

**THE FISCAL YEAR 2013 VIRGINIA
ECONOMIC IMPACTS
OF THE
PORT OF VIRGINIA**

December 26, 2014



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WILLIAM & MARY

THE FISCAL YEAR 2013 VIRGINIA ECONOMIC IMPACTS OF THE PORT OF VIRGINIA

Prepared for
The Virginia Port Authority

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Executive Summary

The Port of Virginia (POV) is Virginia's gateway for waterborne predominantly containerized cargo flowing through Norfolk International Terminals, the Newport News Marine Terminal, the Virginia International Gateway Terminal in Portsmouth, the Port of Richmond, and the Virginia Inland Port intermodal facility in Front Royal, Virginia. It owns the Portsmouth Marine Terminal which had no cargo activity in Fiscal Year 2013. The POV does not handle bulk cargo, such as the coal moving through other private Hampton Roads terminals.

In FY 2013, The Port of Virginia added to Virginia's economy in three ways:

- The POV moved nearly 18 million tons of cargo valued at \$53.2 billion.
- The made-in-Virginia exports were 4.5 million tons worth \$10.9 billion.
- Imports retained in Virginia as inputs for businesses and ultimately consumption by Virginians weighed nearly three million tons with a value of \$10.4 billion.

The total economic impact in Virginia in FY 2013 directly and indirectly attributable to the Port of Virginia was \$60.3 billion in spending. Some of this spending was for goods and services produced outside of Virginia. **The Virginia value-added, our Gross State Product, generated was \$30.5 billion, equal to 6.8% of the estimated \$448.8 billion total GSP in FY 2013.** The major component of value added is employee compensation, which was:

\$17.5 billion paid to 374,000 Virginia employees, 9.4% of the 3,996,000 average Virginia resident employment in FY 2013.

These impacts generated:

- \$553.5 million in state corporate and individual income taxes, 4.6% of the total income tax collections;
- \$457.0 million in general sales taxes, 9.0% of the total paid; and
- \$426.1 million in real property taxes, 5.5% of these VA cities and counties taxes.

\$1.44 billion total enhancement was realized for the three major sources of state and local government revenue in FY 2013.

In summary, this report provides estimates of the Port of Virginia's economic and major fiscal (FY 2013) impacts on the Commonwealth of Virginia and identifies the portion of these economic impacts that took place in the Hampton Roads Metropolitan Statistical Area (MSA). It also includes discussion of operations at the Port of Richmond and the Virginia Inland Port with economic impacts offered for VIP.

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THE FISCAL YEAR 2013 VIRGINIA ECONOMIC IMPACTS OF THE PORT OF VIRGINIA

INTRODUCTION

The Virginia Port Authority, a division of the Commonwealth of Virginia, commissioned the Raymond A. Mason School of Business to assess the Fiscal Year (FY) 2013 economic and fiscal impacts of the Port of Virginia (POV) operations at its owned and leased terminals in Virginia. The Port of Virginia owns and operates the Norfolk International Terminals (NIT), the Portsmouth Marine Terminal (PMT), the Newport News Marine Terminal (NNMT), and the Virginia Inland Port (VIP), an intermodal facility in Front Royal, Virginia. The POV also has an operating lease for the Virginia International Gateway Terminal (VIG) in Portsmouth, formerly known as the APM Terminal, along with an operating lease for the Port of Richmond (POR), where it subcontracts operations to PCI of Virginia, LLC. These terminals are Virginia's gateway to the world for goods too heavy or bulky to transport economically by air. These goods are predominantly shipped in containers that accounted for 98 percent of the tonnage the POV handled in FY 2013, with another 2 percent in break bulk cargo, e.g., construction equipment too large or too heavy to containerize. The POV does not handle bulk cargo, such as coal.

The POV exports totaled 10 million tons in FY 2013, but accounted for only 16 percent of Norfolk Customs District exports because the major Virginia export by tonnage is bulk coal. POV imports weighed 7.9 million tons, which equaled 82 percent of the import tonnage through the Norfolk District since bulk imports are relatively small. The total POV combined export and import tonnage of nearly 18 million tons was 25 percent of the district's export-import total. However, the cargo through the POV terminals had an estimated value of \$53.2 billion, equal to 81 percent of the district's overall trade value of \$66.0 billion.

POV operations are one of the major drivers of the Virginia economy through three major channels: handling and transporting goods within Virginia, exporting goods made in Virginia, and importing goods used in Virginia.

The Port of Virginia along with other port service companies handling the flow of goods through the terminals has a substantial *direct* economic impact on Virginia income and jobs. Additionally, the marine traffic has a large impact on Virginia through distribution centers that process goods for redelivery along with

rail and truck hauling required to move the cargo to the port or inland from the port. If you see a container on a train or truck inside Virginia, especially if they are moving east or west, it is very likely that container is heading to or from a POV terminal. The POV shipped goods from all 50 states and D.C. in FY 2013, and POV imports were destined for 35 states and D.C.

Exports made in Virginia have a separate, additional Virginia economic impact. Producing export goods in Virginia creates income and jobs here, another *direct* economic benefit. Overseas demand for these goods is the ultimate force driving this production. However, the local availability of a geographically well-located deep water port with the ability and capacity to handle a variety of container exports provides global market access for Virginia businesses, expanding the volume they can produce and sell profitably. We include the impact of Virginia-made exports to illustrate an important contribution of the POV ports to the state economy.

Imports remaining in Virginia for use and sale also have an additional Virginia impact. While they do not directly bring new income into the Commonwealth, these imports are inputs into production and trade in Virginia, raw materials for Virginia businesses, and also goods creating Virginia income and jobs as Virginia truckers, wholesalers, and retailers make them available to local consumers. These imports are the Virginia base of the supply chain meeting local demand, a supply chain of services and goods with a large impact on Virginia income and jobs. The dollar cost of the imports is an expense, not Virginia income. But the value added, the margins earned in the supply chain here, are income, creating Virginia payroll, taxes, and jobs. This economic impact is supported by the port operations, and needs to be recognized as a direct contribution to Virginia's economy. We concur with the Virginia Economic Development Partnership's view in ***Virginia and International Trade: Economic Impact of International Imports*** (May, 2005), "Large and positive impacts of economic activity are powerful arguments for the value of imports."

In sum, this study provides estimates of the direct economic impact on Virginia in FY 2013 of three port-related activities: the POV port operations; Virginia production of goods exported through the POV-terminals; and Virginia use and sale of goods imported through the POV terminals.

Impacts are reported here by four measures: revenue (the dollar receipts or sales of goods and services); value added (the local production of goods and services – the Virginia or MSA equivalent of the national Gross Domestic Product); employee compensation (the wages and salaries earned and benefits received by payroll employees); and the number of payroll employees. For all

four measures, the total economic impact is the sum of three types of impacts: the *direct*, *indirect*, and *induced* impacts.

The *direct* impacts give rise to the other two streams: the *indirect* and *induced* impacts. The revenue, shown as a *direct* impact, is the flow of payments generated initially by the demand for the goods or services. This revenue is not a measure of the sellers' contribution to Virginia's Gross Domestic Product since the products sold include inputs purchased from other businesses. The *direct* contribution to Virginia output is value-added, which is the direct source for local income and jobs.

The *indirect* impacts are the business-to-business (B2B) flows created by direct sales, value-added, compensation, and jobs. The revenue shown as a Virginia *indirect* impact is the B2B spending for inputs and supplies from other Virginia businesses – from providers of goods and suppliers of services ranging from power and other utilities to cleaning, accounting, legal, and medical services. The local output, payroll and jobs created by this B2B spending are an *indirect* impact, caused by and dependent upon the initial demand for goods and services (i.e., the *direct* impact).

There also is a third impact stream created, labelled an *induced* impact. This is created as the income earned by households and businesses in the process of meeting the *direct* and *indirect* demands is spent, primarily, for households' consumption along with taxes paid to state and local governments spent to provide public services and infrastructure. The *induced* impact is very real and predictable. Households do spend most of their income, as well as state and local governments who spend the taxes they receive. For example, if a plant shuts down (a *direct* impact), not only do its suppliers lose sales and cut payroll and jobs (an *indirect* impact), but other businesses that sell to the households of the plant and suppliers' workers lose customers and cut back – an *induced* impact. State and local governments also have less revenue and adjust their spending downward.

Each of these impact flows creates value-added, local output and income. We separately report employee compensation, also referred to simply as payroll, which is the largest component of value-added. We do not separately report estimates of other income components such as corporate profits, proprietors' income, and indirect business taxes. However, the income measures not reported here are included in estimates of the state and local government tax flows. The employment measure here is payroll jobs, excluding sole proprietors. These employment figures include part-time as well as full-time jobs, as in the U.S. Bureau of Labor Statistics and Virginia Employment Commission statistics.

There is reliable information on FY 2013 payroll and jobs by type of establishment, so our focus is on measures that can be estimated and verified with confidence.

The *direct* economic impacts of POV-related activities are inputs into the latest (2012) version of the IMPLAN (IMpact analysis for PLANning) model to derive the *indirect*, *induced*, and *total* economic impacts for Virginia. The IMPLAN input-output system is a widely used 440 sector model designed for estimating economic impacts, including port-related impacts (e.g., ***The Economic Impact of Georgia's Deepwater Ports on Georgia's Economy in FY 2006*** (March 2007), ***Washington State Maritime Cluster Economic Impact Study*** (November 2013), and ***Economic Impact of Wisconsin's Commercial Ports*** (January 2014). Dr. Pearson has had extensive experience using various versions of IMPLAN for more than two decades to model state and local economic impacts of Virginia private and public enterprises. A strength of IMPLAN is that it is an open model that allows the user to modify the coefficients. Therefore, the IMPLAN model can be adjusted and fine-tuned to more accurately describe the current state and local economic structure.

The estimated impacts on Virginia in FY 2013 of the three POV port-related activities — the port operations, Virginia production of goods exported through the POV-operated terminals, and Virginia use and sales of goods imported through these terminals — are each described. Then, a summary of the total impacts follows. Next, we discuss some of the Virginia government tax impacts. The final section of this report turns to a discussion of the POV operations in three local areas: The Virginia Inland Port (VIP) in Front Royal; the Port of Richmond (POR); and the hub of POV operations, the metropolitan area we generally call Hampton Roads (which officially is the Virginia portion of the Virginia Beach-Norfolk-Newport News, VA-NC Metropolitan Statistical Area encompassing the Virginia cities of Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg; and the Virginia counties of Gloucester, Isle of Wight, James City, Mathews, Surry, and York).

PORT OPERATIONS

The Port of Virginia (POV) operations here include the Virginia Port Authority, its private operating unit, Virginia International Terminals, and its Port of Richmond subcontractor, PCI of Virginia LLC. The terminals included in referring to the POV terminals, or simply port operations, are the Norfolk International Terminals (NIT), Newport News Marine Terminal (NNMT), the Virginia International Gateway Terminal (VIG), Portsmouth Marine Terminal (PMT), the Port of Richmond (POR), and the Virginia Inland Port (VIP), an intermodal facility in Front Royal.

In FY 2013, the POV operations handled 17,981,331 tons of cargo. To visualize the scale of that feat, the USS George H.W. Bush (CVN-77) nuclear aircraft carrier displaces about 114,000 tons. Moving 18 million tons is equivalent to moving the weight of 158 George H.W. Bush aircraft carriers through the terminals, or three every week. Most of the POV tonnage, 98%, was in containers, equal to 2,165,435 twenty-foot-equivalent units (TEUs), the standard unit for measuring containerized cargo. These containers require massive cranes for loading or unloading ships. The other 2% of the tonnage was break bulk cargo, primarily moved through the Newport News Marine Terminal.

We estimate POV cargo had a value of \$ 53.2 billion. That is an average value per ton of \$2,957, which is 3 1/4 times the \$911 value per ton of the total cargo passing through all Virginia ports, showing the POV container shipments move the high-value waterborne cargo entering and leaving Virginia.

The POV port operations involve far more than the personnel running the terminals and the stevedores loading and unloading the cargo. It includes the pilots and tugboat services who bring the ships into port and companies that provide ship services and maintenance and repair; it includes warehousing and storage companies that consolidate and store the cargo before moving to ships or inland; it includes customs brokers who assure freight is properly categorized and freight forwarders who arrange the transportation and warehousing, along with a variety of enterprises providing other support services such as insurance, inspection, and security. The operations also include moving the cargo to and from the port, 62.6% of which is by truck, 33.1% by rail, and 4.3% by barge.

As reported in Table 1, harbor and port operations expenditures, including loading and unloading cargo at the terminals, were an estimated \$980 million. The direct POV expenditures were \$327 million, only 1/3 of this total. The other

major port-related expenditure is the \$934 million to move the cargo inland within Virginia – truck and rail transportation producing Virginia output and jobs. The total port-related spending to handle and move POV exports and imports in Virginia in FY 2013 was \$2,464 million, creating Virginia Gross State Product (GSP) of \$1,113 million, of which \$862 million went for employee compensation for 14,128 salaried and hourly workers.

Table 1 POV-Related Port Operations (\$ in mil)	Spending	Value Added (GSP)	Employee Compensation	Employment
Ship & harbor operations, vessel (un)loading	\$ 979.9	\$ 409.2	\$ 308.7	\$ 3,900.0
Warehousing & storage	\$ 114.7	\$ 69.1	\$ 65.3	\$ 1,412.4
Freight arrangement & other transportation support	\$ 434.8	\$ 189.4	\$ 186.5	\$ 3,814.6
Truck & rail transportation	\$ 934.4	\$ 445.7	\$ 301.8	\$ 5,001.4
Total	2,464	1,113	862	14,128

Table 2 repeats the POV port operations' *direct* impacts and shows the *indirect*, *induced*, and *total* impacts created and supported by the *direct* impacts. Carrying out these port-related operations required an additional \$1.04 billion in purchases from other businesses, B2B transactions, for goods and services ranging from fuel, power, communications, and office supplies to business and professional services, supporting another 9,062 Virginia jobs, shown in Table 2 as the *indirect* impact.

In addition, an induced demand of \$1.7 billion results from employees spending their wages and salaries, businesses spending out of their net cash flow, and state and local government tax receipts being spent for public goods and services. This *induced* impact, a ripple effect felt throughout the Virginia

economy, supported an estimated 13,581 Virginia jobs, largely in the retail and service sectors.

The combined total POV-related port operations impacts sum to \$5.2 billion in spending, of which Virginia GSP was \$2.8 billion, with \$1.9 billion in worker compensation for 36,771 Virginia jobs.

Table 2 POV-Related Port Operations Impacts (\$ in mil)	Direct	Indirect	Induced	Total
Revenues/Sales	\$ 2,463.7	\$ 1,040.5	\$ 1,721.3	\$ 5,225.5
Value Added (GSP)	\$ 1,113.4	\$ 645.4	\$ 1,086.7	\$ 2,845.5
Employee Compensation	\$ 862.2	\$ 480.5	\$ 588.4	\$ 1,931.1
Employment	14,128	9,062	13,581	36,771

EXPORTS

In order to estimate the value of shipments through the port, we identified from PIERS — the Port Import Export Reporting Service — data for FY 2013 shipments through the POV terminals by the U.S. Harmonized Tariff Codes used in international trade. We then matched this information to North American Industry Classification System (NAICS) digit codes. Next we aggregated the data to 33 3-digit NAICS categories of goods and used U.S. International Trade Commission data on the value of Norfolk District shipments to estimate the value of the POV terminal exports for these 33 categories of goods.

The POV terminals handled 10.1 million tons of export cargo in FY 2013 (equal to moving the weight of the George H.W. Bush aircraft carrier through the port 89 times) with a value of \$26.1 billion. These shipments were only 16% of the Norfolk Ports District export tonnage (since the coal terminals are not part of POV operations) but 91% of the total dollar value. Table 3 shows the dollar value and tons by major NAICS sectors. Sectors 31-33 include all manufactured goods, the major POV exports by value and tonnage.

Table 3				
POV Exports, Value, TEUs and Tons by Major Sectors	Dollar Value (\$ mil)	TEUs	Short Tons	
NAICS Sectors & Description				
11 Agric., forestry & fishing products	\$ 2,262.8	46,362	628,692	
21 Nonmetallic mining products	\$ 59.4	10,117	137,041	
31 Food, bev., textiles, & apparel mfg.	\$ 2,918.5	174,932	2,111,847	
32 Wood, paper, chem., plastics mfg.	\$ 9,244.5	421,603	4,788,555	
33 Metal, machinery, electrical & electronics, transport eqpt. & furniture mfg.	\$ 10,399.9	258,512	1,960,690	
91-99 Waste, scrap, used/spec classification goods	\$ 1,331.3	50,048	475,388	
Total	\$ 26,113.9	961,575	10,102,213	

The Virginia economic impacts of getting these goods to port and on their way aboard ship are included as part of the port operations impacts already discussed. In this section we estimate the separate, additional impacts stemming from the portion of these exports *made in Virginia*.

Based on POV shipment data, survey responses, and U.S. Department of Commerce export analysis by state, we estimate that 42% by value (44% by tonnage) of the POV exports were goods produced in Virginia, a conservative estimate. In FY 2013, an estimated 4.5 million tons of Virginia-made products were exported by the POV, in 400,796 TEUs, with a value of \$10.9 billion. Among the companies exporting thousands of TEUs and tens of thousands of tons were well-known Virginia names: Meadwestvaco, Dupont de Nemours, International Paper, Smithfield Packing, Honeywell International, Stihl, Cargill, Perdue Grain and Oilseed, Pilgrims Pride, and Philip Morris International.

The types of Virginia export goods are reported in Table 4 by NAICS two-digit codes. NAICS Group 11 is the production of crops and animals, along with the harvest of timber and seafood, including aquaculture. Processed foods, including canned, dried, packaged and frozen, are in the NAICS Code 31 manufacturing group. Processed wood and paper products are in NAICS Group 32, the manufacturing group with the largest dollar value and number of TEUs, and tons.

These export products are grown, processed, or manufactured by businesses here in the Commonwealth, and these exporting businesses buy inputs and supplies from other Virginia businesses, thus creating a very large *indirect* impact. The employees of these businesses predominantly live in Virginia, spending most of their earnings here, yield an additional *induced* impact. The cumulative *total* impact of making \$10.9 billion of goods for export is \$18.4 billion being spent in Virginia, as shown in Table 5. The sum of the *direct*, *indirect*, and *induced* Virginia value-added, or GSP, is \$6.6 billion. This Virginia value-added included \$3.9 billion in Virginia employee compensation for 81,395 employees (for an average compensation of \$48,206).

Table 4				
POV Va-Made Exports, Value, TEUs and Tons by Major Sectors	Dollar Value (\$ mil)	TEUs	Short Tons	
NAICS				
<u>Sectors & Description</u>				
11 Agric., forestry & fishing products	\$ 1,711.2	41,514	475,438	
21 Nonmetallic mining products	\$ 17.2	2,431	39,785	
31 Food, bev., textiles, & apparel mfg.	\$ 1,396.8	85,420	1,010,699	
32 Wood, paper, chem., plastics mfg.	\$ 4,457.2	195,939	2,308,771	
33 Metal, machinery, electrical & electronics, transport eqpt. & furniture mfg.	\$ 2,794.0	68,073	526,750	
91-99 Waste, scrap, used/spec classification goods	\$ 480.5	7,420	102,760	
Total	\$ 10,856.8	400,796	4,464,204	

Table 5				
POV Virginia-Made				
Export Impacts				
(\$ in mil)				
	<i>Direct</i>	<i>Indirect</i>	<i>Induced</i>	<i>Total</i>
Revenues/Sales	\$ 10,856.8	\$ 4,703.8	\$ 2,880.0	\$ 18,440.6
Value Added (GSP)	\$ 2,536.4	\$ 2,210.9	\$ 1,818.2	\$ 6,565.5
Employee Compensation	\$ 1,453.1	\$ 1,454.8	\$ 1,015.9	\$ 3,923.7
Employment	27,261	31,407	22,728	81,395

IMPORTS

The value, TEUs, and tonnage of imports by NAICS Code group flowing through the POV terminals were identified from the same sources used for exports. These terminals handled 7.9 million tons of imports (the equivalent of 69 George H.W. Bush aircraft carriers sailing into Virginia) with an estimated value of \$27.1 billion. The import tonnage is less than for POV exports, but a slightly higher total value, because the imports generally are more highly processed with a higher value per ton, especially in NAICS Code 31 and 32 manufacturing groups. Table 6 shows the dollar values, TEUs, and tons by the major industry sectors.

Table 6 POV Imports, Value, TEUs and Tons by Major Sectors	Dollar Value (\$ mil)	TEUs	Short Tons
NAICS			
<u>Sectors & Description</u>			
11 Agric., forestry & fishing products	\$ 2,057.8	26,447	310,971
21 Nonmetallic mining products	\$ 45.2	10,390	196,906
31 Food, bev., textiles, & apparel mfg.	\$ 3,816.7	183,790	1,752,189
32 Wood, paper, chem., plastics mfg.	\$ 5,578.4	230,433	2,478,870
33 Metal, machinery, electrical & electronics, transport eqpt. & furniture mfg.	\$ 15,181.2	422,028	2,970,624
91-99 Waste, scrap, used/spec classification goods	\$ 378.9	18,630	169,597
Total	\$ 27,058.2	891,718	7,879,158

As with exports, the Virginia economic impacts of getting these goods unloaded and across Virginia are included as part of the port operations impacts already discussed. Most of the imports pass through Virginia to other states and even to other countries. Our focus here is the separate, additional impacts of Virginians' use and purchase of nearly 39% of these imports, \$10.4 billion worth. That amount is not Virginia production, and does not directly create income and jobs here. Importantly, as it moves through the supply chain to Virginia businesses, governments, and households (who are the final consumers), value is added by the manufacturers, wholesalers, warehousing companies, and retailers in the

chain. Virginia customers voluntarily pay for the value-added because it is worth it to them to satisfy their demands for these goods. The POV operations do not create these demands; they instead serve as the means to satisfy them efficiently, at a profit for Virginia businesses. Moving these goods through the POV terminals instead of overland from other ports was a voluntary choice, demonstrating that the POV operations were a source of value-added for these Virginians.

Table 7				
POV Va-Used Imports, Value, TEUs and Tons by Major Sectors	Dollar Value (\$ mil)	TEUs	Short Tons	
NAICS				
Sectors & Description				
11 Agric., forestry & fishing products	\$ 914.9	15,827	138,262	
21 Nonmetallic mining products	\$ 12.9	2,948	55,958	
31 Food, bev., textiles, & apparel mfg.	\$ 1,247.7	68,678	572,788	
32 Wood, paper, chem., plastics mfg.	\$ 2,265.4	94,661	1,006,684	
33 Metal, machinery, electrical & electronics, transport eqpt. & furniture mfg.	\$ 5,954.8	201,136	1,165,218	
91-99 Waste, scrap, used/spec classification goods	\$ 23.1	2,005	18,067	
Total	\$ 10,418.7	385,255	2,956,977	

The types of Virginia-used import goods are reported in Table 7 by NAICS two-digit codes. The \$10.4 billion in import value is sales to Virginia by producers in other parts of the world (none of which is Virginia production). The largest sector by value and weight is NAICS Code group 33, machinery, electronics, and furniture, which is 1.2 million tons valued at nearly \$6 billion. However, NAICS 11 imports, largely crops, timber, and seafood, had the highest percentage of the overall POV imports remaining in Virginia, 60% of the TEUs and 44% of the value.

The Virginia import use is quite different from the export production. With the Virginia exports, the dollar value was the final price to the consumer. With imports, the \$10.4 billion in import value is the purchase price of an input, an intermediate input for further processing by Virginia's manufacturers, or a wholesale product for sale by Virginia retailers. The impact in Virginia is the value-added by Virginia businesses, equal to the final price minus all intermediate input purchases. Therefore, to identify the Virginia economic impacts, we had to estimate the final sales value of the imports in the final products sold to the ultimate consumers. The Bureau of Economic Analysis in the U.S. Department of Commerce publishes annual Gross-Domestic-Product-(GDP)-by-Industry Data for 97 industries, with final output in current dollars, dollar amount of intermediate inputs from other businesses and value-added within each industry. From the industry information, intermediate inputs as a percent of industry GDP are calculated and dividing that percent into the dollar value of inputs yields the value of the industry's output.

The Virginia imports are inputs for different types of durable goods manufacturers (e.g., Newell Rubbermaid, Stihl), nondurable goods producers (e.g., International Paper, Meadwestvaco), wholesalers (e.g., BJs, Costco), and retailers (e.g., Family Dollar, Kohl, Walmart). Intermediate inputs for 2012 and 2013 averaged 62% of output value for durable goods manufacturers, 69% for nondurable goods producers, 33% for wholesalers, and 36% for retail businesses. If the intermediate goods are inputs into manufactured goods which then go through wholesalers to retailers, the initial inputs easily can be only 12% to 25% of the final price to the consumer. Viewing Virginia imports as inputs, a conservative estimate is they average 33% of the final Virginia product. What this means is total output is about three times the value of the intermediate inputs (3X multiplier), with additional spending inside Virginia equal to 67% of total sales. Imports are not their only intermediate input, but assuming they are 33% of the final product value puts a conservative limit on the final value. With this 3X

multiplier, the \$10.4 billion of imported inputs yields an estimated final sales value of \$31.3 billion, of which \$20.8 billion was added business activity in Virginia. We report this \$20.8 billion in Table 8 as the *direct* Virginia spending flowing from Virginia use of the imports.

Virginia manufacturers, producers, wholesalers, and retailers creating those sales generated Virginia value-added benefits (over half of which went for employee compensation) and made purchases from other local businesses. The full economic impacts are reported in Table 8. The \$21.1 billion in Virginia Gross State Product, with \$11.7 billion in compensation to 256,297 Virginia workers (for an average compensation of \$45,597) is a very large and often underappreciated economic impact related to the POV operations.

Table 8 POV Virginia-Used Import Impacts (\$ in mil)	Direct	Indirect	Induced	Total
Spending	\$20,837.5	\$9,297.6	\$6,464.5	\$36,599.6
Value Added (GSP)	\$12,021.9	\$5,030.8	\$4,081.0	\$21,133.7
Employee Compensation	\$ 6,224.8	\$3,181.0	\$2,280.5	\$11,686.3
Employment	149,596	55,676	51,025	256,297

VIRGINIA ECONOMIC IMPACT SUMMARY

The total estimated Virginia impacts in FY 2013 of the three POV port-related activities — the POV port operations in Table 2, Virginia-made export impacts in Table 5, and Virginia use of goods imported through the POV terminals summarized in Table 8 — are reported in Table 9. The POV terminal operations produce or contribute to Virginia spending of \$60.3 billion, of which \$30.5 billion

is for goods and services produced within Virginia, part of its Gross State Product (GSP), equal to 6.8% of the \$448.8 billion total GSP in FY 2013. Employee compensation of \$17.5 billion was paid to 374 thousand Virginia employees, 9.4% of the 3,995.6 thousand average Virginia resident employment in FY 2013.

Table 9				
Total Virginia				
Impacts of POV Operations	Direct	Indirect	Induced	Total
(\$ in mil)				
Spending	\$ 34,158.1	\$ 15,041.9	\$ 11,065.8	\$ 60,265.7
Value-Added (GSP)	\$ 15,671.7	\$ 7,887.1	\$ 6,985.9	\$ 30,544.7
Employee Compensation	\$ 8,540.1	\$ 5,116.3	\$ 3,884.7	\$ 17,541.1
Employment	190,986	96,145	87,333	374,464
Compensation per Employee	\$ 44,716	\$ 53,214	\$ 44,482	\$ 46,843

The total port-related Virginia impacts are considerably higher than in Fiscal Year 2006, the base year for the last impact study, and their growth has outpaced that of the overall Virginia economy as shown in Table 10. The dollar value of POV supported value-added, its contribution to Virginia Gross State Product, has increased 32%, versus 22% growth for total Virginia GSP. Similarly, POV-generated labor compensation is up 32%, compared to 21% overall for the Commonwealth. These percent changes are not adjusted for inflation, but the Port of Virginia changes still would be larger than for the Virginia totals since the price indexes for adjusting the two data sets would be very similar. Employment is a physical measure, showing a real change. POV related employment in FY 2013 was 9.2% higher than in FY 2006, while the Commonwealth in 2012-2013 was just getting back to its 2005-2006 level of wage and salary employment.

Table 10 POV Total Impacts Compared to Virginia	POV- Related Total	POV % Change, FY 2006 to FY 2013	Va. % Change, '05-'06 to '12-'13
Value-Added (GSP)	\$30,544.7	31.8%	22.4%
Employee Compensation	\$17,541.1	29.8%	20.7%
Employment	374,464	9.2%	-0.1%

All of these economic impacts are flows of activity, in this case occurring within a fiscal year. The purpose is to show the full contribution to the Commonwealth's economy flowing from the use of the POV terminals, including the contribution flowing from the exports produced in Virginia and the imports used here. We do not speculate about how much of the Virginia production of exports would be lost if the POV operations did not exist. It would be less than 100% of the impacts we report here, but given the footloose nature of international business it would be substantial. Similarly, we do not speculate about the amount of increase in prices, loss of availability of goods, and loss of income and jobs in the state's wholesale and retail supply chains if imported goods are not available through this port. Rather than speculate about hypothetical scenarios, we show the full spending, local value-added (GSP), employee compensation, and jobs impacts of the POV in FY 2013 — use that is growing and expected to continue to grow, particularly with the opening of the Panama Canal expansion.

VIRGINIA TAX IMPACTS

The impact estimates reported here generate a wide range of payments to state and local governments, including corporate income taxes, personal income

taxes, general and motor vehicle sales taxes, property taxes, motor fuels taxes, business and motor vehicle licenses, and non-tax fees and fines. An accurate estimate of all of these payments requires a level of detailed information beyond the scope of this study. We limit our estimates of tax payments to the three major tax sources: the state personal and corporate income tax, the 5% general sales tax (the rate in FY 2013) and the real property tax paid to cities and counties.

We estimate that the FY 2013 POV port operations, Virginia-made exports through the POV terminals, and Virginia use and sales of imports arriving at the POV terminals generated \$553.5 million in Virginia corporate and personal income tax payments, 4.6% of the total income tax collections; \$457.0 million in general sales taxes, 9.0% of the total paid; and \$426.1 million in real property taxes, 5.5% of such taxes paid to Virginia cities and counties. The dollar amounts in millions are reported in Table 11.

Table 11				
Selected POV-Related Virginia Taxes		POV Related	Total Virginia Collections	POV % of Total
(\$ in mil)				
Corp. & Individual Income Tax	\$	553.5	\$ 12,136.7	4.6%
5% General Sales Tax	\$	457.0	\$ 5,052.1	9.0%
Local Real Property Taxes	\$	426.1	\$ 9,118.7	4.7%
Totals	\$	1,436.6	\$ 26,307.5	5.5%

In sum, the Port of Virginia operations *directly* and *indirectly* were the source for producing \$1.437 billion, or 5.5%, of the total amount raised by these three major sources of Virginia governmental revenues.

VIRGINIA INLAND PORT (VIP)

The Virginia Inland Port (VIP) resides in Front Royal and is a U.S. Customs-designated port of entry with a full range of customs functions. Containerized rail service is provided five days a week to VIP from both Norfolk International Terminals and the Virginia International Gateway (Formerly APM) Terminal in Portsmouth.

VIP handles both import and export container cargo, but loaded import containers outnumber loaded export ones by nearly six to one. This imbalance means a large number of containers have to be sent back empty to the Hampton Roads terminals. The VIP container traffic data for FY 2013 is shown in Table 12.

Table 12		
VIP Container Traffic	Containers	Tons
FY 2013		
Loaded, imports from NIT and VIG terminals	15,226	215,869
Empty, from Hampton Roads for reuse	236	
Subtotal	<hr/> 15,462	
Loaded, to Hampton Roads for export	2,678	54,805
Empty, to Hampton Roads for reuse	13,399	
Subtotal	<hr/> 16,077	
Total	<hr/> 31,539	270,674

VIP was developed to take advantage of access to major interstate highways (66 & 81), its proximity to major markets in DC, PA, WV, and MD, and its ability to move freight to and from Hampton Roads without adding to highway traffic. Companies that manufacture, produce, distribute, and sell around the inland port appreciate the additional services at this location. Family Dollar, Kohl's, Rite Aid, and Mercury Paper among others have opened up new facilities in the Front Royal area to utilize VIP. Besides the beauty of the mountains, it has become a business attractant. Distribution centers are a welcome growth industry in Virginia; however, the largely inbound cargo to VIP from import distribution centers creates an imbalance. Partly offsetting the imports are companies that mainly export through VIP, with products such as lumber and poultry.

Red Bull, Mercury Paper, Northwest Hardwoods, and Rubbermaid are some of the success stories for the Virginia Inland Port. Red Bull imports exclusively through the Front Royal facility. Mercury Paper, Northwest Hardwoods, and Rubbermaid export as well as import. VIP is an important facilitator of Northwest Hardwoods growth in imports and exports. Finally, Rubbermaid Commercial Products are headquartered in Winchester, Virginia – near Front Royal. They use many benefits of VIP to lower their costs and improve flexibility. Their facility features a 12 story robotic warehouse to handle the flow of their award winning innovations. More than 100 containers in a single day can be offloaded for delivery to Rubbermaid. Finding that many Draymen (truckers) to make the run to Norfolk would be difficult. But having them railed up and then using a smaller number who can make 5-10 trips to the local port allows them great flexibility.

Interviews reveal these companies appreciate the quality of people and service provided by VIP. They like the ability to “load the box heavy” (load more weight in the container), the flexibility and safety of the yard, lower “dwell” times for trucks, ease of running many small runs with fewer truckers, lower warehousing needs, convenience, and lower holding costs. There is availability of warehouses, refrigeration, and “cross dock” abilities to facilitate incompatible transportation approaches (change to a different trailer or container).

The economic impacts of the Virginia Inland Port operations are included in the Virginia totals. These impacts are a major force in the local area, so we show our VIP-area estimates here. We define the VIP area based on U.S. Census county level journey-to-work data from place-of-residence to place-of-work, where the places of work are Front Royal and the City of Winchester. The commuters predominantly come from the adjoining Frederick County, Page County, Rappahannock County, Warren County where Front Royal is located, and the City of Winchester.

Table 13				
POV-Related Impacts in the VIP region (\$ mil)				
	<i>Direct</i>	<i>Indirect</i>	<i>Induced</i>	<i>Total</i>
Revenue/Sales	\$ 971.1	\$ 323.0	\$ 339.2	\$ 1,633.3
Value-Added (GRP)	\$ 559.1	\$ 183.4	\$ 211.1	\$ 953.6
Employee Compensation	\$ 453.4	\$ 109.9	\$ 114.2	\$ 677.5
Employment	8,722	2,483	3,039	14,244
Compensation per Employee	\$51,985	\$44,262	\$ 37,595	\$ 47,568

The direct impacts are driven by the sales and value-added from exports made in the VIP region, imports through VIP used in the region, and from handling and trucking to move cargo to, or from, the Virginia border to, or from, the VIP terminal. The Norfolk Southern rail transportation of the cargo is not included because nearly all of occurs outside of the region. The VIP region activity stemming from the flow of goods through the Virginia Inland Port terminal generated value-added, Gross Regional Product, of \$953.6 million in Fiscal Year 2013, of which \$677.5 million was employee compensation earned by 14,244 workers.

Over 90% of the total impacts stem from the VIP region's use of the imports unloaded at the VIP terminal. The VIP region is a manufacturing and distribution center, and the VIP imports are either inputs for area manufacturers, or processed and stored in area facilities before being distributed elsewhere. Very few of the imported containers go straight out of the VIP region by truck. The export tonnage not only is small, over 70% of it is goods produced, or timber harvested, in other states – predominantly West Virginia and Pennsylvania.

PORT OF RICHMOND (POR)

The Port of Richmond (POR) is owned by the City of Richmond, leased to the Virginia Port Authority, and operated by PCI of Virginia, an LLC private company. James River Barge Service offers thrice weekly Container-on-Barge service from Hampton Roads to Richmond on the James River. The Port of Richmond has a wharf with 25 foot depth alongside that can handle ships up to 559 feet with drafts of 22 feet. Its Manitowoc crane has heavy lift capability and the port handles containers, temperature-controlled containers, breakbulk and neo-bulk cargo (typically defined as lumber, paper, steel, cars & trucks). It has warehouse capacity (over 300,000 square feet) and direct rail through CSX and Norfolk Southern available via local switch. More than 100 freight companies and brokers serve the port, including specialists in heavy hauling, over-dimensional loads, and liquid and dry bulk.

The two largest users of POR, and committed to making it work, are Meadwestvaco (MWV) and Phillip Morris. MWV is the largest container shipper, and like many customers, motivated by sustainability, reducing truck traffic in the Hampton Roads area, and efficiency. Another Port of Richmond user is The Scoular Company who manages commodity supply-chain risk for customers in growing segments by buying, selling, storing, and transporting grain and ingredients. Their integrated network of owned, managed and third-party facilities coupled with substantial truck, rail, barge, and container freight commitments handle barley, milo, soybeans and wheat through the POR. Proximity to Highway 95, popular services such as transloading and storage, along with contributing to the local Richmond economy are drivers of Port of Richmond's growth.

HAMPTON ROADS ECONOMIC IMPACTS

The Port of Virginia headquarters and main operations are in the Hampton Roads Metropolitan Statistical Area (MSA), a metropolitan area encompassing the Virginia cities of Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg; and the Virginia counties of Gloucester, Isle of Wight, James City, Mathews, Surry, and York. Therefore, its home area impact deserves separate discussion.

According to the U.S. Bureau of Economic Analysis, this metropolitan area's 2012-2013 Gross Regional Product was \$87.7 billion, equal to 19.5% of the Commonwealth's \$448.8 billion Gross State Product (as elsewhere in this study, when only calendar year numbers are available we used the 2012-2013 average to approximate FY 2013). Hampton Roads total employee compensation for 2012-2013 averaged \$49.3 billion, which was 19.1% of the statewide total, while its 2012-2013 full-time and part-time employment of 1,002,376 was 20.4% of the Virginia employment. In sum, the Hampton Roads economy was approximately 20% of the Virginia economy in FY 2013. As we document here, a much higher percent of the POV statewide impacts are in Hampton Roads.

Four POV terminals are in the MSA. The largest is the Norfolk International Terminals (NIT) container port. Operating on 378 of its total 567 acres, its 14 Super Post Panamax ship-to-shore cranes have the capacity to move 820,000 containers, equivalent to 1,426,800 TEUs. Second in capacity is the Virginia International Gateway Terminal (VIG) in Portsmouth. Privately owned but operated by POV, it is a highly automated container terminal operating on 231 acres of a 576 acre tract. VIG has eight Super Post Panamax cranes with a capacity to handle 650,000 containers, equivalent to 1,131,000 TEUs. Both of these terminals are on 50-foot-deep channels and well positioned to accommodate an increase in super container ships with the Panama Canal expansion. However, their total TEU capacity currently is 2,557,800. In FY 2013, the 2,165,435 TEUs handled were 85% of the container capacity. In FY 2014, 6.5% growth to a record 2,305,911 TEUs equaled 90% of the NIT and VIG container capacity.

A third operating terminal is Newport News Marine Terminal (NNMT), on 165 acres north of the James River. NNMT is the POV main breakbulk and roll-on/roll-off facility. POV owns a fourth terminal in Hampton Roads, Portsmouth Marine Terminal (PMT) on 287 acres along the Elizabeth River but this terminal was not in operation in FY 2013. Alternatives for future uses of PMT are being studied.

Based on data from PIERS, the U.S. Department of Commerce's International Trade Administration, Bureau of the Census, Bureau of Economic Analysis, and interviews with port-related enterprises, we concluded that 1.31 million tons of POV exported cargo were made in Hampton Roads, shipped in 116,989 TEU-equivalent containers, with a value of \$3.2 billion. The tons, TEUs, and value all are slightly over 29% of the Virginia-made totals shown in Table 5. We derived these estimates by a bottom-up approach, analyzing shipment data by 6, 4, and 2 digit Harmonized Codes, then by 3 digit NAICS codes before aggregating to

the 2-digit NAICS groups reported in Table 14. For the six two-digit NAICS groups, the Hampton Roads-made percentages of Virginia-made amounts showed only moderate variation, ranging between 28% and 34%, indicating Hampton Roads and Virginia as a whole are taking advantage of similar export opportunities across industries.

Table 14			
Hampton Roads-Made Exports, Value, TEUs and Tons by Major Sectors			
	<i>Dollar Value (\$ mil)</i>	<i>TEUs</i>	<i>Short Tons</i>
NAICS Sectors & Description			
11 Agric., forestry & fishing products	\$ 529.2	12,792	147,029
21 Nonmetallic mining products	\$ 6.0	834	13,827
31 Food, bev., textiles, & apparel mfg.	\$ 431.1	26,152	311,920
32 Wood, paper, chem., plastics mfg.	\$ 1,260.2	54,574	652,749
33 Metal, machinery, electrical & electronics, transport eqpt. & furniture mfg.	\$ 823.3	20,236	155,226
91-99 Waste, scrap, used/spec classification goods	\$ 156.2	2,402	33,358
Total	\$ 3,206.0	116,989	1,314,109

The estimates for POV imports used by Hampton Roads businesses, government institutions (especially federal), and households are given in Table 15. The Hampton Roads use of 812,961 tons of container cargo valued at \$2.6

billion was 27.5% of the Virginia-used tonnage and 25.3% of the value. However, the percentages by industry group varied widely, ranging from 19.2% in tonnage and value for NAICS Code group 33 to 39.7% for NAICS Code group 32, importing wood and paper products. Such a high percent stems from some large processing and distribution firms locating in the MSA, such as Lumber Liquidators whose main operations are in Toano.

Table 15 Hampton Roads-Used Imports, Value, TEUs and Tons by Major Sectors			
	<i>Dollar Value (\$ mil)</i>	<i>TEUs</i>	<i>Short Tons</i>
NAICS Sectors & Description			
11 Agric., forestry & fishing products	\$ 332.7	5,972	50,284
21 Nonmetallic mining products	\$ 4.5	1,055	19,406
31 Food, bev., textiles, & apparel mfg.	\$ 246.6	11,253	113,202
32 Wood, paper, chem., plastics mfg.	\$ 898.8	30,753	399,395
33 Metal, machinery, electrical & electronics, transport eqpt. & furniture mfg.	\$ 1,143.1	32,168	223,684
91-99 Waste, scrap, used/spec classification goods	\$ 7.9	472	6,991
Total	\$ 2,633.6	81,673	812,961

Table 16				
POV-Related				
Hampton Roads	Direct	Indirect	Induced	Total
Impacts (\$ in mil)				
<u>Port operations</u>				
Revenues/Sales	\$ 1,842.4	\$ 778.1	\$1,287.2	\$ 3,907.7
Value Added (GRP)	\$ 816.6	\$ 473.4	\$ 797.1	\$ 2,087.1
Employee Compensation	\$ 652.7	\$ 363.8	\$ 445.4	\$ 1,461.9
Employment	10,534	6,757	10,126	27,417
<u>MSA made exports</u>				
Revenues/Sales	\$ 3,205.7	\$1,380.8	\$ 839.2	\$ 5,425.8
Value Added (GRP)	\$ 752.0	\$ 647.4	\$ 529.8	\$ 1,929.3
Employee Compensation	\$ 427.4	\$ 423.2	\$ 296.0	\$ 1,146.7
Employment	7,997	9,224	6,623	23,844
<u>MSA sold imports</u>				
Revenues/Sales	\$ 5,267.2	\$ 966.7	\$1,821.3	\$ 8,055.2
Value Added (GRP)	\$ 1,300.0	\$ 515.1	\$1,149.2	\$ 2,964.3
Employee Compensation	\$ 745.6	\$ 331.9	\$ 642.3	\$ 1,719.8
Employment	20,684	5,912	14,314	40,910
<u>Total</u>				
Revenue/sales	\$10,315.4	\$3,125.6	\$3,947.7	\$17,388.7
Value Added (GRP)	\$ 2,868.7	\$1,635.9	\$2,476.1	\$ 6,980.6
Employee Compensation	\$ 1,825.7	\$1,118.9	\$1,383.8	\$ 4,328.4
Employment	39,215	21,893	31,062	92,171
Compensation per Employee	\$ 46,556	\$ 51,108	\$ 44,548	\$ 46,961

The total estimated Hampton Roads impacts in FY 2013 of the three POV port-related activities — the POV port operations, Hampton Roads-made export impacts, and the MSA’s use of goods imported through the POV terminals are summarized in Table 16. The total POV spending impact was \$17.4 billion, with local value-added (Gross Regional Product) of \$6.98 billion, out of which \$4.33 billion was labor compensation to 92,171 (full and part time) employees.

The data analysis indicates that 73-76% of four direct impact measures of POV port operations in Virginia (Table 2) are impacts within Hampton Roads and 29-30% for Virginia export production impacts (Table 5). The Hampton Roads use of imports has a wider range of percentages in Table 8 Virginia direct impacts: for direct spending, it is 25%, while for value-added, it is only 11%. The difference is because many import users in the MSA are warehousing and distribution establishments who process the goods here for reshipment and sale outside of the MSA, where most of the retail value-added occurs, e.g., Cost Plus World Market in Windsor, Dollar Tree Distribution in Chesapeake, QVC in Suffolk, and Walmart in Williamsburg. For that same reason, the indirect value-added impacts are only 10% of the state-wide amounts since much of the retail input purchases of goods and services from other businesses (i.e., store services from advertising to electricity) takes place beyond the metropolitan area.

Table 17				
Total POV-Related Hampton Roads Impacts as a Percent of Virginia Impacts				
	<i>Direct</i>	<i>Indirect</i>	<i>Induced</i>	<i>Total</i>
Spending	30%	21%	36%	29%
Value-Added (GSP)	12%	14%	20%	14%
Employee Compensation	21%	22%	36%	25%
Employment	21%	23%	36%	25%

The Hampton Roads summary direct, indirect, induced, and total impacts as a percent of the POV-related Virginia impacts are given in Table 17. The relatively

low value-added percentages stem largely from a high amount of handling of the imports here but a lower percentage of final consumer sales than in the larger geographic area of the Commonwealth. However, the 61,109 Hampton Roads workers whose jobs directly and indirectly depend on the POV activity nearly all live within the metropolitan area and spend their incomes here, providing employment for another 31,062, bringing the total to 92,171 people. This normal level and percent of induced spending within a major metropolitan area brings the Hampton Roads Port of Virginia-related total employee compensation and employment impacts to 25% of the Virginia impacts.

In summary, the total economic impact in Virginia in FY 2013 directly and indirectly attributable to the Port of Virginia was \$60.3 billion in spending, with \$30.5 billion going for goods and services produced in Virginia. Out of this \$30.5 billion in Gross State Product, over 374,000 Virginia wage and salary employees were paid \$17.5 billion. These impacts generated \$1.44 billion in total enhancement for the three major sources of state and local government revenue in FY 2013.

APPENDIX 1: RESOURCES USED

Port Operations:

Source	Data
Port Import Export Reporting Service (PIERS)	<ul style="list-style-type: none"> • Data on imports and exports through POV terminals <ul style="list-style-type: none"> ○ Tonnage, TEUs ○ Origin/Destination ○ Harmonized commodity codes, etc.
U.S. International Trade Commission	<ul style="list-style-type: none"> • Trade value by port district
Virginia International Terminals (VIT)	<ul style="list-style-type: none"> • Cargo data for POV terminals, FY 2013 <ul style="list-style-type: none"> ○ Tonnage, Container counts ○ Payroll and purchases by area
Virginia Port Authority (VPA)	<ul style="list-style-type: none"> • Contact data for: <ul style="list-style-type: none"> ○ Terminal service providers ○ Importers/exporters using terminals ○ Logistics cos. serving terminals • Financial data and reports
Virginia Employment Commission (VEC)	<ul style="list-style-type: none"> • Confidential employment database by NAICS code and FIPS code

Virginia and Hampton Roads Economic Structure:

U.S. Bureau of Economic Analysis	<ul style="list-style-type: none"> • Virginia & MSA Gross Product, Income, compensation by industry; U.S. input-output tables for commodity use.
U.S. International Trade Administration	<ul style="list-style-type: none"> • Export jobs by state.
U.S. Bureau of Labor Statistics	<ul style="list-style-type: none"> • State & MSA resident and place of work employment
Virginia Employment Commission	<ul style="list-style-type: none"> • Confidential wages and employment database by NAICS code and FIPS code

APPENDIX 1: RESOURCES USED (CONTINUED)

Virginia Department of Taxation	<ul style="list-style-type: none"> • FY 2013 Virginia income and sales tax receipts
Virginia Auditor of Public Accounts	<ul style="list-style-type: none"> • FY 2013 Virginia city and county tax and fee receipts

Analytical Model:

Model	Use
IMPLAN Professional Version 3,1.1001.12, Va. state and county 2012 databases (September, 2014)	<ul style="list-style-type: none"> • To model direct, indirect, and induced impacts for Virginia and Hampton Roads using Social Accounts Matrix (SAM) type multipliers to include state and local government flows as endogenous sectors. Modeled on an industry basis with adjustments to accurately model Virginia exports and imports.

APPENDIX 2: BIOGRAPHICAL SKETCHES OF THE PRINCIPALS

Roy L. Pearson, a Mason School of Business faculty member since 1971, was named the Chancellor Professor of Business in 1987 and retired to Emeritus status in 2005. He served as Director of the College's Bureau of Business Research from 1984 to 1998, doing research projects for government agencies and businesses and publishing the *Virginia Outlook*, providing short- and long-term forecasts three times annually for Virginia and its six largest metropolitan areas.

Economic impact modeling is another specialty. For public and private reports, Roy has used all three of the major impact models, IMPLAN, REMI, and RIMS II. Some economic impact studies he prepared while in the Bureau of Business Research were: *The Government Returns and Economic Impacts Generated by Current Richmond International Airport Expansion Initiatives*; *The Virginia Economic Impacts of Philip Morris U.S.A.*; *The Estimated Economic Impact of Disney's America on Prince William County, the Northern Virginia MSA, and the Commonwealth of Virginia*; *The Estimated Economic Impact of the Lego Family Park USA on Prince William County, the Northern Virginia MSA, and the Commonwealth of Virginia*; and *Economic Impacts of Alternative Regulation Environments for Virginia Telephone Companies*. Through the Mason School of Business, he and three other Mason faculty completed *The Fiscal Year 2006 Virginia Economic and Fiscal Impacts of Virginia Port Authority Operations* for the Virginia Port Authority.

Roy has served on the Governor's Joint Advisory Board of Economists at the pleasure of seven Virginia governors, Robb, Baliles, Wilder, Allen, Warner, Kaine, and McAuliffe. President of the Virginia Association of Economists in 1990-91, he was named a Distinguished Fellow of the Association in 1998. In 1994-95, he was President of the Association for University Business and Economic Research, and in 1999 he was elected to honorary membership. He has served on the Board of Directors of the International Institute of Forecasters (IIF), and is the Associate Editor of the IIF's *Foresight: The International Journal of Applied Forecasting*. His other professional memberships include the National Association for Business Economics and the World Future Society. He received a B.S. in Commerce and Ph.D. in Economics from the University of Virginia.

K. Scott Swan is a Professor of International Business, Design, and Marketing at The College of William & Mary (rated #1 undergraduate Marketing program by BusinessWeek). He has lectured internationally at Tsinghua University in Beijing; Aoyama Gakuin University in Tokyo; WHU in Koblenz, Germany; Corvinus University in Hungary; the Vienna Business School; Management Center Innsbruck; and University of Applied Sciences Upper Austria in Wels.

He has also conducted economic impact studies for the Virginia Port Authority and Norfolk Redevelopment and Housing Authority. His research interests have led to publications in journals such as *Strategic Management Journal*, *Journal of International Management*, *Journal of International Business Studies*, *Management International Review*, *Journal of Business Research*, and *The Journal of Product Innovation Management*. He is on the Editorial Review Board of *The Design Journal* and *The Journal of Product Innovation Management*. Professor Swan has worked in project management for Flour-Daniel, marketing management for Foremost Corporation of America, as well as founding several small businesses related to design.