

Augusta County

and the Atlantic Coast Pipeline: Summary of Economic Effects

Key-Log Economics
for Augusta County Alliance
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"I am here to tell you what [the Atlantic Coast Pipeline] can ruin. It can ruin our million dollar view...our water quality...our property value...our family business. It can ruin our way of life, our American dream."

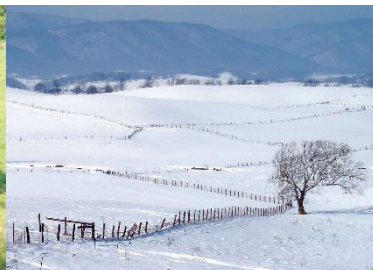
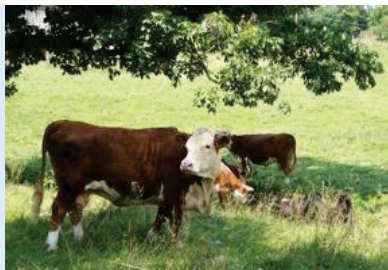
- Virginia Davis, Owner,
Stuarts Draft Farm Market



Augusta County's Economy: What's at Risk

Augusta County has a robust and growing economy thanks in part to its clean and healthy environment and high quality of life. The Atlantic Coast Pipeline, which would run 46.8 miles in Augusta, has triggered widespread concern over what the pipeline would do to the local community, land, and economy. This report describes the assets and trends that may be at risk if the Atlantic Coast Pipeline is built and summarizes research on the potential economic impacts on land value, natural benefits, and key economic sectors in Augusta County.

Left to Right:
Augusta Beef Cattle;
Winter Landscape;
Augusta Vineyard



At a Glance:

The Atlantic Coast Pipeline in Augusta County

- Miles of Pipeline: 46.8
- Acres in the construction corridor and permanent right-of-way (ROW): 709 and 425
- Most impacted land cover types (ROW only): forest (233 acres), pasture (149 acres), and cropland (23 acres)
- Parcels touched by ROW: 214
- Parcels in the 1.4-mile-wide evacuation zone: 3,482
- Residents and housing units in the evacuation zone: 10,778 people and 5,019 homes
- Parcels from which the pipeline would be visible: 14,357, or 21% of all parcels in Augusta County
- Baseline property value at risk (and expected one-time cost due to the ACP):
 - In the ROW: \$123.8 million (\$5.2 to \$16.1 million)
 - In the evacuation zone: \$746.9 million (\$28.4 million)
 - In the viewshed: \$4.2 billion (to avoid double counting with lost aesthetic value under ecosystem services, this effect is not separately estimated)
- Total property value effect lost: \$33.6 to \$44.5 million
- Resulting loss in property tax revenue (annual): \$157,837 to \$209,061
- Lost ecosystem service value, such as for water and air purification, recreational benefits, and others:
 - Over the two-year construction: between \$5.1 and \$18.1 million (a one-time cost)
 - Annually for the life of the ACP: between \$1.4 and \$5.2 million
- Lost economic development opportunity due to the erosion of Augusta County's comparative advantages as an attractive place to visit, reside, and do business. Under the scenarios described below, these could include
 - An annual loss of recreation tourism expenditures of \$20.2 million that supports 194 jobs, \$3.7 million in payroll, and generates \$833,900 in state and \$674,500 in local taxes
 - Annual loss of personal income of \$4.8 million due to slower growth in the number of retirees
 - An annual loss of personal income of \$1.3 million due to slower growth in sole proprietorships
- One-time costs (property value and ecosystem services during construction) would total between \$38.7 and \$62.6 million
- Annual costs (all other costs above) would range from \$48.0 to 51.9 million

Note: For a number of reasons, these estimates are conservative and the actual economic cost of the ACP, if built, would likely be much higher. For further explanation of the concepts, methods, data, and assumptions behind these numbers, please see the technical report, "Economic Costs of the Atlantic Coast Pipeline to Property Value, Ecosystem Services, and Economic Development in Western and Central Virginia," available for download at keylogeconomics.com.

Home to the headwaters of both the James and Shenandoah Rivers, Augusta is an important county with much to offer in western Virginia. Augusta is second in the state in agricultural production. Augusta also leads the Commonwealth in cattle, sheep, and hay production and also has more farm acreage than any other Virginia county.

Nestled in the Shenandoah Valley, the county is bordered to the west by the George Washington National Forest and to the east by more of the National Forest and Shenandoah National Park. The eastern border of Augusta is also home to portions of Skyline Drive, the Blue Ridge Parkway, and the Appalachian Trail, with the latter of the two proposed to be crossed by the ACP. This natural beauty offers a multitude of opportunities for outdoor recreation and a pastoral landscape of historic attractions, wineries, and farms throughout the county. These features contribute to and benefit from Augusta's beautiful, clean environment. They are also an important part of the county's economic success, including faster population, employment, and

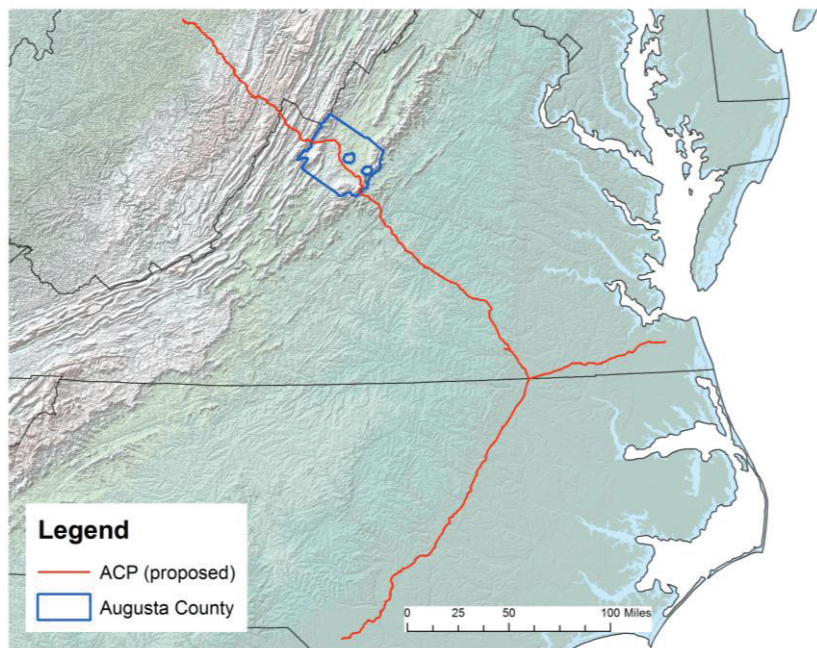


Figure 1: The route of the proposed Atlantic Coast Pipeline, which would bisect Augusta County.

income growth compared to Virginia's other rural counties.

Augusta exhibits what some researchers have termed “the rural growth trifecta” – a combination of outdoor amenities, creative workers, and entrepreneurship (McGranahan, Wojan, and Lambert 2010). Together, these factors attract people who create economic opportunity that fits with the landscape and culture of the area.

Consistent with this reality, Augusta's comprehensive plan includes a vision for the future based on smart development preserving the county's underlying scenic beauty and natural assets. Among those assets is Augusta's farmland. The plan states, “agriculture will continue to be the predominant land use in the county and a major part of the economy....[and] the county's scenic beauty and natural environment will be preserved, with farms, forests, mountains, rivers and streams providing the framework and context for development in the urban areas, and continuing to define the landscape in the rural areas” (“Augusta County Comprehensive Plan Update 2007-2027” 2009).

Recent Trends. Augusta County's population grew by 9.7% between 2000 and 2014 (Headwaters Economics 2015; US Census Bureau 2013).¹

¹ Unless otherwise noted, all employment, income, and population figures are from Headwaters Economics (2015), US Census Bureau (2015a), and Bureau of Economic Analysis (2015).

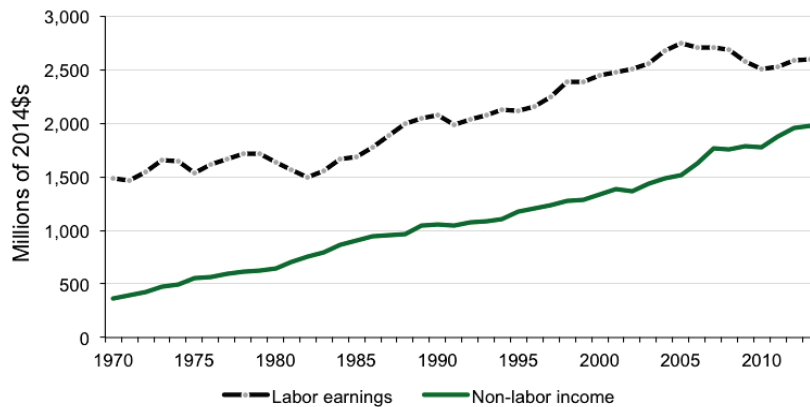


Figure 2: Components of Personal Income, Augusta County (Source: Headwaters Economics 2015, US Bureau of Economic Analysis 2015)

The population increase is largely driven by in-migration, including people of retirement age. Between 2000 and 2014, Augusta experienced an average annual net in-migration of 420 people, which reflects the county’s attractiveness. Through 2013, the population over the age of 65—often retirees who can choose where to live—grew from 14.8% to 17.5%.² Retirees bring their incomes, and when they spend it they create opportunities for economic development, including in the higher-end services (especially health care, financial services, etc.) older residents consume. This migration is one reason for the 45% increase in employment in the real estate and rental and leasing industries since 2000.

Besides labor income (one’s

earnings from a wage-and-salary job and/or self-employment), Augusta residents also receive “non-labor income” in the form of earnings on investments (dividends, interest, and rent) and transfer payments, such as Social Security and Medicare. As a share of the total, non-labor income now accounts for 40 out of every 100 dollars earned or received by Augusta residents, double the percentage in 1970. Since 2000, non-labor income has grown by 43.8%.

This does not mean labor earnings are unimportant. Wages, salaries, benefits, and self-employment income still make up 60% of personal income in the county, and labor income has increased by 13.3% since 2000.

Threatened Business: White’s Wayside Diner

White’s Wayside Diner has served as a community gathering place since 1929. Their “WhiteWay bread” is a local treasure and has even been served in the White House. This bread is a prime example of the importance of “ecosystem services” in that the owners have found the quality of the bread depends on the quality of the water from their artesian well. They have tried to make the bread with water from other places but it is just not the same.

With the proposed route of the ACP passing directly behind the restaurant, the owners fear a loss of water quality during construction. They have already invested nearly \$10,000 in engineering and testing of their water system to meet state requirements. Damage from pipeline construction could put that investment at risk.

The Diner’s owner sees “no benefit to me or my community” from the influx of construction workers. Serving construction workers might mean taking on additional staff who would only be laid off after construction. Further, the increased number of customers would stretch the diner’s water and sewer infrastructure and could be environmentally damaging to the area’s water supply

-Jack Wilson, White’s Wayside Owner

² Age distribution data is the most recent available from the US Census Bureau.

Like retirees, entrepreneurs and small business owners in a variety of industries choose where they locate, basing their decisions on amenities and quality of life, rather than on access to input or output markets or other traditional business concerns (Rasker and Glick 1994). One indicator of this phenomenon in Augusta is the growth in sole proprietorships. By 2014, the county's 14,593 sole proprietors accounted for almost one quarter of employment, and their ranks had grown 29% since 2000. Statistics such as these illustrate the extent to which the creative activity of Augusta's new and long-time residents drives economic development.

Travel and tourism are also an important and growing part of the county's economy. Jobs in the industry—composed of passenger transportation, arts, entertainment, recreation services, accommodation, food services, and portions of the retail sector—make up 13.6% of total private employment in the county.

Between 2010 and 2014, Augusta, Waynesboro, and Stanton saw an \$18.5 million increase in

traveler expenditures, a 6.9% increase in traveler generated employment, and a \$2.4 million dollar increase in travel related payroll (Virginia Tourism Corporation 2015).³

A relatively low unemployment rate as well as a high per-capita personal income (PCPI) further indicate the county's overall economic health. The unemployment rate was 4.7% in 2014 compared to 6.9% for all of non-metro Virginia. PCPI increased by 23.8% between 2000 and 2014, nearly twice the average increase of 13.1% for all of non-metro Virginia. Augusta County's PCPI stood at \$38,579 in 2014 compared to \$33,923 for non-metro Virginia.

Another indicator of Augusta's economic vitality is that its home and agricultural land values are higher than the average for Virginia. This is a good sign for the county because this measure demonstrates the stock of household wealth and is positively correlated with economic growth (Low 2005).

In the context of the proposed Atlantic Coast Pipeline, it is worth emphasizing that Augusta County's healthy economic performance has occurred without energy infrastructure of the ACP's type or scale. While the pipeline promises some benefits (Atlantic Coast Pipeline, LLC, n.d.) and Governor McAuliffe has called such infrastructure "a game changer,"⁴ local, state, and federal officials must consider *how* the ACP would change Augusta's current conditions and whether such change would really be for the better. Our research, summarized in this report, shows some of the ways in which the ACP could make things much worse.

Impacts of the ACP

Property Values

In Augusta, the proposed ACP would pass through some of the most densely populated areas of the county. The ACP would affect property values in three ways: from loss of use and enjoyment of the property, from safety risks, and from diminished views from one's property. With some overlap, these effects would be most prominent in three zones: in the

³ All dollar values have been adjusted for inflation.

⁴ Quoted in Stewart (2015).

right-of-way (ROW), in the evacuation zone (including a narrower “high consequence area”), and within sight, or in the viewshed, of the pipeline.

Loss of use and enjoyment of properties would be felt most acutely by owners of parcels the proposed 75-foot-wide ROW crosses or touches. Forestland in the ROW will be stripped and converted to shrub or grassland, eliminating the prospect of future timber income (Williams 2015). Construction will harm crop and forage productivity due to soil compaction, soil temperature changes, and alteration of drainage patterns (Fitzgerald 2015). Cropland in the ROW also cannot be managed in the same way due to restrictions on the landowner’s ability to cross the pipeline with heavier farm equipment (Monroe and Monroe 2015; Leech 2015). For the same reason, farm and forestland adjacent to the ROW would become less valuable if it becomes more expensive to reach woodlots or fields on the far side of the ROW.

Current and future residential housing is another productive use of land potentially suffering an economic loss from the ACP. People now living on parcels in the ROW will feel less safe, may be at risk of losing wells during or after construction, and will be deprived of the peace, quiet, and scenic views paid for when properties were initially purchased. There would also be a loss for potential subdivision and development depending on how and where the pipeline crosses unimproved properties.

These economic losses translate into financial losses when current owners attempt to sell their properties and find, as Augusta landowners already have, buyers are far less interested in their properties. In the words of one realtor, “every single one of my buyer clients who are looking to buy property in Augusta County have told me that they do not want to even look at properties that are located ON or NEAR the proposed locations of the ACP” (Adler 2015).

Based on the current value of Augusta properties, as well as surveys of buyers, realtors, and appraisers (Kielisch 2015),⁵ the total loss of property value for the parcels touched by the proposed pipeline ROW in the county ranges from \$5.2 to \$16.1 million.

“There is no way anyone in his or her right mind would buy a building lot anywhere near a gas pipeline of this scale...The loss of land value is something that will never be recovered if the ACP is built.”

*- Harry Crosby,
Farmer at Cros-B-Crest Farm, Established in 1894*

Properties outside the ROW, but still near the pipeline, would also suffer a loss in value. First there is a “high consequence area,” within which one’s survival of an explosion would be unlikely. The high consequence area would be 0.4 miles wide (1,092 feet on either side) for a pipeline of this size. There is also a 1.4-mile-wide evacuation zone (3,583 feet on either side), defined as the area an unprotected human would

⁵ Some of our estimates based on the survey of prospective home buyers reported in Kielisch (2015) are conservative. Some 62.2% of the survey respondents said they would not purchase a property with a pipeline (smaller than the ACP would be) at any price. The remaining survey respondents were split between those who would offer 21% less and those who would offer the same amount. In our estimates we use the average price reduction for just those buyers who stay in the market – that is, an average reduction in offer price of 10.5%. If one considers that 62% of buyers are effectively reducing their offer prices by 100%, the average reduction in offer price would be 66.2%.

need to move beyond in order to avoid burn injury in the event of an explosion or a fire following a leak. Living with the 24/7/365 possibility of having to evacuate one's home or business at a moment's notice, if notice is even possible, diminishes the value of the property to its owner.

As with the effects within the ROW, the loss of value to owners within the high consequence area and the larger evacuation zone translates into lower prices if and when current owners choose to sell. The effect in the high consequence area arguably would be greater than in the evacuation zone, but due to lack of studies estimating such a difference, we are conservatively assuming that the effects within the entire evacuation zone, including within the high consequence area, are the same.

The evacuation zone through Augusta would touch 3,268 parcels, not counting those already affected by the ROW.⁶ Based on the current value of these properties and research on the decrease in property value due to a risk of evacuation

(Boxall, Chan, and McMillan 2005), the ACP would induce an additional loss of \$28.4 million in property value.

Depending on topography, the pipeline will also be visible for many miles in all directions. In Augusta County and the cities of Staunton and Waynesboro, 14,357 parcels will have their views affected by the pipeline. Homebuyers, realtors, and commercial property owners know the importance of the proverbial "million-dollar view". While the pipeline might not erase quite that much value from a given property, it is likely a property with a view that suddenly includes a pipeline right-of-way where there was once an unbroken view of woodlands or farm fields will experience a real loss in value. This lost value would be reflected in the loss of aesthetic value included with other effects on ecosystem services described in the next section.

Leaving aside the value lost in the viewshed and counting only

Disrupted Farms and History: Shomo Farm

The Shomo family farm, which has been in continuous operation for over one hundred years, consists of several properties and approximately 1,000 acres in central Augusta County. The ACP, as proposed, would cut across every one of Shomo Farm's parcels, run between two barns used to raise 250 Holstein calves raised as heifers for other dairy producers, and cross a field needed to raise feed for those heifers and for their cow-calf operation.

In order to have any value to their dairy-farm client, those heifers need to be pregnant when they leave the farm, but as the Shomos have learned from their veterinarian, blasting, air emissions, noise, and other features of the ACP's construction and operation could result in a crippling loss of breeding success/fertility among their cows. Their client has already indicated that it is looking elsewhere for a place to have its heifers raised. As Sally Shomo puts it, that heifer operation is now their "milk check" or the farm's bread-and-butter, without which the whole operation will not be financially viable.

Without a viable agricultural operation, the farm would cease to exist and because of the proximity to the pipeline, would likely have little value as housing or commercial property. The Century Farm and its stewards would be wiped out.

⁶ While we have not attempted to quantify the additional impact in monetary terms, it is worth noting that several of these parcels are schools, for which the loss of sense of well-being would extend to the parents of students no matter how far from the pipeline they live.

the impacts in the right-of-way and the evacuation zone, the ACP could cause between \$33.6 and \$44.5 million in lost property value in Augusta County. Applying the median property tax rate for the county, this one-time loss in property value translates into an annual loss of property tax revenue between \$157,837 and \$209,061.

These estimates of lost property value and tax revenue are conservative for five reasons. First and as explained in footnote five,⁵ estimated impacts on sale prices for properties in the ROW do not take into account the fact that more than 3 out of 5 prospective buyers would not buy such properties at any price. Second, our estimates treat properties in the (higher risk) high consequence areas as if they are affected only to the same degree that properties in the evacuation zone would be affected. Third, they do not take into account the disproportionate effect the ACP would have on the assessed value of developable, but currently unimproved, parcels for which the ACP could impede subdivision. Augusta County has 46 unimproved parcels in the proposed right-of-way whose assessed value includes the

value of a house site. Depending on where and how the ROW crosses these properties, it is likely that some will lose their potential for future development and the assessed value and associated property tax revenue will fall. Fourth, we have not quantified the effect of additional surface infrastructure, such as access roads, that would take up land outside the right-of-way. Fifth and finally, the estimated impacts on tax revenue do not reflect lost value for properties with pipeline-damaged views. If the ACP is permitted, a property-by-property reappraisal of all parcels affected in any of these ways and in all areas—along the ROW, in the evacuation zone, and throughout the viewshed—should be undertaken to determine the full impact on landowners and local tax revenues.

Ecosystem Services

The construction and presence of the ACP will alter the flow of natural benefits people receive from well-functioning, healthy ecosystems. Known as “ecosystem services” and defined as the benefits people obtain from ecosystems, these natural benefits include services such as clean water for drinking and for industrial processes, food grown on cropland, raw materials in the form of timber, and the aesthetic value of beautiful views from residential and commercial properties as well as from areas used for recreation.

Ecosystems also protect people and property from extreme events like floods and wildfire, regulate local and global climate, clean the air, support food production through natural pest control and pollination, provide wildlife to hunt, fish to catch, and spaces for other forms of recreation.

Because these ecosystem benefits are benefits to people, they convey economic value. To the extent the ACP would reduce the flow of these benefits, the reduction must be counted among the ACP’s economic costs. Beyond this economic rationale, there is a growing legal and regulatory imperative to consider ecosystem services effects, particularly where federal land, such as the George Washington National Forest, and federal actions are involved (USDA Forest Service 2012; Donovan, Goldfuss, and Holdren 2015).

To estimate these costs, we use the well-established “benefit transfer method” in which different land uses are associated with different rates of

delivery of various ecosystem services. For example, each acre of forest produces a certain number of dollars' worth of aesthetic value, recreational opportunity, water and water flow regulation, among others each year. Similarly, cropland produces food and other natural benefits at its particular rate. Urban open space makes its own contribution to aesthetics and other values. These rates of delivery are transferred to the study region from previous research on areas that are reasonably similar to the study region.

Acreage converted from a more productive to a less productive land use results in lower ecosystem service values. During construction, the ACP would convert all acreage in the 125-foot-wide construction zone to barren land, which has no ecosystem service value. After construction, we assume acreage in the construction zone but outside

the 75-foot-wide ROW would return to its previous land use/land cover. Within the ROW, we assume previous forestland would return to shrub/scrub and that cropland would return as pasture/forage.⁷ All other acreage, including those beginning as shrub/scrub or pasture/forage is assumed to return to its pre-pipeline use or cover type.

The other driver of change in ecosystem service value is the difference in per-acre productivity for land that returns to its previous use after construction. For example, post-construction differences in soil structure, compaction, and other factors may render pasture/forage less valuable for food production, water purification, and producing other benefits once a pipeline runs through it. As Fitzgerald (2015) concludes, "It is my professional opinion that the productivity for row crops and alfalfa will never be regenerated to its existing present 'healthy' and productive condition [after installation of the pipeline]." Similarly, urban open space might become less suitable as a place for children to play or people to relax once it becomes open space occupied by a high-pressure gas transmission line. While we are aware of one proposed study focused on agricultural productivity,⁸ there are not yet data indicating how severe the changes would be. Our estimates assume, therefore, that acreage in the ROW is as productive after construction as any other acreage in the same land use/land cover.

In Augusta, ecosystem service value lost in the temporary conversion from forest, cropland, urban open space, and other areas to a 125-foot-wide construction zone ranges from \$2.5 to \$9.1 million in each of the two years of construction.⁹ Ecosystem service value lost in the ROW each and every year thereafter is estimated to be between \$1.4 and \$5.2 million.

⁷ We recognize that some land in the ROW could technically be used for crop production again after construction. However, restrictions on the weight of machinery that can cross the pipeline itself may make such production uneconomic. Moreover, the presence of the pipeline and restrictions on activities that can occur within the ROW can have spillover effects on the crop fields through which the ROW passes. As Augusta County farmer Harry Crosby has testified, the ROW would take an entire field of 30-40 acres out of crop production (Crosby 2015a; Crosby 2015b). Our assumption that ONLY the acreage in the ROW itself would be lost to crop production is therefore a conservative one.

⁸ Once funded, this Ohio State study would use field-level data to examine the anecdotal evidence gathered over the course of decades that fields with pipelines have lower crop and forage yields than those without (Culman 2015).

⁹ While construction at any given point along the pipeline would not take two years, we assume that it would be two years before the construction zone is fully revegetated and functioning as the land use or ecosystem type in which it will stay during operation of the pipeline.

Lost aesthetic value represents the largest share of this total. Disruptions to water supply and water flows, the related category of protection from extreme events, and recreation make up much of the remainder.

We regard these as conservative estimates because we only count the loss of value that would otherwise emanate from the ROW and construction corridors themselves. Additional losses would occur due to the conversion of forest and other areas to barren or urban land (both of which have relatively low ecosystem service productivity) that would serve as access roads and other pipeline-related infrastructure.

In addition, the ROW would serve as a pathway by which invasive species or wildfire could more quickly penetrate areas of interior forest habitat, thereby reducing the natural productivity of an even larger area. During construction, the construction corridor itself could be a source of air and water pollution that may over-burden the ability of surrounding areas to absorb sediment, particulates, and other pollutants. If that is the case, the ecosystem service value of the construction corridor during

construction would not be zero, it would be negative.

Finally, these estimates reflect only changes in natural benefits that occur due to changes on the surface of the land. Particularly because the proposed pipeline would traverse areas of karst topography, there is concern subsurface hydrology could be affected during construction and throughout the lifetime of the pipeline (Pyles 2015). Blasting and other activities during construction could alter existing underground waterways and disrupt water supply. There is also a risk that sediment and other contaminants could reach groundwater supplies if sinkholes form near the pipeline during construction or afterwards. These scenarios would entail further loss of ecosystem service value and, for the homeowners or municipalities affected, major expenditures. Officials in Augusta estimate it would cost at least \$2.1 million to establish a new municipal well, for example (Hoover 2015).

Economic Development Opportunity

Augusta County's economic development strategic plan stresses "Respect for Heritage and Environment: Promote a quality of life that embraces our heritage, preserves the environment and effectively manages the resources we have been given" (Glover and Castle 2015). The ACP would undermine progress toward this goal if the loss of scenic and recreational amenities, the perception and the reality of physical danger, and environmental and property damage were to discourage people from visiting, relocating to, or staying in the county. Workers, businesses, and retirees who might otherwise choose to locate along the ACP's proposed route will instead pick locations retaining their rural character, productive and healthy landscapes, and the promise for a higher quality of life.

This is already occurring in the region. With the possibility of the ACP looming, business plans have stalled and the real estate market has slowed (Smith 2015b; Smith 2015a; Adler 2015). Augusta residents are also concerned that the ACP could have broad, negative impacts on the economy. Of the commenters who mentioned the economy in written comments to the Federal Energy Regulatory Commission during the scoping phase of its environmental review, 74% expressed a belief that the ACP would have a negative effect. Of those who mentioned agriculture,

91% thought the effect would be negative and every commenter who addressed tourism said the effect would be negative.

These fears are consistent with research results from this region and around the country demonstrating that quality of life is often of primary importance when people choose places to visit, live or do business. As Niemi and Whitelaw (1999, 54) state, “as in the rest of the Nation, natural-resource amenities exert an influence on the location, structure, and rate of economic growth in the southern Appalachians. This influence occurs through the so-called people-first-then-jobs mechanism, in which households move to (or stay in) an area because they want to live there, thereby triggering the development of businesses seeking to take advantage of the households’ labor supply and consumptive demand”. They note that decisions affecting the supply of amenities “have ripple effects throughout local and regional economies”.

Along similar lines, Johnson and Rasker (1995) found that quality of

life is important to business owners deciding where to locate a new facility or enterprise and whether to stay in a location already chosen. This is not surprising. Business owners value safety, scenery, recreational opportunities, and quality of life factors as much as residents, vacationers, and retirees.

It is difficult to predict how large an effect the ACP would have on decisions about visiting, locating to, or staying in Augusta. Even so, based on information provided by business owners to FERC and as part of this research, we can consider reasonable scenarios for how the ACP might affect key portions of the county’s overall economy.

Augusta residents believe the ACP will harm the travel and tourism industry. Wintergreen Resort, partially located in Augusta County, expects a 40% drop in business relative to a planned expansion (Theiss 2015). The nearby Fenton Inn projects it “will be losing at least 10% of projected income for [the life of the pipeline]” and that insurance and other costs will further impact its bottom line (Fenton and Fenton 2015). In one widely reported case, a planned resort in Nelson County will never be built if the ACP is constructed—effectively a 100% loss for a business that would supply 50 full-time and 50 part-time jobs (Averitt 2015). Finally, Yogaville in Buckingham County surveyed current and former guests regarding how a pipeline near their campus could affect future demand for its programs and found some 95% of those surveyed responded they would visit less often if the pipeline were constructed.

While more systematic research could provide refined estimates of the impact of natural gas transmission pipelines on recreation and tourism spending, one plausible scenario is that the impact is at least as high as the minimum of these business owners’ reported expectations. If the ACP were to cause a 10% drop in recreation and tourism spending from the 2014 baseline, the ACP could mean \$20.2 million less in travel expenditures in Augusta.¹⁰ Those missing revenues would otherwise support roughly \$3.7 million in payroll, \$674,500 in local tax revenue,

¹⁰ Raw data on travel expenditures is from the Virginia Tourism Corporation (2015). This reduction in economic activity would be in addition to the lost recreation benefits (the value to the visitors themselves over and above their expenditures on recreational activity) that are included with ecosystem service costs.

\$833,900 in state tax revenue, and 194 jobs in Augusta County's recreation and tourism industry each year. In the short run, these changes multiply through the broader economy as recreation and tourism businesses buy less from local suppliers and fewer employees spend their paychecks in the local economy.

Along similar lines, another important economic engine affected by the ACP is retirement income. In county-level statistics from the US Department of Commerce, retirement income shows up in investment income and as age-related transfer payments, including Social Security and Medicare payments. In Augusta, investment income grew by 1.2% per year from 2000 through 2014, and age-related transfer payments grew by 5.5% per year. During roughly the same time period (through 2013), the number of residents age 65 and older grew by 28% (2.2% per year), and this age cohort now represents 17.5% of the total population.²

Although it is difficult to precisely quantify the effect of the ACP on retirement income, given the strong expression of concern from residents about changes in quality of life,

safety, and other factors influencing retirees' location decisions, it is important to consider that some change is likely. Here, we consider what just a 10% slowing of the rate of increase might entail. For Augusta, such a scenario entails an annual decrease in investment and age-related transfer payments of approximately \$4.8 million. That loss would ripple through the economy as the missing income is not spent on groceries, health care, and other services, such as restaurant meals, etc.

The same phenomenon also applies to people starting new businesses or moving existing businesses to Augusta. This may be particularly true of sole proprietorships and other small businesses who are most able to choose where to locate. As noted, sole proprietors account for a large and growing share of the county's jobs. If proprietors' enthusiasm for starting businesses in Augusta were dampened to the same degree as retirees' enthusiasm for moving there, the effect would be 30 fewer new jobs and \$1.3 million less in added personal income each year.

For "bottom line" reasons (e.g., cost of insurance) or due to the owners' own personal concerns, other businesses besides sole proprietorships might choose locations where the pipeline is not an issue. If so, further opportunities for local job and income growth will be missed.

These are simple scenarios and the actual magnitude of these impacts of the ACP will not be known unless and until the pipeline is built. Even so, and especially because the pipeline is promoted by supporters as bringing some jobs and other economic benefits to the region, it is important to consider the potential for loss.

Conclusion

The full costs of the proposed Atlantic Coast Pipeline in Augusta County are wide-ranging. They include one-time costs like reductions in property value and lost ecosystem services during pipeline construction, which we estimate to be between \$38.7 and \$62.6 million. Also, there are ongoing costs like lost property tax revenue, diminished ecosystem service value, and dampened economic growth that recur year after year for the life of the pipeline. These annual costs would range from \$48 to \$51.9 million per year. Most of these costs would be borne by Augusta County

residents, businesses, and institutions. By contrast, the ACP's one local benefit would be much smaller. It is an estimated average tax payment of \$1.1 million per year through 2025 (Natural Resource Group 2015, 5–31). Other ACP-promoted benefits, such as jobs from the ACP's construction and operation and those stemming from lower

energy costs, would accrue primarily in other places (Atlantic Coast Pipeline, LLC, n.d.).¹¹

The decision to approve or to not approve the ACP does not hinge on a simple comparison of estimated benefits and estimated costs. The scope and magnitude of the costs outlined here, however, reflect and are an important component of the full environmental effects that must be considered in making that decision. Impacts on human well-being, including those that can be expressed in dollars-and-cents must be taken into account by the Federal Energy Regulatory Commission and others weighing the societal value of the Atlantic Coast Pipeline.

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¹¹ Due to issues with the methods and assumptions used in the ACP-sponsored studies, the benefit estimates they present may be inflated. See Stanton, et al. (2015) and Phillips (2015) for a review.

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