81	MONONGAHELA RIVER
35	I101187	0.71	CSXT	16.86	Anker Energy Scott's Run Dock	0.65	MONONGAHELA RIVER
36	S000383	2.35	CSXT	17.77	Anker Energy Scott's Run Dock	2.41	MONONGAHELA RIVER
37	C001182	0.30	CR	12.29	Anker Energy Scott's Run Dock	0.36	MONONGAHELA RIVER
38	S024376	2.28	CSXT	20.86	Anker Energy Scott's Run Dock	4.21	MONONGAHELA RIVER
39	S102589	3.17	CSXT	22.18	Anker Energy Scott's Run Dock	5.86	MONONGAHELA RIVER
40	S100897	2.95	CSXT	22.12	Anker Energy Scott's Run Dock	5.92	MONONGAHELA RIVER



<b>Site No</b>	<b>PermitID</b>	<b>Railroad (RR)</b>	<b>Owner (RR)</b>	<b>Intermodal Terminal Facility (IF)</b>	<b>Name - IF</b>	<b>National Waterway (NW)</b>	<b>Name-NW</b>
41	C000483	1.58	CSXT	21.35	Anker Energy Scott's Run Dock	4.17	MONONGAHELA RIVER
42	S200501	1.05	CR	14.57	Anker Energy Scott's Run Dock	3.49	MONONGAHELA RIVER

**Table 6: Shortest Distances from Sites to Sewer Lines (SL) and Water Lines (WL)**

<b>Site No</b>	<b>Permit_ID</b>	<b>SL</b>	<b>Public Utility - SL</b>	<b>WL</b>	<b>Public Utility - WL</b>
1	S003282	2.48	Town of Barrackville	1.21	Rivesville Water Department
2	S104886	1.58	Whitehall Public Service District	0.97	Coon's Run Public Service District
3	S103087	0.12	Town of Worthington (Sanitary System)	0.11	Hutchinson Community Water Association
4	S025574	0.34	Town of Barrackville	0.38	Monumental Public Service District
5	S002583	0.66	Whitehall Public Service District	0.41	City of Shinnston
6	S105186	4.46	Town of Barrackville	0.33	Little Creek Public Service District
7	C000782	4.04	Town of Barrackville	0.72	Little Creek Public Service District
8	C000781	2.83	Town of Barrackville	0.09	Grant Town Water Department
9	S102988	1.43	Whitehall Public Service District	0.43	Coon's Run Public Service District
10	S101989	0.00	Whitehall Public Service District	0.00	Tri-County Water Association
11	S008182	0.16	Whitehall Public Service District	0.14	Tri-County Water Association
12	S101392	1.43	Town of Barrackville	0.75	Paw Paw Rt 19 Public Service District
13	C000982	0.35	Whitehall Public Service District	0.12	Tri-County Water Association
14	I106486	1.83	Town of Barrackville	1.15	Paw Paw Rt 19 Public Service District
15	S200810	3.26	Town of Barrackville	0.22	Grant Town Water Department
16	S016876	0.18	Kingmill Valley Public Service District	1.68	Valley Falls Public Service District
17	S101095	0.90	Town of Barrackville	0.23	Paw Paw Rt 19 Public Service District
18	S103287	0.23	Town of Worthington (Sanitary System)	0.01	Town of Monongah
19	S101192	1.03	Whitehall Public Service District	0.87	City of Shinnston
20	S101786	3.06	Town of Barrackville	0.92	Little Creek Public Service District
21	S101788	1.17	Town of Barrackville	0.22	Ice's Run Route 250 Public Service District
22	S103589	5.94	Town of Barrackville	0.76	Grant Town Water Department
23	S007783	2.83	Town of Barrackville	0.09	Grant Town Water Department
24	S007785	1.87	Town of Barrackville	1.21	Paw Paw Rt 19 Public Service District

<b>Site No</b>	<b>Permit_ID</b>	<b>SL</b>	<b>Public Utility - SL</b>	<b>WL</b>	<b>Public Utility - WL</b>
25	S104686	2.40	Town of Barrackville	0.06	Monumental Public Service District
26	S000585	0.31	Whitehall Public Service District	0.06	City of Shinnston
27	S101290	0.41	Greater Marion Public Service District	0.28	Town of Monongah
28	S100398	0.93	Mannington Sanitary Board	0.44	Downs Public Service District
29	S200106	2.11	Town of Barrackville	0.07	Monumental Public Service District
30	S100288	2.46	Town of Barrackville	0.97	Rivesville Water Department
31	S006884	3.64	Town of Barrackville	0.11	Paw Paw Rt 19 Public Service District
32	S200904	1.51	Town of Barrackville	0.48	Monumental Public Service District
33	S011979	4.99	Town of Barrackville	0.56	Grant Town Water Department
34	S003584	1.35	Whitehall Public Service District	0.98	Coon's Run Public Service District
35	I101187	0.13	Kingmill Valley Public Service District	1.89	Valley Falls Public Service District
36	S000383	1.32	Town of Barrackville	0.07	Ice's Run Route 250 Public Service District
37	C001182	2.88	Town of Barrackville	0.53	Rivesville Water Department
38	S024376	0.06	Town of Monongah	0.06	Town of Monongah
39	S102589	1.39	Whitehall Public Service District	0.95	Coon's Run Public Service District
40	S100897	1.30	Whitehall Public Service District	0.41	Tri-County Water Association
41	C000483	0.14	Whitehall Public Service District	0.21	City of Shinnston
42	S200501	4.14	Town of Barrackville	0.75	Grant Town Water Department

**Table 7: Shortest Distances from Sites to Broadband and Power Lines**

Site No	Permit ID	Broadband	Provider	Power Lines	Type	Size kV
1	S003282	3.39	West Side Telephone Company	0.07	Transmission	115-138
2	S104886	0.20	Cequel III Communications II	1.75	Transmission	115-138
3	S103087	0.44	Comcast Cable Communications, LLC	0.29	Transmission	115-138
4	S025574	0.64	Comcast Cable Communications, LLC	0.35	Transmission	115-138
5	S002583	0.14	Comcast Cable Communications, LLC	1.59	Sub-Transmission	Unknown
6	S105186	1.48	West Side Telephone Company	0.22	Transmission	115-138
7	C000782	1.35	West Side Telephone Company	0.29	Transmission	500
8	C000781	1.39	TIME WARNER CABLE LLC	0.34	Sub-Transmission	Unknown
9	S102988	0.06	Cequel III Communications II	0.83	Sub-Transmission	Unknown
10	S101989	0.17	Cequel III Communications II	1.29	Sub-Transmission	Unknown
11	S008182	0.91	Cequel III Communications II	0.52	Sub-Transmission	Unknown
12	S101392	2.79	Comcast Cable Communications, LLC	0.10	Sub-Transmission	Unknown
13	C000982	0.19	Cequel III Communications II	1.49	Sub-Transmission	Unknown
14	I106486	3.16	Comcast Cable Communications, LLC	0.13	Sub-Transmission	Unknown
15	S200810	1.21	Frontier West Virginia, Inc.	0.31	Transmission	115-138
16	S016876	1.53	Comcast Cable Communications, LLC	1.14	Transmission	115-138
17	S101095	2.40	Comcast Cable Communications, LLC	0.29	Sub-Transmission	Unknown
18	S103287	0.51	Comcast Cable Communications, LLC	0.24	Transmission	115-138
19	S101192	0.03	Cequel III Communications II	1.14	Sub-Transmission	Unknown
20	S101786	2.77	West Side Telephone Company	0.12	Transmission	115-138
21	S101788	0.29	TIME WARNER CABLE LLC	0.49	Transmission	115-138
22	S103589	1.45	Frontier West Virginia, Inc.	0.31	Transmission	500
23	S007783	1.39	TIME WARNER CABLE LLC	0.34	Sub-Transmission	Unknown
24	S007785	3.38	Comcast Cable Communications, LLC	0.18	Sub-Transmission	Unknown
25	S104686	1.16	TIME WARNER CABLE LLC	0.74	Sub-Transmission	Unknown
26	S000585	0.06	Comcast Cable Communications, LLC	1.34	Sub-Transmission	Unknown
27	S101290	1.12	Frontier West Virginia, Inc.	0.02	Transmission	500
28	S100398	1.01	Citizens Telecommunications Company of West Virginia	0.71	Transmission	115-138

Site No	Permit ID	Broadband	Provider	Power Lines	Type	Size kV
29	S200106	1.05	TIME WARNER CABLE LLC	1.03	Sub-Transmission	Unknown
30	S100288	3.22	West Side Telephone Company	0.01	Transmission	115-138
31	S006884	1.19	West Side Telephone Company	0.72	Transmission	115-138
32	S200904	0.48	TIME WARNER CABLE LLC	1.59	Transmission	115-138
33	S011979	0.78	Frontier West Virginia, Inc.	0.71	Transmission	500
34	S003584	0.03	Cequel III Communications II	1.52	Sub-Transmission	Unknown
35	I101187	1.89	Comcast Cable Communications, LLC	1.50	Transmission	115-138
36	S000383	0.29	TIME WARNER CABLE LLC	0.48	Transmission	115-138
37	C001182	2.39	West Side Telephone Company	0.09	Transmission	500
38	S024376	0.02	Comcast Cable Communications, LLC	0.83	Transmission	115-138
39	S102589	0.03	Cequel III Communications II	1.52	Sub-Transmission	Unknown
40	S100897	0.18	Cequel III Communications II	1.02	Transmission	115-138
41	C000483	0.11	Comcast Cable Communications, LLC	1.58	Sub-Transmission	Unknown
42	S200501	0.62	Frontier West Virginia, Inc.	0.26	Transmission	115-138

**Table 8: 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	S003282	0.53	PRICKETTS FORT STATE PARK	12.10	Marion Co. Landfill
2	S104886	2.15	JRM ENTERPRISES APTS.	8.91	Meadowfill
3	S103087	0.93	WORTHINGTON TOWN OF	5.51	Marion Co. Landfill
4	S025574	1.20	OAKWOOD MHP	7.00	Marion Co. Landfill
5	S002583	0.49	MARION PARK APARTMENTS	7.16	Marion Co. Landfill
6	S105186	3.77	CEDAR GABLES TRAILER	14.53	Monongalia Co. Landfil
7	C000782	6.16	OAKWOOD MHP	4.25	Monongalia Co. Landfil
8	C000781	4.04	OAKWOOD MHP	7.65	Marion Co. Landfill
9	S102988	2.81	Shinnston Water Treatment Plant	6.78	Marion Co. Landfill
10	S101989	0.70	Shinnston Water Treatment Plant	7.40	Marion Co. Landfill
11	S008182	2.08	APPLE VALLEY APTS	8.87	Marion Co. Landfill
12	S101392	1.27	FAIRMONT CITY OF	10.86	Marion Co. Landfill
13	C000982	1.25	Shinnston Water Treatment Plant	7.24	Marion Co. Landfill
14	I106486	1.03	FAIRMONT CITY OF	10.61	Marion Co. Landfill

Site No	Permit_ID	Sewer Treatment (ST)	Facility Name (ST)	Solid Waste Treatment (SWT)	Facility Name (SWT)
15	S200810	5.09	OAKWOOD MHP	7.77	Monongalia Co. Landfil
16	S016876	1.91	COLFAX PSD	9.61	Marion Co. Landfill
17	S101095	0.76	FAIRMONT CITY OF	10.95	Marion Co. Landfill
18	S103287	1.13	MONONGAH TOWN OF	4.32	Marion Co. Landfill
19	S101192	2.76	JRM ENTERPRISES APTS.	7.96	Marion Co. Landfill
20	S101786	5.59	OAKWOOD MHP	6.26	Monongalia Co. Landfil
21	S101788	1.69	OAKWOOD MHP	5.20	Marion Co. Landfill
22	S103589	8.08	OAKWOOD MHP	7.34	Monongalia Co. Landfill
23	S007783	4.04	OAKWOOD MHP	7.65	Marion Co. Landfill
24	S007785	0.74	PRICKETTS FORT STATE PARK	11.47	Marion Co. Landfill
25	S104686	3.63	OAKWOOD MHP	8.06	Marion Co. Landfill
26	S000585	0.35	Shinnston Water Treatment Plant	6.52	Marion Co. Landfill
27	S101290	2.52	FARMINGTON CITY OF	2.37	Marion Co. Landfill
28	S100398	0.97	KIMBERLY HEIGHTS MHP	4.95	Marion Co. Landfill
29	S200106	3.38	OAKWOOD MHP	7.93	Marion Co. Landfill
30	S100288	1.08	PRICKETTS FORT STATE PARK	12.25	Marion Co. Landfill
31	S006884	5.64	OAKWOOD MHP	4.76	Monongalia Co. Landfil
32	S200904	3.31	OAKWOOD MHP	6.52	Marion Co. Landfill
33	S011979	7.28	OAKWOOD MHP	7.75	Monongalia Co. Landfil
34	S003584	2.39	JRM ENTERPRISES APTS.	7.51	Marion Co. Landfill
35	I101187	2.56	Pricket's Fort Exxon #1009	9.11	Marion Co. Landfill
36	S000383	1.54	OAKWOOD MHP	5.06	Marion Co. Landfill
37	C001182	5.07	OAKWOOD MHP	5.38	Monongalia Co. Landfil
38	S024376	0.60	MONONGAH TOWN OF	5.72	Marion Co. Landfill
39	S102589	2.41	JRM ENTERPRISES APTS.	7.46	Marion Co. Landfill
40	S100897	1.54	JRM ENTERPRISES APTS.	8.30	Meadowfill
41	C000483	0.18	Shinnston Water Treatment Plant	6.88	Marion Co. Landfill
42	S200501	6.06	OAKWOOD MHP	8.23	Monongalia Co. Landfil

**Table 9: 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	S003282	2.11	Dominion Transmission Inc.	0.81	Unknown
2	S104886	1.36	Dominion Transmission Inc.	1.35	E
3	S103087	0.36	Equitrans, LP	1.02	E

Site No	Permit ID	Gas Pipe (GP)	Company Name (GP)	Oil Pipe (OP)	Company Name (OP)
4	S025574	0.99	Hope Gas, Inc.	0.11	CN
5	S002583	1.83	Equitrans, LP	0.10	E
6	S105186	2.13	Dominion Transmission Inc.	0.81	Unknown
7	C000782	3.50	Dominion Transmission Inc.	0.57	Unknown
8	C000781	1.75	Equitrans, LP	0.79	CN
9	S102988	1.63	Equitrans, LP	1.02	E
10	S101989	2.62	Equitrans, LP	1.15	E
11	S008182	1.77	Dominion Transmission Inc.	1.80	CN
12	S101392	2.20	Dominion Transmission Inc.	0.31	CN
13	C000982	2.60	Dominion Transmission Inc.	1.41	E
14	I106486	1.88	Dominion Transmission Inc.	0.47	CN
15	S200810	2.34	Equitrans, LP	0.07	CN
16	S016876	0.35	Hope Gas, Inc.	0.05	E
17	S101095	2.28	Hope Gas, Inc.	0.23	CN
18	S103287	0.09	Equitrans, LP	1.25	E
19	S101192	2.06	Equitrans, LP	1.28	E
20	S101786	2.17	Dominion Transmission Inc.	0.58	Unknown
21	S101788	0.44	Hope Gas, Inc.	0.19	CN
22	S103589	1.67	Equitrans, LP	0.04	CN
23	S007783	1.75	Equitrans, LP	0.79	CN
24	S007785	2.14	Dominion Transmission Inc.	0.94	CN
25	S104686	1.99	Equitrans, LP	0.92	Unknown
26	S000585	2.04	Equitrans, LP	0.59	E
27	S101290	0.22	Equitrans, LP	0.31	CN
28	S100398	0.49	Hope Gas, Inc.	0.36	E
29	S200106	2.18	Equitrans, LP	1.01	Unknown
30	S100288	2.34	Dominion Transmission Inc.	0.58	Unknown
31	S006884	4.35	Equitrans, LP	0.35	CN
32	S200904	0.85	Hope Gas, Inc.	0.36	CN
33	S011979	1.66	Equitrans, LP	0.47	Unknown
34	S003584	1.77	Dominion Transmission Inc.	1.71	E
35	I101187	0.32	Hope Gas, Inc.	0.12	E
36	S000383	0.34	Hope Gas, Inc.	0.11	CN
37	C001182	2.97	Dominion Transmission Inc.	0.17	Unknown
38	S024376	0.95	Equitrans, LP	0.93	E
39	S102589	1.74	Dominion Transmission Inc.	1.71	E
40	S100897	1.26	Dominion Transmission Inc.	1.25	E
41	C000483	2.23	Equitrans, LP	0.63	E
42	S200501	1.88	Equitrans, LP	0.53	CN

## Suitability Model

The suitability model for Marion 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, RTI’s own research on the existing conditions in Marion 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 existing highway ranges from 5 to 10 miles, the site will be given 7 points for the Existing Highways 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 differences 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

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



different relative scores. *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.

### 1. Weighting

Table 10 prioritizes post-mining land-use criteria for surface coal mining site selection in Marion 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 10: Weighting Sites Selection Criteria**

No	Criteria	Weight
1	Interstate	8
2	Existing Highway	8
3	Sewer Treatment Facilities	7
4	Solid Waste Treatment Facilities	8
5	National Waterway Network	4
6	Intermodal Terminal Facilities	6
7	Sewer Lines	8
8	Railroads	5
9	Water Lines	10
10	Power Lines	10
11	Gas Pipes	6
12	Pipe Lines	6
13	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 11 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 treatment facilities are considered more important in site selection (weight: 8 vs. 6).

**Table 11: 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
	Intermodal Terminal Facilities	0 - 10	10 - 20	20 - 30	30 - 40	> 40
	Interstate	0 - 5	5 - 14	14 - 22	22 - 30	> 30
	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
	National Waterway Network	0 - 2.5	2.5 - 5	5 - 7.5	7.5 - 10	> 10
	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
	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 12 shows four statistical groups and their relative scores in the Marion 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). Second, it is not affected by personal opinion and does not consider either traveling method or nature of criteria.

**Table 12: Relative Scoring System**

		Threshold (Distances in miles)		Min - Q1	Q1 - Q2	Q2 - Q3	Q3 – Max
		Relative Score		10	7.5	5	2.5
No.	Criteria	Min	Q1	Q2	Q3	Max	
1	Interstate	0.05	1.66	3.20	6.21	9.81	
2	Existing Highway	0.01	0.80	1.69	2.64	4.74	
3	National Waterway Network	0.18	1.03	2.68	4.70	9.02	
4	Sewer Treatment Facilities	0.18	1.04	2.12	3.74	8.08	
5	Solid Waste Treatment Facilities	2.37	6.32	7.49	8.73	14.53	
6	Intermodal Terminal Facilities	10.98	14.97	16.94	21.34	24.74	
7	Sewer Lines	0.00	0.36	1.41	2.74	5.94	
8	Railroads	0.19	0.62	1.58	2.80	7.12	
9	Water Lines	0.00	0.12	0.41	0.84	1.89	
10	Power Lines	0.01	0.27	0.50	1.14	1.75	
11	Gas Pipes	0.09	1.06	1.80	2.18	4.35	
12	Oil Pipes	0.04	0.31	0.58	1.02	1.80	
13	Broadband	0.02	0.19	0.96	1.47	3.39	

### 3. Marion County's Suitability Model:

Table 13 shows the total scores of all studied sites in Marion County. Site No-36 (Permit ID = S000383) has the highest score of 701.5. The sites with higher total scores suggest better opportunities for development. Results in Table 13 are also plotted in the bar chart (Figure 15) for better visualization. Among 42 analyzed potential development sites of Marion County, it is easy to notice the top five 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.

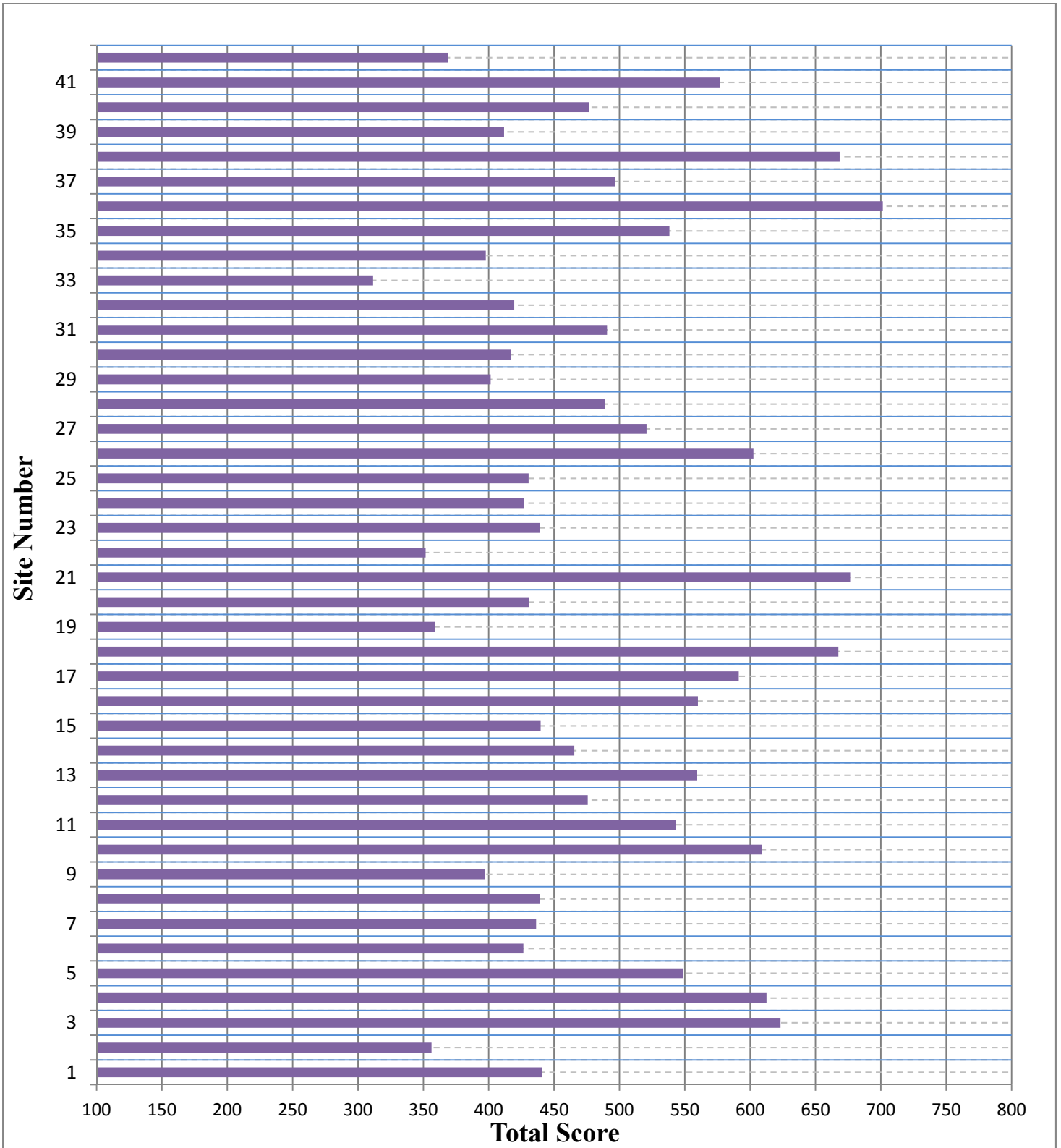
Besides a distance analysis, a suitability model for Marion is supported by demographic data as well as two additional analyses, which are workforce analysis and retail location density (shown on Table 14 and Map 41). The best decision will be made with careful consideration of the suitability analysis as well as the demographic and economic information.

**Table 13: Total Score of Mine Sites in Marion County**

Site No	Permittee	Permit ID	Score
1	Thompson Coal & Const Inc	S003282	440.75
2	W. C. Tonkery Coal Co	S104886	356.25
3	Bell Mining Company	S103087	623.25
4	W & S, Inc	S025574	612.5
5	Bell Mining Company	S002583	548.5
6	Larosa Fuel Company Inc	S105186	426.5
7	Berry Trucking Inc	C000782	436.25
8	Use Coal, Inc	C000781	439.25
9	Antco Inc	S102988	397.25
10	United International, Inc	S101989	609
11	Bell Mining Company	S008182	543
12	J & B Coal Company	S101392	475.75
13	Antco Inc	C000982	559.5
14	Thompson Coal & Const Inc	I106486	465.5
15	Lp Mineral Llc	S200810	439.75
16	West Virginia Fuels, Inc	S016876	560
17	Stanley Industries Inc	S101095	591.25

Site No	Permittee	Permit ID	Score
18	Ten-A Coal Co., Inc.	S103287	667.5
19	Angel Coal Company Inc	S101192	358.75
20	Bl & S Coal Co Inc	S101786	431
21	Amerikohl Mining Inc	S101788	676.5
22	Stanya Coal Co	S103589	351.75
23	Use Coal, Inc	S007783	439.25
24	Thompson Coal & Const Inc	S007785	427
25	Three-C Mining, Inc	S104686	430.5
26	Bell Mining Company	S000585	602.5
27	Bridgeport Mining Co	S101290	520.75
28	Hidden Valley Estates Golf Course Inc.	S100398	488.75
29	Lp Mineral Llc	S200106	401.5
30	J & B Coal Company	S100288	417.25
31	B & G Coal Co	S006884	490.5
32	American Bituminous Power Partners, L.P.	S200904	419.5
33	S.R.J. Energy Inc	S011979	311.5
34	Patriot Mining Company Inc	S003584	397.75
35	E & S Coal Co Inc	I101187	538.25
36	Stanya Sales Co	S000383	701.5
37	Green Hills Enterprises	C001182	496.5
38	Roger'S Construction Co Inc	S024376	668.5
39	W. C. Tonkery Coal Co	S102589	411.75
40	Grace Enterprises Inc	S100897	476.75
41	Antco Inc	C000483	576.75
42	Patriot Mining Company Inc	S200501	368.75

**Figure 15: Marion 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>11</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 14: Employment and unemployment within radius of 5, 10 and 15 miles from the site**

Site No	Permit ID	Emp_05	Unemp_05	Emp_10	Unemp_10	Emp_15	Unemp_15
1	S003282	15048	2379	25817	3294	29135	3686
2	S104886	5188	413	23961	3309	29601	3856
3	S103087	7151	727	26114	3527	30215	4011
4	S025574	21240	3020	27362	3460	29907	3895
5	S002583	15151	2306	26435	3461	30004	3928
6	S105186	5986	624	23835	3172	28148	3530
7	C000782	7059	749	24220	3197	29215	3683
8	C000781	13330	2134	27266	3459	30007	3928
9	S102988	6897	630	24884	3391	29958	3924
10	S101989	12369	1629	25476	3390	29782	3877
11	S008182	11952	1609	25069	3345	29318	3789
12	S101392	18936	2788	26462	3345	29355	3738
13	C000982	9954	972	25115	3373	29744	3872
14	I106486	18126	2699	26262	3327	29184	3706
15	S200810	10691	1471	26092	3335	29877	3886
16	S016876	19577	2847	26219	3350	29014	3699
17	S101095	19924	2902	26697	3366	29526	3776
18	S103287	11738	1228	26986	3551	30235	4005
19	S101192	7628	699	24876	3378	29875	3904
20	S101786	12817	2132	25271	3262	28982	3656
21	S101788	21344	3036	27693	3512	30038	3937
22	S103589	2976	186	23121	3140	29837	3876
23	S007783	13330	2134	27266	3459	30007	3928
24	S007785	17454	2632	26252	3324	29250	3714
25	S104686	15661	2435	27320	3450	29980	3919
26	S000585	13118	1829	25885	3428	29946	3914
27	S101290	9082	966	28260	3715	30252	4024

<sup>11</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>.

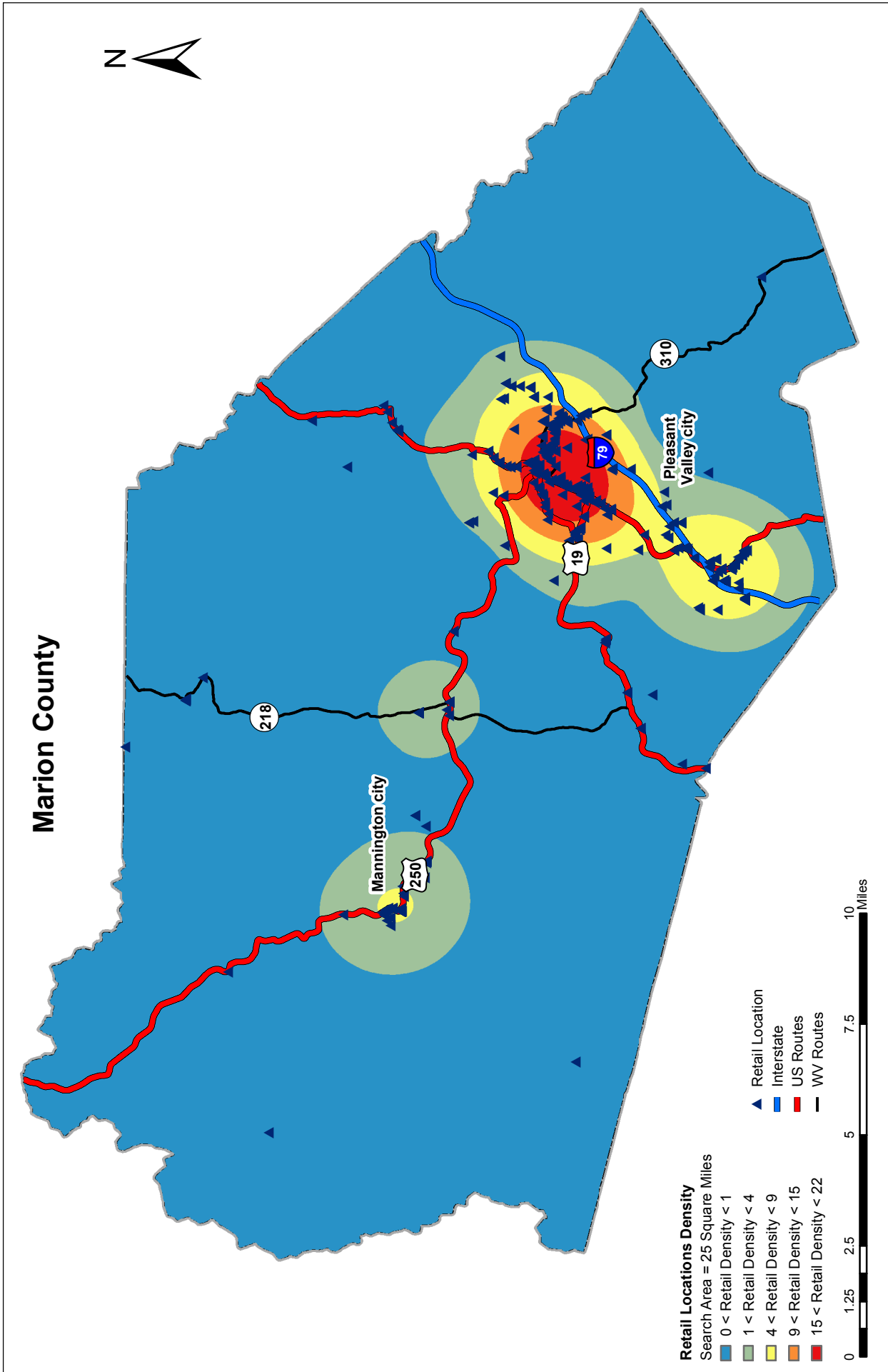
Site No	Permit ID	Emp_05	Unemp_05	Emp_10	Unemp_10	Emp_15	Unemp_15
28	S100398	3455	417	24380	3534	29689	3981
29	S200106	17173	2631	27298	3443	29963	3913
30	S100288	14965	2371	25849	3297	29218	3700
31	S006884	8498	976	24782	3232	29486	3761
32	S200904	20385	2963	27857	3528	30073	3949
33	S011979	5137	407	24983	3282	29926	3902
34	S003584	6311	544	24412	3344	29755	3882
35	I101187	19995	2897	26418	3366	29226	3734
36	S000383	21332	3037	27742	3521	30060	3945
37	C001182	12956	2136	25520	3277	29328	3716
38	S024376	15633	2374	27157	3530	30161	3977
39	S102589	6188	529	24380	3343	29758	3882
40	S100897	5200	394	23754	3276	29185	3785
41	C000483	14065	2135	25951	3426	29910	3904
42	S200501	7137	658	25730	3329	29933	3904

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



# Retail Location Density



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## **VI. Conclusion**

Marion County has a decreasing and aging population, with overall school enrollment slowly tapering off. However, the economy is diverse and increasing the number of professional businesses, wages are consistently growing, and the infrastructure is extensive. Marion County appears to be poised for growth if its assets can be utilized optimally.

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 Marion County to thrive.

Through a site distance analysis and complete demographic calculation, this plan provides the most comprehensive understanding of the economic state of Marion 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.