

The Appalachian Development Highway System In Kentucky 2010



What's Changed Since 1965



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Introduction

In 1965, Congress passed the Appalachian Regional Development Act (ARDA). Title II of this Act authorized the construction of 2,350 miles of highways, designated the Appalachian Development Highway System (ADHS). In subsequent years, Congress added 740 more miles that now form the 31 unique corridors of the ADHS. Individual states have taken the lead in planning, designing, constructing, and maintaining these corridors, while the Appalachian Regional Commission and the Federal Highway Administration have oversight responsibilities. Beginning in 1970, funding for construction of the highway projects has come from designated monies in the federal transportation authorizations as well as matching funds from the individual states.

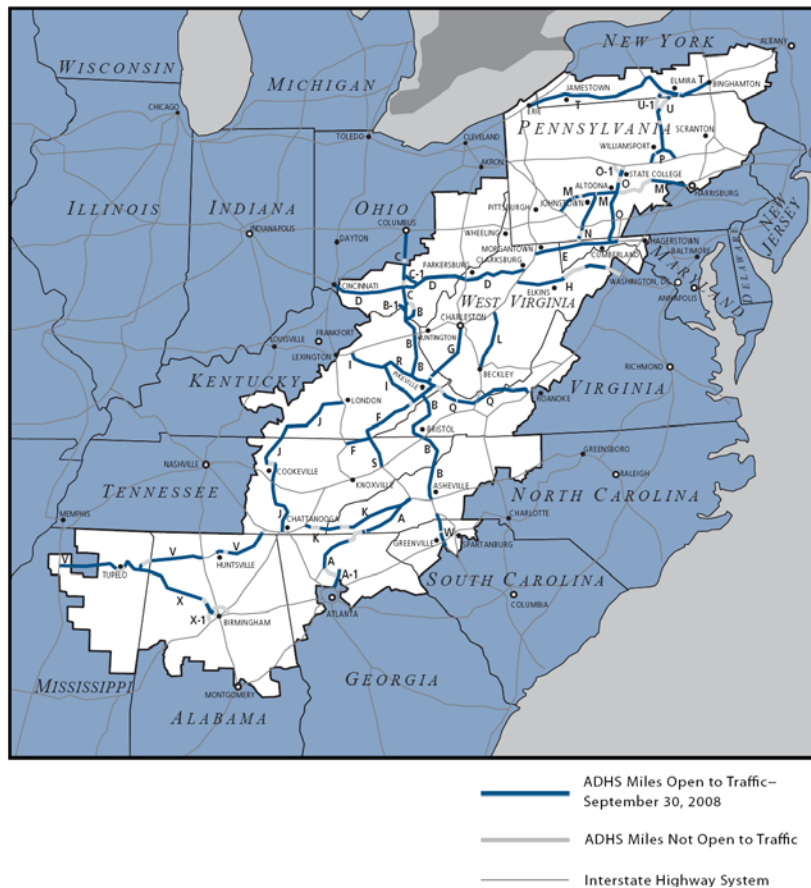


Figure 1: Appalachian Development Highway System¹

To date, approximately \$1.4 billion has been spent on Kentucky’s portion of the ADHS² and the system in Kentucky is nearly complete. Over 92% of the system has been built, over 2% is being constructed, and the remainder is being

¹ Appalachian Regional Commission, www.arc.gov

² KYTC Division of Program Management (actual money spent; figures not adjusted for inflation)

designed³. With the end of over 40 years of construction in sight, it poses the question, were the goals of this system realized? The original act recognized that the “region’s uneven past development (has) failed to provide the economic base that is a vital prerequisite for vigorous, self-sustaining growth.” The legislation created the ADHS to “open up areas with a development potential where commerce and communication have been limited by lack of adequate access.”⁴ In other words, the intent of the ADHS in Kentucky was to improve inter-regional access to the Interstate system that would then lead to improved economic prosperity for the counties that the ADHS would serve.

This report examines what the roadway system was like for the people of Appalachia before the ADHS was constructed and how travel has changed. It also looks at the economic changes for the people within the counties that are served by the ADHS. Have the goals of the ADHS, as envisioned in 1965, been met as its completion nears? Read further and decide for yourself.



³ 2007 Estimate of the Cost to Complete the ADHS in the Commonwealth of Kentucky

⁴ Appalachian Regional Development Act of 1965, Findings of Statement and Purpose; and Title II, Section 201.

What is the ADHS in Kentucky?

Kentucky has eight official ADHS corridors totaling 575 miles. This includes 148 ineligible miles, those sections of the ADHS that had already been improved to an acceptable condition and therefore ineligible to receive federal ADHS funding. Each corridor has been designated by a letter. Figure 2 shows the current routes of the ADHS in Kentucky in 2010. Most of the system is complete however, much of Corridor Q and one section of Corridor F still remains to be built; it is estimated that it will cost close to \$900M to complete them.⁵

Corridor	From	To	Route(s)
B	Virginia State Line near Jenkins, KY	Ohio State Line near Gray's Landing, KY	US 23; KY 10
B-1	Corridor B near Greenup Dam, KY	Ohio State Line near Portsmouth, OH	US 23
F	Tennessee State Line near Middlesboro, KY	Corridor B near Jenkins, KY	US 25E; US 119
G	Corridor B near Pikeville, KY	West Virginia State Line near Williamson, WV	US 119
I	Corridor F near Whitesburg, KY	I-64 near Winchester, KY	Mountain Pkwy. KY 15
J	Tennessee State Line near Peytonsburg, KY	I-75 near London, KY	KY 61 KY 90 KY 80
Q	Corridor B near Shelbiana, KY	Virginia State Line near Elkhorn City, KY	US 460 KY 80
R	Corridor I near Campton, KY	Corridor B near Prestonsburg, KY	Mountain Pkwy. KY 114

Table 1: ADHS Corridor Termini & Routes

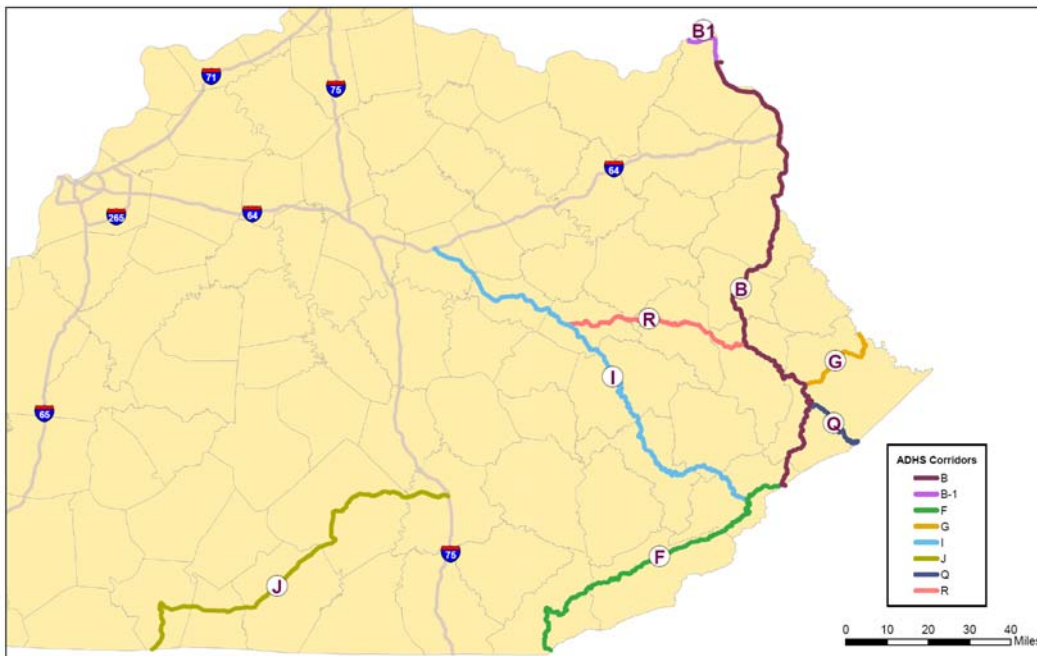


Figure 2: Kentucky's ADHS Corridors in 2010

⁵ 2007 Estimate of the Cost to Complete the ADHS in the Commonwealth of Kentucky

What was the road network like in 1965?

When the eight identified ADHS corridors were originally built, the technology and funding to create straighter and wider roads did not exist. They were primarily two-lane, narrow roadways that hugged the topography of the mountains and along the creeks of eastern and southern Kentucky. Tight turns and steep grades dominated much of the road system in Appalachia.



This limited opportunities for cars to pass slow moving vehicles. To make matters worse, many of the corridors were important for the transport of coal. Coal trucks were slow moving on the upgrades and caused traffic to queue with no chance pass safely. In addition, roads passed through many small cities, resulting in chokepoints caused by high concentrations of driveway access, traffic controls, and high volumes of vehicles. As a result, travel between and through cities were long, slow, and oftentimes treacherous.



How have the new routes changed travel times?

Over the last 40 years, many of the old routes have been reconstructed or realigned. In many cases, the new routes are significantly shorter in distance than their predecessors. The new ADHS has primarily been designed at a 55 miles-per-hour design speed or higher. Most of the tight turns and steep grades have been replaced. Nearly all of the cities have been bypassed. Some of the routes were widened to four lanes and the roads that were rebuilt with two lanes have a much higher number of passing opportunities. Significant travel time has been shaved off of each trip for travelers using the ADHS routes.

Travel Times

Roadway changes have led to a considerable improvement in mobility for residents of eastern Kentucky. For example, to travel from Hazard to Campton (68 miles) it would have taken approximately 110 minutes in 1965. After the road was reconstructed along Corridor I, travel time is now about 55 minutes, a savings of nearly an hour.

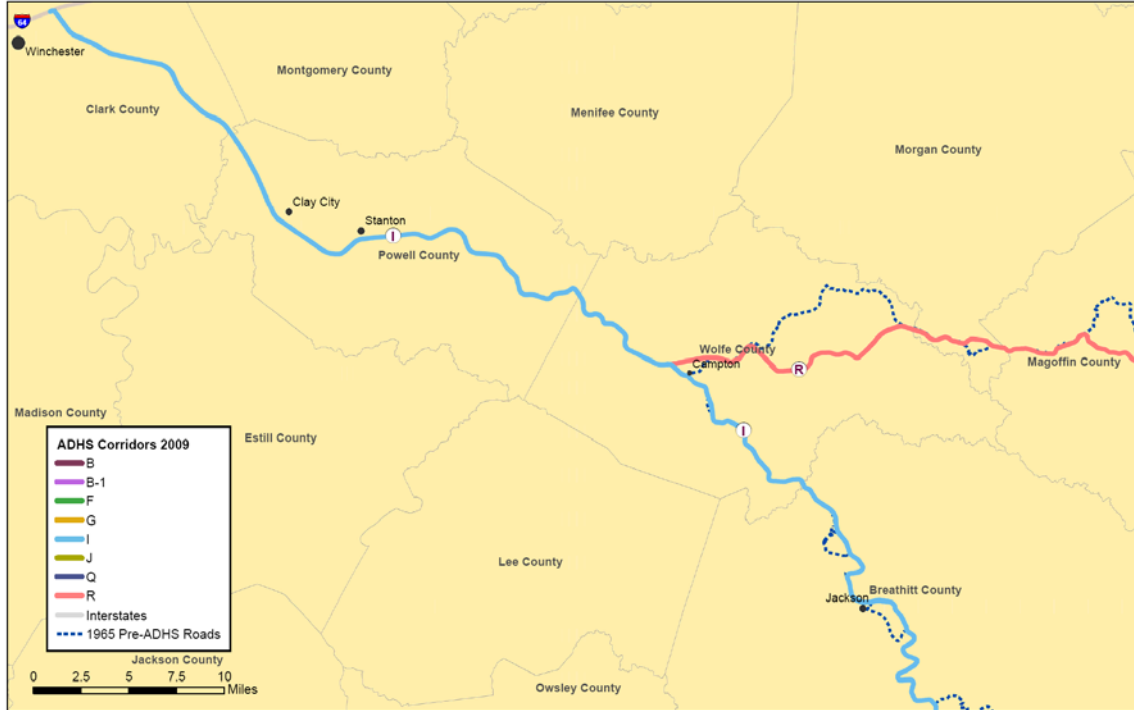
The travel speeds were estimated by driving the new and portions of the old routes. Table 2 compares the mileage (as approximated from GIS) and estimated travel speeds of the old and new routes. It also shows the improvement in travel time for each of the corridors as a result of the construction of the ADHS.

Corridor	Old Mileage	New Mileage	Old Travel Speed	New Travel Speed	Improvement in Travel Time
B	161	145	40 mph	53 mph	79 min
B-1	13	13	45 mph	55 mph	3 min
F	100	95*	36 mph	48 mph	42 min
G	29	27	32 mph	54 mph	19 min
I	146	126	44 mph	56 mph	86 min
J	108	103	42 mph	53 mph	42 min
Q	20	17	35 mph	60 mph**	18 min
R	62	51	35 mph	55 mph	51 min

* Corridor not complete; status as of October 2009. New speed is based on current corridor
 **Corridor beginning construction; New travel speed is projected based on future corridor.

Table 2: Improvement in ADHS Corridor Travel Times

The following pages show photographs that sample the different characteristics of the new ADHS routes. Each of the figures (Figure 3 through Figure 11) shows the alignment of the new routes and the routes that were used prior to the construction of the ADHS.



Corridors I & R

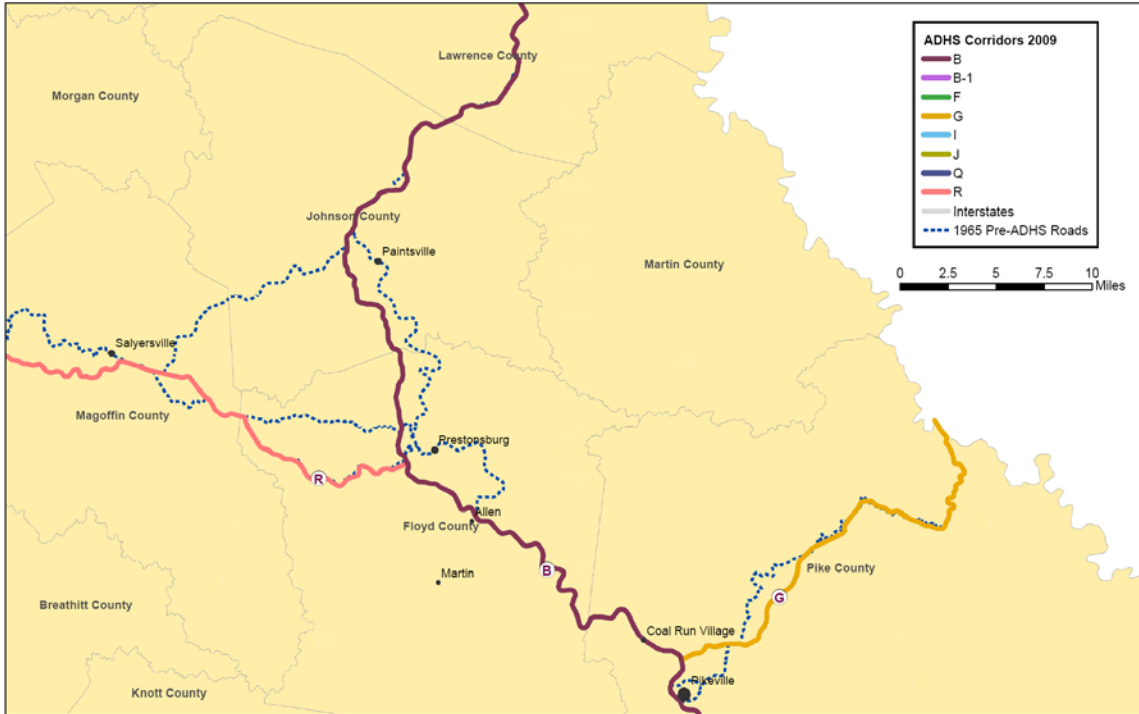
Figure 3



1. Corridor R: KY 114



2. Corridor R: Mountain Parkway, next to old route



Corridors B, G & R

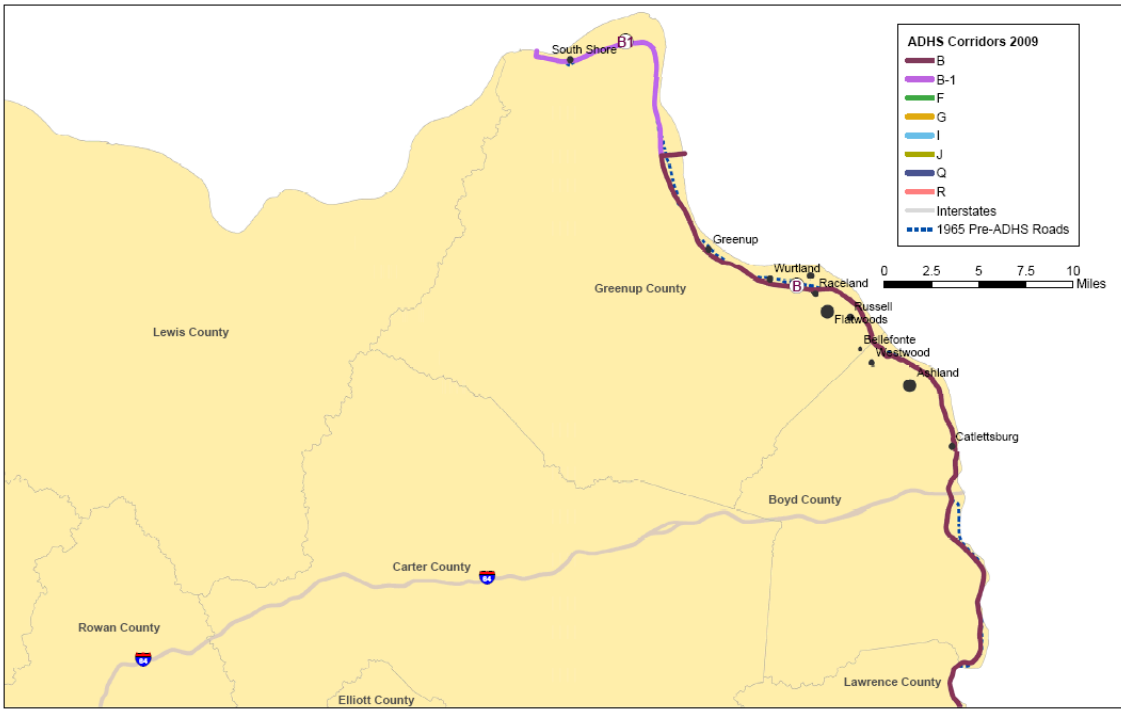
Figure 4



1. Corridor G: US119



2. Corridor R: KY 114 near US 460



Corridors B & B-1

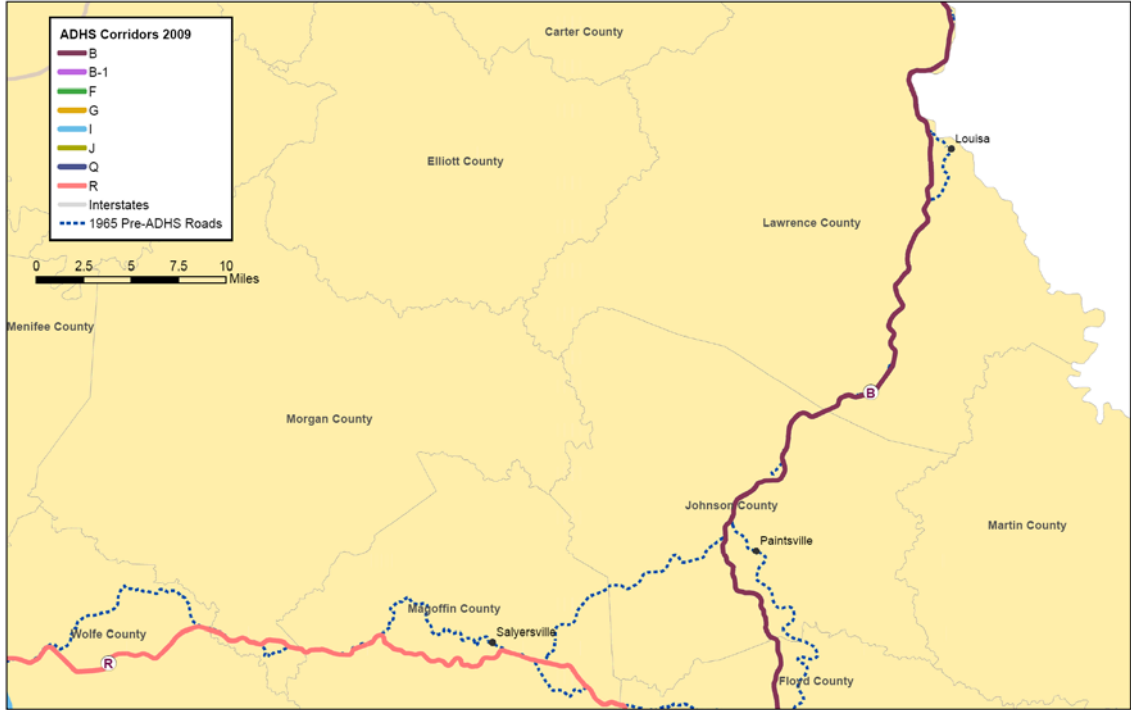
Figure 5



1. Corridor B: US 23 in Ashland



2. Corridor B-1: US 23 near South Shore



Corridors B & R

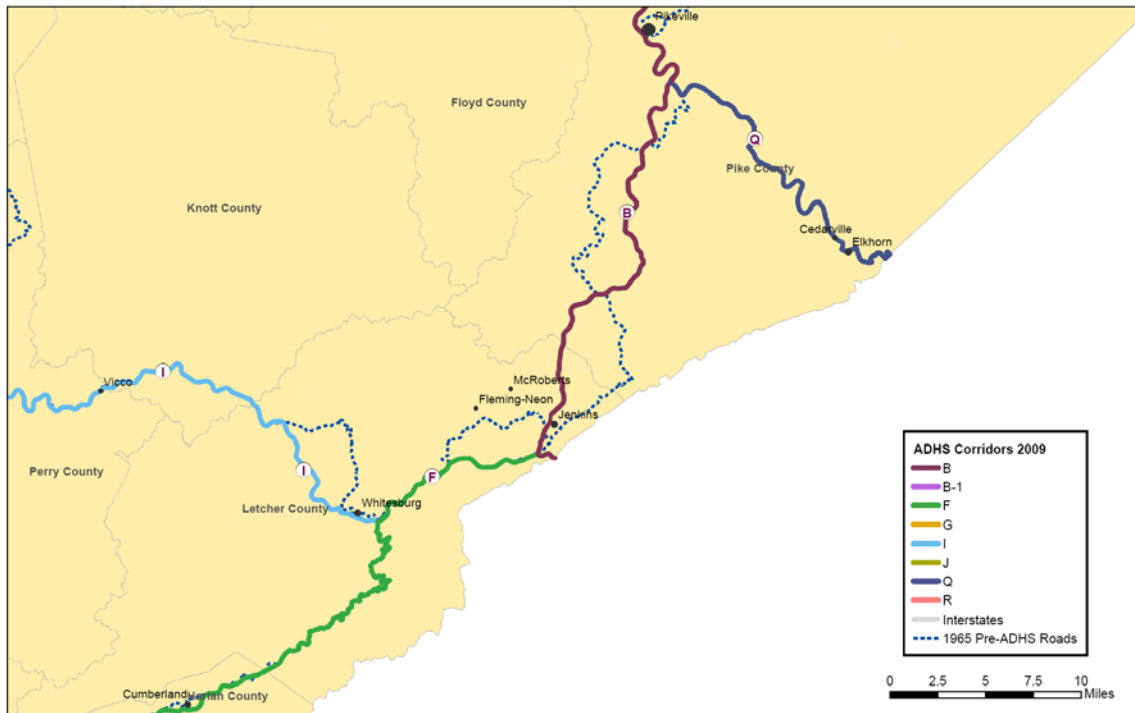
Figure 6



1. Corridor B: US 23 North of Paintsville



2. Corridor B: US 23 near Louisa



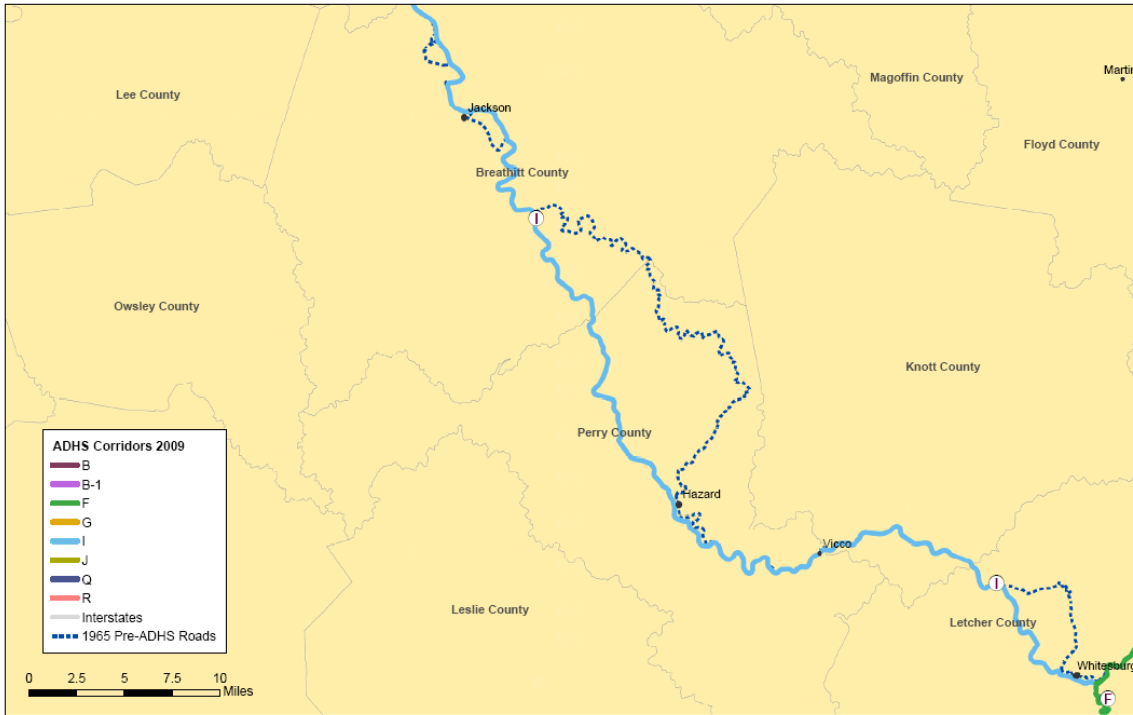
Corridors B, F, I & Q

Figure 7



1. Corridor Q: Future Alignment of US 460

2. Corridor F: US 119 west of Pine Mountain



Corridors F & I

Figure 8



1. Corridor I: KY 15 with passing lanes

2. Corridor I: KY 15 in Jackson



Corridor F

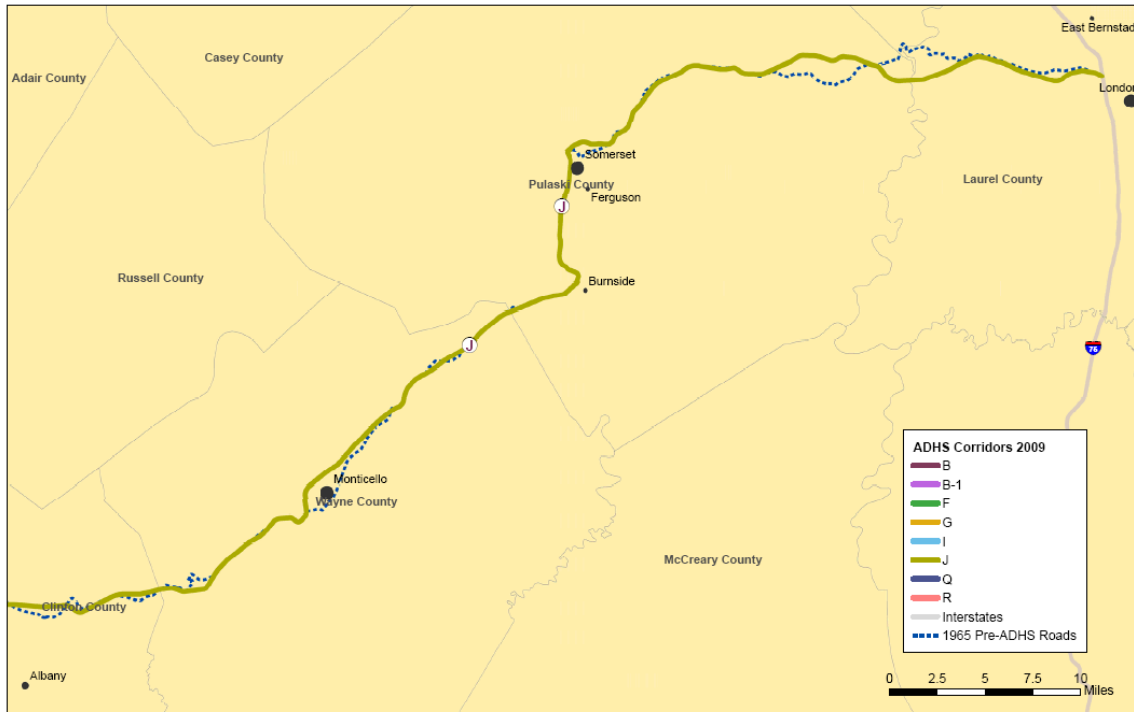
Figure 9



1. Corridor F: US 25E
Cumberland Gap
Tunnel



2. Corridor I: KY 15 in Jackson



Corridor J

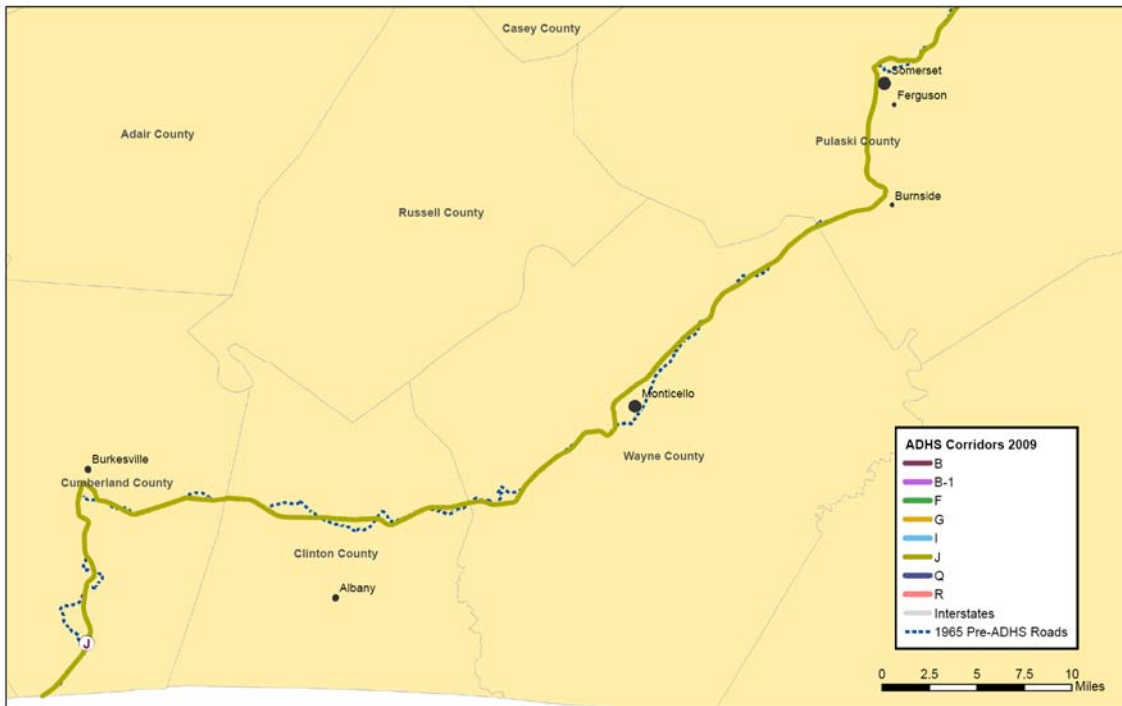
Figure 10



1. Corridor J: US 27 in Somerset



2. Corridor J: KY 90 Bridge over Lake Cumberland



Corridor J

Figure 11



1. Corridor J: US 61 near Peytonsburg



2. Corridor J: KY 90 north of Albany

Travel Time to Work

Since 1980, the U.S. Census has surveyed people on their travel time to work. This measurement includes multiple modes of transportation including personal automobile driving, transit, walking, and biking. In Appalachia, nearly all travel is done by individually owned vehicles, as opposed to the other modes or carpooling. In 1980, the average travel time for residents that live within counties containing an ADHS route was 23.7 minutes. In 1990, it remained nearly the same at 23.9 minutes (see Figure 12). In 2000, the measure took a large 18% jump up to 28.3 minutes. This followed a similar pattern to what happened statewide.

The increase in travel times happened despite having better travel conditions and faster overall travel times. In fact, work travel times for the ADHS counties (combined) are longer than the average Kentuckian (23.5 minutes.) Individually, 10 of the counties had average travel times 10 minutes or more than the state average (see Figure 13). This may indicate that workers may need to travel longer distances to find employment or that they are willing to travel farther to find better paying jobs.

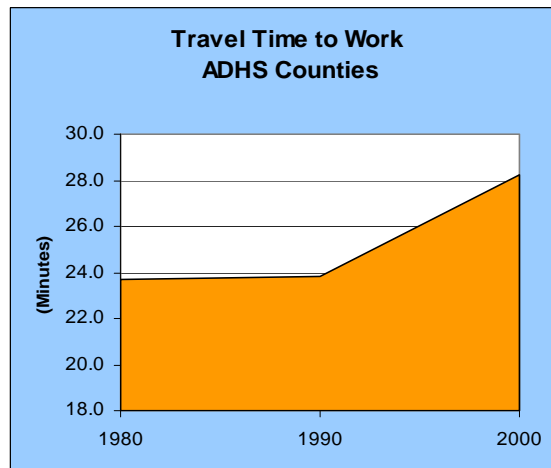


Figure 12: Average Travel Time to Work for ADHS Counties

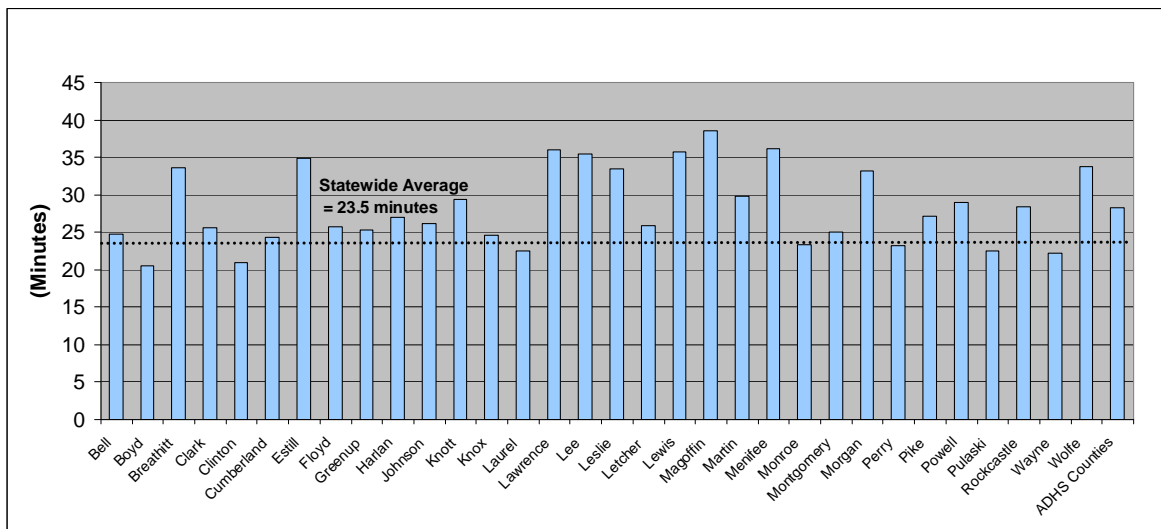


Figure 13: Travel Time to Work by County in 2000

What economic changes have taken place?

Initially, the principle purpose of creating the ADHS was to spark economic development and prosperity to the Appalachian region. To measure the economic progress, we chose two direct indicators as measured by the U.S. decennial census: poverty and unemployment. Both measurements focus on the success of individuals while collectively measuring the level of prosperity of the Appalachian counties and region as a whole. We also looked at population trends as a reflective indicator of wealth for the region.

Poverty Trends

Poverty levels are truly the best measurement for the economic success of a region because it measures the income and relative wealth of individuals and households.

It is important to understand a few things about how the U.S. Census Bureau currently measures and previously had measured poverty. Poverty was first reported in the 1970 decennial census. Since 1980, the poverty threshold has been defined by the size of the family and the number of children. Prior to that, it was defined by sex of the household head, size of the family, number of children, and by farm or non-farm residence. The latter threshold also did not distinguish among families with 7, 8, and 9 or more persons and the farm residents' poverty threshold was set at 85% of the non-farm residence threshold. These differences resulted in poverty rates in 1970 that were significantly higher than subsequent years.

Beginning with the new definition in 1980, the difference in poverty in counties that had the ADHS planned or built compared to Kentucky's statewide average was 7.5%. Although that difference has fluctuated, the gap between ADHS counties and statewide averages remains nearly the same in 2007. In ADHS counties, nearly 25% of the entire population still remains in, at, or below the poverty level.

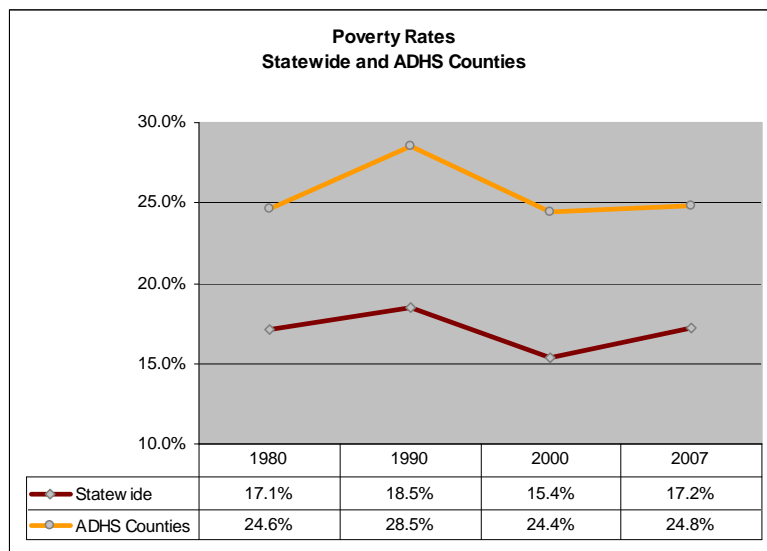


Figure 14: Poverty Rates of Individuals by Year

From 1980 to 2000, there were some counties, such as Morgan, Clinton, and Rockcastle that experienced significant reductions in poverty levels (see Figure 15.) However, according to the 2000 Census data on poverty rates, 28 of the 32 ADHS counties were higher than the statewide average of 15.4%.

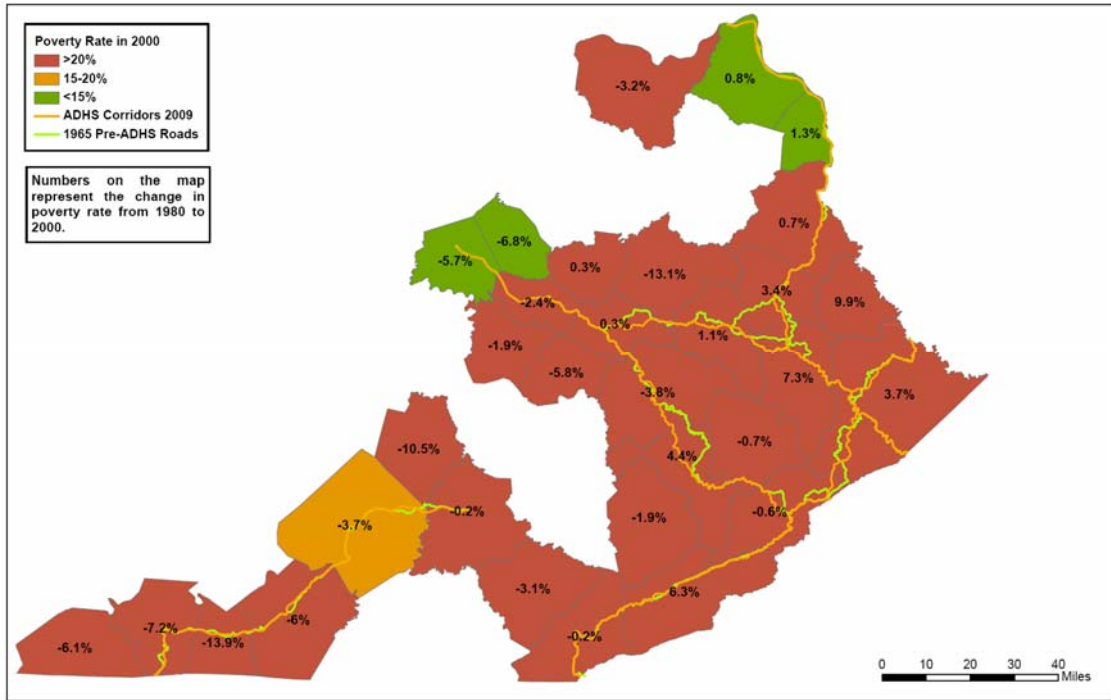


Figure 15: Poverty Rate in 2000 and Change from 1980 to 2000

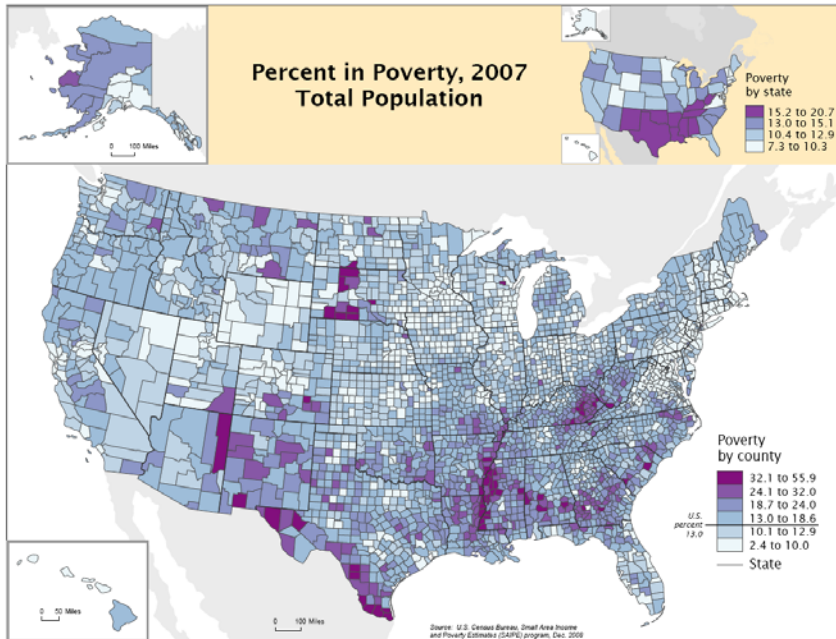


Figure 16: Percent In Poverty by County

In 2007, the economic prosperity of the region did not look promising. Of the 32 counties with an ADHS route, 29 have at least two in every ten persons living in poverty⁶ (see Figure 17.) Ten of those counties have at least three of ten in poverty. Only three counties – Boyd, Clark, and Greenup – are below the Kentucky statewide average.

⁶ US Census Bureau Small Area Income and Poverty Estimates (SAIPE) Model, 2007.

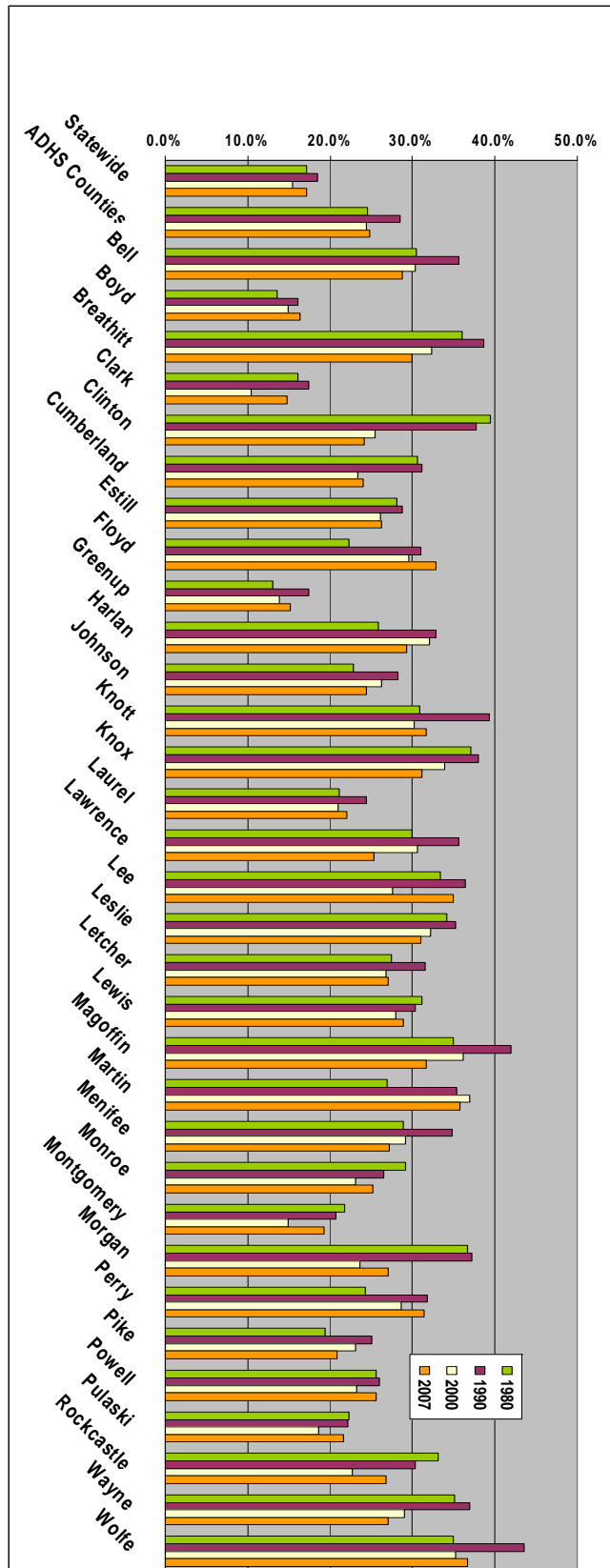


Figure 17: Poverty Rate By Year

Employment Trends

Level of employment is a way to measure the percentage of the available workforce that is able to get a job. It does not measure the quality or the levels of pay and benefits of the jobs. As such, employment does not fully represent the economic picture. However, you are able to see the historic trends of employment levels and the relative levels compared to the statewide average. For this report, the unemployment rate, a more common measure, rather than employment rate has been used.

There are two primary sources of employment data that were considered: the annual Labor Force Statistics (LFS) compiled by the Workforce Kentucky and the decennial census information collected by the U.S. Census Bureau. The methodologies in data collection differ so there are significant variations in the results.

Source	Region	1960	1970	1980	1990	2000	2008
LFS	ADHS Counties	N/A	N/A	9.3%	8.8%	5.9%	7.2%
LFS	Statewide	N/A	N/A	5.5%	6.1%	4.2%	6.4%
Census	ADHS Counties	10.0%	6.4%	11.0%	11.1%	8.4%	NA
Census	Statewide	6.0%	4.6%	5.6%	7.4%	5.7%	NA

Table 3: Unemployment Rates by Year

Unemployment has varied over the decades from a low 6.4% to a high 11.1% in the study area. ADHS counties have had and continue to have a significantly higher unemployment rate than the state of Kentucky (see Figure 18).⁷

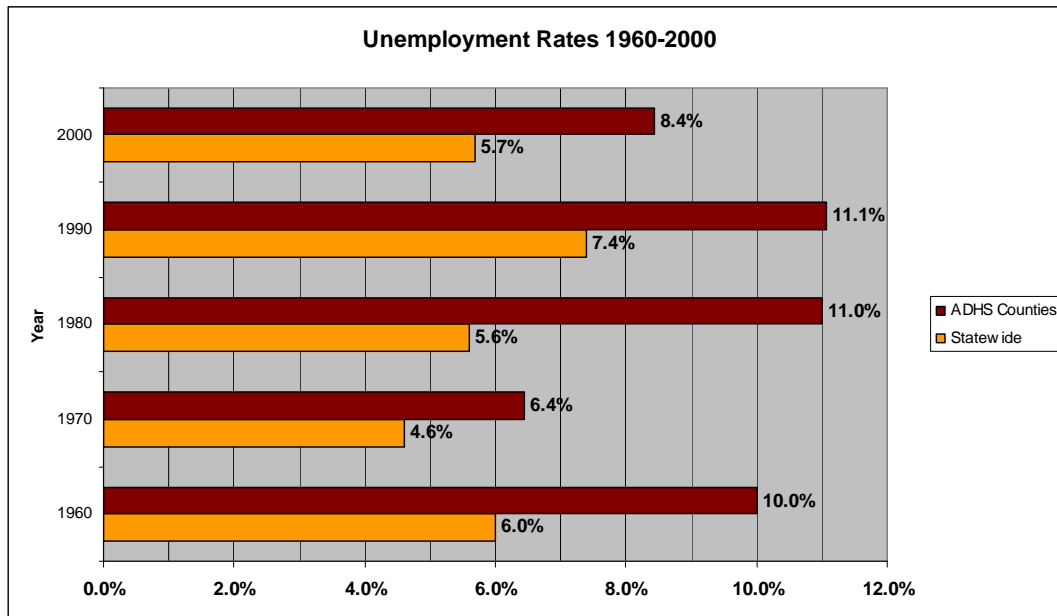


Figure 18: Unemployment by Year

⁷ U.S. Census Bureau

In 1960, 25 of 32 ADHS counties had higher unemployment rates than the statewide average (see Figure 19); in 2000, that number increased to 28 counties. Only Clark, Laurel, Powell, and Pulaski had lower percentages than the statewide average.

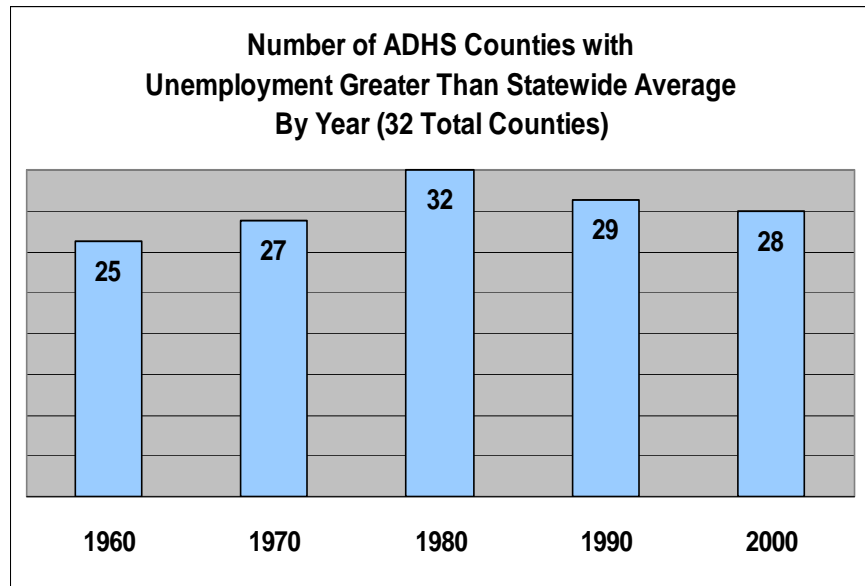


Figure 19: Unemployment Greater than Statewide Average

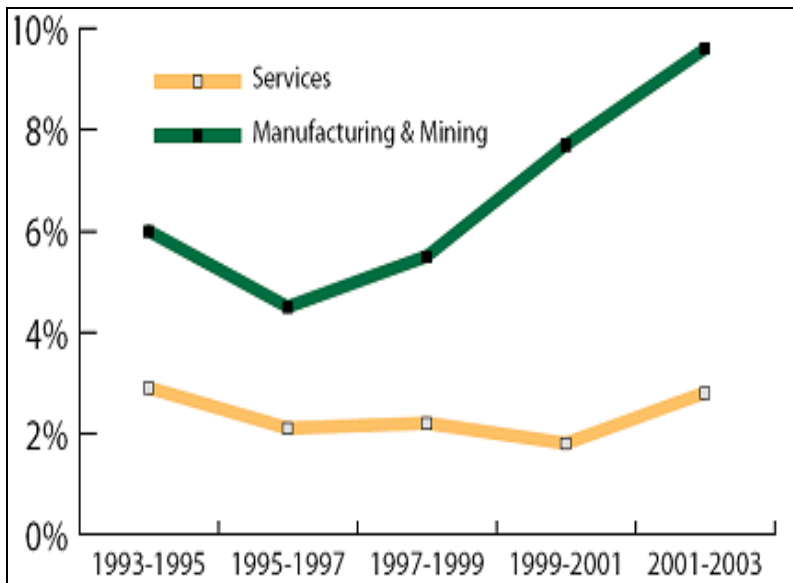


Figure 20: Appalachian Worker Displacement Rate by Sector: 1993 to 2003

Many of the workers in the ADHS counties work in the mining or manufacturing industries. As economic conditions for companies worsen, often workers are displaced. This may be due to a plant closing, insufficient amount of work, or the position was abolished. It was found that the displacement rates for these businesses in Appalachia have increased substantially between 1993 and

2003⁸. In fact, the displacement rate in the mining and manufacturing industries has grown at a much faster rate than those employed in the service sector in Appalachia (Figure 20). As a result of displacement, over 11% of displaced workers moved to a new location. For those that found full-time work after displacement, approximately half accepted wages at least 20% below their previous job. One other startling trend that was observed was that displacement in Appalachia, for most years in the studied decade, was significantly higher than the rest of the United States (Figure 21). These statistics include several states and show that the some of the problems with employment are indicative of the Appalachian region and are not limited to eastern Kentucky.

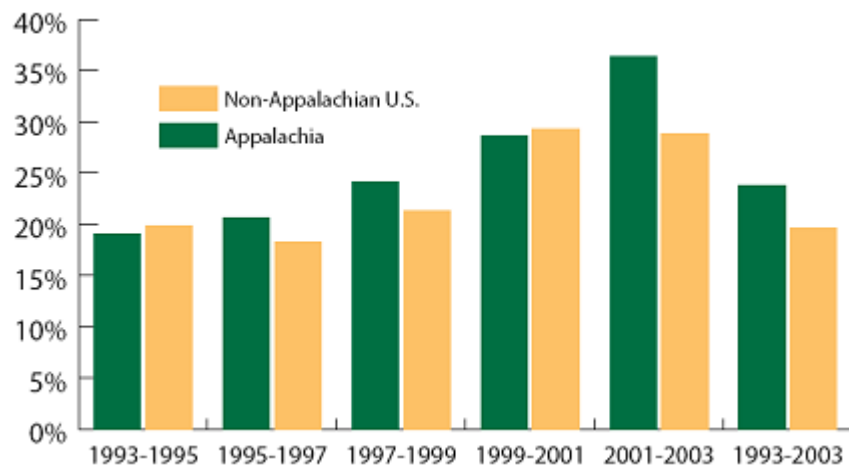


Figure 21: Worker Displacement Rate, Appalachia & Non-Appalachian U.S.: 1993 to 2003

⁸ Displacement in Appalachia and the Non-Appalachian United States 1993-2003, Keystone Research Center.

Population Trends

Populations of counties and regions can fluctuate for various reasons. Most often, the change in population can reflect the economic success or decline of an area. As industry and jobs increase, populations often increase. Congruently, as industry and jobs are lost, people tend to move away to locations that have jobs available. As such, population change may serve as a solid, indirect measurement of economic change.

Since 1960, the population in the ADHS counties has continued to change. This trend has not happened in a straight-line fashion, but has varied over time. As seen in Figure 22, there was an overall population loss in the decades of the 1960's and the 1980's, but an increase during the 1970's and 1990's. For the forty year span, the net growth for the ADHS Counties has been significantly lower than the Kentucky statewide population growth. Only eight of the ADHS counties had a growth rate higher than the statewide average.

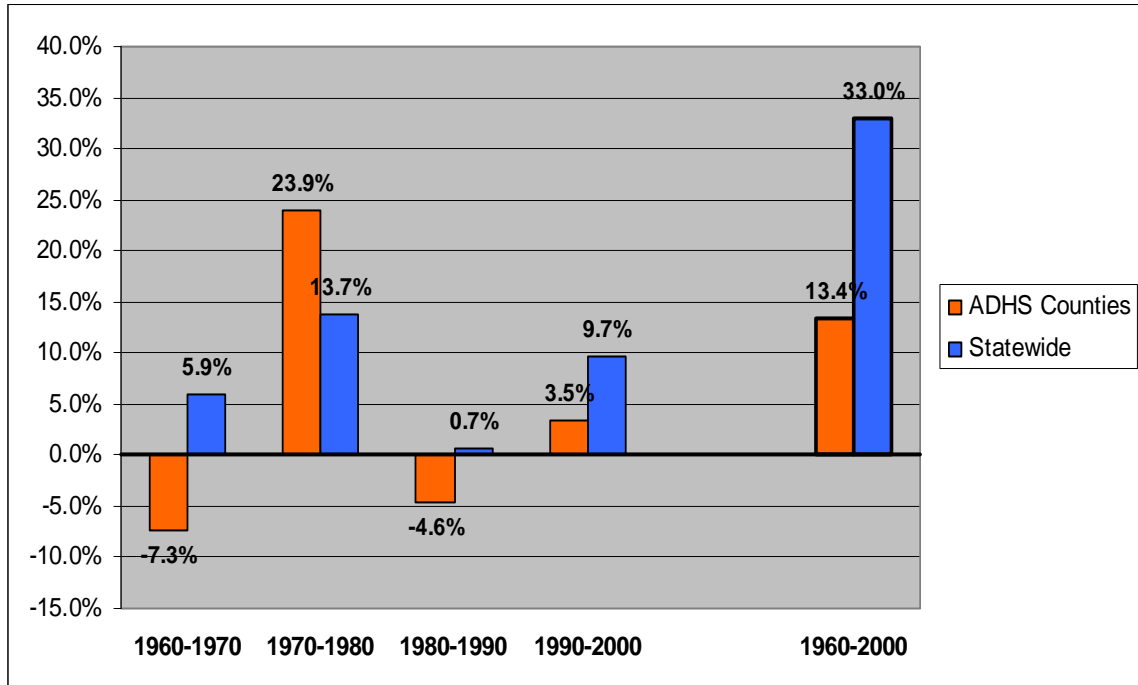


Figure 22: Population Change by Decade: ADHS Counties and Statewide

To examine population change at a finer scale, data at the census block group level was mapped. As seen in Figure 23, over the last forty years, many of the block groups within the region have remained stable (between -.5% and +.5% change per year) or grown at a mild rate (0.5% to 1.5% per year.) Most of the moderate (1.5 to 2.5%) and high growth (>2.5%) has taken place around larger cities: Ashland, London, Somerset, and Winchester.

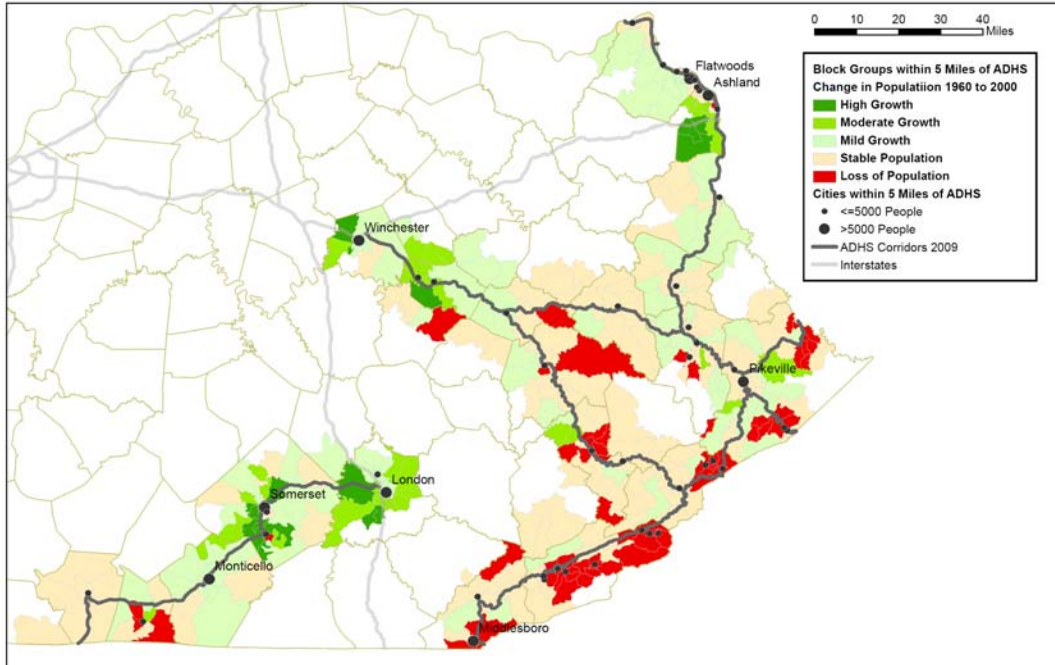


Figure 23: Population Change 1960 to 2000

The story between 1990 and 2000 has been quite different. It is clear that many block groups have lost population during this time period (see Figure 24.) This trend is widespread, but the general tendency is that the farther you travel southeast, the greater the density of block groups with population loss. It also appears that population loss is greater the farther you travel from the Interstate highway system. The largest growth areas are in London, Winchester, and Lake Cumberland Area, southwest of Somerset.

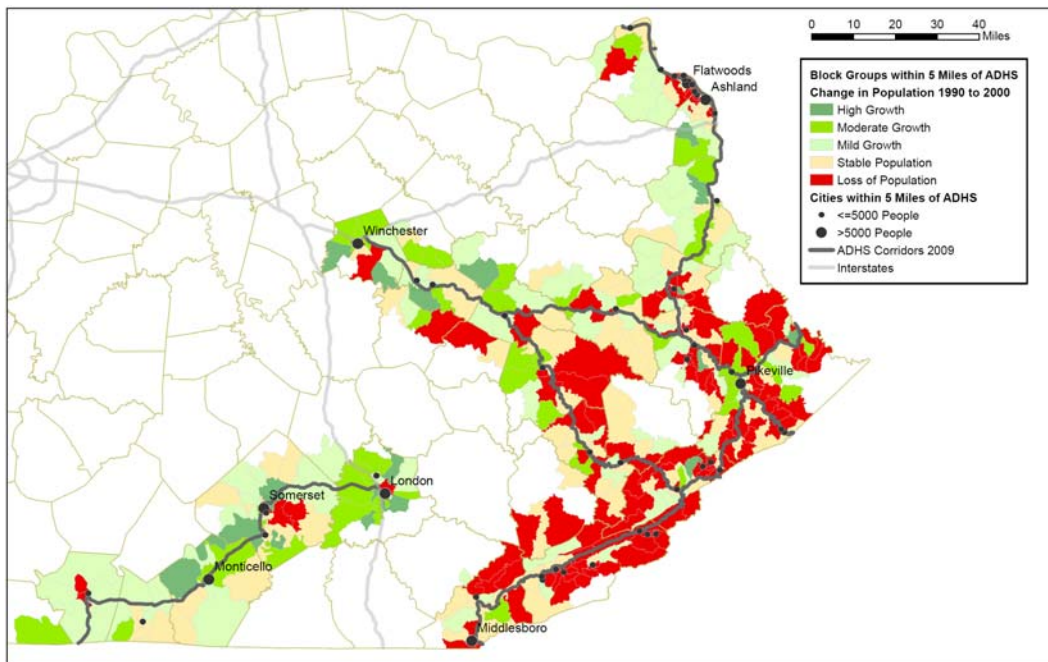


Figure 24: Population Change 1990 to 2000

The Impact of Coal

For many of the counties containing ADHS routes, the coal industry has been the primary economic engine. In fact, in eight of the ADHS counties (Bell, Harlan, Knott, Leslie, Letcher, Martin, Perry, and Pike), 15% to 58% of the wages of all workers comes directly from mining employment⁹. These figures do not include administrative and professionals that are employed by the mining industry. They also do not include private services or indirect employment such as private haulers. From these figures, it is clear that coal strongly drives the economy of these counties; therefore, changes and impacts to the coal industry have had a very direct bearing on the economic vitality and resultant population of these counties.

Over the last four decades there have been four major changes that affected the coal industry of eastern Kentucky. First, beginning in the early 1970s, there was a shift toward using surface mining techniques in addition to underground extraction. You can see in Figure 25, the amount of surface mining sharply increased and actually surpassed underground mining for a short time in the mid-1970s.

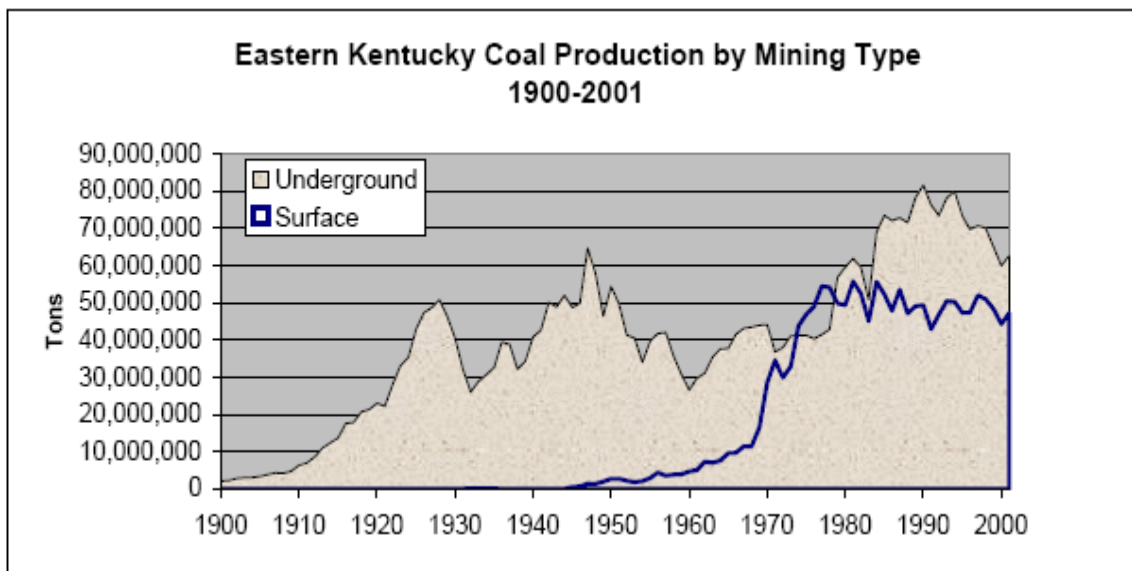


Figure 25: Surface and Underground Coal Production

Second, technological advances lead to greater mechanization and efficiencies of the coal extraction process which, in turn, required fewer employees per ton of coal. In the Appalachian region, productivity (tons of coal per employee) more

⁹ Kentucky Coal Education website, http://www.coaleducation.org/Ky_Coal_Facts/employment/county_employment.htm

than doubled from the year 1973 to 2003.¹⁰ Using Knott County as an example, beginning in 1992, there was a sharp increase in coal production (see Figure 26). In 2000, production was 38% higher than it was in 1990. Despite record production numbers, unemployment numbers were at record levels in 2000, and poverty levels remained above 30%. In 2004, over 59% of the wages for Knott County came from the coal industry. It could be inferred that the mechanization has kept the employment and thus poverty levels from improving despite the growth in coal production.

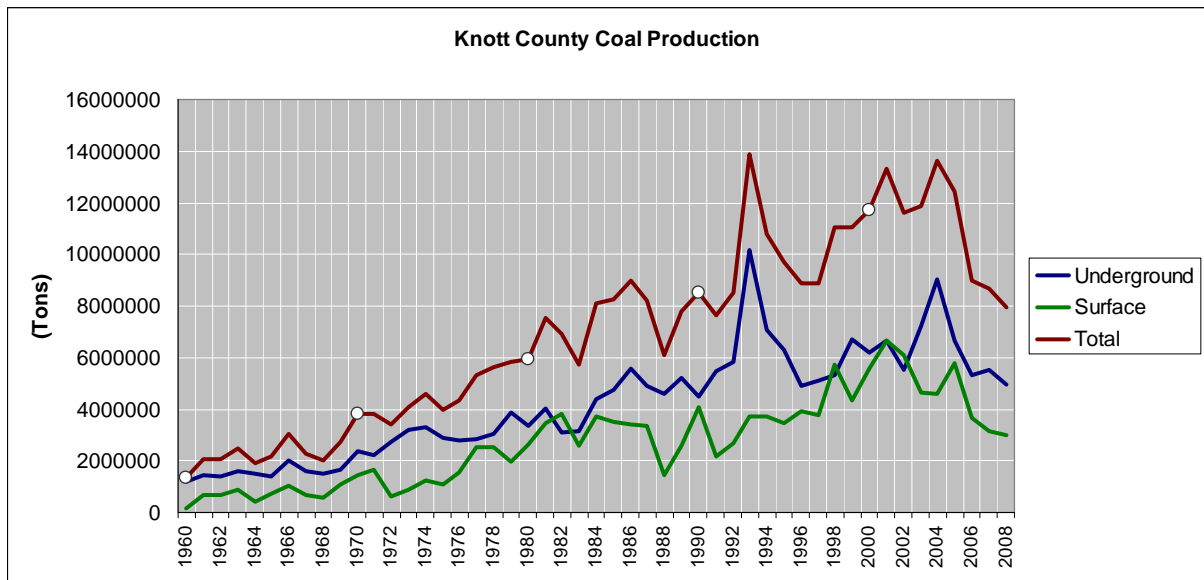


Figure 26: Knott Count Coal Production 1960-2008

Third, as a reaction to the oil embargo in 1973-4 and energy crisis in 1979-80, there was an increase in production of coal (see Figure 27.) The amount of both underground and surface mining skyrocketed and then plateaued through the late 1980s and 1990s.

¹⁰ Coal Production in the United States, U.S. Energy Information Administration, October 2006.

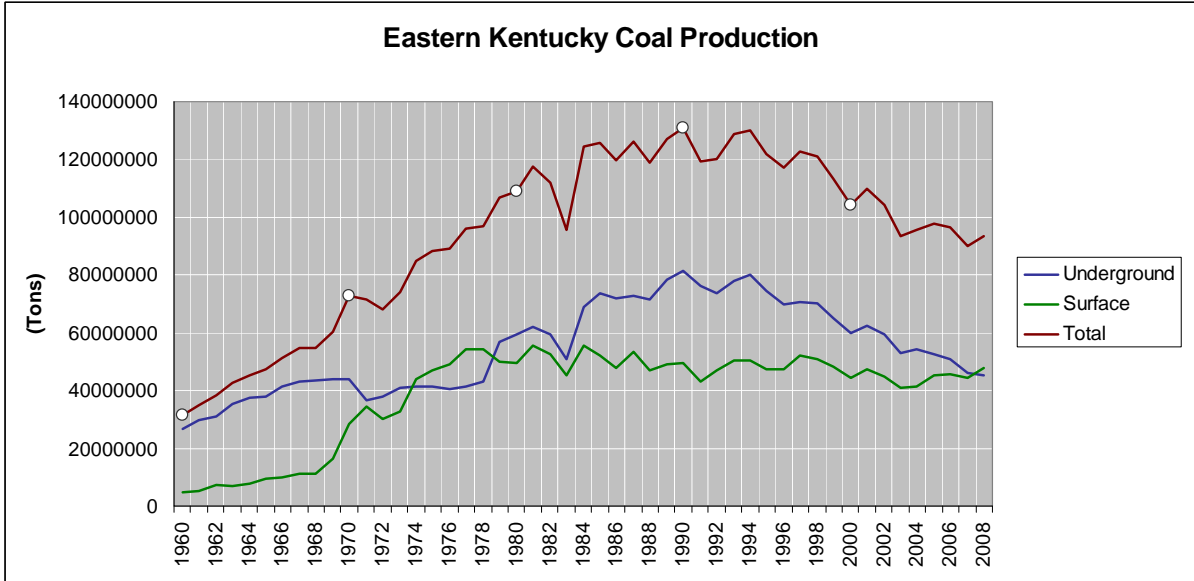


Figure 27: Eastern KY Coal Production 1960 - 2008

Finally, production of cleaner-burning coal from western states has increased significantly. Due to stricter air quality standards, this lower-sulfur coal is in higher demand than the eastern U.S. higher-sulfur coal. Since the 1990s, the rate of coal extraction in eastern Kentucky has dropped 30% (See Figure 27.)

Conclusion

The Appalachian Development Highway System was created to improve access, i.e. connections, to the Interstate highway system with the goal of improving economic conditions for the people living in Appalachia. With over 92% of the Kentucky portion of the ADHS complete, this study set out to determine if the creation of the ADHS in Kentucky has affected enough change to reach those goals. Through examination of field conditions and socio-economic data, it can be said that the creation of the ADHS was only partially successful. While travel conditions have clearly improved throughout the region as a direct result of the ADHS, the economic conditions have not improved for the people within the counties most directly served.

Access to the Interstate system and regional mobility for residents of Appalachia were greatly improved due to the construction of the ADHS. Travel times were greatly reduced due to reduced corridor lengths, higher design speeds, and an increase in safe locations to pass slow moving vehicles. This improved mobility has allowed people of the region to travel farther and safer to locations previously difficult and dangerous to reach.

Economic conditions, on the other hand, have not improved as a whole over the last 40 years. Poverty rates have not significantly changed and remain far higher than the statewide average. Almost one-quarter of all people within the analyzed counties were in poverty in 2000. Similarly, employment data has shown that the unemployment rate remains far higher than the Kentucky statewide average. Finally, population trends were considered as an indicator of economic prosperity. The region has grown as a whole but at a significantly slower rate than the statewide average. It is also evident that the counties farthest southeast have been losing population between 1990 and 2000, a sign of economic struggle and lack of good jobs.

Several questions must be asked although the answers may only be speculative. What would this region be like had the ADHS not been built? Would the economics of the region be better or worse? It must be pointed out that the construction of a quality highway system is only a small part of driving the economic success for a rural community or region. Low wage rates, numbers of high school graduates, amenities associated with a retirement community, higher levels of education spending, an airport within 50 miles, and communities with high quality of life are all critical elements in attracting positive economic growth.¹¹ What if more public funding had been directed to other infrastructure and services and less on transportation? A lesson from this is that highways must be used as an economic development tool in conjunction with many other strategies in order to be effective. The ADHS is nearly complete and will serve as a solid base for local and statewide leaders to improve the economic conditions for the citizens of Kentucky's Appalachia.

¹¹ Rural Economic Development: What Makes Rural Communities Grow?, Lorna Aldrich and Lorin Kusmin, Agriculture Information Bulletin No. 737, USDA, September 1997.