

Appalachia

THEN AND NOW

Examining Changes to the Appalachian Region Since 1965

EXECUTIVE SUMMARY

FEBRUARY 2015



Prepared by the Center for Regional Economic Competitiveness
and West Virginia University for the Appalachian Regional Commission

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Assessing Appalachia's Progress: An Overview



Credit: Ken Murray

Background

In the late 1950s, intense poverty and economic struggle characterized the existence of many of the 19 million people living in the Appalachian Region. The magnitude and vastness of Appalachia's challenges led the Region's governors in 1960 to form the Conference of Appalachian Governors, in order to develop a regional approach to addressing Appalachia's needs. In 1961, the governors took their case to newly elected President John F. Kennedy, who had been deeply moved by the poverty he saw during campaign trips to West Virginia.

In 1963, President Kennedy formed a federal-state commission, the President's Appalachian Regional Commission (PARC), and directed it to draw up a comprehensive program for the economic development of the Appalachian Region. The commission's report, released in April 1964, called on the federal government to make substantial investments in the Region to provide infrastructure and other programs essential to help the Region grow and provide opportunity for its people. The report also recommended establishing a regional organization,

the Appalachian Regional Commission (ARC), to leverage the use of existing resources and maximize new ones in an ongoing development effort.

The PARC report's recommendations were endorsed by the Conference of Appalachian Governors and cabinet-level officials, and were subsequently used as the basis for the Appalachian Regional Development Act of 1965 (ARDA), ARC's governing legislation. A broad bipartisan coalition in Congress passed the ARDA early in 1965, and President Lyndon B. Johnson signed the legislation into law on March 9, 1965.

It has now been 50 years since the passage of the ARDA. Appalachia has experienced significant progress since then, but still faces persistent challenges. This research report was undertaken to quantify and document changes to Appalachia over the past 50 years, to evaluate ARC's contribution to the Region's economic development during this period, and to assess the extent to which Appalachia remains "a region apart" from the rest of the United States.

The research summarized in this report used an array of evaluation techniques developed to evaluate the impact and legacy of ARC's investments in the Appalachian Region. In particular, this report (1) documents 50 years of socioeconomic and structural changes in the Region; (2) analyzes the economic impacts of ARC's investments, using two techniques: regional input-output analysis and a quasi-experimental method that compares ARC-assisted counties with a control group of counties outside the Region; and (3) examines stakeholder perceptions about past performance and future priorities.

About the Appalachian Region

The current boundary of the Appalachian Region (see Figure 1) includes all of West Virginia and parts of 12 other states: Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, and Virginia. It covers 205,000 square miles and 420 counties, and is home to more than 25 million Americans. Forty-two percent of the Region's population is rural, compared with 20 percent of the nation's.

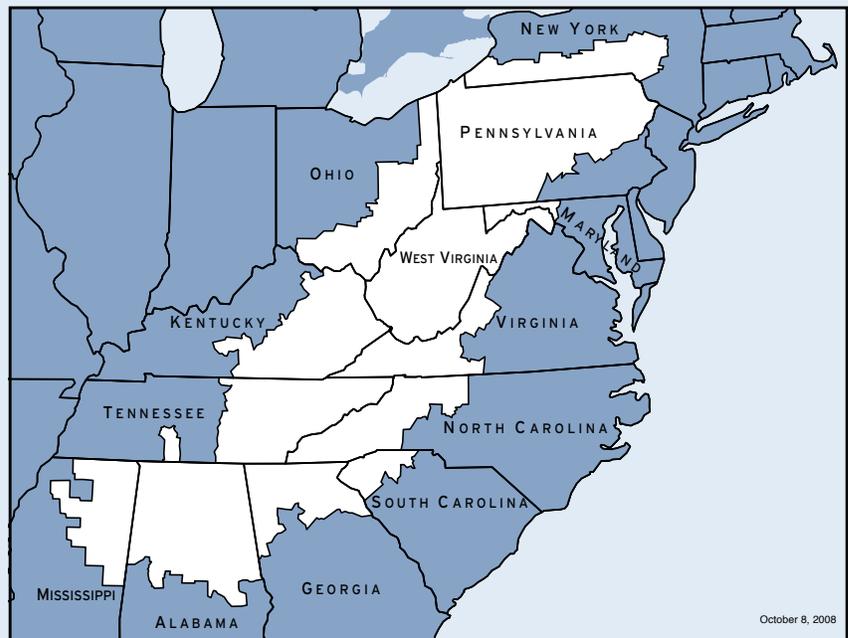
In 1965, the ARDA defined the Appalachian Region as 360 counties in 11 states (Alabama, Georgia, Kentucky, Maryland, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, and West Virginia). The official boundary has expanded several times since then: New York joined the Commission in late 1965, adding 13 counties to the Region, and Mississippi joined in 1967, adding 20. Also in 1967, two Alabama counties, one New York county, and one Tennessee county were added to the Region. In 1990, one Ohio county was added; in 1991 one Mississippi county was added; in 1998 two Alabama counties, two Georgia counties, one Mississippi county, and two Virginia counties were added; in 2002 two Kentucky counties and two Mississippi counties were added, and in 2008, three Kentucky counties, three Ohio counties, two Tennessee counties, and two Virginia counties were added to the Region.

About the Appalachian Regional Commission

The Appalachian Regional Commission represents a partnership of federal, state, and local governments. Established by the Appalachian Regional Development Act of 1965, ARC's mission is to help the Region achieve socioeconomic parity with the rest of the nation by partnering with the Region and advocating for sustainable community and economic development in Appalachia.

The 1964 report by the President's Appalachian Regional Commission sketched out the major priorities for ARC-funded activities: improving the Region's physical accessibility, developing the Region's economy while reducing dependence on the extraction of natural resources, and enhancing the capability of the Region's people to achieve economic prosperity.

Figure 1: The Appalachian Region



Source: Appalachian Regional Commission

Appalachia is a 205,000-square-mile region that follows the spine of the Appalachian Mountains from southern New York to northern Mississippi. It includes all of West Virginia and portions of 12 other states: Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, and Virginia. Forty-two percent of the Region's population is rural, compared with 20 percent of the nation's.



Credit: Ken Murray

ARC's structure was designed to ensure an active federal-state-local partnership. There are 14 Commission members: the governors of the 13 Appalachian states and a federal co-chair, who is appointed by the president and confirmed by the Senate. Each year one of the 13 governors is elected by the others to serve as states' co-chair of the Commission. Each governor appoints an alternate, who oversees the state's ARC program and serves as the state-level contact for those seeking ARC assistance. The states' interests at ARC/Washington are handled by the states' Washington representative, who is hired by the states.

Commission members appoint an executive director to serve as the chief executive, administrative, and fiscal officer. Commission staff serve both the federal and the state members in carrying out ARC programs and activities. The Commission's administrative costs are shared equally by the federal and state governments.

All program strategies, allocations, and other policy matters must be approved by both a majority of the governors and the federal co-chair. This consensus model ensures close collaboration between the federal and state partners



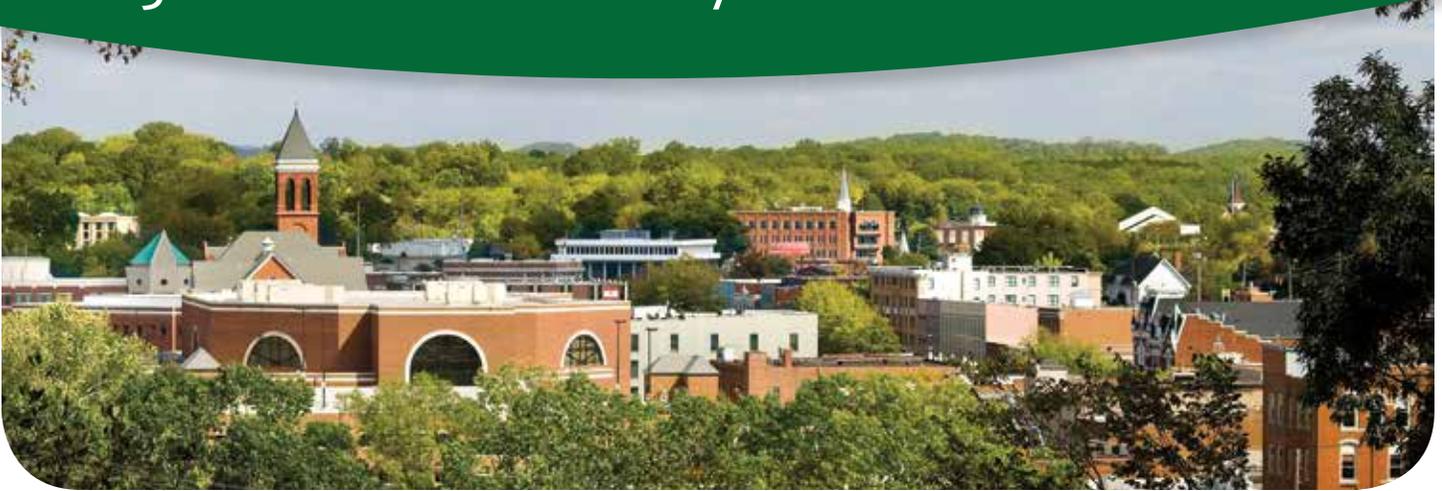
Credit: Ken Murray

in carrying out ARC's mission. Local participation is provided through multi-county local development districts, with boards made up of elected officials, businesspeople, and other local leaders.

Unlike economic development agencies that are primarily grant makers, the Commission also performs advocacy, regional planning, and research activities in combination with its

grant programs. These planning and technical assistance activities multiply the influence and shape of ARC's grant programs. No other entity has this regional mandate for Appalachia.

A Region Apart: Measuring Appalachia's Progress toward Parity



Credit: Ken Murray

Key Measures

The 1964 PARC report called Appalachia “a region apart—geographically and statistically,” adding that the Region had many natural advantages that had benefitted too few of its people. At that time, incomes in the Region were much lower than the U.S. average, unemployment was much higher, and the Region suffered from many other disadvantages that reflected what the PARC report called “the realities of deprivation.” These and other measures helped make the case for creating a focused regional development program.

This research uses the same ten key measures that led to the creation of the Appalachian Regional Commission to determine whether there has been measurable improvement across the Region over the last 50 years. While these ten indicators in some ways reflect the concerns of earlier decades, most are just as relevant today.

1. Large income disparity between Appalachia and the rest of the nation.

2. Relatively high unemployment.
3. Decline in employment.
4. Outmigration of people (and workers) from the Region.
5. Over-concentration of employment in extractive industries.
6. Relatively low educational attainment.
7. Relatively poor quality of available housing.
8. Health of the Region's population.
9. Relative isolation due to lack of transportation access.
10. Relative isolation due to limited communications.

INCOME DISPARITY

Improving, but still Problematic in some Parts of the Region

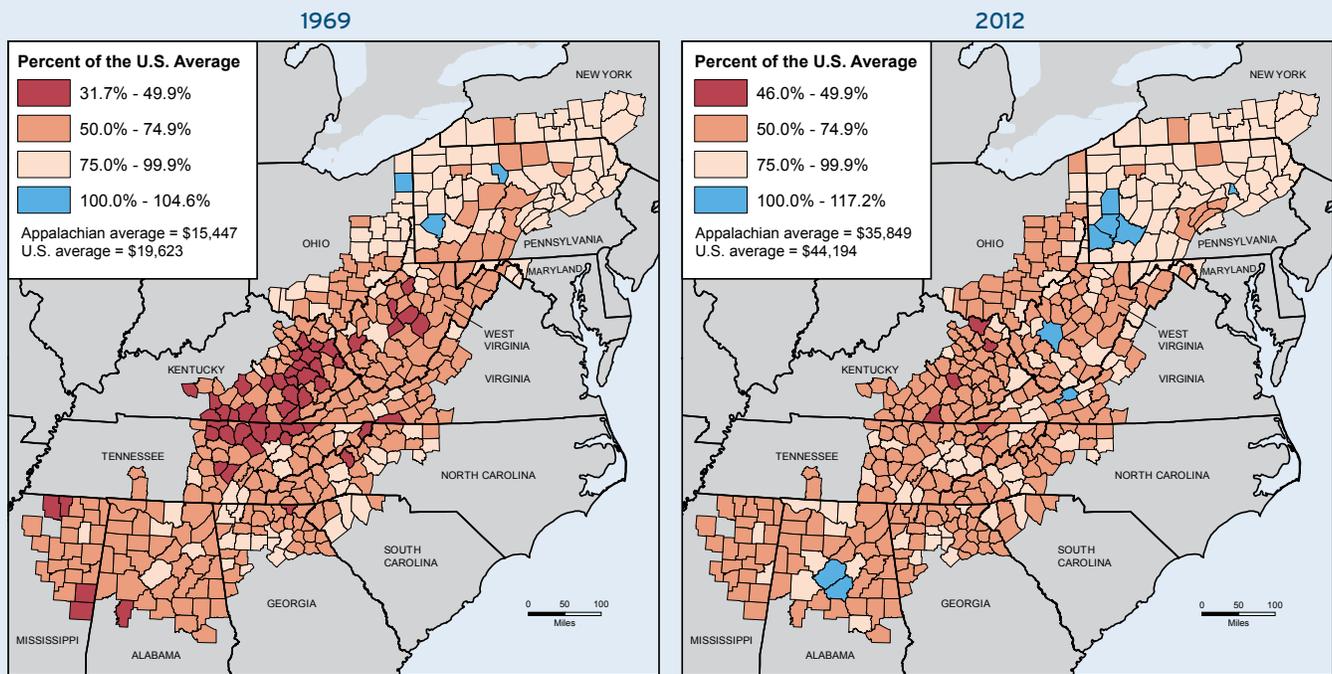
Appalachia's poverty rate has been cut in half over the past five and a half decades, from nearly 31 percent in 1960 to about 16.6 percent today. In 1960, per capita income in Appalachia was measured at about 74 percent of U.S. per capita income. A big challenge at

Appalachia's poverty rate has been cut in half over the past five and a half decades, from nearly 31 percent in 1960 to about 16.6 percent today.

that time was the rural character of the Region and the lack of a formal economy in much of it.

Family incomes in the Region were 84 percent of the U.S. level in 1960. This number reflects the facts that the Region's families were larger and more family members earned income (many in informal ways, including barter and exchange) than was typical for the rest of the nation.

Figure 2: Per Capita Income in Appalachia, Relative to the U.S. (Percent of the U.S. Average)



Source: U.S. Bureau of Economic Analysis

Notes: Per capita income is total personal income divided by total population. The percent of U.S. average is computed by dividing the county personal income by the U.S. average and multiplying by 100. Income data are adjusted for inflation, expressed in 2012 dollars.

By 2012, many counties were approaching socioeconomic parity with the rest of the nation, although some were still struggling, with per capita income levels below 75 percent of the U.S. average.

Currently, government transfer payments account for nearly 24 percent of personal income in the Appalachian Region. By comparison, those payments account for 17.5 percent of personal income nationally.

Figure 2 shows that per capita income in many counties across Appalachia in 1969 was less than half the national average, and that significant progress had been made by 2012, with only five counties still having such a low income. By

2012, many counties were approaching socioeconomic parity with the rest of the nation, although a number of counties were still struggling, with per capita income levels below 75 percent of the U.S. average.

**UNEMPLOYMENT
Much Improved Compared with the Nation as a Whole**

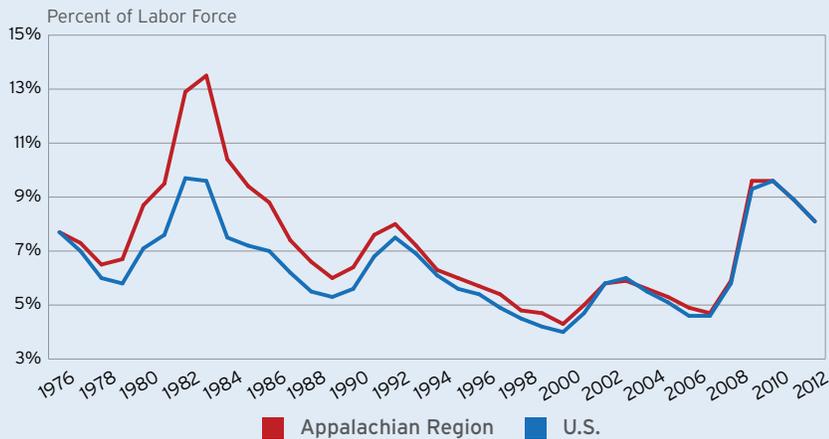
In 1960, the Appalachian Region's unemployment rate stood at 7.1 percent, more than 2 points higher than the

national rate of 5.0 percent. The lack of job opportunities in the Region was due to declines in key sectors, including mining and agriculture. As the Region's economic structure evolved, its unemployment rate converged with that of the nation as a whole, as illustrated in Figure 3.

The Region's unemployment rate tracked slightly higher than the rest of the nation's in the late 1970s, 1980s, and 1990s, but never quite matched the U.S. rate until the recession of the early 2000s. However, since the 2008-09 recession, the Region's unemployment rate has tracked the U.S. rate closely, with a few persistent pockets of joblessness.

Despite the improvement in the unemployment rate, labor force participation rates in Appalachia have remained well below the national average throughout the past 30 years.

Figure 3: Unemployment, Appalachia and the U.S.

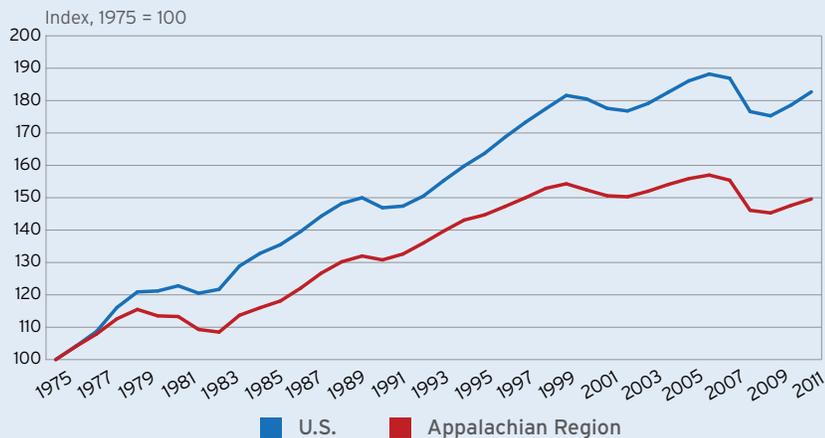


Source: U.S. Bureau of Labor Statistics' 1990 to 2012 published rates and 1976 to 1989 unofficial rates. Data prior to 1976 were not available.

In the 1950s, Appalachian businesses were shedding jobs, while the U.S. economy grew: the nation increased its total employment by 17 percent during the decade, while the Appalachian Region lost 1.5 percent of its total employment.

was growing, but more slowly than employment in the nation as a whole.

Figure 4: Total Private Employment, Appalachia and the U.S.



Source: U.S. Bureau of Labor Statistics

National recessions have been particularly harsh to the Appalachian economy. The recession in the early 1980s began a period of much slower employment growth in the Region—slower than the growth in the rest of the nation (see Figure 4). The 1981-82 recession caused rapid employment decline in Appalachia, while employment in the rest of the nation simply stagnated. The Region's reliance on steel and coal employment drove much of that decline. The recessions of 1990-91 and 2001 also adversely affected the Region.

As the U.S. economy transformed over the past 30 years, regional economic growth kept pace with it, but the Region started from a much smaller base. While the rest of the nation experienced economic expansion, driven in part by the real estate bubble, Appalachia missed out on that growth period. But Appalachia was not affected as seriously as the rest of the nation was by the real estate market crash in 2008. In 2012, employment in Appalachia stood at nearly 50 percent above its 1975 level, while the national figure was nearly 83 percent above its 1975 level.

The most recently available data found national labor force participation at 64.2 percent of working-age adults (age 16 and above), compared with 59.5 percent of Appalachian working-age adults. Part of the difference can be explained by greater participation in the informal barter economy in the Region, and a larger proportion of the population receiving government transfer payments, as well as the limited job opportunities in the Region's rural communities.

EMPLOYMENT CHANGE

Lagging, with a Widening Gap

In the 1950s, Appalachian businesses were shedding jobs, while the U.S. economy grew. While the nation increased its total employment by 17 percent during the 1950s, the Appalachian Region lost 1.5 percent of its total employment. Among the goals of ARC was to help stabilize this job loss. By the 1970s, Appalachian employment

POPULATION CHANGE

Much Slower Growth, Older Population

During the past generation, the U.S. population has grown at a pace nearly twice that of the Appalachian Region's (see Figure 5). This is due in part to the fact that the vast majority of Appalachian counties have a smaller share of young people (those below age 20) and a much greater (and more rapidly growing) share of seniors (those aged 65 and older) than does the nation.

Today, the area remains much more rural than the rest of the nation. Forty-two percent of the people in Appalachia still live in rural areas, compared with 20 percent nationally; and Appalachians who live in cities are much more likely to live in smaller urban centers than are residents of other parts of the country.

Throughout the country, young adults have flocked to major cities for access to jobs and other opportunities. Since there are few major cities in the Appalachian Region, it is not surprising that the Region continues to witness a steady outmigration of adults between the ages of 18 and 35. This trend contributes to the more rapidly aging population in the Appalachian Region.

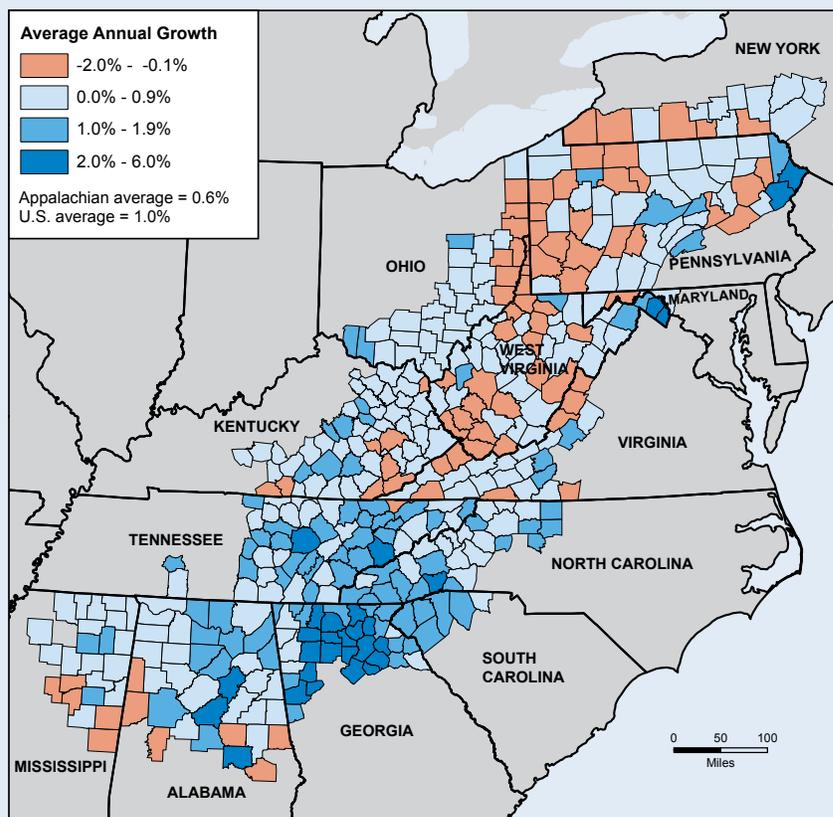
Recessionary periods exacerbate outmigration. During the economic stagnation of the 1980s, population growth in Appalachia languished. Even when the Region's population began to grow again in the early 1990s, its growth rate significantly trailed the U.S. rate.

ECONOMIC AND INDUSTRY MIX

Converging toward the U.S. Norm

The Appalachia of 1964 was heavily dependent on large-scale logging and coal mining, but employment in both sectors was rapidly declining. The job losses in these industries were particularly hard on the Region, because they were often in the highest-wage

Figure 5: Average Annual Population Growth in Appalachia, 1969-2012



Source: U.S. Bureau of Economic Analysis

sectors and served as a primary source of family-sustaining wages. The declines limited economic opportunities for area residents and contributed to stagnated regional economic growth.

At the same time, the 1950s and 1960s were a period in which U.S. manufacturing reigned supreme. Building on a very small base, growth in the Region's manufacturing sector was much lower than in the nation as a whole. The raw materials extracted from the hills of Appalachia were used modestly in the Region's growing manufacturing sector; most were shipped to cities in the industrial heartland to supply factories there. When there was a shock to the business cycle, it was Appalachia that felt

the impacts first, as manufacturers cut back on their orders in response to drops in demand.

Over time, manufacturing employment adjusted to consumer demand, shifts in energy sources, advances in product materials, and access to global supply chains, as well as to improvements in productivity and relative loss of U.S. manufacturing competitiveness. As a result, the Region's extractive industries required less labor, and employment in those sectors has continued to decline. Manufacturing employment has also declined—not only in Appalachia, but nationally as well. The Region is becoming less dependent on employment from resource-extractive

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As Figure 6 demonstrates, the Region's economy trails the U.S. economy as a whole in its transition to becoming more service-oriented. The service-producing sector now accounts for more than 75 percent of the Region's employment. According to data from the U.S. Bureau of Labor Statistics, service-sector employment increased nationally from 3 million jobs in 1979 to nearly 6

million jobs in 2012 (even after declines attributed to the recession of 2008-09). Still, one-quarter of the economy relies on highly cyclical manufacturing and extractive industries or the government sector. Manufacturing employment in Appalachia declined from its peak of 2.2 million jobs in 1979 to 1.2 million jobs in 2012, while mining and natural resources-related employment peaked at 241,000 workers in 1979 and stabilized at about 131,000 workers in 2012.

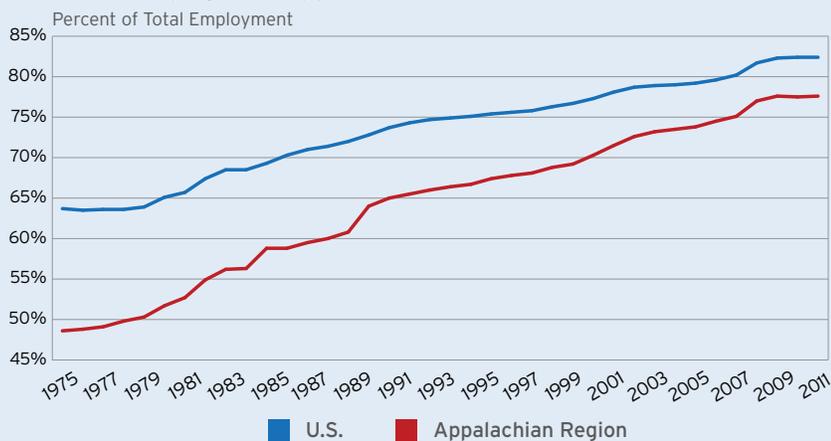
EDUCATIONAL ATTAINMENT
The Gap is Wide, and Widening

In 1960, the Appalachian Region struggled with a poorly educated populace. Ninety-two percent of the U.S. population over the age of 25 had completed the 5th grade, compared with 89 percent of the Appalachian population. Thirty-two percent of the Appalachian population had completed high school (10th grade or higher), compared with 42 percent of the U.S. population. Only 5 percent of Appalachian residents had earned a college degree; compared with nearly 8 percent of all Americans.

As it is today, education 50 years ago was seen as a pathway to prosperity. Concern over the Region's educational attainment rates at the time was acute, because primary and secondary school systems were funded locally, by tax bases often limited by low income levels in the community. Breaking this cycle required investments from outside the Region.

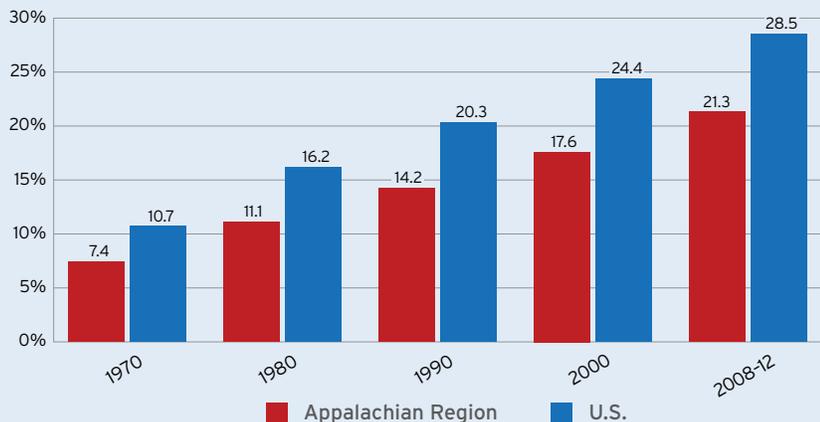
Today the Appalachian Region has achieved near-parity with the nation in high school graduation rates, an important accomplishment since the 1960s; but the Region remains behind in post-secondary educational attainment. In today's economy, the best-paying jobs in the service sector (the sector that dominates the economy now) are highly knowledge-intensive. A high school education is seen as a

Figure 6: Private Service Sector Employment as a Share of Total Private Employment, Appalachia and the U.S.



Source: U.S. Bureau of Labor Statistics

Figure 7: Share of Population 25 Years+ with a Bachelor's Degree or Higher, Appalachia and the U.S.



Source: U.S. Census Bureau, 1970, 1980, 1990, and 2000 Censuses, and 2008-2012 American Community Survey

prerequisite, but not sufficient, for economic success.

Increasingly, businesses demand post-secondary education from workers receiving middle-class wages. Using “college graduates” as a proxy measure for the phenomenon reveals steady improvements in the Region, but the improvement is not as rapid as it is in the rest of the nation.

Figure 7 shows that the share of the Region’s population over age 25 with at least a bachelor’s degree has tripled since 1970 (to 21.3 percent). However, at 28.5 percent, the share of the nation’s population over 25 with at least a bachelor’s degree has nearly tripled, and the gap between the share of Appalachian adults and the share of the nation’s adults with a college degree has widened steadily over the past two generations.

HOUSING QUALITY

Significantly Improved, but Continues to Lag

Not long ago, many homes in the Region lacked adequate plumbing and relied on water from local streams. Many houses were dilapidated, with 7.5 percent in such poor shape that they were deemed a danger to the health and safety of the families living in them. The PARC report found that the median value of homes in the Region was 27 percent below the median value of homes in the rest of the nation, and one in four homes in the Region was valued at less than \$5,000 in 1960, nearly double the national rate.

ARC investments were targeted to help address these concerns, and the Region has made great strides in moving toward parity with the nation on housing quality. Today, 3.2 percent of Appalachian houses lack complete plumbing, compared with 2 percent nationally, as illustrated in Figure 8; a stark improvement from the 13.6 percent of houses in Appalachia that lacked complete plumbing in 1970.

The share of the Region’s population over age 25 with at least a bachelor’s degree has tripled since 1970.

HEALTH

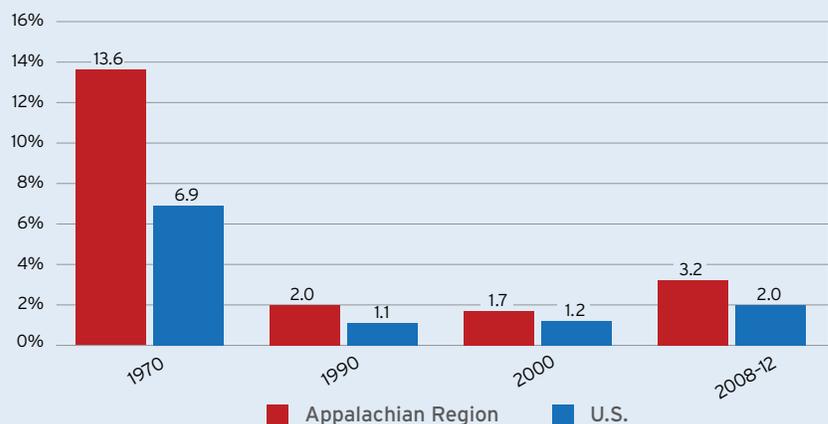
Losing Ground

Combined with other factors, individual health is a prime indicator of quality of life and impacts economic vitality. In the early 1960s, living standards in Appalachia, as measured by the health and well-being of the population, were well below those of the rest of the nation, and they remain so today.

One of the most basic measures of a region’s health is the mortality rate of its population. The Region’s mortality rate declined rapidly during the 1960s and 1970s, as did the nation’s, due to improved medical care and preventative care. Infant mortality rates, in particular, dropped by more than two-thirds in Appalachia, moving much closer toward parity with the rest of the nation. Today, however, overall

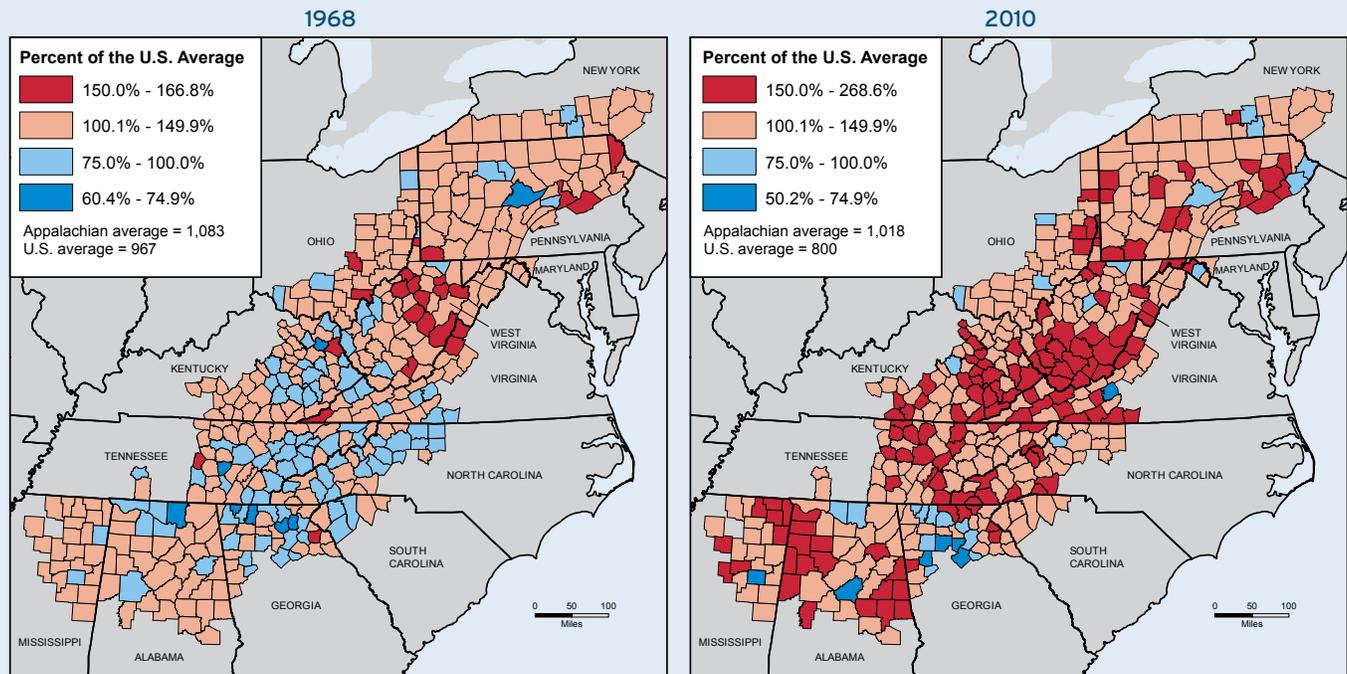
mortality rates are up in the Region, even as they continue to fall in the rest of the country. One reason for Appalachia’s increased mortality rates could be rising rates of obesity; other possible explanations include lack of access to care and the Region’s aging population. As shown in Figure 9, the problem has become particularly acute in areas of Central and Southern Appalachia. These same regions have also seen a rapid rise in the prevalence of diabetes, suggesting that health issues may be increasingly contributing to a lower quality of life there. This is a particularly important problem for government; in 2012 more than one third of the Region’s population was covered under government health insurance. The Region’s rate of population covered by government health insurance has been consistently higher than the rest of the nation’s for the past

Figure 8: Percent of Homes Lacking Complete Plumbing Facilities, Appalachia and the U.S.



Source: U.S. Census Bureau, 1970, 1990, and 2000 Censuses, and 2008-2012 American Community Survey

Figure 9: Mortality Rates in Appalachia (Deaths per 100,000 People), Relative to the U.S. (Percent of the U.S. Average)



Source: U.S. Centers for Disease Control and Prevention

Notes: A mortality rate is computed by dividing the number of deaths by total population and multiplying it by 100,000. These rates are not adjusted to differences in mortality rates by age. The percent of U.S. average is computed by dividing the county share by the U.S. average and multiplying by 100.

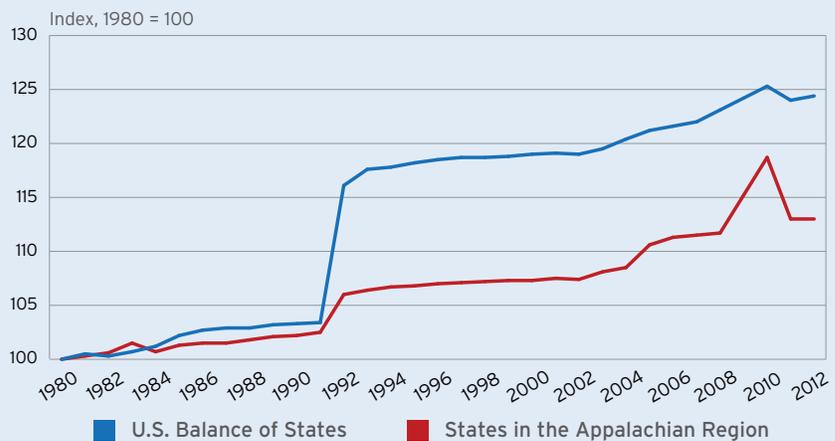
25 years. (These data are from years prior to the implementation of the Patient Protection and Affordable Care Act.)

ISOLATION: TRANSPORTATION ACCESS

Lagging, Fallen Behind

One of the most critical challenges facing the Appalachian Region in 1964 was the isolation caused by its limited transportation network. The Interstate Highway System, in the midst of a tremendous building boom in the 1950s, largely bypassed Appalachia, going through or around the Region's rugged terrain as cost-effectively as possible. This resulted in limited access to the rest of the nation for large swaths of Appalachia, and constituted barriers to trade with the rest of the nation and with global markets. Construction of the Appalachian Development Highway System (ADHS), authorized by the ARDA, was given priority as a key to economic development. The system was designed

Figure 10: Federal-Aid Highway Miles (Indexed to 1980 Mileage Levels)



Source: Federal Highway Administration, Highway Statistics

to generate development in previously isolated areas; to connect Appalachia federal-aid to, and to supplement, the interstate system; and to provide access to areas within the Region as well as to markets in the rest of the nation.

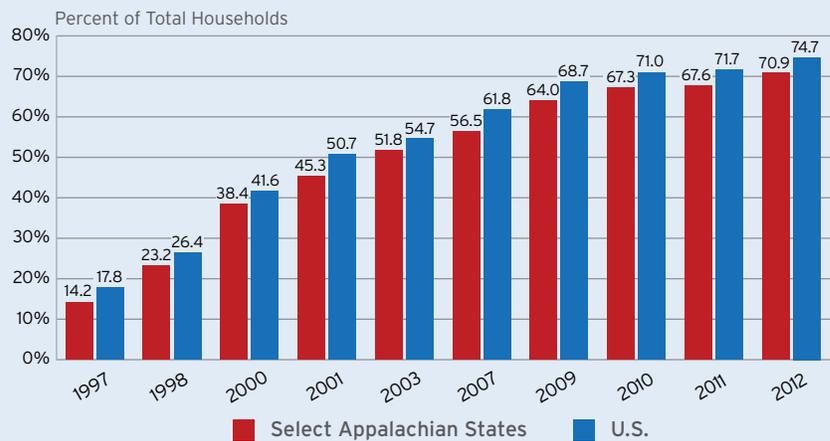
For many years, Appalachian states built federal-aid highway miles at a rate comparable to that of the rest of nation (see Figure 10). A major increase in the rate of miles built in both the Region and the rest of the nation occurred

in 1992; another increase occurred in 2005 as part of a steady increase in funds available with the passage of Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Resources made available through the 2009 American Recovery and Reinvestment Act also helped to increase the number of highway miles built, both regionally and nationally. However, recent data suggest that declines in federal funding have impacted the Appalachian Region more than the rest of country, partly because the relative per-mile cost of building major highways through mountainous terrain and the sparse population in these areas make it difficult for Appalachian states to compete for limited federal funds.

**ISOLATION:
TELECOMMUNICATIONS CAPACITY**
Improving, but Lagging in the Form of Broadband

Another key aspect of the Region’s isolation in the 1960s was its relative inability to communicate with the outside world. This limited not only the inflow of new ideas and technologies, but also the ability of area residents and leaders to imagine a different future. In the 1960s, a key public policy goal was universal access to telephone service. Many areas of Appalachia lacked access to phone service, and, often, where it was available, multiple families shared party lines. As late as 1970, 16.2 percent of area homes did not have access to phone service, compared with 13 percent of households nationally. By 2012, the proportion of households without phone service in the Appalachian Region was about 2.8 percent, very nearly the same as the national average of 2.5 percent.

Figure 11: Percent of Households Using the Internet



Note: Select Appalachian States include Alabama, Pennsylvania, and West Virginia
Source: U.S. Census Bureau, Current Population Surveys

Today, the gap in use of the Internet—the communications engine driving the information and knowledge economy—is more relevant. As Figure 11 illustrates, some Appalachian states are improving as rapidly as the rest of the U.S. in this area, but the Region began the Internet era of the late 1990s lagging other parts of the country in Internet use.

What these data mask, however, is the fact that Internet access alone is not enough: it is important to have access to high-speed Internet services. Anecdotal evidence from interviews with local leaders suggests that Appalachia trails badly in the affordability of Internet service, as well as in access to high-speed broadband, especially at the household or business-unit level. High-speed Internet represents the superhighway for transporting services to customers in today’s global economy. Many local leaders understand that building this infrastructure is as vital as building major highways for helping

Building telecommunications infrastructure is as vital as building major highways for helping Appalachian companies compete and win in the high-growth technology industries that offer the best-paying jobs for area citizens.

Appalachian companies compete and win in the high-growth technology industries that offer the best-paying jobs for area citizens.

Impacts from Appalachian Regional Commission Investments



Credit: Ken Murray

Investments in Appalachia

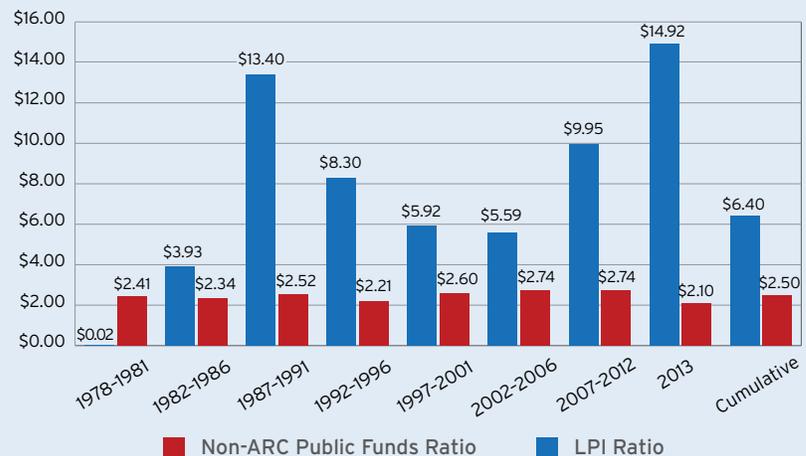
More than \$25 billion in public investments¹ (through FY 2013) have been made in the Appalachian Region by ARC and other federal, state, and local agencies in both highway- and non-highway-related activities. Since 1965, ARC has made investments in nearly 25,000 strategic non-highway activities in the Region. These investments were funded by \$3.8 billion in appropriated ARC funds and \$9 billion in matching funds from other federal, state, and local funding sources. Since 1978, these matching funds have averaged \$2.50 for each \$1.00 in funds invested by ARC. This ratio has been relatively steady; in the most recent five-year period (2007-2012), it was 2.74 to 1.

ARC investments in Appalachia have attracted nearly \$16 billion in leveraged

private investment (LPI), the dollar amount of private-sector financial commitments (non-project funds), that result from an ARC investment. Since 1978, when ARC began tracking this data, for each \$1 in funds invested by ARC in non-highway projects, an average of \$6.40 in private-sector funding has been leveraged (see Figure 12). This figure was nearly 10 to 1 in the most recent five-year period (2007-2012) and nearly 15 to 1 in 2013. See Figure 12 for

Since 1965, ARC has made investments in nearly 25,000 strategic non-highway activities in the Region.

Figure 12: Ratio of ARC Investments to Non-ARC Matching Project Funds and to LPI (Non-Highway Investments)



¹This figure includes \$3.8 billion in ARC Area Development Program funds, \$9 billion in other federal, state, or local public match dollars connected to these investments, \$9.1 billion obligated to the Appalachian Development Highway System, including funds from TEA-21, SAFETEA-LU and their extension acts, and \$3.5 billion in state and local funds, assumed to be a 20 percent ADHS match. This total does not include 100 percent state- and local-funded highway projects.



Credit: Ann Hawthorne

Economic Impacts from ARC Non-Highway Grant Investments

This section quantifies the employment and income impacts attributable to the ARC non-highway grant investments made in the Region over the years. ARC's investments have helped stimulate economic activity that has fueled the hiring of workers and the purchase of material goods and services needed to put new developments in place. Income from all of these activities fueled additional demand, further multiplying the total economic impacts of these investments.

ARC investments have been made over a 50-year time span, presenting a unique challenge in measuring these multiplier impacts. The economic structures of the Appalachian Region and the nation have changed significantly, so impact models must be recalibrated over time to reflect those structural changes. For this study, a customized input-output (I-O) model for the Appalachian Region was constructed, with adjustments to

data on non-ARC matching funds and LPI for ARC non-highway investments.

Through FY 2013, more than \$9 billion has been obligated to the states for the Appalachian Development Highway System (ADHS). An additional \$3.5 billion has been provided in state and local match funds. As of September 30, 2014, a total of 2,762.9 miles, or 89.4 percent of the 3,090 miles authorized for the ADHS, were completed or under construction (see Figure 13). Another 96 miles were in the final design or right-of-way acquisition phase, and 231.2 miles were in the location studies phase.

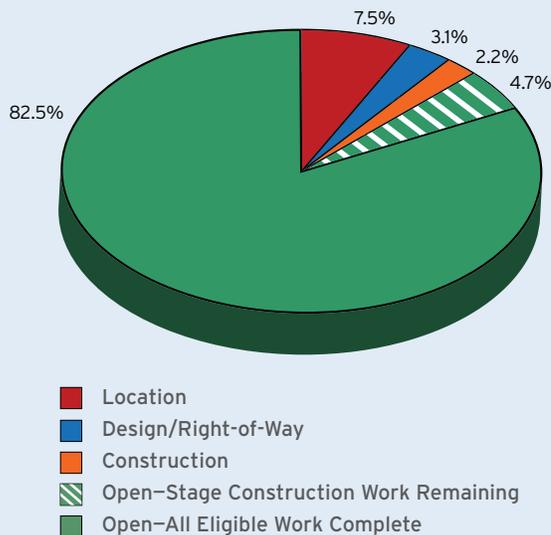
Many of the new jobs created over the past five decades were in professional and technical services, manufacturing, trade, and construction industries.

the modeling made after every five-year period to help account for measured economic changes. Detailed investment data were provided by the Appalachian Regional Commission and were assigned to one of 39 final demand categories, and then aggregated to one of 11 industry sectors.²

The results from the economic modeling show that the \$3.8 billion in ARC non-highway investments (Area Development Program) were responsible for creating nearly 312,000 jobs and \$10 billion in added earnings in the Region. On average, annually, these ARC funds supported an estimated 6,364 jobs and \$204 million (in constant 2013 dollars) in earnings.

Figure 14 shows the detailed results from the I-O analysis. Many of the new jobs created were in professional and technical services, manufacturing, trade, and construction industries. These figures include the direct, indirect, and induced job growth. Direct effects are the employment directly attributable to the spending of ARC funds within a particular industry. Indirect effects are the spending and employment of suppliers and contractors to produce inputs for the industry. Induced effects

Figure 13: Appalachian Development Highway System Status of Completion as of 9/30/2014
3,090 Eligible Miles



Source: Appalachian Regional Commission

² The investment data covered ARC Area Development Program investments made from 1965 to 2013.

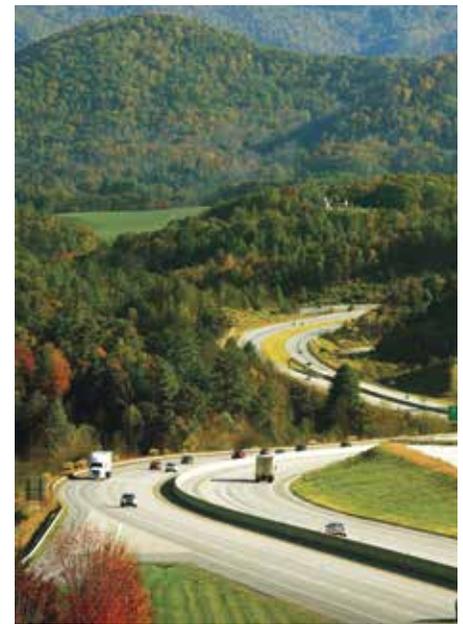
include household spending on goods and services by both industry employees and the employees of contractors and suppliers (both direct and indirect employees). Total economic impact is the sum of direct, indirect, and induced effects.

Only the ARC portion of funds for non-highway investments was included in the economic modeling produced for this study. In every ARC-funded activity there are also public monies from other federal, state, and local sources, as well as the likelihood of leveraged private investment. Therefore, the total employment and income impacts to the Region would be substantially higher if all funding sources were included in the modeling. However, in this report, only the ARC portion of funds was modeled in order to prevent attributing the overall economic effect from a combined total investment to only the ARC portion of that investment. Therefore, the

figures reported here should be read as conservative estimates of the ultimate employment and income effects from various ARC-supported non-highway investments. Given the large amount of non-ARC dollars that were directed to many of these investments, the actual resulting employment and income effects may be many times greater.

Economic Impacts from ADHS Investments

In 1964, the President’s Appalachian Regional Commission reported to Congress that economic growth in Appalachia would not be possible until the Region’s isolation had been overcome. Because the nation’s Interstate Highway System sought out the most cost-effective routes, it largely bypassed the rugged terrain of the Appalachian Region. Congress responded by creating the Appalachian Development Highway System (ADHS) expressly to provide



Credit: Ken Murray

growth opportunities for the residents of Appalachia—the same benefits afforded the rest of the nation through the construction of the Interstate Highway System. The ADHS, a system of modern highway corridors, would

Figure 14: Employment Impacts—Appalachian Region Totals (Non-Highway Investments)

| Period | Farming | Agricultural Services, Forestry, and Fishing | Mining | Construction | Manufacturing | Transportation and Public Utilities | Wholesale and Retail Trade | Finance, Insurance, and Real Estate | Services | Federal Civilian Government | State and Local Government | Total |
|-----------|---------|--|--------|--------------|---------------|-------------------------------------|----------------------------|-------------------------------------|----------|-----------------------------|----------------------------|---------|
| 1965-1971 | 1,989 | 2,057 | 962 | 3,932 | 11,852 | 3,282 | 10,609 | 2,885 | 41,130 | 1,545 | 5,308 | 85,551 |
| 1972-1976 | 2,396 | 2,533 | 642 | 5,132 | 14,387 | 3,963 | 12,645 | 3,378 | 47,448 | 1,810 | 6,289 | 100,622 |
| 1977-1981 | 1,149 | 1,225 | 639 | 4,622 | 7,630 | 2,041 | 7,499 | 2,028 | 21,571 | 844 | 3,527 | 52,775 |
| 1982-1986 | 424 | 553 | 247 | 1,906 | 2,664 | 684 | 2,884 | 755 | 6,369 | 291 | 1,224 | 18,002 |
| 1987-1991 | 255 | 333 | 111 | 1,315 | 1,546 | 415 | 1,862 | 474 | 4,282 | 176 | 695 | 11,463 |
| 1992-1996 | 309 | 498 | 123 | 1,914 | 1,975 | 598 | 2,661 | 537 | 5,662 | 231 | 916 | 15,426 |
| 1997-2001 | 169 | 308 | 61 | 2,098 | 1,203 | 395 | 1,658 | 335 | 3,576 | 18 | 134 | 9,954 |
| 2002-2006 | 134 | 147 | 53 | 1,548 | 811 | 259 | 948 | 173 | 4,300 | 13 | 106 | 8,491 |
| 2007-2013 | 122 | 162 | 57 | 1,952 | 760 | 241 | 971 | 195 | 4,970 | 10 | 113 | 9,552 |
| All Years | 6,946 | 7,816 | 2,895 | 24,420 | 42,828 | 11,877 | 41,736 | 10,760 | 139,307 | 4,937 | 18,312 | 311,835 |

replace a network of worn, winding two-lane roads, with the aim of generating economic development in previously isolated areas, supplementing the interstate system, and providing access to areas within the Region as well as to markets in the rest of the nation and overseas (see Figure 15).

Additionally, as part of the ADHS program and its federal funding authority, Congress authorized use of a portion of the funds for local access roads, at the discretion of ARC member states. This approach provides the flexibility to meet local needs with a financing mechanism to support a variety of economic development opportunities throughout the Region. In addition to using ADHS funds for local access road projects, a state may also use ARC non-highway funds and have its state department of transportation and the Federal Highway Administration administer the project.

The ARDA authorized construction of 2,350 miles of the ADHS; revisions to the ARDA over the years increased the authorized mileage to 3,090.

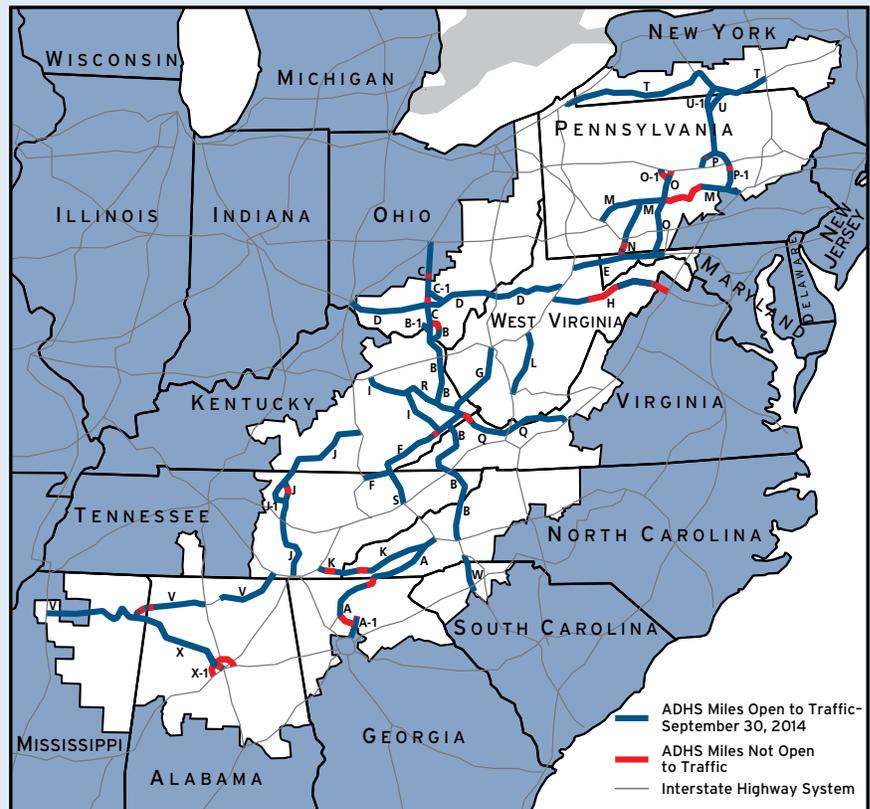
A recent study of the ADHS measured the economic development and safety benefits to the Region from sustained highway-system investments. The June 2008 study, conducted by Cambridge Systematics, Inc., with Economic Development Research Group, Inc., assessed the travel performance, trade, and economic development impacts that would result from completing the ADHS.³ The study also assessed connectivity, accessibility, and how well the ADHS corridor improvements would connect Appalachian people and businesses to other highway facilities, multimodal transportation, and economic markets after completion of the ADHS.



Credit: Ken Murray

Recent studies of the ADHS measured the economic development and safety benefits to the Region from sustained highway-system investments and found significant positive results.

Figure 15: Appalachian Development Highway System



Source: Appalachian Regional Commission

³ Cambridge Systematics, Inc., Economic Development Research Group, and HDR Decision Economics. *Economic Impact Study of Completing the Appalachian Development Highway System*. Appalachian Regional Commission, June, 2008.



Credit: Ken Murray

The study found that total economic impacts on the Region of completing the ADHS would include the direct effects of reduced travel time and costs, along with increased regional competitiveness via market accessibility gains and multiplier effects. These effects would gradually increase over time and by 2035 would result in an estimated 80,500 jobs, \$5.0 billion in increased value-added production, and \$3.2 billion in increased wages for workers in the Region. At the national level, the estimated return on investment would yield \$3.00 for every \$1.00 invested.

Assessing ARC's Role in Achieving Growth in the Region

Reviewing ARC's role in helping Appalachia develop its economy and the funds it has invested in the Region to do so raises the question as to whether this experiment in regional economic development has paid off for U.S. taxpayers. The research aimed to answer this question by using a quasi-experimental methodology that compares counties in the Appalachian Region to similar counties outside the Region. The results of this research

indicate that employment and per capita income grew at a faster rate in the Appalachian counties than in the non-Appalachian counties, as a result of the ARC investments.

Prior to this report, assessing the impact of Appalachian Regional Commission investments in the Region's counties was the topic of the seminal Isserman and Rephann study (1995) of the Region, in which the authors sought to assess whether actual changes in the Appalachian Region could be attributed to ARC programs.⁴ They determined that answering the question of the effectiveness of ARC's investments requires positing an alternative scenario: if the ARC investments had not taken place, would the Region have grown less rapidly? Although this seems like a daunting task, the methodology outlined in Isserman and Rephann (1995) can be used to assess the effectiveness

⁴Isserman, Andrew and Terrance Rephann. "The Economic Effects of the Appalachian Regional Commission: An Empirical Assessment of 26 Years of Regional Development Planning." *Journal of the American Planning Association*, vol. 61, no. 3, summer 1995, pp. 345-364.

of these investments and answer the counterfactual question posed above.

The Quasi-Experimental Method (QEM) is an empirical technique designed to answer such counterfactual claims. Somewhat similar to a traditional scientific experiment, the QEM methodology uses matching techniques to assign each "treated" entity (or counties in this instance) with one (or more) "control" entities (or counties). Then, QEM uses statistical methods to see if the difference in the outcome variable in the two entities is statistically significant. If the matching is done accurately and the differences between treatments and controls are statistically different, it can confidently be stated that the divergence is due to the policy implementation.

Isserman and Rephann (1995) conducted a study in which they constructed a counterfactual by matching counties in Appalachia that received ARC funding (i.e., the "treated" group) to counties outside of Appalachia that did not receive any ARC funding (i.e., the "control" group). The matching of treated counties and control counties is a fundamental step in this process and "closer" matches tend to provide more convincing evidence.

The results presented here use a methodology similar to the one used by Isserman and Rephann (1995), with two differences designed to improve the matching process. First, while the 1995 Isserman and Rephann study used 24 variables to match the treated and control counties, this study used five additional variables (a total of 29 variables) to assist in the matching. The use of these additional variables in the matching algorithm ensured a match as good as, or better than, the match obtained by Isserman and Rephann. Second, this study used a different econometric technique to implement the matching, based on developments that have occurred in the field since the 1995 study.

The empirical examples undertaken in this study concentrate on two important metrics: the growth in employment and the growth in per capita income. Job growth is one economic indicator that is important to many stakeholders, as it measures how economically viable a region is in terms of employment. The same may be said for the importance of per capita income. The results of the analysis using these two metrics follow.

The first set of results appears in Figure 16, “Employment Growth Rates between Treated and Control Counties.” The results indicate that for virtually every year used in the analysis (i.e., from 1970 to 2012), the counties in the Appalachian Region (treatment counties) had higher employment growth than the matched counties that did not receive ARC funding. The average difference in growth rates between the counties that obtained ARC investments and those that did not receive ARC investments was approximately 4.2 percent. This statistical analysis provides evidence that ARC investments led to higher employment growth over the time period 1970–2012.

The second set of results, illustrated in Figure 17, “Per Capita Income Growth Rates between Treated and Control Counties,” indicates that the per capita income growth rate in counties that received ARC investments grew an average of 5.5 percent more over the time period than the counties that did not receive ARC investments, providing evidence that ARC investments led to higher growth in per capita income over the time period 1970–2012.

In summary, using a well-established QEM technique, the research shows that employment growth and per capita income growth over the period 1970–2012 were higher in Appalachian counties than in counties that did not receive ARC investments. On average, counties that received ARC investments

Figure 16: Employment Growth Rates between Treated and Control Counties, Base Year 1969

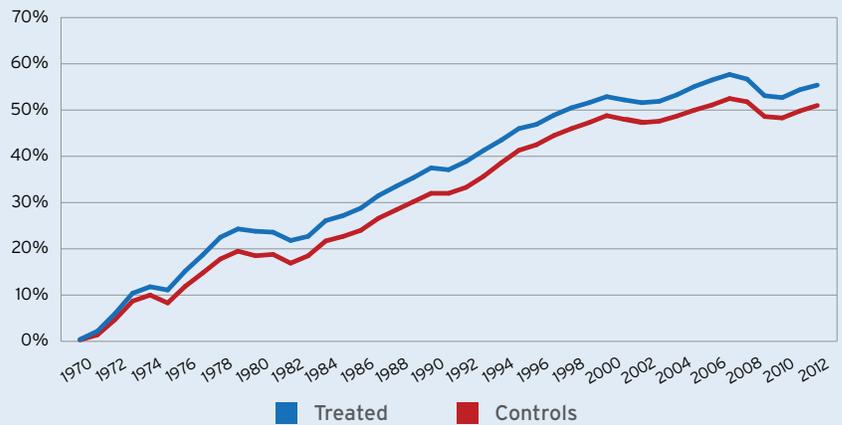
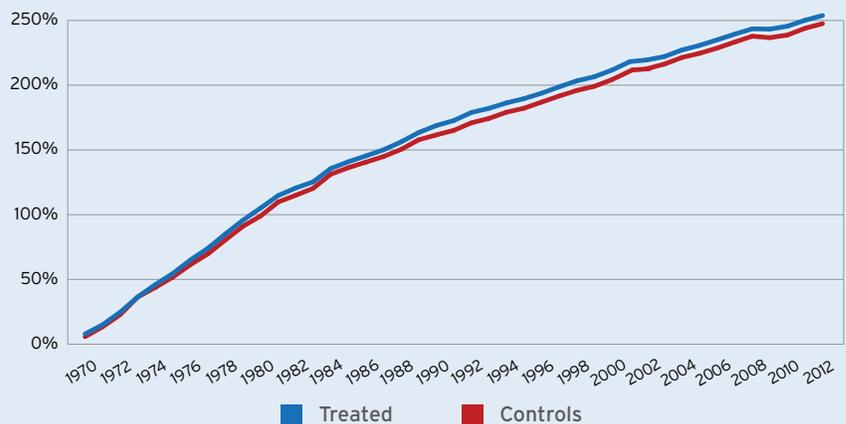


Figure 17: Per Capita Income Growth Rates between Treated and Control Counties, Base Year 1969



experienced 4.2 percent higher employment growth and 5.5 percent higher per capita income growth than the counties that did not receive ARC funding. These results indicate the effectiveness of ARC investments for the Appalachian counties in the study.

The research shows that employment growth and per capita income growth over the period 1970–2012 were higher in counties that received ARC investments than in counties that did not.

Input from Stakeholders



Credit: Ken Murray

As part of this research, meetings were held in all 13 Appalachian states to give key stakeholders the opportunity to provide insights about their region's ARC-related activities. More than 220 stakeholders participated in these facilitated sessions, each of which involved roughly 10 to 20 participants. This section provides a brief synopsis of the comments and broad themes that arose during those sessions. They speak to ARC's legacy, the strength of its partnership model, and how ARC investments can be used to generate significant regional impact.

The ARC Model

- Stakeholders were quick to mention ARC's catalyzing role in spurring regional development. Regional stakeholders shared many examples of relatively small ARC investments that planted the seed for significantly more investment and growth. In many of these examples, later investments would not have occurred without the initial ARC investment. This was especially true for many investments in the Region's most distressed communities, which have few accessible funding sources because of the difficulty they have in

raising even a modest amount of local matching funds.

- ARC does more than fund projects—it also provides leadership, advocacy, planning, research, and timely seed-investments to advance these efforts, and has done so with countless federal, state, nonprofit, and private partners. This model has proven effective over the past 50 years and may become even more important for achieving the Region's development goals in the future.
- Stakeholders noted that over the past 50 years, ARC's federal-state-local partnership model has proven effective in helping Appalachian communities advance efforts with great local support and impact.
- ARC allows states and regions to set their own priorities and make their own decisions about how ARC funding is used. This model has allowed states to shift their focus in response to changing economic, political, or fiscal conditions. Diminished funds have led a number of states to refocus their ARC investments from relatively expensive physical infrastructure projects to business enterprise and

ARC allows states and regions to set their own priorities and make their own decisions about how ARC funding is used. This allows states to shift their focus in response to changing economic, political, or fiscal conditions.

tourism development, workforce training, and health promotion activities. Many stakeholders see this new generation of investments as having greater regional impact with the available funds.

Flexibility of ARC Funding

Local and regional stakeholders universally praise ARC's flexibility. Unlike other funding programs, ARC funding allows regions to think creatively about how best to address pressing regional challenges.



Credit: Ken Murray

Many stakeholders spoke of ARC's role in supporting the expansion of health-care and education facilities and the importance of those investments to the well-being of the Region's population. In many ways, these efforts helped address serious market failures that would have significantly diminished the health and welfare of the Region's residents.

Several focus group participants said that economic transformation in Appalachia is less about diversification, and more about forging entirely new economies. To help facilitate this process, ARC has made investments that support these transformations. This includes investing in the preparation of industrial sites, but also providing support for entrepreneurship, tourism destination development and promotion, export expansion, and business development programs, helping companies access programs that support technology acceleration or advanced manufacturing processes.

State and Local Partnerships

ARC's approach to development prioritizes partnerships with other federal, state, private, and nonprofit partners. Therefore ARC funding aligns

with and complements state development initiatives, such as New York State's Regional Economic Development Councils and Kentucky's Shaping Our Appalachian Region (SOAR) initiative.

Stakeholders from every state noted the importance of ARC's support for the Region's 73 local development districts (LDDs). Several focus group participants cited the critical ability of LDDs to serve as an interagency connection between different service providers and local jurisdictions within the Region; and to connect local residents and businesses with resources at the state, regional, and federal levels, as well as with private resources. ARC funding also allows the LDDs to assist communities with project development, including assistance in grant writing for common funding sources. Without this support, stakeholders maintained, many of the most successful ARC projects would never have started.

ARC Investments Complement One Another

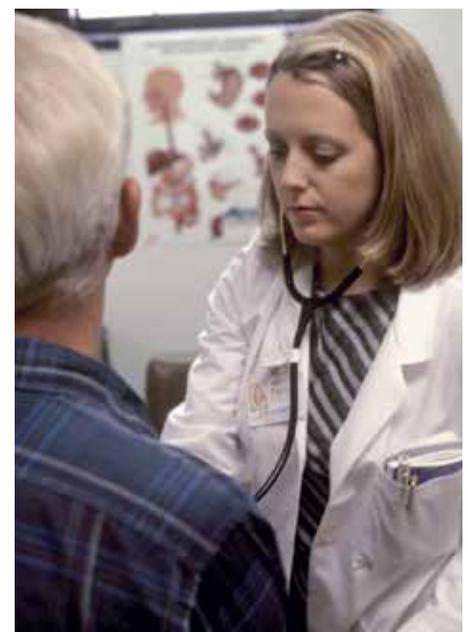
- While the challenges facing Appalachia shift over time, ARC continues to lay the groundwork for future development by making investments that are designed to advance the Commission's strategic goals. Few investments embody this more than those that improve the Region's broadband infrastructure. Efforts to increase broadband access and speed have proven to be a vital foundation in addressing many other issues, including entrepreneurship development, tourism, telemedicine, distance learning, and even in-person education. Stakeholders throughout the Region noted that this was one of the most prominent issues that required ARC attention and investment.
- ARC investments in basic physical infrastructure, such as highways; water and wastewater; and, more recently, broadband, have allowed Appalachian communities to lay

the basic foundation for additional development. Without this assistance, these communities would be at a significant disadvantage in taking advantage of future economic development opportunities.

- ARC has made investments to advance education and training programs to prepare the Region's workers for the jobs of tomorrow. These investments

ARC's approach to development prioritizes partnerships with other federal, state, private, and nonprofit partners.

are not only for curricula and educational programs, but also for the construction of new facilities and the purchase of training equipment, with an emphasis on assisting the Region's most economically distressed or underserved communities.



Credit: Ken Murray

- Place-making projects are another area where ARC investments not only create new economic activity, but also preserve Appalachian culture and improve the Region's overall quality of life. Focus group participants noted several ARC-supported projects that helped preserve historic buildings or revitalize downtowns. Similarly, efforts to develop local food systems are beneficial in that they can serve as an attraction to visitors while creating new economic opportunities and healthier food options for residents. Focus group participants noted that these kinds of ARC-supported projects contribute to the Region's tourism infrastructure.
- ARC has invested in efforts to link individual projects, such as Virginia's Crooked Road, which connects heritage music venues and events; and the Great Allegheny Passage trail, which provides bike access from Pittsburgh to Cumberland, Maryland. These projects leverage many individual attractions to make the Region a more compelling destination



Credit: Courtesy of Jackson County Commissioners

for visitors since they can take advantage of many attractions rather than just one.

Accomplishments and Challenges

- Many communities said they are continuously trying to do more with less. In order to do this, they must find ways to partner and leverage other public and private funding opportunities. For example, ARC launched multi-year Global Appalachia grants to foster member states' rural trade development efforts, building on the State Trade and Export Promotion Program of the U.S. Small Business Administration. Another example is ARC's participation in the Rural Jobs and Innovation Accelerator Challenge, in partnership with the U.S. Economic Development Administration and the U.S. Department of Agriculture.
- Communities can find projects that fit into other ARC or regional investments. Tourism and cultural projects provide a structure that

allows regions to connect individual attractions into a bigger idea that makes the region itself a more attractive destination for visitors. By leveraging other investments, the sum of the parts becomes greater than the whole and is an effective way of doing more with less.

- Stakeholders recognize the importance of prioritizing ARC funding based on need. This does not mean, however, that the classification of counties by distress levels is free from challenges. For instance, persistent pockets of poverty can remain even in counties that overall are performing well relative to other counties. Additionally, while not a common occurrence, fluctuations in county economic status from year to year can also pose challenges for communities. Given that a change in status results in a change in matching funds requirements, this can introduce some long-term planning difficulties for some counties.
- Finally, stakeholders also suggested that ARC recognize that its impact has been well beyond what might be easily measured. As noted in several states and in similar ways, it is impossible to drink water, flush a toilet, or drive down a highway without seeing firsthand the result of an ARC investment. Given this significant impact on the Region, many stakeholders thought that ARC should more actively promote its accomplishments in ways similar to what other agencies do (e.g., signs that read "This road was paid for in part through ARC funds").



Credit: Kathryn Whiteman

Key Report Findings



Credit: Ken Murray

Based on the analysis in this report, key findings emerge.

1. ARC represents a highly valued and active player in the Appalachian Region's economic development, supporting state and local partners in their efforts to transform their communities.

Since 1965, ARC has made nearly 25,000 non-highway strategic investments in the Region. Working with federal, state, and local partners, ARC has invested more than \$3.8 billion in these projects. These investments supported a variety of community and economic development initiatives, including basic infrastructure improvements, job creation initiatives, and leadership development. For every dollar in ARC funds, state and local partners were able to leverage an average of \$2.50 from other federal, state and local funds, as well as \$6.40 in private-sector investments.

In addition, more than \$9 billion has been obligated since 1965 for the

Appalachian Development Highway System, which is now 89 percent complete or under construction. When finished, the 3,090-mile ADHS will connect almost every part of the Region to an interstate-quality highway and to the national Interstate Highway System.

2. ARC has had a significant and important impact on the Region's economic vitality.

Over the past 50 years (with much higher appropriations in the earlier years of the program), ARC's \$3.8 billion in non-highway investments have resulted in nearly 312,000 direct, indirect, and induced jobs for the Region and \$10.5 billion (in constant 2013 dollars) in additional earnings. Between 2007 and 2013, ARC non-highway investments accounted for nearly 10,000 jobs and \$400 million in regional earnings. These impacts do not include the benefits accruing as a result of the investments ARC has leveraged over the years.

Furthermore, our research demonstrates that counties receiving ARC investments grew at a slightly faster pace than similar counties that did not receive ARC investments. Using a rigorous quasi-experimental research method, our analysis suggests that ARC investments helped counties add employment at a 4.2 percent faster pace, and per capita income at a 5.5 percent faster pace, than similar counties that did not receive ARC investments.

Moreover, leaders in the Region expressed consensus about the value of ARC's role as a catalyst in helping to make projects happen that might not otherwise have gone forward. In interviews with over 220 local, state, and federal stakeholders in every Appalachian state, ARC was praised for helping leaders respond to uniquely local problems and for its ability to leverage other resources (by seeding new projects or providing the "last dollars" in) when projects did not fit neatly into other funding program models and might not have otherwise happened.

3. ARC has made progress toward helping the Appalachian Region reach socioeconomic parity with the nation, but much work remains in moving some key indicators.

ARC's strategic plan has four major goals: (1) increasing job opportunities and per capita income in the Region; (2) strengthening the capacity of the people of Appalachia to compete in the global economy; (3) developing and improving the Region's infrastructure; and (4) building the ADHS to reduce Appalachia's isolation. On measures related to poverty, income disparity, unemployment, the industrial mix, and housing quality, the Region has improved significantly. For instance, as Figure 18 shows, there has been a dramatic reduction in the number of Appalachian counties where the share of the population living in poverty exceeds 150 percent of the national average. The number of high-poverty counties in the

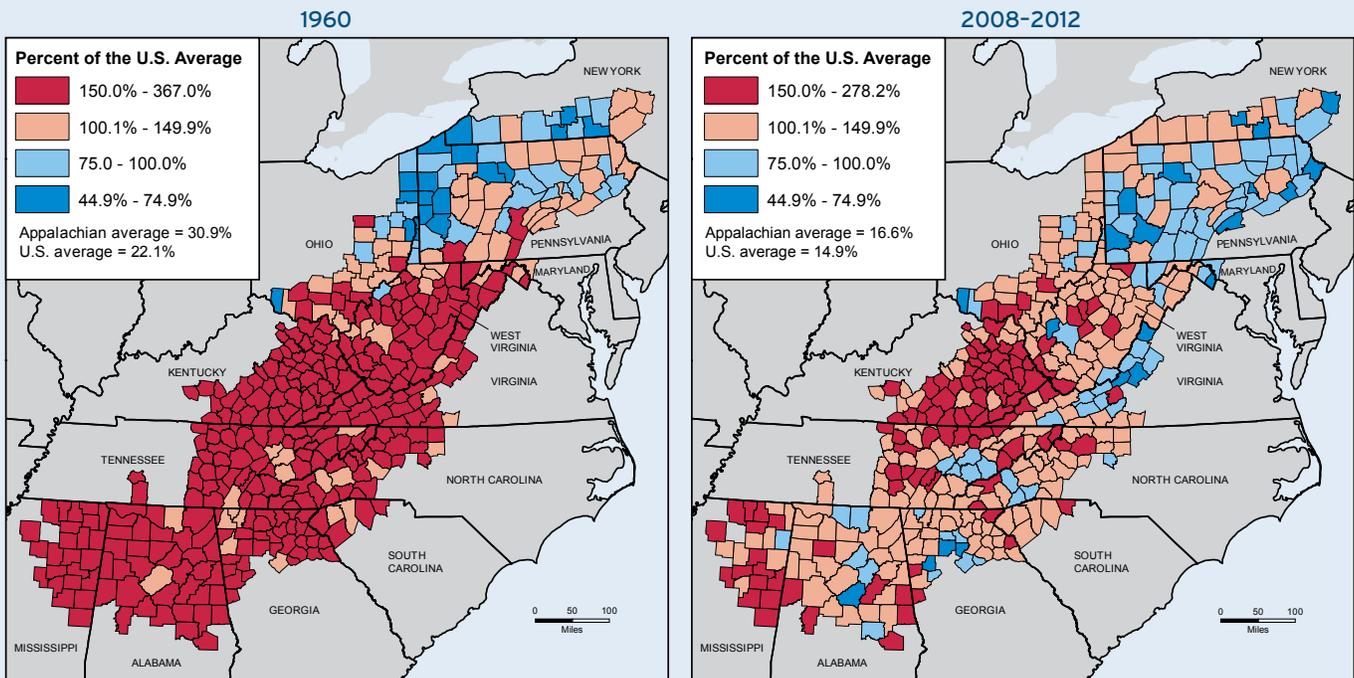
Region (those with poverty rates above 150 percent of the U.S. average) declined from 295 in 1960 to 107 for the period 2008-2012. The overall poverty rate for Appalachia is almost half that of 1960, dropping from over 30 percent to just under 17 percent.

ARC investments have supported a variety of community and economic development initiatives, including basic infrastructure improvements, job creation initiatives, and leadership development.



Credit: Ken Murray

Figure 18: Poverty Rates in Appalachia, Relative to the U.S. (Percent of the U.S. Average)



Source: U.S. Census Bureau, 1960 Census and 2008-2012 American Community Survey
 Notes: A poverty rate is the ratio of persons whose income falls below the poverty level, to the total number of persons for whom poverty status is determined. The percent of U.S. average is computed by dividing the county rate by the U.S. average and multiplying by 100.

4. ARC has not yet fully accomplished its mission of bringing the Region to parity with the rest of the nation on key socioeconomic indicators.

The Region still lags in many key areas. The Region's population growth is relatively stagnant, reflecting an economy that lags in terms of employment growth and educational attainment, so that there are not enough high quality jobs to support its citizens.

Government transfer payments account for one-quarter of all personal income, a 41 percent higher rate than the rest of the nation. By comparison, the ratio was 17 percent after the 1981-82 recession, about 35 percent higher than the rest of the nation. Some, but certainly not all, of this increase can be explained by the rise in citizens aged 65 and over now eligible for Social Security.

Furthermore, the Region's citizens have relatively poorer health outcomes (in terms of mortality rates as well as the prevalence of obesity and diabetes), reflecting changes in modern-day life that have reduced the quality of life for many residents. In addition, the Region remains relatively more isolated from the rest of the nation because the ADHS is not yet completed and, increasingly, because the Region lags the rest of the nation in access to affordable high-speed broadband service.



Credit: Ken Murray

Appalachia Moving Forward

The data from this research suggest that ARC has been a vital partner in the economic and community development progress achieved in the Appalachian Region. However, there is a continued need for investment to help Appalachia reach socioeconomic parity with the rest of the nation. Many questions remain about how best to address the challenges Appalachia faces today. How can leaders create a climate of entrepreneurship and opportunity so that local citizens can remain and contribute to Appalachia's future success? How can the Region compete and succeed in the global economy when it cannot always reach new markets? Few states or localities have the capacity to address these significant challenges without outside help. Addressing the Region's disparities will require continued local-state-federal partnerships and strategic investments that build opportunity for growth.

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