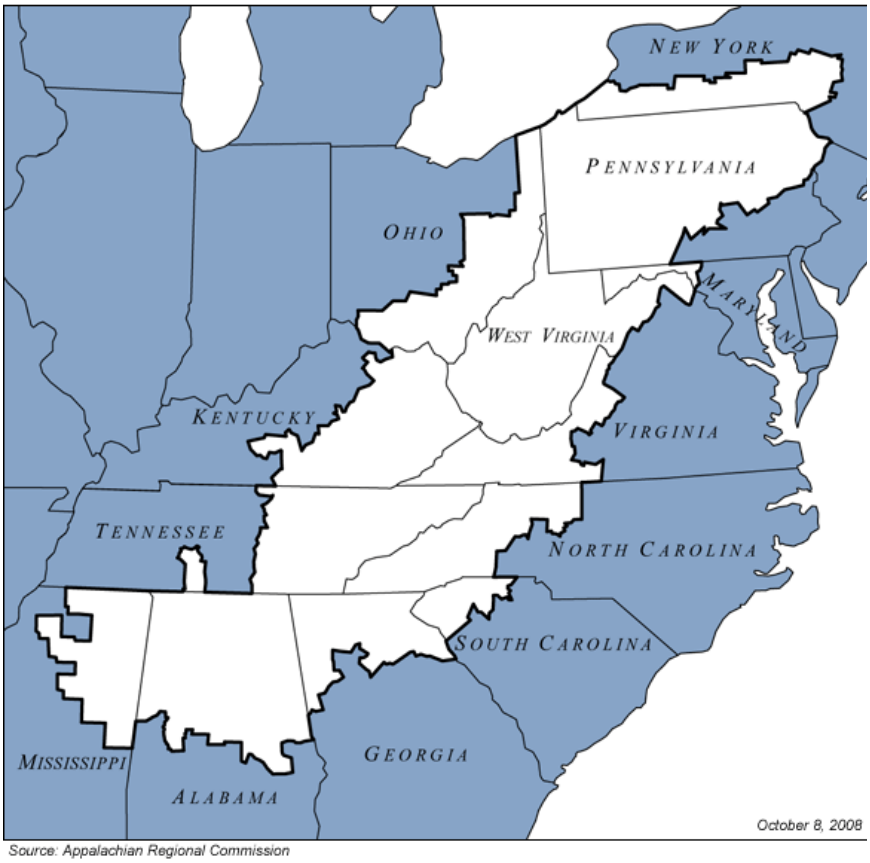
FINAL REPORT

Trade, Freight and Economic Development in Appalachia

Appalachian Regional Commission

July 12, 2012



Source: Appalachian Regional Commission

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1. INTRODUCTION

1.1 Overview

Freight movement in the U.S. contributes to the nation's economy, security, and quality of life. Each day, the U.S. freight transportation system moves more than 60 million tons of freight, roughly $40 billion in goods.[1] The demand for freight transportation has been increasing as well, primarily due to growth in international trade. For example, global trade in manufactured goods increased an average of 7.6 percent per year over the past six decades.[2] President Obama's announcement in the 2010 State of the Union address, setting a goal to double U.S. exports by the end of 2014, further supports the importance of global trade to the nation's economy.

This study presents information related to goods movement, trade, freight volumes and the economic impact of the Appalachian Development Highway System (ADHS), a 3,090-mile interstate highway system composed of 31 individual corridors. The ADHS was designed to stimulate socioeconomic development throughout the Appalachian Regional Commission (ARC) by linking Appalachia to external markets. One of the goals of the system is to provide better trade linkages into, out of, and through Appalachia supporting U.S. economic competiveness and enhancing the economy of Appalachia. Built to enhance the flow of commerce and open isolated areas to economic opportunity, it also improves commuting and the delivery of key social services to residents.

The study leverages and highlights freight-related findings and results from previous studies completed for ARC by HDR. It also presents an analysis of international trade data based on the PIERS data set. The study is comprised of the following sections:

- Section 2 presents the methodology and key data sources utilized in the analysis;
- Section 3 offers an overview of freight and trade in Appalachia based on previous ARC studies;
- Section 4 describes international trade (exports) from Appalachian companies; and
- Section 5 details the jobs and economic development contribution of freight in Appalachia.

1.2 Summary of Findings

Freight transportation and trade connect a relatively isolated region of the country to external markets, including international gateways. Continuing to maintain and improve connectivity between modes of transportation and with external markets is critical to the continued and expanded economic competitiveness of the ARC region.

- Completion of the ADHS is expected to result in freight truck user benefits of nearly $3 billion – more than half of the $5.1 billion in total user benefits expected to be generated by the project's completion.
    - More than 65 percent of benefits to freight flows are external to Appalachia, reflecting the long-distance nature of shipments and the national importance of the ADHS.
- In the past 12 months, companies in Appalachia have exported more than 59 million tons of goods valued at $129.4 billion through ports in all regions of the U.S. When compared to total U.S. Waterborne Foreign Trade Statistics for 2010, this accounts for approximately 25 percent of all U.S. exports. As these are different data sources for slightly different time periods, it is

[1] NCFRP Report 13, Freight Facility Location Selection: A Guide for Public Officials, Transportation Research Board, Sponsored by the Research and Innovative Technology Administration, 2011.
[2] "Network Appalachia, Access to Global Opportunity," Appalachian Regional Commission.

difficult to make an exact comparison, but the ARC region clearly exports a large volume of waterborne goods.[3]

- The majority of freight movements are done through Atlantic ports.
- Freight industry output in the Appalachian region was estimated to be $31.4 billion in 2010.
- The freight industry employed 264,947 employees, approximately 4.4 percent of the roughly 12.6 million employees in the region in 2010.
- With a location quotient of 1.37, truck transportation employment is more concentrated in the region than it is in the overall U.S. Rail transportation and warehousing & storage employment is also more concentrated regionally than in the U.S. with a location quotient of 1.22.
- Truck transportation accounts for the largest share of total Appalachian region freight related employment. In addition, approximately 2.4 million employees are estimated to be in freight-dependent industries, including manufacturing, construction, agriculture, and mining.
- Rail transport, in coordination with trucking and inland navigation services, provides critical access to Appalachia's coal industry, moving 335 million short tons of coal in 2010 and directly supporting nearly 150,000 jobs across the region.

[3] The U.S. data is from the U.S. Waterborne Foreign Trade Statistics: http://www.marad.dot.gov/documents/U.S._Waterborne_Foreign_Trade_by_Custom_District.XLS for 2010. This comparison assumes that the periods and data provided by the U.S. Census Bureau and PIERS data are comparable.

2. METHODOLOGY

2.1 Key Data Sources

The three major data sources used in the analysis are presented below.

2.1.1 PIERS Data

States within the ARC region purchased a set of exporter data from the Port Import/Export Reporting Service (PIERS)[4] as part of an effort to highlight the importance of trade to the region. This PIERS waterborne trade data aggregates bills of lading for 88 ports within the United States on a rolling annual basis, with this particular dataset including data from November 2010-November 2011. Records are kept by company with information on industry, number of employees at each company, tonnage, value, primary commodity exported, ports, and destination countries.

In order to create a dataset consistent with the Appalachian Region, data were aggregated from the city to the county level and only information from the 420 counties that are within the Region were included in the analysis.

While the PIERS data is unique in that it allows specific information on exports that no other data set provides, there are some limitations to the data. First, since the purchased data is an exporter dataset, information on imports is only available for those companies that also export. For this reason, import movements have not been included in this analysis, as values generated from the data may not accurately reflect overall imports to the Appalachian Region. Secondly, the data only records the top five export countries, export ports, and export commodities by number of movements. This provides two limitations: 1.) Only movements to the top five countries, through the top five ports, or of the top five commodities are included; and 2.) Only the number of shipments can be counted by country, port, or commodity and no tonnage or value can be attributed to these categories.

2.1.2 Transportation Economic Development Impact System (TREDIS)

TREDIS data is based on U.S. Bureau of Labor Statistics, Bureau of Economic Analysis, and County Business Patterns. For the study, the TREDIS data provides estimates of jobs, output, value added, and labor income by industry for all of the states in the Appalachian Region. This data was analyzed at the Appalachian Region level, at the state level, and by industry.

2.1.3 Previous ARC Reports

Three previously completed reports related to the ADHS and Appalachian region were reviewed as part of this study, and quantitative and qualitative information on regional goods movement was obtained. The Network Appalachia study provided information related to international trade and other freight-related matters. The "Economic Impact Study of Completing the Appalachian Development Highway System (ADHS)" was reviewed; it quantified benefits of freight transportation. The final study reviewed was the more recent economic impact study of the 2009 rockslides in Tennessee and North Carolina.

[4] http://www.piers.com/

3. FREIGHT AND TRADE IN APPALACHIA – PAST STUDIES

Numerous studies have been conducted for the ARC highlighting the importance of transportation in Appalachia. Several of these studies focus on freight transportation and the impacts of the goods movement and overall trade on the region. The economic impact of the ADHS and the region's transportation network is also described in these studies, and freight flows are discussed.

The studies reviewed in this section help quantify how significantly freight transportation impacts the national and Appalachian economies. For example, one study estimates that completion of the ADHS will generate freight truck user benefits of nearly $3 billion by 2035. Another examines exports from and imports to the region and finds that auto parts and furniture are the top imports to Appalachia. According to the study, top exports include synthetic resins and paper/paperboard. As mentioned above, the following three key studies were reviewed:

1. The documentation of Network Appalachia's freight and trade findings;
2. *Economic Impact of Completing the Appalachian Development Highway System, Final Report*, June 2008; and
3. *Economic Impact of Rockslides in Tennessee and North Carolina*, May 2010.

In addition, this section includes a brief profile of the coal industry in terms of trade, jobs, and transportation.

3.1 Network Appalachia

The ARC established a regional study group comprised of economic development, transportation and international trade professionals in Appalachia to evaluate changing macroeconomic trends and provide insight on the effects of these trends on the region's future commerce and movement of goods. According to the study, the ARC region has several competitive advantages with respect to future commerce and the movement of goods. The region is:

1. Strategically centered among some of the nation's strongest production centers and consumer markets
2. Positioned as a natural crossroads for emerging international trade lanes linking America with markets worldwide

The study found that for 2007 imports to the region:

- Most were likely to arrive through the Port of NY/NJ, followed by Charleston and Savannah
- North Asia was the dominant origin with 65 percent of the imports in the region
- Europe had 17 percent of the imports

In terms of commodities, Appalachia's top five imports in 2007 were:

1. Auto parts – 31,825 TEUs
2. Furniture – 30,819 TEUs
3. Miscellaneous general cargo – 25,676 TEUs
4. Footwear – 19,247 TEUs
5. Auto and truck, tire and tubes – 16,868 TEUs

For 2007 exports from the region:

- Most were likely to move through Charleston, Houston and Savannah
- North Asia was the destination of 25 percent of the exports
- Europe was the destination of 24 percent of the exports

In terms of commodities, Appalachia's top five exports in 2007 were:

1. Synthetic resins – 34,426 TEUs
2. Paper and paperboard (+ waste) – 30,651 TEUs
3. Auto parts – 17,935 TEUs
4. Miscellaneous general cargo – 16, 299 TEUs
5. Fabrics (+ raw cotton) – 15,043 TEUs

The study also discussed the importance of connectivity. It recommended a more coordinated and integrated transportation network and highlighted the importance of linking the region's railways, waterways and highways. The study discussed each of these three primary transportation facilities and considered county proximity to highways, inland ports, and other transportation-related facilities. Of greatest importance to business are:

1. Distances to Interstates, Intermodal Container Transfer Facilities (within the intermodal Freight Rail Network) and proximity to rail road intersections
2. Access to the ADHS

Three primary building blocks relevant to freight transportation also were developed:

1. Completion of the ADHS – This highway system is 85 percent complete. The economic benefits to completing the ADHS are estimated to be 80,500 new jobs and $5 billion in increased value added. In addition to connecting ARC region to economic centers, ADHS is an important component of longer-distance trade lanes.
2. Intermodal Corridors of Commerce – While ADHS has served as a critical element of the region's economic development program, it is alone insufficient to help Appalachia's communities compete globally. Appalachia's growth and prosperity will depend on its ability to develop an integrated intermodal transportation system. These corridors will link inland Appalachian ports to coastal ports, the region's gateways to global commerce.
3. Inland Ports of Appalachia – A region-wide system of local freight terminals will establish the critical connection between Appalachia's transportation system and its economy. These ports directly connect local businesses with the region's highway, railroad, and waterway corridors.

3.2 Economic Impact of Completing the Appalachian Development Highway System

The purpose of this study is to assess the travel performance, trade, and economic development impacts directly related to completing the ADHS. The study also addresses how the corridor improvements connect the Appalachian people and businesses to other highway facilities, multimodal transportation, and economic markets. With a completed ADHS, more direct and efficient highway connections will significantly boost regional, national, and international trade flows with the following benefits:

- Freight truck user benefits (excluding travel-time reliability benefits) are estimated to be:
    - Between $376 and $401 million in 2020
    - Between $2.5 and $2.7 billion in 2035

- Vehicle hours traveled by all trucks are estimated to decrease:
  - Between 111,000 and 127,000 hours by 2020
  - Between 435,000 and 493,000 hours by 2035
- Between 80,000 and 92,000 jobs will be created by 2035
- Accessibility will be improved to buyer and supplier markets within a three-hour drive for 225 of the 410 counties
- More than 65 percent of benefits to freight flows are external to the ARC region, reflecting the long-distance nature of shipments and the national importance of ADHS completion

Depending on assumptions, the benefit-cost ratio of completing the ADHS is estimated to be between 1.9 to 3.6, meaning that benefits are likely to be approximately two to almost four times as large as the costs. This strong return on investment finding for mostly rural highway segments is due to: 1) the remaining ADHS segments complete important linkages in a long-distance network that serves a growing domestic and global trade environment; and 2) these highway segments provide necessary access and connections to/from isolated, mountainous Appalachian communities thus providing significant new economic opportunities and supporting the future economic competitiveness of the ARC region and the U.S.

The study also includes three case studies of corridors located in Appalachia. Corridor T in New York, Corridor V in Northwest Mississippi, and Corridor H in West Virginia and Virginia are the focus. These case studies highlight the importance of international shipping and freight on the corridors within the ADHS.

- The Corridor T case study found that completion of the corridor will help support the growth of an aerospace cluster in the region by allowing supplies to be shipped and delivered more quickly and reliably.
- The Corridor V case study indicates that once the corridor is complete, a new automotive parts supplier is expected to move into industrial land south of Tupelo. The completed corridor will also improve the connection between existing furniture manufacturers and markets to the east and reduce local congestion associated with furniture freight shipments.
- The Corridor H case study found that it is very important to connect manufacturers (exporters) to the ports of Norfolk and Baltimore for shipments of wood-based products (Appalachian hardwood, furniture) to Europe. Other manufacturing industries, such as aluminum, charcoal, and food products should also benefit from Corridor H completion.

3.3 Economic Impact of Rockslides in Tennessee and North Carolina

The study assesses the economic impact of two major rockslides that occurred in the southwestern portion of North Carolina and southeastern portion of Tennessee during the fall of 2009. The first rockslide resulted in the closure of a section of Interstate 40 near the Tennessee border. The second occurred in Polk County, Tennessee, and closed a section of US-64. For the analysis, two categories of benefits are considered, local and regional economic impacts and transportation costs.

- The study found that due to the rockslides, and associated road closures and traffic diversion, transportation costs increased $197 million
- 47 percent of the transportation costs is estimated to be borne by trucks, reflecting the impact to trade and important role the highways play in connecting markets
- The I-40 rockslide generated:

    - $174.9 million in transportation costs, of which truck costs are $86.9 million
        - 40 percent of truck vehicle operating costs are for diesel and nearly 50 percent for truck maintenance and repair
- The US-64 rockslide generated:
    - $22.1 million in transportation costs, of which truck costs are $4.7 million
        - Nearly 50 percent of truck vehicle operating costs are for increased maintenance and repair expenses and 40 percent is for additional diesel fuel
- Based on interviews with nearly 30 businesses in Bradley, Cherokee, Cocke, Hamilton, Haywood, and Polk Counties, economic activity also decreased in the areas most impacted by the rockslides
    - One trucking company in the area incurred an additional $1,500 per day in transportation costs after the rockslides

3.4 Coal Industry and Trade

More than one-third of the coal produced in the U.S. comes from the Appalachian region, with most of the coal used for steam generation for electricity, metal production and export. This is not surprising, given that West Virginia is the second largest coal-producing state in the nation.[5] The U.S. Energy Information Administration (EIA) reports that the Appalachian region produced 335 million short tons of coal in 2010, and analysis of PIERS trade data reveals that 1,199 coal shipments were exported from the region to international destinations.[6]

A study conducted by the University of Kentucky found that Appalachian coal mining employment is concentrated in the area where Kentucky, Virginia, and West Virginia intersect, along with smaller pockets of high employment in Alabama and several counties in Pennsylvania. The total economic impact of the coal industry is estimated to account for roughly 3.0 percent of employment in both the northern and southern sections of Appalachia, but in the Central Appalachian region, the total economic impact of this industry is estimated to account for 30 percent of that area's employment.[7] Based on 2010 TREDIS data developed for this study, 144,566 employees in the ARC region work in the Mining, Quarrying, Oil & Gas Extraction industry. Among the identified freight-dependent industries in the region, Mining, Quarrying, Oil & Gas Extraction has the highest location quotient (1.47), further supporting the relative importance of this industry to the region.

FHWA's Freight Analysis Framework (FAF) data for 2010 indicate that 73.6 percent of the coal originating in the States of West Virginia, Kentucky and Virginia is transported by rail, accounting for 94 percent of rail tonnage from these three states. Another 14.2 percent is transported by truck and nearly 9.0 percent is transported by water. According to the Network Appalachia Study, coal and petroleum (including crude oil and petroleum products) are the largest commodities by volume moving on the region's 1,500 mile long inland waterway system, followed by grain, aggregates, chemicals (including fertilizers) minerals, and products such as steel.[8]

[5] http://www.eia.gov/energyexplained/index.cfm?page=coal_where
[6] Piers Trade Database – November 2010 to November 2011
[7] A Study on the Current Economic Impacts of the Appalachian Coal Industry and its Future in the Region, FINAL REPORT, prepared by the Center for Business and Economic Research, Gatton College of Business and Economics, University of Kentucky, March 27, 2001.
[8] Network Appalachia, Access to Global Opportunity, Appalachian Regional Commission.

4. INTERNATIONAL TRADE AND APPALACHIA

4.1 Introduction

Global trade of manufactured goods has increased 7.6 percent per year over the past six decades, 6.6 percent per year between 1996 and 2007.[9] This trend offers economic opportunity to Appalachia, and emphasizes the continued importance of regional connectivity to trade routes and outside ports. Better understanding freight flows in Appalachia facilitates the development of freight transportation strategies that will best position the region for potential economic growth.

In an effort to highlight the significance of international trade at region and state levels, this section of the report uses the PIERS export data to highlight the most important export routes from the Appalachian Region. The PIERS data provides information on the number of companies exporting by their location, their primary industry based on NAICS code, the total number of export shipments, the total value of export shipments, the total tonnage of export shipments, and the total TEUs for each company. It also provides the top five ports of export, the top five destination countries, and the top five commodities for each of these companies. However, there are some limitations to the PIERS data, which include:

- Only companies that export to other countries are counted in this particular dataset
- The data are reported by company and only include the top five of any particular category. For example, only the top five ports that are used are explicitly counted. This results in movements by Port summing to less than Total movements. The same is true for commodities.
- Only the number of shipments or movements can be determined for the top five ports or commodities.
- The PIERS data analyzed were received in March 2012, reflecting exports from November 2010 to November 2011.

Section 4.2 presents analysis of the region as a whole, Section 4.3 looks at movements by state, and Section 4.4 examines exports by metropolitan designation.

4.2 Appalachian Region-Wide Exports

4.2.1 Total Export Trade Value and Volumes

Based on the available PIERS data, companies in the Appalachian Region have exported more than 59 million tons of goods valued at $129.4 billion through ports within the United States, as shown in Table 1. For context, based on the US Census Bureau Foreign Trade Division, total U.S. waterborne exports in 2010 were 783.2 million tons and total export value was $455.5 billion.[10]

Table 1: Total Appalachian Export Trade Volumes

	Amount
Total Export Value (Millions of $)	$129,409
Total Export Tonnage (Thousands)	59,023
Total Export TEUs	464,198
Total Export Shipments	523,999

[9] "Network Appalachia, Access to Global Opportunity," Chapter 2.
[10] http://www.marad.dot.gov/documents/U.S._Waterborne_Foreign_Trade_by_Custom_District.XLS

Pennsylvania, largely driven by the Pittsburgh metropolitan area, accounts for the largest share of both tonnage and value, exporting 34.6 million tons of goods valued at nearly $57.5 billion, as shown in Table 2 below. South Carolina ranks second, in terms of value shipped, but this represents less than half of Pennsylvania's overall value. Based on the data, it appears that South Carolina is possibly exporting lighter, higher-valued goods. West Virginia ranks second in terms of export tonnage, 10.9 million tons from November 2010 to November 2011, indicating that West Virginia exports many large, bulk commodities such as coal and lumber.

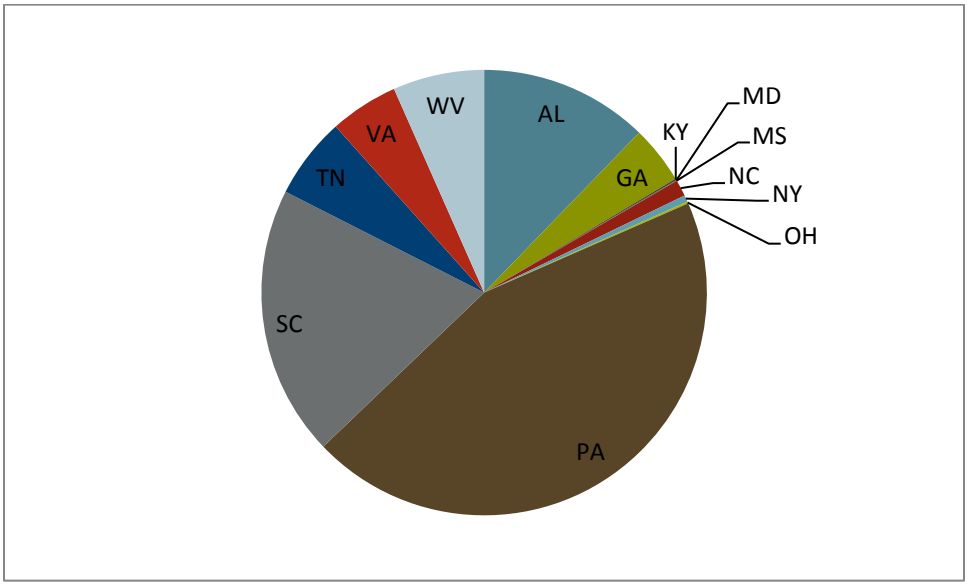
Table 2: Total Appalachian Trade Volumes by State

	Total Export Value ($ Millions)	Total Export Tonnage	Total Export TEUs	Total Export Shipments
AL	$15,852	6,448,130	28,079	25,659
GA	$5,451	514,596	55,905	114,776
KY	$140	843,187	1,614	1,062
MD	$52	5,843	622	558
MS	$33	6,384	1,655	1,085
NC	$1,532	266,088	26,550	31,263
NY	$621	61,774	8,764	3,487
OH	$182	41,929	2,637	2,618
PA	$57,466	34,632,007	122,035	212,290
SC	$25,406	1,676,875	53,924	32,352
TN	$7,651	2,216,766	102,678	52,968
VA	$6,441	1,372,133	53,169	35,210
WV	$8,582	10,937,726	6,565	10,671
Total	**$129,409**	**59,023,438**	**464,198**	**523,999**

Pennsylvania's share accounts for 59 percent of tonnage and 44 percent of the value of the region as a whole, shown in Figure 1 and Figure 2 respectively. Pennsylvania also accounts for the largest share of TEUs and total shipments, with more than 122 thousand TEUs and 212 thousand shipments, 26 and 41 percent respectively. This finding is not surprising, given that the City of Pittsburgh is included in the Appalachian region and in the data for the state

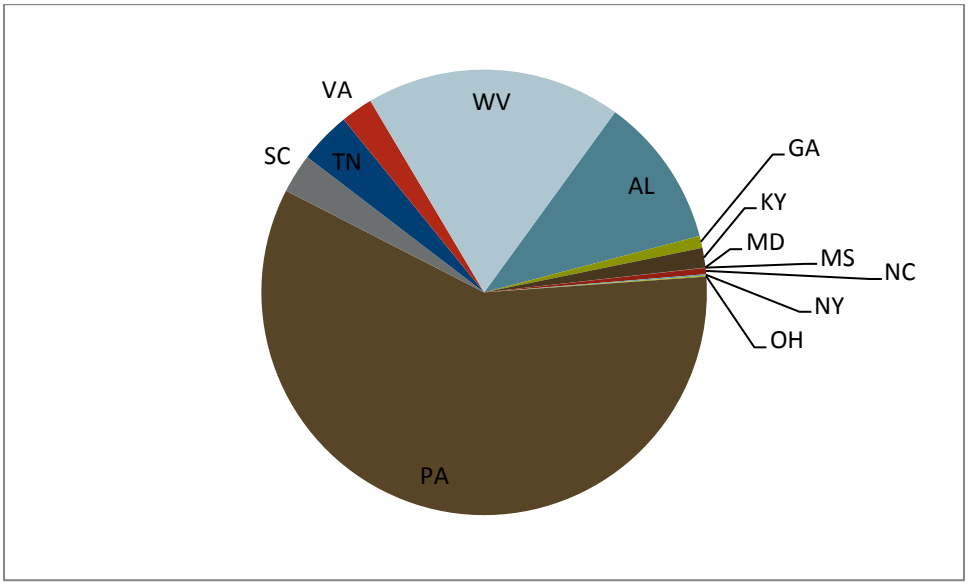
While Pennsylvania accounts for the largest share of all trade metrics, the state with the second highest levels varies. The second highest export value is attributable to Appalachian counties in South Carolina, with more than $25 billion of product being exported, followed by Appalachian Counties in Alabama, accounting for nearly $16 billion. The top three states account for 76 percent of total export value.

Figure 1: Share of Appalachian Region Export Value by State



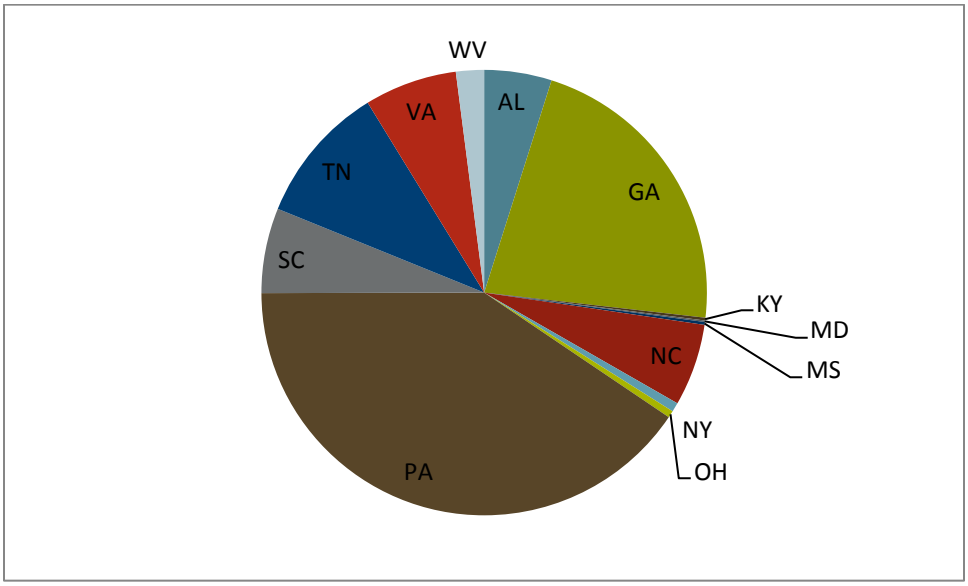
West Virginia exported the second highest tonnage, nearly 11 million tons, and Alabama had the third highest export tonnage at nearly 6.5 million tons. The top three states account for 88 percent of total tonnage exported from the region.

Figure 2: Share of Export Tonnage by State



Georgia accounts for the second highest number of shipments, with almost 115 thousand and Tennessee is the third highest with slightly less than 53 thousand movements. The top three states account for nearly 73 percent of all shipments from the Appalachian Region.

Figure 3: Share of Export Shipments by State



4.2.2 Major Ports Used by Appalachian Firms[11]

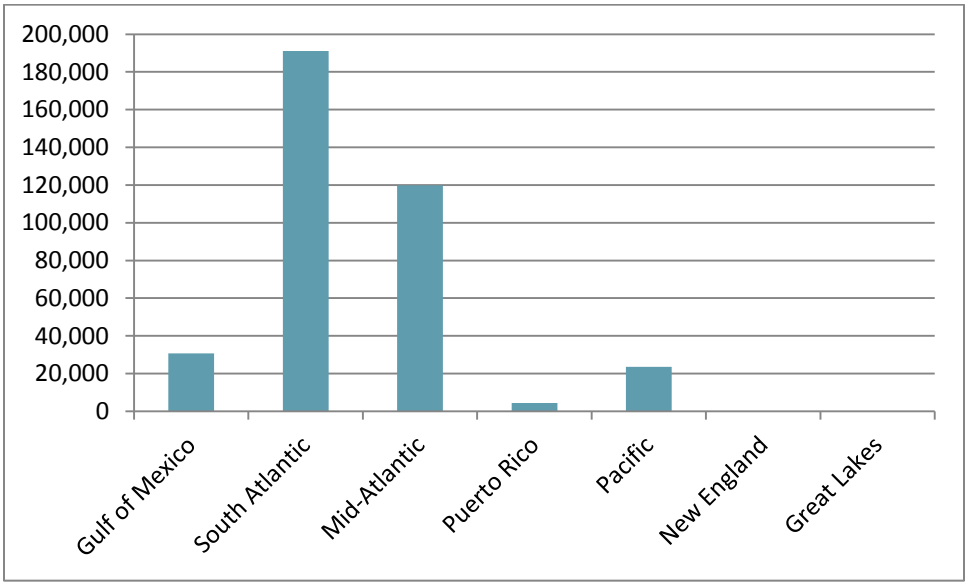
Port specific information from the PIERS database is available for 70 percent of shipments, 369,616 of the 523,999 movements from November 2010 to November 2011. It is important to note that if a company exports through more than five different ports, information is only provided for the first five, and only the number of shipments are counted. The number of port-specific movements will thus be lower than the total number of movements and the value for any given port may be understated. Details for these shipments are provided in this section.

The exporting companies within the Appalachia Region use a total of 56 different ports throughout the United States to ship their goods to foreign countries. Eighteen of these ports are in the Gulf of Mexico, 12 along the Pacific coast, 11 in the Mid-Atlantic – defined as between New York and the Virginia/North Carolina border, and 11 in the South Atlantic – from North Carolina to Florida. See Appendix A for a full list of ports and their respective region.

While Appalachian companies export through ports all around the country, the majority of movements, 310,892 movements (84 percent) are done from Atlantic ports as shown in Figure 4 below. South Atlantic ports accounted for 191,000 movements (51.7 percent), Mid-Atlantic ports accounted for almost 83,000 movements and Gulf ports nearly 31,000.

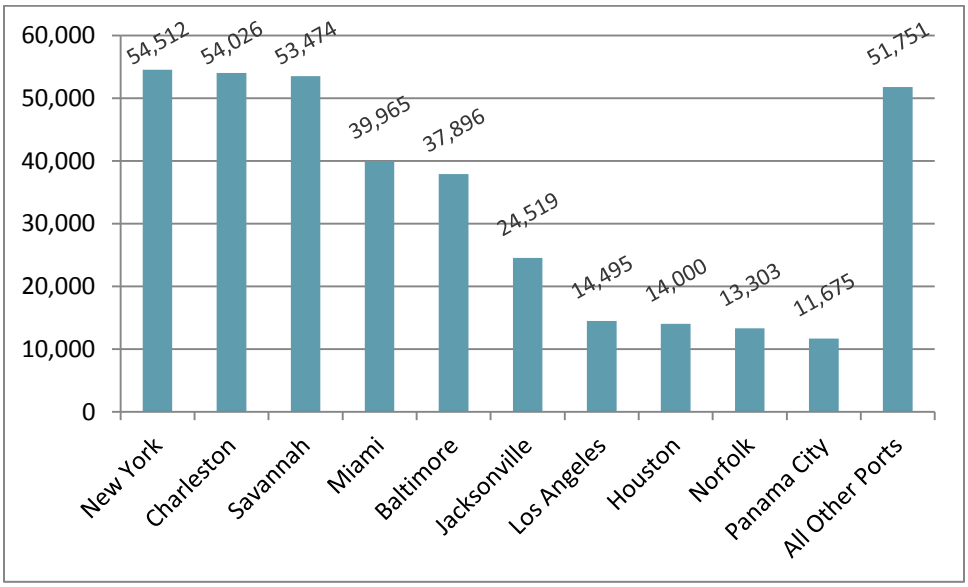
[11] It is important to note that if a company exports through more than five different ports, information is only provided for the first five, and only the number of shipments are counted. The number of Port-specific movements will thus be lower than the total number of movements and the value for any given port may be understated.

Figure 4: Appalachian Export Shipments by Port Region



The Ports of New York and Charleston each accounted for approximately 15 percent of all shipments in the region. New York moved 54,512 shipments and Charleston reported 54,026 movements. New York was the first port of call for 20,767 shipments from the Appalachian region. Charleston was the first port of call for 26,000 movements. The Port of Miami was the largest of the primary ports, accounting for more than 38,000 of the port's nearly 40,000 movements. This is approximately 19 percent of all first-port movements. The Port of Savannah was the third most-used Port, also accounting for more than 50,000 movements. The top three ports accounted for nearly 44 percent of all tracked movements regardless of whether it was the first or fifth most frequently used port for a company.

Figure 5: Top Ten Ports by Number of Shipments



4.2.3 Top Commodities Region-Wide by Number of Shipments

The Appalachian Region is home to a variety of industries, as further detailed in Section 5. The PIERS database identifies 6,193 companies as either importers or exporters. Of these companies, 1,807 did not provide information on their primary industry. Of the remaining 4,386 companies, 1,749 have listed some form of manufacturing as their primary industry.[12] Seven of these manufacturing industries, accounting for 1,289 of the companies, are in the top 10 industries in the region as shown in Table 3.

The most often listed primary industry is Merchant Wholesalers of Durable Goods, of which there were 739 companies; there were also 252 non-durable goods merchant wholesalers. These two together comprise 16 percent of all industries and 22.5 percent of companies that provided information. The only non-manufacturing and non-wholesale industry that is in the top ten is Professional, Scientific, and Technical Services, which had 163 companies exporting product. The industries within these Professional, Scientific and Technical Services that accounted for the largest share of exports were Management Consulting Services, Engineering Services, Research and Development Services and Advertising Distribution Services.

Table 3: Top 10 Exporting Industries in the Appalachian Region by Primary 3-Digit NAICS Listing

NAICS Code	NAICS Description	Companies
423	Merchant Wholesalers, Durable Goods	739
333	Machinery Manufacturing	279
424	Merchant Wholesalers, Nondurable Goods	252
332	Fabricated Metal Product Manufacturing	219
325	Chemical Manufacturing	198
326	Plastics and Rubber Products Manufacturing	175
541	Professional, Scientific, and Technical Services	163
331	Primary Metal Manufacturing	143
337	Furniture and Related Product Manufacturing	142
336	Transportation Equipment Manufacturing	133
	All Remaining Industries	1,943
	No Information	1,807
Total Businesses		**6,193**

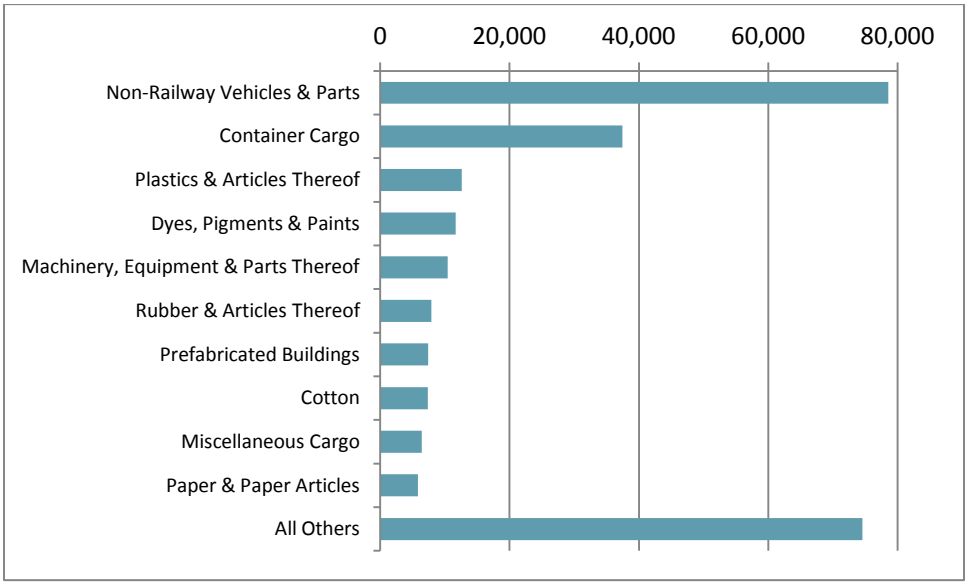
This list of industries in Table 3 helps paint the picture of the different types of commodities exported from the region. The commodities listed are based on *Schedule B: Statistical Classification of Domestic and Foreign Commodities Exported from the United States*. There are approximately 8,000 commodity codes in this classification system. For simplicity, these commodities have been aggregated to the two-digit level, as presented in Appendix B. As with the other specific information, only the top five commodities exported by any particular company are counted. The information presented below does not represent all of the commodities exported from the region. The analysis is based on the number of commodity-specific movements reported by companies, 260,300 from November 2010 to November 2011. This represents about half of the total number of export movements from the region (523,999). The large difference is due to the extremely specific and detailed classification of exports; there are approximately 8,000 commodity

[12] This value represents the sum of all manufacturing industries (NAICs code 31-33).

classifications used for foreign trade, with slight variations in product often being classified under a different code. A summary of the aggregated codes used for analysis can be found in Appendix B.[13]

As shown in Figure 6, the largest aggregate commodity exported from the Appalachian Region, with more than 78,000 movements, is non-railway vehicles and parts. This accounts for more than 30 percent of all commodities counted. The second largest commodity moved was container cargo, which is accounted for more than 37,000 movements, or 14 percent of the total. Other top commodities shown in Figure 6 include plastics, dyes, machinery, rubber, prefabricated buildings, cotton, paper products, and miscellaneous cargo shipments.

Figure 6: Top Commodities Exported from Appalachian Region by Number of Movements



4.3 Top Commodities and Ports by State

The following section details the top commodities and top ports of export for the relevant counties within each state that are located in the Appalachian Region. The state-specific numbers show the types of goods produced in various areas of the region as well as how these goods leave the country. The data reflect a very diverse set of ports and help highlight the overall transportation infrastructure required to maintain connectivity and competitiveness for these firms.

Alabama

Non-railway vehicles and parts movements of 12,811 from November 2010 to November 2011 account for almost 64 percent of the state's total commodity movements., Most of this freight is exported from the Port of Charleston, more than 11,100 movements, representing approximately 41 percent of all port-specific exports from Alabama. Other top five ports used by businesses within Alabama include Jacksonville, Savannah, Brunswick and Port Everglades. Combined, these ports comprise more than 90 percent of all port-specific movements for the state. All of the top ports used by Alabama exporters are in the southeastern United States, either on the Gulf or Atlantic.

[13] Full detail on all Schedule B Classification Codes can be found here: http://www.census.gov/foreign-trade/schedules/b/

Table 4: Top 5 Commodities and Ports of Export for Alabama

Commodity	Movements
Non-Railway Vehicles & Parts	12,811
Miscellaneous Cargo	1,454
Glass & Glassware	1,385
Container Cargo	762
Machinery, Equipment & Parts Thereof	684
All Others	3,014
Total Commodity	**20,110**

Port	Movements
Charleston	11,116
Jacksonville	5,706
Savannah	3,628
Brunswick	2,782
Port Everglades	1,123
All Others	2,624
Total Port	**26,979**

Georgia

Similar to Alabama, Georgia's top export is also non-railway vehicles and parts, with more than 32,500 movements, or nearly 46 percent of commodity specific movements. Container cargo was the second-most exported commodity, accounting for nearly one-fifth of movements. Prefabricated buildings, household goods and cotton are the other goods in the top five exported commodities.

The most frequently used ports for exports from Georgia are Baltimore and New York, each accounting for almost 25 percent of export shipments. Access to both of these ports requires use of both the highway and railway systems. The Port of Savannah is also heavily utilized, with nearly 20,000 movements.

Table 5: Top 5 Commodities and Ports of Export for Georgia

Commodity	Movements
Non-Railway Vehicles & Parts	32,576
Container Cargo	13,944
Prefabricated Buildings	5,817
Household Goods	5,291
Cotton	1,745
All Others	11,274
Total Commodity	**70,647**

Port	Movements
Baltimore	26,213
New York	24,633
Savannah	19,203
Charleston	10,259
Houston	9,696
All Others	12,496
Total Port	**102,500**

Kentucky

The main commodities exported from Kentucky are wood and wood articles, machinery, container cargo, and non-railway vehicles. The major ports of export are Norfolk and New York with smaller shares of goods being exported via the Pacific coast ports of Seattle, Los Angeles, and Long Beach. The top five ports account for nearly 79 percent of all movements.

Table 6: Top 5 Commodities and Ports of Export for Kentucky

Commodity	Movements
Wood & Wood Articles	333
Machinery, Equipment & Parts Thereof	187
Container Cargo	116
Non-Railway Vehicles & Parts	110
Mineral Fuels, Mineral Oils & Products	31
All Others	119
Total Commodity	**896**

Port	Movements
Norfolk	325
New York	207
Seattle	81
Los Angeles	80
Long Beach	51
All Others	200
Total Port	**944**

Maryland

There are only three Maryland counties that are considered part of the Appalachian Region – Allegany, Garrett and Washington. As with several of the other states, the commodities exported most frequently are non-railway vehicles and parts, accounting for nearly half of all Maryland exports.

The largest port of export for Maryland counties is the Port of Baltimore, accounting for more than two-thirds of all exports from within the state. The Port of New York was also frequently used, with more than 100 movements. These two ports account for more than 85 percent of all Appalachian-Maryland exports.

Table 7: Top 5 Commodities and Ports of Export for Maryland

Commodity	Movements
Non-Railway Vehicles & Parts	219
Machinery, Equipment & Parts Thereof	76
Paper & Paper Articles	33
Railway Vehicles & Parts	24
Miscellaneous Cargo	24
All Others	111
Total Commodity	**487**

Port	Movements
Baltimore	375
New York	102
Norfolk	27
Fort Pierce	17
Port Everglades	14
All Others	20
Total Port	**555**

Mississippi

The primary good exported from Mississippi by sea is prefabricated buildings, with more than 325 of the 821 export shipments from the state. Rubber, machinery, and electrical machinery are also in the top five.

The two most-frequently used ports are Jacksonville and Miami, which together account for 803 of the 1,057 export shipments that were counted in the data. All of the top ports used by Mississippi companies are along the South Atlantic coast.

Table 8: Top 5 Commodities and Ports of Export for Mississippi

Commodity	Movements
Prefabricated Buildings	325
Rubber & Articles Thereof	152
Machinery, Equipment & Parts Thereof	68
Container Cargo	50
Electrical Machinery & Parts; Sound & TV Recorders	42
All Others	184
Total Commodity	**821**

Port	Movements
Jacksonville	454
Miami	349
Fort Pierce	82
West Palm Beach	69
Charleston	30
All Others	73
Total Port	**1,057**

New York

The Appalachian Region counties in New York have very diverse exports, with the top five commodity categories accounting for less than 60 percent of all commodity movements, indicating that the exporting companies in the region vary greatly. The most-exported commodity category is wood and wood articles, followed by sugars and confections and other miscellaneous edible preparations. Non-metallic minerals and ceramic products were also exported.

While the commodities are very diverse, the top five ports used account for more than 81 percent of all port movements. The most frequently used port, by far, is the Port of New York, which accounted for

more than 1,400 of the 3,500 export shipments. New York companies used ports in many different areas, including the lower Mid-Atlantic, Virginia, and Los Angeles.

Table 9: Top 5 Commodities and Ports of Export for New York

Commodity	Movements
Wood & Wood Articles	525
Sugars & Sugar Confectionary	455
Non-Metallic Minerals	294
Miscellaneous Edible Preparations	293
Ceramic Products	279
All Others	1,266
Total Commodity	**3,112**

Port	Movements
New York	1,430
Pennsauken	459
Los Angeles	446
Norfolk	368
Philadelphia	178
All Others	660
Total Port	**3,541**

North Carolina

The two largest exports from North Carolina companies are tobacco and tobacco substitutes and cotton, which together make up more than half of the export commodities. There is also a large amount of container cargo exported from North Carolina, and smaller amounts of paper and paper products, and machinery.

The three largest ports of export used by North Carolina companies are in Florida - Panama City, Miami, and Port Everglades. These three ports account for 60 percent of export movements. The other top ports used are also on the Atlantic Coast – Norfolk and Charleston.

Table 10: Top 5 Commodities and Ports of Export for North Carolina

Commodity	Movements
Tobacco & Tobacco Substitutes	5,687
Cotton	5,323
Container Cargo	4,372
Paper & Paper Articles	1,061
Machinery, Equipment &d Parts Thereof	714
All Others	3,902
Total Commodity	**21,059**

Port	Movements
Panama City	7,341
Miami	6,353
Port Everglades	5,147
Norfolk	3,792
Charleston	3,119
All Others	5,551
Total Port	**31,303**

Ohio

The primary commodity exported from Ohio is rubber and rubber products, accounting for nearly half of all export movements. The other top commodities exported include container cargo, plastics, wood, and miscellaneous edible preparations.

Ohio companies use three main ports to ship more than two-thirds of their exports, two on the Pacific coast and one on the Atlantic. The most frequently used port is Los Angeles, with more than 1,400 movements, followed by Norfolk and Long Beach with more than 1,100 each. Chester, Pennsylvania and Miami were also used with relative frequency in the study period.

Table 11: Top 5 Commodities and Ports of Export for Ohio

Commodity	Movements
Rubber & Articles Thereof	2,387
Container Cargo	768
Plastics & Articles Thereof	342
Wood & Wood Articles	273
Miscellaneous Edible Preparations	234
All Others	1,067
Total Commodity	**5,071**

Port	Movements
Los Angeles	1,405
Norfolk	1,223
Long Beach	1,114
Chester PA	483
Miami	419
All Others	934
Total Port	**5,578**

Pennsylvania

The largest commodity exported from Pennsylvania is non-railway vehicles and parts, with more than 18,000 shipments from November 2010 to November 2011. Container cargo had more than 8,000 shipments and aluminum articles, machinery, and rubber articles were also in the top five.

The primary port of seaborne export for Pennsylvania companies was the Port of Miami, which accounted for 40 percent of movements. The Port of New York was also heavily used, with more than 15,600 movements. Other ports in the top five include Baltimore, Los Angeles, and Chester, Pennsylvania.

Table 12: Top 5 Commodities and Ports of Export for Pennsylvania

Commodity	Movements
Non-Railway Vehicles & Parts	18,010
Container Cargo	8,189
Aluminum & Articles Thereof	3,475
Machinery, Equipment & Parts Thereof	3,214
Rubber & Articles Thereof	2,568
All Others	18,224
Total Commodity	**53,680**

Port	Movements
Miami	30,770
New York	15,604
Baltimore	8,393
Los Angeles	4,061
Chester PA	3,114
All Others	14,236
Total Port	**76,178**

South Carolina

Nearly half of South Carolina exports in the study period were non-railway vehicles and parts. This was by far the most exported commodity, with more than 13,300 movements compared to the next highest category, miscellaneous cargo, which had only 2,467 movements.

The largest port of export was the Port of Charleston, with more than 12,000 movements, followed by the Port of Savannah with more than 11,000 of the nearly 32,000 movements. All of the top five ports are in the same region of the country.

Table 13: Top 5 Commodities and Ports of Export for South Carolina

Commodity	Movements
Non-Railway Vehicles & Parts	13,396
Miscellaneous Cargo	2,467
Rubber & Articles Thereof	2,436
Container Cargo	1,882
Plastics & Articles Thereof	1,375
All Others	5,573
Total Commodity	**27,129**

Port	Movements
Charleston	12,206
Savannah	11,053
Jacksonville	5,017
Port Everglades	583
Norfolk	436
All Others	2,529
Total Port	**31,824**

Tennessee

Commodities exported from Tennessee are diverse, with no single commodity dominating the others. The largest export was plastics and plastic articles, with more than 7,000 movements, compared to machinery with nearly 4,000 and container cargo with just over 3,700. More than 3,000 shipments of paper articles were exported as well. The top five commodities account for only approximately two-thirds of shipments.

The major ports of export are Charleston and Savannah, which together account for nearly half of all movements. Los Angeles and Jacksonville also saw relatively high volumes of exports.

Table 14: Top 5 Commodities and Ports of Export for Tennessee

Commodity	Movements
Plastics & Articles Thereof	7,367
Machinery, Equipment & Parts Thereof	3,863
Container Cargo	3,704
Paper & Paper articles	3,105
Wadding, Felt & Nonwovens; Special Yarns, Ropes & Cables	2,665
All Others	10,154
Total Commodity	**30,858**

Port	Movements
Charleston	12,857
Savannah	11,383
Los Angeles	6,743
Jacksonville	5,308
San Juan	3,674
All Others	8,298
Total Port	**48,263**

Virginia

Dyes, pigments and paints were the largest commodity shipments from Virginia from November 2010 to November 2011, with more than 55 percent, or 10,020 movements. Other chemicals, essential oils, and fabrics along with container cargo comprised the rest of the top five.

Norfolk was the most frequently used port for exports, followed by Long Beach and Chester, Pennsylvania.

Table 15: Top 5 Commodities and Ports of Export for Virginia

Commodity	Movements
Dyes, Pigments & Paints	10,020
Container Cargo	1,985
Miscellaneous Chemical Products	1,792
Essential Oils; Perfumery, Cosmetic or Toilet Preparations	1,730
Special Woven Fabrics; Tufted Textiles; Lace; Tapestries	1,061
All Others	1,584
Total Commodity	**18,172**

Port	Movements
New York	9,497
Chester PA	5,846
Savannah	5,806
Charleston	3,259
New Orleans	2,539
All Others	2,879
Total Port	**29,826**

West Virginia

The primary commodity exported from West Virginia in the study period was organic chemicals with more than 3,400 of the 8,258 total movements. Container cargo and mineral fuels and oils (including coal) also had more than 1,000 movements each.

The primary port of export for companies in West Virginia was the Port of New York, with more than 3,500 movements. The next most frequently used port was Chester, Pennsylvania with nearly 2,000 of the 11,000 movements. Of the top ports used, all of them were on the Atlantic Ocean or Gulf of Mexico.

Table 16: Top 5 Commodities and Ports of Export for West Virginia

Commodity	Movements
Organic Chemicals	3,483
Container Cargo	1,508
Mineral Fuels, Mineral Oils & Products	1,201
Plastics & Articles Thereof	826
Non-Railway Vehicles & Parts	515
All Others	725
Total Commodity	**8,258**

Port	Movements
Norfolk	3,560
Long Beach	1,998
Chester PA	1,594
Baltimore	1,520
Los Angeles	717
All Others	1,679
Total Port	**11,068**

4.4 Top Counties for Trade Shipments

Trade patterns and volumes vary considerably across metropolitan and non-metropolitan regions, and a more detailed examination of trade movements was completed based on whether a county is designated as large metropolitan, small metropolitan, or non-metropolitan using a combination of aggregated Economic Research Service codes for Urban Influence Zones[14] from 2003 to classify counties within the Appalachian Region. Large metropolitan areas are defined as those with more than one million residents. Small metropolitan areas have are metropolitan areas with less than one million people. Non-metropolitan areas include micropolitan areas and other noncore areas.

Table 17 summarizes the total value, tonnage, TEUs and shipments of exports from the Appalachian Region based on Metro-area classification. Metropolitan areas account for more than 95 percent of the total value exported from the region, with small metropolitan areas exporting a value of more than $64 billion or 50 percent of the total value and large metropolitan areas exporting $59 billion or 45 percent of the $129 billion total in export value. Small metropolitan areas also accounted for the largest share of both TEUs and shipments, followed closely by large metropolitan areas, while large metropolitan areas exported a higher tonnage than small metropolitan areas.

[14] www.ers.usda.gov/Briefing/Rurality/UrbanInf

Table 17: Total Export Movements by County Metropolitan Distinction

	Export Value ($ Millions)	Export Tonnage	Export TEUs	Export Shipments
Large Metro	$59,077	33,451,744	127,564	195,506
Small Metro	$64,428	22,449,910	285,222	271,382
Non-Metro	$5,904	3,121,784	51,412	57,111
Grand Total	**$129,409**	**59,023,438**	**464,198**	**523,999**

When compared to total jobs for these categories of counties, the large metro areas have a disproportionate share of export value and export tonnage. For example, large metro areas have 24% of total jobs but 46% of export value. Small metro areas have 43% of total jobs, 50% of export value and 38% of export tonnage. Non-metro areas export relatively less when compared to total jobs as they provide 33% of total jobs, but only 5% of export value and tonnage, demonstrating some of the challenges of expanding export industries and linkages with more rural areas of the ARC region.

The following sections detail the export value, export tonnage, and export shipments for each sized metropolitan or non-metropolitan area by county.

4.4.1 Large Metropolitan Counties

There are seven large metropolitan areas that contain counties from the Appalachian Region:

- Pittsburgh, PA;
- Birmingham, AL;
- Atlanta, GA;
- Cincinnati, OH;
- Memphis, TN;
- Nashville, TN; and
- Washington, DC.

Thirty-four of the 420 counties in the Appalachian Region belong to these metropolitan areas, including counties in PA, GA, AL, OH, MS, TN and WV. Of these 34 counties, 33 exported commodities accounted for in the PIERS database. These large metropolitan areas accounted for more than 33 million tons of exports valued at more than $59 billion from November 2010 to November 2011. Among these large metropolitan areas, only Pittsburgh and Birmingham include the major city within the Appalachian Region.

Allegheny, Westmoreland and Washington Counties in PA are part of the Pittsburgh metro area and have a significant presence in terms of top export value and tonnage in the Appalachian Region. Allegheny County exported more than five million tons worth more than $27 billion in the study period. Westmoreland County exported the largest amount of tonnage, nearly 27 million, and also had the second highest value of exports with more than $24 billion during this period. Washington County was third in export tonnage, but fourth in export value accounting for nearly $1.7 billion in exports.

Five counties surrounding Atlanta, Georgia – Gwinnett, Forsyth, Cherokee, Douglas and Haralson - were in the top ten exporters in terms of value, with more than $5 billion from these five counties alone. Of these counties, all but Haralson were also in the top ten in terms of tonnage, accounting for more than 405,000 tons.

The Birmingham Metropolitan area had two counties in the top ten for value and tonnage as well, with these two counties exporting $217 million in value and 167,000 tons. Clermont, OH, part of the Cincinnati metropolitan area is the tenth highest exporting county in terms of tonnage, with more than 6,000 tons exported from November 2010 to November 2011.

Table 18: Top Exporting Large Metropolitan Counties by Value and Tonnage

County	Export Value ($ Millions)	County	Export Tonnage
Allegheny, PA	$27,565	Westmoreland, PA	21,732,972
Westmoreland, PA	$24,433	Washington, PA	5,663,629
Gwinnett, GA	$3,884	Allegheny, PA	5,447,861
Washington, PA	$1,698	Gwinnett, GA	225,278
Forsyth, GA	$688	Jefferson, AL	158,100
Cherokee, GA	$198	Forsyth, GA	101,240
Jefferson, AL	$185	Douglas, GA	49,765
Douglas, GA	$173	Cherokee, GA	29,662
Haralson, GA	$69	Shelby, AL	9,932
Shelby, AL	$32	Clermont, OH	6,037
Remaining Large Metro Counties	$153	Remaining Large Metro Counties	27,268
TOTAL	**$59,077**	**TOTAL**	**33,451,744**

4.4.2 Small Metropolitan Counties

Small metropolitan areas account for 108 of the 420 counties in the Appalachian Region, with 100 of these counties exporting by sea according to the PIERS data. These counties represent 50 different small metropolitan areas in 12 of the 13 Appalachian States, with Mississippi being the only state that has no counties in a small metropolitan area.

As shown in Table 19, counties within small metropolitan areas exported slightly less tonnage than those within large metropolitan areas, but a higher value overall. More than $64 billion in value and 22 million tons were exported from counties within small metropolitan areas from November 2010 to November 2011. The top counties, shown in Table 19, accounted for more than 96 percent of all value and more than 98 percent of all tonnage. Of these top 10 exporting counties in terms of value, each represented a different small metropolitan area, and of the top tonnage exporters, only Putnam and Kanawha, WV are from the same small metropolitan area – the Charleston, WV MSA.

The largest exporter in terms of value was Greenville County, SC, which had the third largest value of any county, and the highest of small metro areas. Greenville County exported more than $23 billion in value. Greenville County was also the fourth largest small-metro exporting county in terms of tonnage, with more than 1.5 million tons in the study period.

Tuscaloosa, AL was the second small-metro county exporter in terms of both tonnage and value. The more than$14 billion in value was the fourth highest of any county of any region type and the more than six million tons was third highest of all region types. The largest small metro exporter in terms of tonnage was Berkeley, WV with more than 7.8 million tons exported.

Table 19: Export Value for Small Metropolitan Counties

County	Export Value ($ Millions)	County	Export Tonnage
Greenville, SC	$23,163	Berkeley, WV	7,858,118
Tuscaloosa, AL	$14,282	Tuscaloosa, AL	6,136,186
Botetourt, VA	$6,102	Kanawha, WV	2,800,843
Berkeley, WV	$6,033	Greenville, SC	1,569,597
Sullivan, TN	$4,200	Botetourt, VA	1,266,583
Kanawha, WV	$2,244	Sullivan, TN	1,096,789
Spartanburg, SC	$2,168	Knox, TN	821,991
Knox, TN	$1,789	Luzerne, PA	252,239
Forsyth, NC	$1,114	Forsyth, NC	144,947
Luzerne, PA	$876	Putnam, WV	91,087
Remaining Small Metro Counties	$2,456	Remaining Small Metro Counties	411,529
TOTAL	**$64,428**	**TOTAL**	**22,449,910**

4.4.3 Non-Metropolitan Counties

The remaining 278 counties are classified as non-metropolitan; 231 of these counties had exports counted in the PIERS data. Not surprisingly, these more rural communities have a smaller volume of exports in terms of both value and tonnage than the metropolitan areas. Combined, these counties exported 4.5 percent of all value and five percent of all tonnage from November 2010 to November 2011. The largest exporting county in terms of value was Fulton, PA with more than $1.6 billion in the same period, which is the 13th highest of all of the counties in the Region. Somerset, PA, home to 17 exporting companies, exported more than 1.2 million tons of goods, primarily coal, which is the 8th highest tonnage of all Appalachian counties.

Table 20: Top Exporting Non-Metropolitan Counties by Value and Tonnage

County	Export Value	County	Export
Fulton, PA	$1,610	Somerset, PA	1,205,860
Marshall, AL	$772	Whitley, KY	831,508
Putnam, TN	$657	Fulton, PA	137,537
Steuben, NY	$517	Sevier, TN	124,022
Talladega, AL	$243	Marshall, AL	116,775
Monroe, PA	$238	Mingo, WV	81,264
Mitchell, NC	$217	Mitchell, NC	75,697
Somerset, PA	$200	Wise, VA	67,167
Tyler, WV	$184	Putnam, TN	58,423
Sevier, TN	$120	Clearfield, PA	43,810
Remaining Non-Metro Counties	$1,147	Remaining Non-Metro Counties	379,720
TOTAL	**$5,904**	**TOTAL**	**3,121,784**

5. JOBS AND ECONOMIC DEVELOPMENT CONTRIBUTION OF FREIGHT IN APPALACHIA

5.1 Appalachian Region Employment by Freight Industry

There are 12.6 million employees in the ARC region. Of this, 264,947 are in the freight industry, representing roughly 4.4 percent of total Appalachian employment. The truck transportation industry, with 182,698 employees, comprises the largest share of the total.

In addition to total employment, the table below presents location quotients. These represent how different the Appalachian region is to the nation as a whole, in terms of employment concentration in a particular industry. A number greater than one suggests that employment in a particular industry in a specific region is more concentrated than the overall U.S. A number less than one indicates that the industry represents a relatively smaller share of regional employment than it does nationwide.

As shown below, the freight industry as a whole is more concentrated in the region than it is in the overall U.S., with a location quotient of 1.27. Truck transportation employment is also more concentrated regionally. Its location quotient is 1.37. This higher concentration is also the case for both rail transportation and warehousing & storage, both of which have location quotients of 1.22. The water transportation industry is the only freight industry in the region that represents a relatively smaller share of Appalachian Region employment than it represents nationally. This industry still provides a relatively significant number of jobs, however, particularly given that there are no seaports located in the Appalachian region. The location quotient data further support the importance of the freight industry in the Appalachian Region, not only in terms of the movement of goods but also in terms of employment in the region.

Table 21: Appalachian Region Freight Industry Employment and Location Quotients (2010)

Industry	Employment	Share of Total Regional Employment	Location Quotients
Rail Transportation	15,142	0.12%	1.22
Truck Transportation	182,698	1.45%	1.37
Warehousing & Storage	65,070	0.52%	1.22
Water Transportation	2,037	0.02%	0.39
TOTAL Freight Industry Employment	**264,947**		**1.27**
TOTAL ARC Employment	**12,606,504**		

5.2 Appalachian Region Value Added, Output, Labor Income by Industry

In 2010, total freight industry output in ARC region was estimated to be $31.4 billion, and freight industry labor income was $13.1 billion (Table 22). Value-added was nearly $17 billion for the region. When compared to all industries in the region, the freight industry represents approximately two percent of total regional output, labor income, and value added.

By far, truck transportation output accounted for the largest share of Appalachia's freight industry output, $20.7 billion or roughly 66 percent. This relative dominance of the truck transportation industry is reflected in value added and labor income as well. It also reiterates the importance of roadway systems, like the ADHS, to the region's overall economy.

Table 22: Appalachian Region Freight Industry Output, Value Added, and Labor Income (2010)

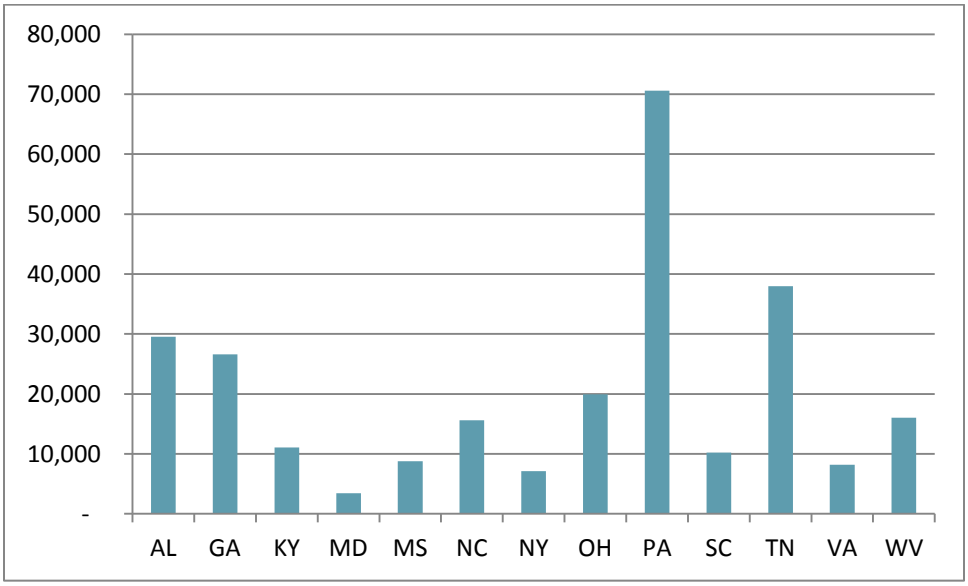
Industry	Output ($Mil)	Value Added ($Mil)	Labor Income ($Mil)
Rail Transportation	$ 4,678	$ 2,488	$ 1,474
Truck Transportation	$ 20,731	$ 10,963	$ 9,010
Warehousing & Storage	$ 5,172	$ 3,236	$ 2,439
Water Transportation	$ 802	$ 300	$ 148
Total Freight Industry	**$ 31,383**	**$ 16,986**	**$ 13,071**
Total ARC	**$ 1,651,887**	**$ 875,077**	**$ 535,194**

5.3 Employment by State by Freight Industry

In this section, employment is presented by freight industry for states in the ARC region. Please note that "state" does not include all counties in the state. Throughout this section of the report, the "State of Pennsylvania," for example, includes all of the Appalachian region counties that are located in Pennsylvania and excludes counties in the state that are not part of Appalachia.

As shown in Figure 7, the State of Pennsylvania accounts for the largest number of freight industry employees, 70,591 in 2010. This is nearly two times larger than Tennessee, the state with the second largest freight industry in terms of employment.

Figure 7: 2010 Freight Industry Employment by State



As shown in Table 23, most of Pennsylvania's employees are in the truck transportation industry, 41,155. More than 25,000 employees also work in the state's warehousing & storage industry. The fewest freight industry employees were reported in Maryland, 3,426 in 2010.

West Virginia has the largest number of rail transportation employees, 2,534. Pennsylvania has the largest number of truck transportation and warehousing & storage employees, 41,155 and 25,264, respectively. When compared to other states, warehousing & storage employment in Pennsylvania is four times larger than the next largest state, Georgia (6,643 employees). The water transportation industry employed relatively more people in West Virginia, 491, followed closely by Pennsylvania, 490 employees.

Table 23: 2010 Employment by State by Freight Industry

Employment	Rail	Truck	Warehousing & Storage	Water	Total Freight Industry
AL	2,059	21,662	5,532	277	29,529
GA	427	19,476	6,643	35	26,582
KY	1,192	7,660	1,982	223	11,057
MD	653	1,881	888	4	3,426
MS	219	6,339	2,166	21	8,745
NC	280	10,259	5,000	49	15,588
NY	392	4,710	1,893	122	7,117
OH	1,025	14,685	4,094	145	19,949
PA	3,682	41,155	25,264	490	70,591
SC	324	7,685	2,158	28	10,195
TN	1,753	30,876	5,197	151	37,976
VA	602	5,367	2,196	2	8,166
WV	2,534	10,944	2,057	491	16,026
TOTAL	**15,142**	**182,698**	**65,070**	**2,037**	**264,947**

5.4 Output by State by Freight Industry

Freight industries in the ARC region generated $31 billion in output in 2010, as shown in Table 24. Truck transportation accounted for the largest share, $20.7 billion.

As shown in Figure 8, the Pennsylvania freight industry generated the largest share of output in the region, $8.5 billion. Of this, $5 billion was due to the truck transportation industry. Pennsylvania's output represents the largest share of total output among all but the water transportation industry. For this industry, West Virginia's output was the largest, $198 million. The smallest overall contributor in terms of output was Maryland with $532 million total.

Table 24: 2010 Output ($Millions) by State by Freight Industry

Output	Rail Transportation	Truck Transportation	Warehousing & Storage Transportation	Water Transportation	Total
AL	$612	$2,352	$423	$118	$3,504
GA	$133	$1,999	$521	$10	$2,663
KY	$385	$821	$164	$104	$1,474
MD	$212	$238	$80	$1	$532
MS	$83	$683	$166	$9	$941
NC	$86	$1,075	$330	$20	$1,510
NY	$122	$486	$129	$42	$780
OH	$327	$1,667	$317	$47	$2,358
PA	$1,108	$5,030	$2,198	$187	$8,523
SC	$98	$891	$165	$8	$1,162
TN	$577	$3,568	$380	$57	$4,582
VA	$194	$579	$164	$1	$937
WV	$741	$1,341	$137	$198	$2,417
TOTAL	**$4,678**	**$20,731**	**$5,172**	**$802**	**$31,383**

Figure 8: 2010 Freight Industry Output ($Millions) by State

5.5 Freight Dependent Industries

Although rail, truck, and water transportation, along with warehousing & storage, generally represent the industries that provide freight services, there are other industries that are freight dependent. These include manufacturing, agriculture, construction, and mining/quarrying/oil & gas extraction.

Of the 12.6 million employees in the ARC region, 2.4 million are estimated to be in freight-dependent industries, as shown in Table 25. The manufacturing industry accounts for the largest share of this employment, approximately half of the total. The construction industry also employs a significant number in Appalachia, 735,822 in 2010.

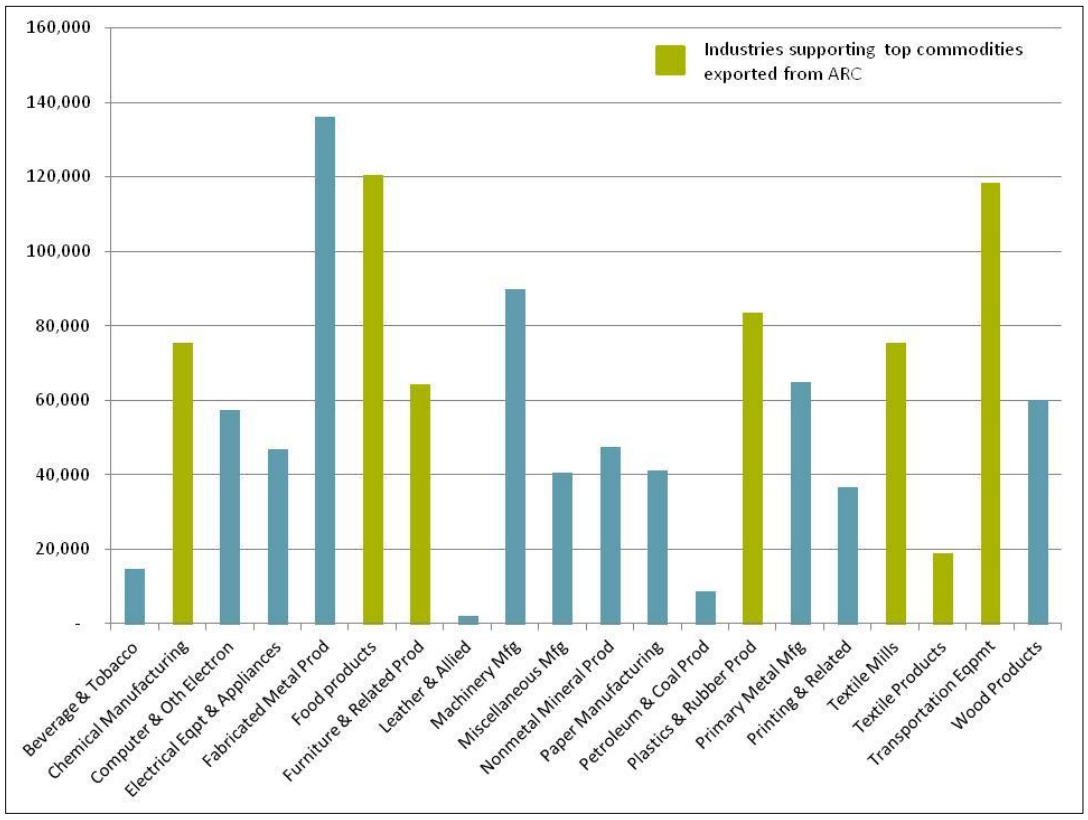
Location quotients are presented for freight-dependent industries in the table below. In all cases, employment in these industries is more concentrated in the region than it is in the U.S. overall. Mining, quarrying, oil and gas extraction has the highest location quotient, 1.47. Manufacturing also represents a more significant share of Appalachian employment than it does nationwide.

Table 25: ARC Freight-Dependent Industry Employment and Location Quotients

Industry	Employment	Share of Total ARC Employment	Location Quotient
Manufacturing	1,202,179	9.54%	1.41
Construction	735,822	5.84%	1.12
Agriculture, Forestry, Fishing and Hunting	279,927	2.22%	1.12
Mining, Quarrying, Oil and Gas Extraction	144,566	1.15%	1.47
TOTAL Freight Dependent Industry Employment	**2,362,494**		
TOTAL ARC Employment	**12,606,504**		

In the region, most manufacturing employment is in fabricated metal, food, and transportation products, as shown in Figure 9. The concentration of employment in these manufacturing industries is consistent with the export findings presented earlier in the study. For example, non-railway vehicles and parts are the top export commodity for the ARC and the transportation products industry is one of the largest manufacturing employers in the region. Those industries that support the ARC region's top exported commodities are shown by a green bar in the figure below.

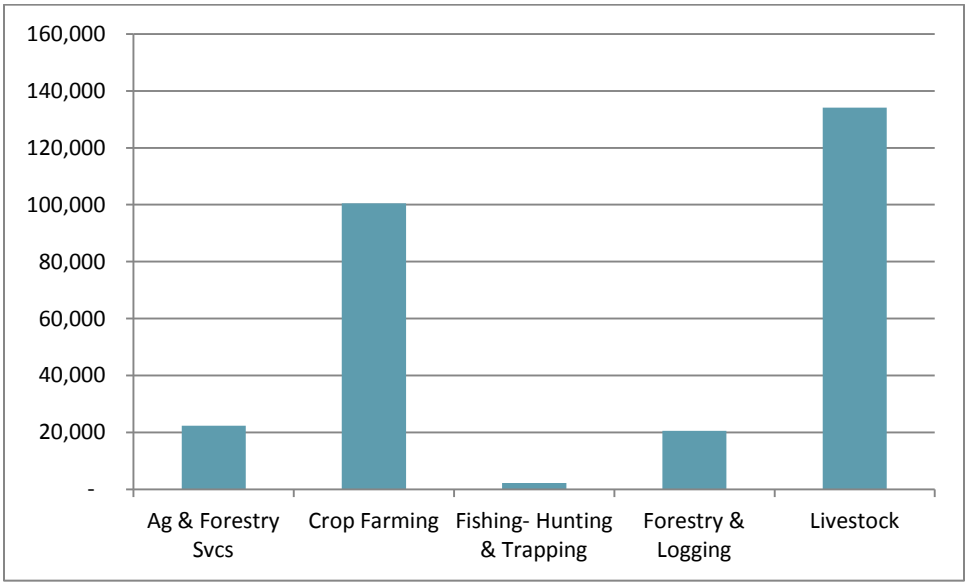
Figure 9: ARC Region Manufacturing Employment by Industry



Other larger employers in freight-dependent industries include construction, agriculture, and mining and related services. In the data utilized for this study, business types within the construction industry were not available. As a result, it is not clear whether construction employment is primarily commercial or residential, for example. Detail was available for both agriculture and mining, as shown in the following two figures.

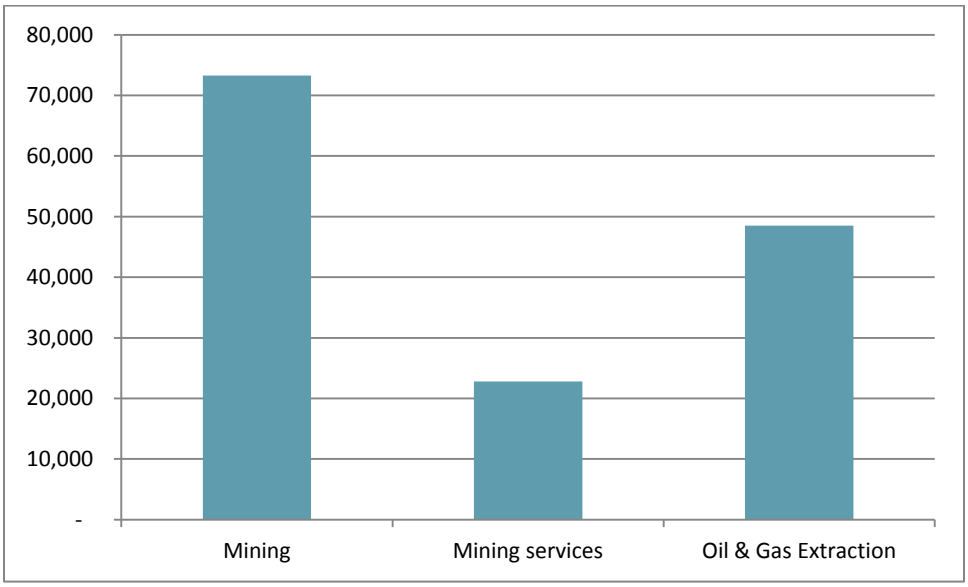
As presented in Figure 10, employment in Appalachia's livestock industry accounts for the largest share of overall agriculture employment. Crop farming is the second largest employer in this category. These industries combined represent 84 percent of regional employment in agriculture.

Figure 10: Agriculture Industry Employment Detail



The mining industry employs more than 73,000 people in Appalachia and another 48,000 are employed by the oil & gas extraction industry, as shown in Figure 11.

Figure 11: Mining, Quarrying, Oil & Gas Extraction Employment Detail



6. APPENDIX A: PORTS USED BY APPALACHIAN FIRMS

Port	Port Location
Baton Rouge, LA	Gulf of Mexico
Corpus Christi, TX	Gulf of Mexico
Freeport, TX	Gulf of Mexico
Galveston, TX	Gulf of Mexico
Gramercy, LA	Gulf of Mexico
Gulfport, MS	Gulf of Mexico
Houston, TX	Gulf of Mexico
Lake Charles, LA	Gulf of Mexico
Mobile, AL	Gulf of Mexico
New Orleans, LA	Gulf of Mexico
Panama City, FL	Gulf of Mexico
Pascagoula, MS	Gulf of Mexico
Pensacola, FL	Gulf of Mexico
Port Arthur, TX	Gulf of Mexico
Port Lavaca, TX	Gulf of Mexico
South Louisiana, LA	Gulf of Mexico
Tampa, FL	Gulf of Mexico
Texas City, TX	Gulf of Mexico
Brunswick, GA	South Atlantic
Charleston, SC	South Atlantic
Fernandina Beach, FL	South Atlantic
Fort Pierce, FL	South Atlantic
Jacksonville, FL	South Atlantic
Miami, FL	South Atlantic
Port Canaveral, FL	South Atlantic
Port Everglades, FL	South Atlantic
Savannah, GA	South Atlantic
West Palm Beach, FL	South Atlantic
Wilmington, NC	South Atlantic

Port	Port Location
Baltimore, MD	Mid-Atlantic
Camden, NJ	Mid-Atlantic
Chester, PA	Mid-Atlantic
New York, NY	Mid-Atlantic
Newport News, VA	Mid-Atlantic
Norfolk, VA	Mid-Atlantic
Pennsauken, NJ	Mid-Atlantic
Philadelphia, PA	Mid-Atlantic
Richmond, VA	Mid-Atlantic
Salem, NJ	Mid-Atlantic
Wilmington, DE	Mid-Atlantic
Aberdeen, WA	Pacific
Everett, WA	Pacific
Honolulu, HI	Pacific
Long Beach, CA	Pacific
Los Angeles, CA	Pacific
Oakland, CA	Pacific
Portland, OR	Pacific
Port Hueneme, CA	Pacific
San Diego, CA	Pacific
Seattle, WA	Pacific
Tacoma, WA	Pacific
Vancouver, BC	Pacific
San Juan, PR	Puerto Rico
Boston, MA	New England
Sault St. Marie, MI	Great Lakes
Toledo, OH	Great Lakes

7. APPENDIX B: AGGREGATED SCHEDULE B COMMODITIES

Code	Commodity Name
0	No Information
2	Meat and Edible Meat Offal
3	Fish and Crustaceans, Mollusks and Other Aquatic Invertebrates
4	Dairy Produce; Birds Eggs; Natural Honey; Edible Products of Animal Origin, NESOI
5	Products of Animal Origin, NESOI
6	Live Trees and Other Plants; Bulbs, Roots and the Like; Cut Flowers and Ornamental Foliage
7	Edible Vegetables and Certain Roots and Tubers
8	Edible Fruit and Nuts; Peel of Citrus Fruit or Melons
9	Coffee, Tea, Mate and Spices
10	Cereals
11	Products of the Milling Industry; Malt; Starches; Inulin; Wheat Gluten
14	Vegetable Plaiting Materials; Vegetable Products NESOI
15	Animal or Vegetable Fats and Oils and Their Cleavage Products; Prepared Edible Fats; Animal or Vegetable Waxes
16	Preparations of Meat, of Fish or of Crustaceans, Mollusks or Other Aquatic Invertebrates
17	Sugars and Sugar Confectionary
18	Cocoa and Cocoa Preparations
19	Preparations of Cereals, Flour, Starch, or Milk; Bakers' Wares
20	Preparations of Vegetables, Fruit, Nuts or Other Parts of Plants
21	Miscellaneous Edible Preparations
22	Beverages, Spirits, and Vinegar
23	Residues and Waste from the Food Industries: Prepared Animal Feed (Fodder)
24	Tobacco and Manufactured Tobacco Substitutes
25	Salt; Sulfur; Earths and Stone; Plastering Materials, Lime and Cement
26	Ores, Slag and Ash
27	Mineral Fuels, Mineral Oils, and Products of Their Distillation; Bituminous Substances; Mineral Waxes
28	Inorganic Chemicals; Organic or Inorganic Compounds of Precious Metals, of Rare-Earth Metals, of Radioactive Elements or of Isotopes
29	Organic Chemicals
30	Pharmaceutical Products
31	Fertilizers
32	Tanning or Dyeing Extracts; Tannins and Their Derivatives; Dyes, Pigments and Other Coloring Matter; Paints and Varnishes; Putty and Other Mastics; Inks
33	Essential Oils and Resinoids; Perfumery, Cosmetic or Toilet Preparations
34	Soap, Organic Surface-Active Agents, Washing Preparations, Lubricating Preparations, Artificial Waxes, Polishing or Scouring Preparations, Candles and Similar Articles, Modeling Pastes, "Dental Waxes" and Dental Preparations with a Basis of Plaster
35	Albuminoidal Substances; Modified Starches; Glues; Enzymes

Code	Commodity Name
36	Explosives; Pyrotechnic Products; Matches; Pyrophoric Alloys; Certain Combustible Preparations
37	Photographic or Cinematographic Goods
38	Miscellaneous Chemical Products
39	Plastics and Articles Thereof
40	Rubber and Articles Thereof
41	Raw Hides and Skins (Other than Furskins) and Leather
42	Articles of Leather; Saddlery and Harness; Travel Goods, Handbags and Similar Containers; Articles of Catgut (Other than Silkworm Gut)
44	Wood and Articles of Wood; Wood Charcoal
46	Manufactures of Straw, of Esparto or of Other Plaiting Materials; Basketware and Wickerwork
47	Pulp of Wood or of Other Fibrous Cellulosic Material; recovered (Waste or Scrap) Paper or Paperboard
48	Paper and Paperboard; Articles of Paper Pulp, of Paper or of Paperboard
49	Printed Books, Newspapers, Pictures and Other Products of the Printing Industry; Manuscripts, Typescripts and Plans
51	Wool, Fine or Coarse Animal Hair; Horsehair Yarn and Woven Fabric
52	Cotton
53	Other Vegetable Textile Fibers; Paper Yarn and Woven Fabrics of Paper Yarn
54	Manmade Filaments; Strip and the Like of Manmade Textile Materials
55	Manmade Staple Fibers
56	Wadding, Felt and Nonwovens; Special Yarns; Twine, Cordage, Ropes, and Cables and Articles Thereof
57	Carpets and Other Textile Floor Coverings
58	Special Woven Fabrics; Tufted Textile Fabrics; Lace; Tapestries; Trimmings; Embroidery
59	Impregnated, Coated, Covered or Laminated Textile Fabrics; Textile Articles of a Kind Suitable for Industrial Use
60	Knitted or Crocheted Fabrics
61	Articles of Apparel and Clothing Accessories, Knitted or Crocheted
62	Articles of Apparel and Clothing Accessories, Not Knitted or Crocheted
63	Other Made-Up Textile Articles; Sets; Worn Clothing and Worn Textile Articles; Rags
64	Footwear, Gaiters and the Like; Parts of Such Articles
65	Headgear and Parts Thereof
67	Prepared Feathers and Down and Articles Made of Feathers or of Down; Artificial Flowers; Articles of Human Hair
68	Articles of Stone, Plaster, Cement, Asbestos, Mica or Similar Materials
69	Ceramic Products
70	Glass and Glassware
71	Natural or Cultured Pearls, Precious or Semiprecious Stones, Precious Metals, Metals Clad with Precious Metal, and Articles Thereof; Imitation Jewelry; Coin
72	Iron and Steel
73	Articles of Iron or Steel
74	Copper and Articles Thereof
75	Nickel and Articles Thereof

Code	Commodity Name
76	Aluminum and Articles Thereof
79	Zinc and Articles Thereof
80	Tin and Articles Thereof
81	Other Base Metals; Cermets; Articles Thereof
82	Tools, Implements, Cutlery, Spoons and Forks, of Base Metal; Parts Thereof of Base Metal
83	Miscellaneous Articles of Base Metal
84	Nuclear Reactors, Boilers, Machinery and Mechanical Appliances; Parts Thereof
85	Electrical Machinery and Equipment and Parts Thereof; Sound Recorders and Reproducers, Television Image and Sound Recorders and Reproducers, and Parts and Accessories of Such Articles
86	Railway or Tramway Locomotives, Rolling Stock and Parts Thereof; Railway or Tramway Track Fixtures and Fittings and Parts Thereof; Mechanical (including Electro-Mechanical) Traffic Signaling Equipment of All Kinds
87	Vehicles Other than Railway or Tramway Rolling Stock, and Parts and Accessories Thereof
88	Aircraft, Spacecraft, and Parts Thereof
89	Ships, Boats and Floating Structures
90	Optical, Photographic, Cinematographic, Measuring, Checking, Precision, Medical or Surgical Instruments and Apparatus; Parts and Accessories Thereof
91	Clocks and Watches and Parts Thereof
92	Musical Instruments; Parts and Accessories of Such Articles
93	Arms and Ammunitions; Parts and Accessories Thereof
94	Furniture; Bedding, Mattresses, Mattress Supports, Cushions and Similar Stuffed Furnishings; Lamps and Lighting Fittings, NESOI; Illuminated Signs, Illuminated Nameplates and the Like; Prefabricated Buildings
95	Toys, Games and Sports Equipment; Parts and Accessories Thereof
96	Miscellaneous Manufactured Articles
97	Works of Art, Collectors' Pieces and Antiques
797	Household Goods
7985	Miscellaneous Cargo
9669	Container Cargo