An aerial photograph of a large-scale highway interchange under construction. The image shows multiple levels of concrete overpasses and ramps, with numerous construction vehicles, cranes, and workers visible on the site. The highway is filled with traffic, including cars and trucks. The surrounding area includes green trees, a body of water, and some urban buildings. A semi-transparent yellow rectangular box is overlaid on the right side of the image, containing the title text.

# **The Economic Impact of Highway & Bridge Construction Investment in Virginia**

# TABLE OF CONTENTS

About this Report	3
About the Authors	3
Executive Summary	4
Economic Benefits of Highway and Bridge Construction Investment	6
The Importance of the Federal Aid Program	12
The Scope of Virginia's Transportation Construction Industry Employment	13
<b>The Economic Impacts of a \$2 Billion Annual Investment in Transportation Construction on Major Industry Sectors</b>	<b>15</b>
Agriculture, forestry, fishing, and hunting	16
Mining	17
Utilities	18
Construction	19
Manufacturing	20
Wholesale trade	21
Retail trade	22
Transportation and warehousing	23
Information	24
Finance and insurance	25
Real Estate, rental, and leasing	26
Professional, scientific, and technical services	27
Management of companies and enterprises	28
Administrative and waste management services	29
Educational services	30
Health care and social assistance	31
Arts, entertainment, and recreation	32
Accommodation	33
Food services and drinking places	34
Other services	35
Methodology and Sources	36

# ABOUT THIS REPORT

This report examines how public investments in Virginia’s highway and bridge infrastructure stimulate business activity and government revenues throughout the region.

We use the sophisticated “Regional Input–Output Modeling System” (RIMS II) developed by the U.S. Department of Commerce to track the complex money flows and interactions that occur between the state’s diverse business sectors. This, in tandem with data from the U.S. Census Bureau’s “County Business Patterns” report, allows us to determine how \$2 billion in highway and bridge construction work impacts the output of key business sectors within the region.

The results show the unique and synergistic nature of transportation capital investments—how they trigger immediate economic activity that creates and sustains jobs and tax revenues, yet yield long-lived capital assets that facilitate economic activity for many decades to come by providing access to jobs, services, materials and markets.

Most importantly, the results strongly suggest that such an investment should be a fundamental component of any plan to grow the region’s economy and boost its future competitiveness in state, national and international markets.

# ABOUT THE AUTHORS

This research was conducted for the Virginia Transportation Construction Alliance (VCTA) by a team led by Dr. Alison Premo Black, senior vice president and chief economist for the American Road & Transportation Builders Association (ARTBA) in Washington, D.C. Ms. Lital Shair made significant contributions to the research and analysis.

Dr. Black, who earned her PhD in Economics at The George Washington University in the Nation’s Capital, also holds an M.A. in International Economics and Latin American Studies from the Johns Hopkins School of Advanced International Studies. She graduated magna cum laude from Syracuse University, with majors in International Relations, Latin American Studies and Spanish. Since joining ARTBA in 2000, Dr. Black has led teams and authored over 65 studies examining state transportation funding and investment patterns.

Lital Shair is the market research associate in ARTBA’s Economics and Research Team. Ms. Shair graduated magna cum laude from Brandeis University with majors in Economics and International & Global Studies. Since joining ARTBA in 2012, she has researched trends in state transportation construction, and has authored over ten custom reports for clients. Ms. Shair also manages ARTBA’s transportation market intelligence subscription reports.

# EXECUTIVE SUMMARY

<sup>1</sup>State output measures total industry sales for both intermediate and final goods, while GSP measures the value added of all industry sales, or sales to final users in the economy only.

Highway and bridge construction investment in Virginia by local governments and the Virginia Department of Transportation (VDOT) is a key part of the Virginia economy, supporting \$4.6 billion in state economic output, \$2.4 billion in Gross State Product (GSP) and 36,390 jobs.<sup>1</sup> Highway and bridge investment not only spurs immediate economic growth, but also improves safety, lowers business operating costs, relieves congestion and increases efficiency. For this report, we examined the impact of a \$2 billion baseline level of highway and bridge construction spending in Virginia.

A \$2 billion investment in the Virginia highway and bridge network has the following economic impact:

- Stimulates \$4.6 billion in output of goods and services in Virginia.
- Contributes \$2.4 billion in value added to Virginia's GSP.
- Supports 36,390 full-time jobs, with a total annual payroll of \$1.4 billion.
- These jobs are throughout all sectors of the economy, including 3,836 jobs in retail trade and 2,102 jobs in manufacturing.
- Generates and sustains over \$263 million in government revenues. Many of these revenues, generated from federal, state, county and local taxes, will be invested back into Virginia. Estimated government revenues include:
  - \$112.1 million in federal (\$104.9 million) and state (\$7.3 million) payroll taxes
  - \$120.1 million in state income taxes
  - \$29.2 million in state and local sales taxes
  - \$2.0 million in city and county sales taxes

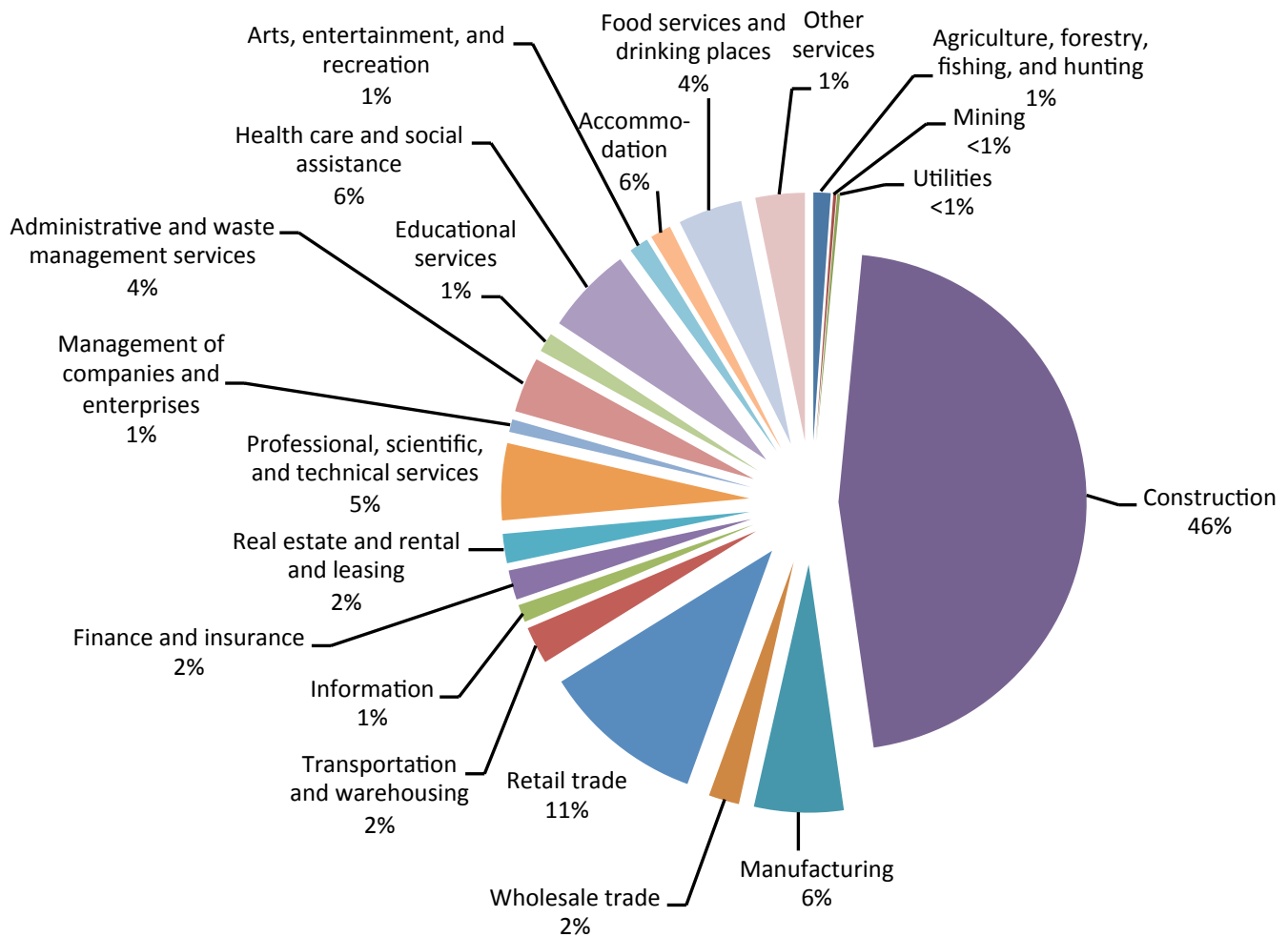
In addition, investment in Virginia's infrastructure creates tangible assets that are long-lived and will facilitate economic activity for many years to come by providing access to jobs, services, materials and markets. An improved highway network results in reduced operating costs and increased market access for Virginia businesses. Sustained investment in highways and bridges is critical to making the best use of these capital assets.

## Economic Impact of \$2 Billion in Highway and Bridge Construction Investment in Virginia

Total Output	\$4.6 billion
Total Value Added (GSP)	\$2.4 billion
Earnings	\$1.4 billion
Employment	36,390 jobs
State Payroll Tax	\$7.3 million
Federal Payroll Tax	\$104.9 million
State Income Tax	\$120.1 million
State and Local Sales Tax	\$29.2 million
City and County Sales Tax	\$2.0 million

# EXECUTIVE SUMMARY

## Virginia Jobs Supported by Highway and Bridge Construction Investment



# ECONOMIC BENEFITS OF HIGHWAY & BRIDGE CONSTRUCTION INVESTMENT

Highway and bridge construction investment in Virginia not only provides the infrastructure to keep the region moving, but also serves as an engine for growth across every sector of the economy. An investment of \$2 billion in Virginia highway and bridge construction generates \$4.6 billion in economic output across the state economy.

How does this ripple effect work? Highway and bridge contractors purchase inputs from Virginia businesses, in addition to other firms outside of the area as they complete work on projects. These workers spend their earnings by purchasing clothing, food and other goods and services, thereby creating demand in other sectors of the state economy. As jobs are created or sustained, employees receive additional income and spend more, and businesses increase sales. Subsequently, taxes grow due to larger payroll and sales volumes, providing the state and local municipalities with additional revenues to reinvest in Virginia.

The current baseline level of Virginia highway and bridge construction investment is \$2.0 billion. This level of investment generates the following economic benefits:

- \$4.59 billion in economic output as businesses throughout the economy sell more goods and services
- \$2.37 billion in value added, which contributes to Virginia’s GSP
- Supports 36,390 jobs across all sectors of the economy
- Those workers earn nearly \$1.4 billion in wages
- \$263.4 million in additional federal, state, local, county and city revenues, including:
  - \$7.3 million in state payroll taxes
  - \$104.9 million in federal payroll taxes
  - \$120.1 million in state income taxes
  - \$29.2 million in state and local sales taxes
  - \$2.0 million in city and county sales taxes

## Economic Impact of \$2 Billion in Highway and Bridge Construction Investment in Virginia

	Current Value	Impacts of \$2 billion investment	Highway & bridge construction as % of total
Total Output	\$799.2 billion	\$4.6 billion	0.6%
Total Value Added (GSP)	\$452.6 billion	\$2.4 billion	0.5%
Earnings	\$152.8 billion	\$1.4 billion	0.9%
Employment	3,089,241 jobs	36,390	1.2%
State Payroll Tax	\$809.7 million	\$7.3 million	0.9%
Federal Payroll Tax	\$11.7 billion	\$104.9 million	0.9%
State Income tax	\$10.2 billion	\$120.1 million	1.2%
State and Local Sales Tax	\$5.1 billion	\$29.2 million	0.6%
City and County Sales Tax	\$348.7 million	\$2.0 million	0.6%

Sources: U.S. Bureau of Economic Analysis, U.S. Census Bureau RIMS, U.S. Department of Labor, County Business Patterns, Government Census, Virginia Department of Taxation, National Association of Counties

# ECONOMIC BENEFITS OF HIGHWAY & BRIDGE CONSTRUCTION INVESTMENT

To put the economic impact in perspective, the \$2 billion invested in Virginia’s highway and bridge construction program is larger than the estimated annual contribution to GSP of Virginia’s entire farms industry (\$1.996 billion), amusements, gambling, and recreation industries (\$1.4 billion) and rail transportation industry (\$1.2 billion), among others. It is just below GSP levels for Virginia’s securities, commodity contracts, and investments industry

(\$2.01 billion) and its’ broadcasting and telecommunications industry (\$2.2 billion).

But that is only a small part of the picture. Without the infrastructure built, maintained and managed by the Virginia’s transportation construction industry, virtually all of the major industry sectors that comprise the Virginia economy—and the American jobs they sustain—would not exist or could not function.

## Economic Impact of \$2 Billion in Highway and Bridge Construction Investment in Virginia

Industry	Impact on Industry Output (in millions)	Jobs Supported/ Created
Agriculture, forestry, fishing and hunting	\$43.6	405
Mining	\$18.0	72
Utilities	\$46.0	72
Construction	\$2,015.2	16,697
Manufacturing	\$531.0	2,102
Wholesale trade	\$143.4	720
Retail trade	\$271.2	3,836
Transportation and warehousing	\$124.0	884
Information	\$119.8	413
Finance and insurance	\$176.2	696
Real estate and rental and leasing	\$296.6	688
Professional, scientific, and technical services	\$246.2	1,808
Mangement of companies and enterprises	\$62.2	299
Administrative and waste management services	\$83.2	1,302
Educational services	\$28.2	454
Health care and social assistance	\$170.8	2,064
Arts, entertainment, and recreation	\$18.8	455
Accommodation	\$21.6	493
Food services and drinking places	\$66.2	1,512
Other services	\$107.4	1,159
<b>Total industry impact*</b>	<b>\$4,589.6</b>	<b>36,390</b>

\* Does not include impact on government output.

# ECONOMIC BENEFITS OF HIGHWAY & BRIDGE CONSTRUCTION INVESTMENT

<sup>2</sup>Weisbrod, Glen, Donald Vary and George Treyz. Economic Implications of Congestion. NCHRP Report #463. Project 2-21, National Cooperative Highway Research Program, Transportation Research Board, Washington, DC, 2001

<sup>3</sup>Nadiri 1998

<sup>4</sup>The Importance of Transport in Business' Location Decisions.

<sup>5</sup>Ibid.

<sup>6</sup>It is an industry standard to use elasticities of supply and demand for materials as a measure of the impact of a change in transportation infrastructure investment. Based on a study conducted by the Federal Highway Administration (FHWA), the output elasticity of materials is usually the largest. The elasticity of labor and capital inputs is the second largest.

**Dependent Employment**—The simple fact is that 1.8 million Virginia jobs in tourism, manufacturing, transportation and warehousing, agriculture and forestry, mining, retailing and wholesaling alone are fully dependent on the work done by the state's transportation construction industry. These dependent industries provide a total payroll of \$32.7 billion and their employees contribute \$4.9 billion annually in state and federal payroll taxes.

The efficient and safe movement of goods and people is critical to the economic competitiveness of Virginia and the quality of life for its citizens. Every employee, customer and business pays a price when the system is congested, unsafe or in poor condition.

## Highway and Bridge Investment Spurs Business Growth

The importance of a robust transportation network has been well documented by business analysts, economists and the research community.<sup>2</sup> Overall estimates are that every \$1 increase in the highway and bridge capital stock generates a total of 30 cents in business savings.<sup>3</sup>

Some of these specific benefits include:

- **Staying Competitive:** The overall business environment in the United States is changing, and there is likely to be a greater importance placed on logistics and global transportation networks.<sup>4</sup> The value of truck freight shipments in Virginia is expected to almost double from \$589.7 billion in 2012 to over \$1 trillion in 2040. Truck shipments of Virginia goods for export are estimated to increase from \$29.0 billion in 2012 to over \$90 billion—an increase of over 300 percent.
- **Access to labor:** A better transportation system means that it is easier for employees in Virginia to get to work, and that businesses may recruit from a larger pool of potential workers.
- **Increased Market Share & More Customers:** A good transportation system means that Virginia businesses can reach a greater pool of customers. For example, if a pharmaceutical company can count on better roads for its employees and key product delivery and supply routes, the company may be able to increase employment and its market access to hospitals and other linked industries. Local industries will benefit from these larger markets and reduced transaction costs.<sup>5</sup>
- **Reducing production costs:** Economic studies show that reduced costs for inputs is one of the main business benefits from an increase in transportation investment. Typically businesses pay less for inputs when they have access to larger markets.<sup>6</sup>



# ECONOMIC BENEFITS OF HIGHWAY & BRIDGE CONSTRUCTION INVESTMENT

- **Agglomeration Economies:** Firms benefit by locating near one another, even if they are competitors. This is known as the agglomeration of market activity. This happens because a group of firms will attract a greater number of suppliers and customers than one company alone. Lower transportation costs are a key factor for agglomeration, and will be important in attracting new firms to an area.<sup>7</sup> Increasing returns to local industries can be anticipated in areas with intermodal linkages or intra-modally, as between major highways.
- **More efficient operations:** With an efficient transportation system, businesses can make better decisions about their products, inputs and workforce without worrying about poor roadways or congestion. Businesses respond in a variety of ways to congestion. Some businesses may change their mix of labor and capital, reduce the daily deliveries made by a driver or serve a smaller, more specialized market. All of these adjustments can mean a loss for business productivity and market share.<sup>8</sup>
- **Increase in demand for inputs:** As the economy expands, businesses will purchase more goods from their suppliers and will increase their demand for private capital. This includes buying more vehicles, equipment, office supplies or even building new plants and factories.<sup>9</sup>

Consider the benefits to a business in Virginia when the state invests in highway and bridge improvements. The increase in construction activity will mean more demand for products and services in the local area. A local business would sell more of its products and may even hire additional employees to increase output. With an improved transportation network, local business on the many main streets in Virginia could thrive.

The business will also have lower distribution costs because of the improved highways in the area. More customers will be able to reach the business, and the owner may be able to hire more talented, educated and skilled workers that live further away.

The increase in demand may also lead the business to expand, opening another store, plant or business location. Finally, the business will demand more inputs and raw materials from their own suppliers, creating economic ripple effects throughout the economy. It could also be the case that the business owner is able to purchase cheaper inputs because they have greater access to more markets.

<sup>7</sup>Dr. Jean-Paul Rodrigue, Transport and Location, the Geography of Transport Systems

<sup>8</sup>Weisbrod

<sup>9</sup>The magnitude of the effect of highway capital on output will differ by industry, with the largest difference observed between manufacturing and non-manufacturing industries.

<sup>10</sup>Economic studies have found output elasticities ranging from as high as 0.56 (Aschauer 1989) to a low of 0.04 (Garcia-Mila and McGuire 1992). This means that a one percent increase in highway investment would result in between 0.04 to 0.56 percent increase in output. Most of this variation is because studies have a different focus—looking at different types of investment measures and output at either the national, state or county level.

# ECONOMIC BENEFITS OF HIGHWAY & BRIDGE CONSTRUCTION INVESTMENT

<sup>11</sup>Munnell, Alicia, How Does Public Infrastructure Affect Regional Economic Performance, New England Economic Review, September/October 1990

<sup>12</sup>Munnell's elasticity for private capital is 0.31, so that a one percent increase in private capital would raise national output by 0.31 percent. This is in line with other studies of returns from private capital investment.

<sup>13</sup>Munnell says she is not implying that government-provided education and health services have no effect on productivity, but rather "the stock of buildings ... may not be the best indicator of the quality of education services; teachers' salaries, for example, might be a better measure."

## Benefits of Highway Investment Well Documented: Support from Economic Literature

The overall economic benefits of highway investment to economic activity are well documented in the economics literature. There are numerous studies that have found a positive correlation between transportation infrastructure investment and economic development. Although the exact impact of the investment has varied among studies, the fact that there is a positive relationship is widely accepted.<sup>10</sup>

- A study by Dr. Alicia Munnell of the Federal Reserve Bank of Boston concluded that states that invested more in infrastructure tended to have greater output, more private investment and more employment growth.<sup>11</sup> Her work found that a one percent increase in public capital would raise national output by 0.15 percent.<sup>12</sup> She further notes that the major impact of public capital output is from investment in highways and water and sewer systems. Other public capital investments, such as school buildings and hospitals, had virtually no measureable impact on private production.<sup>13</sup> Munnell also concludes that public capital and infrastructure investment have a significant positive impact on a state's private employment growth and private sector output.
- Smith (1994) reached similar conclusions, estimating increasing investment in highway and capital stock would increase a state's gross output by 0.121 to 0.127 percent.<sup>14</sup>
- Additional studies have found that transportation infrastructure investments have an impact on the attractiveness of local communities, which helps determine local economic activity and land values. In general, most studies find that locations close to large transportation infrastructure investment have higher land values.<sup>15</sup>
- M. Ishaq Nadiri of New York University and the National Bureau of Economics Research and Theofanis P. Mamuneas of New York University find significant cost structure and productivity performance impacts on the U.S. manufacturing industry as a result of highway investment. Their work shows that the rate of return on highway investment can be greater than private investment. Some major findings include<sup>16</sup>:
  - Over the period 1950 to 1989, U.S. industries realized production cost savings averaging 18 cents annually for each dollar invested in the road system.
  - Investments in non-local roads yield even higher production cost savings—estimated at 24 cents for each dollar of investment.

# ECONOMIC BENEFITS OF HIGHWAY & BRIDGE CONSTRUCTION INVESTMENT

- Although the impact of highway investment on productivity has declined since the early 1970s and the initial construction of the Interstate, evidence suggests that highway infrastructure investments more than pay for themselves in terms of industry cost savings.
- The U.S. highway network's contribution to economic productivity growth was between 7 and 8 percent over the time period 1980 to 1989.
- The net social rate of return on investment in the non-local road system during the 1980s was 16 percent, and the rate of return for the entire road network was 10 percent.<sup>17</sup>
- This rate of return was significantly higher than the prevailing rate of return on private capital and the long-term interest rate during this time period.
- The higher return to highway capital is due to its network feature, since the benefits are shared by all industries.

<sup>14</sup>Smith, Theresa M. "The Impact of Highway Infrastructure on Economic Performance." Public Roads—Federal Highway Administration, Spring 1994.

<sup>15</sup>A synopsis of these studies are available in the Transportation Research Board's Expanding Metropolitan Highways: Implications for Air Quality and Energy Use—Special Report 245, 1995

<sup>16</sup>Summary provided by U.S. Department of Transportation, Productivity and the Highway Network: A Look at the Economic Benefits to Industry from Investment in the Highway Network.

<sup>17</sup>The net social rate of return is an estimate of the benefits to private industries derived from the shared use of public highways.

# THE IMPORTANCE OF THE FEDERAL AID PROGRAM

<sup>18</sup>This percent is the ratio of federal-aid reimbursements to Virginia and total Virginia capital outlays. This was calculated using Virginia 11-year average (2001-2011) values for reimbursements and outlays from FHWA Highway Statistics Tables SF-1 and SF-2. This percent is indicative of the importance of the federal-aid program to state capital spending for highways and bridges. This figure does not include local capital spending. Federal highway reimbursements are primarily used for capital outlays, including construction, right-of-way acquisition and engineering, but are also used for debt service and GARVEE bonds.

Federal investment also plays a key role in supporting highway and bridge construction expenditures in Virginia and across the state. Over the past ten years, on average, the federal highway program has accounted for 57 percent of VDOT capital outlays for highway and bridge projects.<sup>18</sup>

VDOT decides which of the state projects that are eligible for federal aid will be funded. All projects are awarded by VDOT as part of their state highway and bridge program. VDOT pays for the ongoing construction work and is reimbursed by the federal government as the project is underway.

Some major projects in Virginia that are being or have been supported by investment from the federal aid program include:

- **U.S. Route 40 Corridor Improvement.** Virginia has recently published the Draft Environmental Impact Statement for this project.
- **Midtown Tunnel Corridor project.** Also known as the Elizabeth River Tunnels project, the project comprises the design and construction of a new two-lane tunnel under the Elizabeth River. This project is currently under construction, and the new Midtown Tunnel is expected to be complete in 2016.
- **I-95 High Occupancy Toll (HOT) Lanes.** This nearly \$1 billion project will include nine new bridges that will provide access to the new tolled lanes once they are open. Design is 100% complete and construction is 80% complete.
- **Capital Beltway HOT Lanes.** This \$1.4 billion project was completed in November 2012. It included the construction of fourteen miles of new lanes on I-495 to form the Express Lanes.

# THE SCOPE OF VIRGINIA'S TRANSPORTATION CONSTRUCTION INDUSTRY EMPLOYMENT

The firms and public agencies that design, build, maintain and manage the Commonwealth of Virginia's transportation infrastructure network—together with those who manufacture and produce the equipment, materials, supplies and services necessary for their work—comprise the Virginia transportation construction industry.

In addition to highway and bridge construction spending by VDOT, local governments are also investing in their own transportation networks.

The U.S. Census Bureau maintains a national database of all business establishments in the United States, organized under the North American Industry Classification System (NAICS). The NAICS is used by government and business to classify individual businesses by the type of economic activity they conduct. Each firm selects its own NAICS designation, choosing a six-digit code that allows the firm to be correctly classified by specialty type under an umbrella of 20 major industry sector categories. Through this rich database, we are able to quantify the number of firms, down to the county level, that conduct certain business activities within a state.

According to U.S. Census Bureau data, there are more than 30,000 individual business establishments and public agencies directly involved, at least partially, in transportation infrastructure design, construction or management activities in the Commonwealth of Virginia for all modes of transportation. Some of these businesses include:

- **548 highway and bridge contractor firms** that employ 12,132 men and women full-time
- **20,290 general construction firms** whose transportation work supports 8,399 full-time jobs<sup>19</sup>
- **8,263 design and engineering firms** whose transportation work supports 3,407 full-time jobs
- **24 asphalt manufacturing firms** whose transportation project sales support 186 full-time jobs
- **138 aggregate and materials business establishments** whose transportation market sales support 561 full-time jobs
- **231 cement and concrete business establishments** whose transportation project sales support 524 full-time jobs
- **2,471 construction equipment manufacturing, sales, rental and maintenance establishments** whose transportation market sales support 346 full-time jobs; and

<sup>19</sup>Those 20,290 firms actually employ over 200,000 workers in Virginia, but for this study we have pulled out the estimated jobs related to transportation construction, based on the company's transportation construction work. We have used a similar process for the other industries in this list – we have taken the average amount of business's output used for highway and bridge construction, available from the U.S. Census Bureau, and estimated the number of jobs in the industry supported by transportation construction investment.

# THE SCOPE OF VIRGINIA'S TRANSPORTATION CONSTRUCTION INDUSTRY EMPLOYMENT

<sup>20</sup>This number may appear low, but that is because the industry classification that includes traffic safety and control devices also includes a large number of other businesses that manufacture all types of communications equipment. For that reason, the percent of transportation work for this industry, overall, is fairly low. However, if there is a manufacturing firm in Virginia that solely works on traffic control and safety device manufacturing, that employment number could be higher. We don't have enough specific information to make that determination, so what you have is a baseline average.

- **26 traffic safety and control device manufacturers or distributors** whose transportation market sales support 44 full-time jobs.<sup>20</sup>
- **15,151 Virginians are employed full-time by federal, state or local transportation agencies**, including transit workers, county and state engineers and DOT employees.

**THE ECONOMIC  
IMPACTS OF A  
\$2 BILLION ANNUAL  
INVESTMENT IN  
TRANSPORTATION  
CONSTRUCTION ON  
MAJOR INDUSTRY  
SECTORS**

# The Economic Benefits of Highway and Bridge Investment— Impact on Sectors in Virginia

## AGRICULTURE, FORESTRY, FISHING, AND HUNTING

### SECTOR OVERVIEW

Agriculture, forestry, fishing, and hunting in Virginia contributed \$2.5 billion to state economic activity in 2013, accounting for 0.6% of the state’s Gross State Product (GSP).<sup>21</sup> Total sales in the industry were an estimated \$4.5 billion, which includes goods and services for final consumers as well as any inputs sold to other industries. This sector includes 672 establishments and sole proprietorships in Virginia with an existing payroll valued at \$183.2 million. These businesses located in Virginia contribute an estimated \$15.0 million in state and federal payroll taxes. Individuals working in this sector earn an average of \$47,244 each year. The Agriculture, Forestry, Fishing and Hunting sector comprises establishments primarily engaged in growing crops, raising animals, harvesting timber, and harvesting fish and other animals from a farm, ranch, or their natural habitats.

### IMPACT OF HIGHWAY AND BRIDGE INVESTMENT ON THIS SECTOR

The highway and bridge construction industry in Virginia has an impact on the output, employment and value added for this industry in two ways. The first is through direct purchases from transportation construction firms and suppliers involved in building Virginia’s highways and bridges. The second effect is when employees of the transportation construction firms spend their wages and make purchases throughout the economy.

The highway and bridge work done by construction firms in Virginia supports 405 jobs in this sector, generating \$43.6 million in output and \$6.0 million in wages.

<sup>21</sup>GSP is the value added by an industry to the overall economy. Virginia’s GSP was \$452.6 in 2013, according to the U.S. Bureau of Economic Analysis. That is the difference between total sales and the intermediate goods. Gross output is the measure of total industry sales for both intermediate and final goods. Virginia’s gross output in 2013 is estimated to be \$799.2 billion.

Regional Profile	Current Value	Virginia Ranking	Percentage of State Total
Industry Output	\$4.5 billion	20	0.6%
Value Added (contribution to GSP)	\$2.5 billion	20	0.6%
Establishments	672 businesses	18	0.3%
Employment	3,877 people	20	0.1%
Average Annual Salary	\$47,244	11	
Total Payroll	\$183.2 million	20	0.1%
State Payroll Tax Contribution	\$970.8 thousand	20	0.1%
Federal Payroll Tax Contribution	\$14.0 million	20	0.1%
State Income Tax Contribution	\$9.5 million	20	0.1%
State & Local Sales Tax Contribution	\$9.8 million	18	0.2%
City & County Sales Tax Contribution	\$673.0 thousand	18	0.2%

	Current Value	Activity supported by highway & bridge construction	Highway & bridge construction activity as % of total
Industry Output	\$4.5 billion	\$43.6 million	1.0%
Value Added (contributions to GSP)	\$2.5 billion	\$18.2 million	0.7%
Employment	3,877 people	405 people	10.5%
Total Payroll	\$183.2 million	\$6.0 million	3.3%
State Payroll Tax Contribution	\$970.8 thousand	\$31.8 thousand	3.3%
Federal Tax Contribution	\$14.0 million	\$459.0 thousand	3.3%
State Income Tax Contribution	\$9.5 million	\$996.9 thousand	10.5%
State & Local Sales Tax Contribution	\$9.8 million	\$56.3 thousand	0.6%
City & County Sales Tax Contribution	\$673.0 thousand	\$3.9 thousand	0.6%



# The Economic Benefits of Highway and Bridge Investment— Impact on Sectors in Virginia

## MINING

### SECTOR OVERVIEW

Mining in Virginia contributed \$2.9 billion to state economic activity in 2013, accounting for 0.6% of the state’s Gross State Product (GSP).<sup>22</sup> Total sales in the industry were an estimated \$5.2 billion, which includes goods and services for final consumers as well as any inputs sold to other industries. This sector includes 288 establishments and sole proprietorships in Virginia with an existing payroll valued at \$650.8 million. These businesses located in Virginia contribute an estimated \$53.2 million in state and federal payroll taxes. Individuals working in this sector earn an average of \$68,120 each year. The Mining, Quarrying, and Oil and Gas Extraction sector comprises establishments that extract naturally occurring mineral solids, such as coal and ores; liquid minerals, such as crude petroleum; and gases, such as natural gas.

### IMPACT OF HIGHWAY AND BRIDGE INVESTMENT ON THIS SECTOR

The highway and bridge construction industry in Virginia has an impact on the output, employment and value added for this industry in two ways. The first is through direct purchases from transportation construction firms and suppliers involved in building Virginia’s highways and bridges. The second effect is when employees of the transportation construction firms spend their wages and make purchases throughout the economy.

The highway and bridge work done by construction firms in Virginia supports 72 jobs in this sector, generating \$18.0 million in output and \$4.2 million in wages.

<sup>22</sup>GSP is the value added by an industry to the overall economy. Virginia’s GSP was \$452.6 in 2013, according to the U.S. Bureau of Economic Analysis. That is the difference between total sales and the intermediate goods. Gross output is the measure of total industry sales for both intermediate and final goods. Virginia’s gross output in 2013 is estimated to be \$799.2 billion.

Regional Profile	Current Value	Virginia Ranking	Percentage of State Total
Industry Output	\$5.2 billion	17	0.6%
Value Added (contribution to GSP)	\$2.9 billion	17	0.6%
Establishments	288 businesses	20	0.1%
Employment	9,554 people	19	0.3%
Average Annual Salary	\$68,120	6	
Total Payroll	\$650.8 million	19	0.4%
State Payroll Tax Contribution	\$3.4 million	19	0.4%
Federal Payroll Tax Contribution	\$49.8 million	19	0.4%
State Income Tax Contribution	\$35.0 million	19	0.4%
State & Local Sales Tax Contribution	\$13.5 million	15	0.3%
City & County Sales Tax Contribution	\$930.5 thousand	15	0.3%

	Current Value	Activity supported by highway & bridge construction	Highway & bridge construction activity as % of total
Industry Output	\$5.2 billion	\$18.0 million	0.3%
Value Added (contributions to GSP)	\$2.9 billion	\$9.6 million	0.3%
Employment	9,554 people	72 people	0.8%
Total Payroll	\$650.8 million	\$4.2 million	0.6%
State Payroll Tax Contribution	\$3.4 million	\$22.3 thousand	0.6%
Federal Tax Contribution	\$49.8 million	\$321.3 thousand	0.6%
State Income Tax Contribution	\$35.0 million	\$262.7 thousand	0.8%
State & Local Sales Tax Contribution	\$13.5 million	\$77.8 thousand	0.6%
City & County Sales Tax Contribution	\$930.5 thousand	\$5.3 thousand	0.6%

# The Economic Benefits of Highway and Bridge Investment— Impact on Sectors in Virginia

## UTILITIES

### SECTOR OVERVIEW

Utilities in Virginia contributed \$6.3 billion to state economic activity in 2013, accounting for 1.4% of the state’s Gross State Product (GSP).<sup>23</sup> Total sales in the industry were an estimated \$11.2 billion, which includes goods and services for final consumers as well as any inputs sold to other industries. This sector includes 319 establishments and sole proprietorships in Virginia with an existing payroll valued at \$1.2 billion. These businesses located in Virginia contribute an estimated \$101.0 million in state and federal payroll taxes. Individuals working in this sector earn an average of \$89,929 each year. The Utilities sector comprises establishments engaged in the provision of the following utility services: electric power, natural gas, steam supply, water supply, and sewage removal.

### IMPACT OF HIGHWAY AND BRIDGE INVESTMENT ON THIS SECTOR

The highway and bridge construction industry in Virginia has an impact on the output, employment and value added for this industry in two ways. The first is through direct purchases from transportation construction firms and suppliers involved in building Virginia’s highways and bridges. The second effect is when employees of the transportation construction firms spend their wages and make purchases throughout the economy.

The highway and bridge work done by construction firms in Virginia supports 72 jobs in this sector, generating \$46.0 million in output and \$8.0 million in wages.

<sup>23</sup>GSP is the value added by an industry to the overall economy. Virginia’s GSP was \$452.6 in 2013, according to the U.S. Bureau of Economic Analysis. That is the difference between total sales and the intermediate goods. Gross output is the measure of total industry sales for both intermediate and final goods. Virginia’s gross output in 2013 is estimated to be \$799.2 billion.

Regional Profile	Current Value	Virginia Ranking	Percentage of State Total
Industry Output	\$11.2 billion	15	1.4%
Value Added (contribution to GSP)	\$6.3 billion	15	1.4%
Establishments	319 businesses	19	0.2%
Employment	13,734 people	18	0.4%
Average Annual Salary	\$89,929	2	
Total Payroll	\$1.2 billion	17	0.8%
State Payroll Tax Contribution	\$6.5 million	17	0.8%
Federal Payroll Tax Contribution	\$94.5 million	17	0.8%
State Income Tax Contribution	\$67.5 million	16	0.8%
State & Local Sales Tax Contribution	\$29.4 million	12	0.6%
City & County Sales Tax Contribution	\$2.0 million	12	0.6%

	Current Value	Activity supported by highway & bridge construction	Highway & bridge construction activity as % of total
Industry Output	\$11.2 billion	\$46.0 million	0.4%
Value Added (contributions to GSP)	\$6.3 billion	\$27.4 million	0.4%
Employment	13,734 people	72 people	0.5%
Total Payroll	\$1.2 billion	\$8.0 million	0.6%
State Payroll Tax Contribution	\$6.5 million	\$42.4 thousand	0.6%
Federal Tax Contribution	\$94.5 million	\$612.0 thousand	0.6%
State Income Tax Contribution	\$67.5 million	\$354.8 thousand	0.5%
State & Local Sales Tax Contribution	\$29.4 million	\$168.8 thousand	0.6%
City & County Sales Tax Contribution	\$2.0 million	\$11.6 thousand	0.6%

# The Economic Benefits of Highway and Bridge Investment— Impact on Sectors in Virginia

## CONSTRUCTION

### SECTOR OVERVIEW

Construction in Virginia contributed \$16.1 billion to state economic activity in 2013, accounting for 3.6% of the state’s Gross State Product (GSP).<sup>24</sup> Total sales in the industry were an estimated \$28.5 billion, which includes goods and services for final consumers as well as any inputs sold to other industries. This sector includes 19,222 establishments and sole proprietorships in Virginia with an existing payroll valued at \$8.2 billion. These businesses located in Virginia contribute an estimated \$674.7 million in state and federal payroll taxes. Individuals working in this sector earn an average of \$49,011 each year. The Construction sector comprises establishments primarily engaged in the construction of buildings or engineering projects (e.g., highways and utility systems).

### IMPACT OF HIGHWAY AND BRIDGE INVESTMENT ON THIS SECTOR

The highway and bridge construction industry in Virginia has an impact on the output, employment and value added for this industry in two ways. The first is through direct purchases from transportation construction firms and suppliers involved in building Virginia’s highways and bridges. The second effect is when employees of the transportation construction firms spend their wages and make purchases throughout the economy.

The highway and bridge work done by construction firms in Virginia supports 16,697 jobs in this sector, generating \$2.0 billion in output and \$687.2 million in wages.

<sup>24</sup>GSP is the value added by an industry to the overall economy. Virginia’s GSP was \$452.6 in 2013, according to the U.S. Bureau of Economic Analysis. That is the difference between total sales and the intermediate goods. Gross output is the measure of total industry sales for both intermediate and final goods. Virginia’s gross output in 2013 is estimated to be \$799.2 billion.

Regional Profile	Current Value	Virginia Ranking	Percentage of State Total
Industry Output	\$28.5 billion	8	3.6%
Value Added (contribution to GSP)	\$16.1 billion	8	3.6%
Establishments	19,222 businesses	4	10.0%
Employment	168,289 people	7	5.4%
Average Annual Salary	\$49,011	9	
Total Payroll	\$8.2 billion	7	5.4%
State Payroll Tax Contribution	\$43.7 million	7	5.4%
Federal Payroll Tax Contribution	\$631.0 million	7	5.4%
State Income Tax Contribution	\$430.9 million	8	5.4%
State & Local Sales Tax Contribution	\$76.4 million	7	1.5%
City & County Sales Tax Contribution	\$5.2 million	7	1.5%

	Current Value	Activity supported by highway & bridge construction	Highway & bridge construction activity as % of total
Industry Output	\$28.5 billion	\$2.0 billion	7.1%
Value Added (contributions to GSP)	\$16.1 billion	\$904.6 million	5.6%
Employment	168,289 people	16,697 people	9.9%
Total Payroll	\$8.2 billion	\$687.2 million	8.3%
State Payroll Tax Contribution	\$43.7 million	\$3.6 million	8.3%
Federal Tax Contribution	\$631.0 million	\$52.6 million	8.3%
State Income Tax Contribution	\$430.9 million	\$42.8 million	9.9%
State & Local Sales Tax Contribution	\$76.4 million	\$438.9 thousand	0.6%
City & County Sales Tax Contribution	\$5.2 million	\$30.1 thousand	0.6%

# The Economic Benefits of Highway and Bridge Investment— Impact on Sectors in Virginia

## MANUFACTURING

### SECTOR OVERVIEW

Manufacturing in Virginia contributed \$42.3 billion to state economic activity in 2013, accounting for 9.4% of the state’s Gross State Product (GSP).<sup>25</sup> Total sales in the industry were an estimated \$74.8 billion, which includes goods and services for final consumers as well as any inputs sold to other industries. This sector includes 5,084 establishments and sole proprietorships in Virginia with an existing payroll valued at \$12.2 billion. These businesses located in Virginia contribute an estimated \$996.3 million in state and federal payroll taxes. Individuals working in this sector earn an average of \$52,491 each year. The Manufacturing sector comprises establishments engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products.

### IMPACT OF HIGHWAY AND BRIDGE INVESTMENT ON THIS SECTOR

The highway and bridge construction industry in Virginia has an impact on the output, employment and value added for this industry in two ways. The first is through direct purchases from transportation construction firms and suppliers involved in building Virginia’s highways and bridges. The second effect is when employees of the transportation construction firms spend their wages and make purchases throughout the economy.

The highway and bridge work done by construction firms in Virginia supports 2,102 jobs in this sector, generating \$531.0 million in output and \$92.2 million in wages.

<sup>25</sup>GSP is the value added by an industry to the overall economy. Virginia’s GSP was \$452.6 in 2013, according to the U.S. Bureau of Economic Analysis. That is the difference between total sales and the intermediate goods. Gross output is the measure of total industry sales for both intermediate and final goods. Virginia’s gross output in 2013 is estimated to be \$799.2 billion.

Regional Profile	Current Value	Virginia Ranking	Percentage of State Total
Industry Output	\$74.8 billion	3	9.4%
Value Added (contribution to GSP)	\$42.3 billion	3	9.4%
Establishments	5,084 businesses	11	2.6%
Employment	232,037 people	6	7.5%
Average Annual Salary	\$52,491	8	
Total Payroll	\$12.2 billion	3	8.0%
State Payroll Tax Contribution	\$64.6 million	3	8.0%
Federal Payroll Tax Contribution	\$931.8 million	3	8.0%
State Income Tax Contribution	\$640.6 million	4	8.0%
State & Local Sales Tax Contribution	\$199.5 million	4	3.9%
City & County Sales Tax Contribution	\$13.7 million	4	3.9%

	Current Value	Activity supported by highway & bridge construction	Highway & bridge construction activity as % of total
Industry Output	\$74.8 billion	\$531.0 million	0.7%
Value Added (contributions to GSP)	\$42.3 billion	\$188.4 million	0.4%
Employment	232,037 people	2,102 people	0.9%
Total Payroll	\$12.2 billion	\$92.2 million	0.8%
State Payroll Tax Contribution	\$64.6 million	\$488.7 thousand	0.8%
Federal Tax Contribution	\$931.8 million	\$7.1 million	0.8%
State Income Tax Contribution	\$640.6 million	\$5.8 million	0.9%
State & Local Sales Tax Contribution	\$199.5 million	\$1.1 million	0.6%
City & County Sales Tax Contribution	\$13.7 million	\$78.7 thousand	0.6%

# The Economic Benefits of Highway and Bridge Investment— Impact on Sectors in Virginia

## WHOLESALE TRADE

### SECTOR OVERVIEW

Wholesale trade in Virginia contributed \$18.5 billion to state economic activity in 2013, accounting for 4.1% of the state’s Gross State Product (GSP).<sup>26</sup> Total sales in the industry were an estimated \$32.7 billion, which includes goods and services for final consumers as well as any inputs sold to other industries. This sector includes 7,412 establishments and sole proprietorships in Virginia with an existing payroll valued at \$6.2 billion. These businesses located in Virginia contribute an estimated \$505.1 million in state and federal payroll taxes. Individuals working in this sector earn an average of \$59,728 each year. The Wholesale Trade sector comprises establishments engaged in wholesaling merchandise, generally without transformation, and rendering services incidental to the sale of merchandise.

### IMPACT OF HIGHWAY AND BRIDGE INVESTMENT ON THIS SECTOR

The highway and bridge construction industry in Virginia has an impact on the output, employment and value added for this industry in two ways. The first is through direct purchases from transportation construction firms and suppliers involved in building Virginia’s highways and bridges. The second effect is when employees of the transportation construction firms spend their wages and make purchases throughout the economy.

The highway and bridge work done by construction firms in Virginia supports 720 jobs in this sector, generating \$143.4 million in output and \$42.8 million in wages.

<sup>26</sup>GSP is the value added by an industry to the overall economy. Virginia’s GSP was \$452.6 in 2013, according to the U.S. Bureau of Economic Analysis. That is the difference between total sales and the intermediate goods. Gross output is the measure of total industry sales for both intermediate and final goods. Virginia’s gross output in 2013 is estimated to be \$799.2 billion.

Regional Profile	Current Value	Virginia Ranking	Percentage of State Total
Industry Output	\$32.7 billion	7	4.1%
Value Added (contribution to GSP)	\$18.5 billion	7	4.1%
Establishments	7,412 businesses	10	3.8%
Employment	103,377 people	10	3.3%
Average Annual Salary	\$59,728	7	
Total Payroll	\$6.2 billion	10	4.0%
State Payroll Tax Contribution	\$32.7 million	10	4.0%
Federal Payroll Tax Contribution	\$472.3 million	10	4.0%
State Income Tax Contribution	\$328.4 million	10	4.1%
State & Local Sales Tax Contribution	\$319.2 million	3	6.3%
City & County Sales Tax Contribution	\$21.9 million	3	6.3%

	Current Value	Activity supported by highway & bridge construction	Highway & bridge construction activity as % of total
Industry Output	\$32.7 billion	\$143.4 million	0.4%
Value Added (contributions to GSP)	\$18.5 billion	\$92.0 million	0.5%
Employment	103,377 people	720 people	0.7%
Total Payroll	\$6.2 billion	\$42.8 million	0.7%
State Payroll Tax Contribution	\$32.7 million	\$226.8 thousand	0.7%
Federal Tax Contribution	\$472.3 million	\$3.3 million	0.7%
State Income Tax Contribution	\$328.4 million	\$2.3 million	0.7%
State & Local Sales Tax Contribution	\$319.2 million	\$1.8 million	0.6%
City & County Sales Tax Contribution	\$21.9 million	\$125.9 thousand	0.6%

# The Economic Benefits of Highway and Bridge Investment— Impact on Sectors in Virginia

## RETAIL TRADE

### SECTOR OVERVIEW

Retail trade in Virginia contributed \$23.6 billion to state economic activity in 2013, accounting for 5.2% of the state’s Gross State Product (GSP).<sup>27</sup> Total sales in the industry were an estimated \$41.7 billion, which includes goods and services for final consumers as well as any inputs sold to other industries. This sector includes 27,469 establishments and sole proprietorships in Virginia with an existing payroll valued at \$10.4 billion. These businesses located in Virginia contribute an estimated \$849.5 million in state and federal payroll taxes. Individuals working in this sector earn an average of \$25,023 each year. The Retail Trade sector comprises establishments engaged in retailing merchandise, generally without transformation, and rendering services incidental to the sale of merchandise.

### IMPACT OF HIGHWAY AND BRIDGE INVESTMENT ON THIS SECTOR

The highway and bridge construction industry in Virginia has an impact on the output, employment and value added for this industry in two ways. The first is through direct purchases from transportation construction firms and suppliers involved in building Virginia’s highways and bridges. The second effect is when employees of the transportation construction firms spend their wages and make purchases throughout the economy.

The highway and bridge work done by construction firms in Virginia supports 3,836 jobs in this sector, generating \$271.2 million in output and \$85.2 million in wages.

<sup>27</sup>GSP is the value added by an industry to the overall economy. Virginia’s GSP was \$452.6 in 2013, according to the U.S. Bureau of Economic Analysis. That is the difference between total sales and the intermediate goods. Gross output is the measure of total industry sales for both intermediate and final goods. Virginia’s gross output in 2013 is estimated to be \$799.2 billion.

Regional Profile	Current Value	Virginia Ranking	Percentage of State Total
Industry Output	\$41.7 billion	5	5.2%
Value Added (contribution to GSP)	\$23.6 billion	5	5.2%
Establishments	27,469 businesses	2	14.3%
Employment	415,037 people	2	13.4%
Average Annual Salary	\$25,023	17	
Total Payroll	\$10.4 billion	5	6.8%
State Payroll Tax Contribution	\$55.0 million	5	6.8%
Federal Payroll Tax Contribution	\$794.5 million	5	6.8%
State Income Tax Contribution	\$490.3 million	6	6.1%
State & Local Sales Tax Contribution	\$3.2 billion	1	63.3%
City & County Sales Tax Contribution	\$220.8 million	1	63.3%

	Current Value	Activity supported by highway & bridge construction	Highway & bridge construction activity as % of total
Industry Output	\$41.7 billion	\$271.2 million	0.6%
Value Added (contributions to GSP)	\$23.6 billion	\$160.4 million	0.7%
Employment	415,037 people	3,836 people	0.9%
Total Payroll	\$10.4 billion	\$85.2 million	0.8%
State Payroll Tax Contribution	\$55.0 million	\$451.6 thousand	0.8%
Federal Tax Contribution	\$794.5 million	\$6.5 million	0.8%
State Income Tax Contribution	\$490.3 million	\$4.5 million	0.9%
State & Local Sales Tax Contribution	\$3.2 billion	\$18.5 million	0.6%
City & County Sales Tax Contribution	\$220.8 million	\$1.3 million	0.6%

# The Economic Benefits of Highway and Bridge Investment— Impact on Sectors in Virginia

## TRANSPORTATION AND WAREHOUSING

### SECTOR OVERVIEW

Transportation and warehousing in Virginia contributed \$11.5 billion to state economic activity in 2013, accounting for 2.5% of the state's Gross State Product (GSP).<sup>28</sup> Total sales in the industry were an estimated \$20.4 billion, which includes goods and services for final consumers as well as any inputs sold to other industries. This sector includes 4,793 establishments and sole proprietorships in Virginia with an existing payroll valued at \$4.1 billion. These businesses located in Virginia contribute an estimated \$335.6 million in state and federal payroll taxes. Individuals working in this sector earn an average of \$44,896 each year. The Transportation and Warehousing sector includes industries providing transportation of passengers and cargo, warehousing and storage for goods, scenic and sightseeing transportation, and support activities related to modes of transportation.

### IMPACT OF HIGHWAY AND BRIDGE INVESTMENT ON THIS SECTOR

The highway and bridge construction industry in Virginia has an impact on the output, employment and value added for this industry in two ways. The first is through direct purchases from transportation construction firms and suppliers involved in building Virginia's highways and bridges. The second effect is when employees of the transportation construction firms spend their wages and make purchases throughout the economy.

The highway and bridge work done by construction firms in Virginia supports 884 jobs in this sector, generating \$124.0 million in output and \$35.6 million in wages.

<sup>28</sup>GSP is the value added by an industry to the overall economy. Virginia's GSP was \$452.6 in 2013, according to the U.S. Bureau of Economic Analysis. That is the difference between total sales and the intermediate goods. Gross output is the measure of total industry sales for both intermediate and final goods. Virginia's gross output in 2013 is estimated to be \$799.2 billion.

Regional Profile	Current Value	Virginia Ranking	Percentage of State Total
Industry Output	\$20.4 billion	12	2.5%
Value Added (contribution to GSP)	\$11.5 billion	12	2.5%
Establishments	4,793 businesses	12	2.5%
Employment	91,390 people	12	3.0%
Average Annual Salary	\$44,896	13	
Total Payroll	\$4.1 billion	13	2.7%
State Payroll Tax Contribution	\$21.7 million	13	2.7%
Federal Payroll Tax Contribution	\$313.9 million	13	2.7%
State Income Tax Contribution	\$212.4 million	12	2.7%
State & Local Sales Tax Contribution	\$11.8 million	16	0.2%
City & County Sales Tax Contribution	\$808.6 thousand	16	0.2%

	Current Value	Activity supported by highway & bridge construction	Highway & bridge construction activity as % of total
Industry Output	\$20.4 billion	\$124.0 million	0.6%
Value Added (contributions to GSP)	\$11.5 billion	\$64.2 million	0.6%
Employment	91,390 people	884 people	1.0%
Total Payroll	\$4.1 billion	\$35.6 million	0.9%
State Payroll Tax Contribution	\$21.7 million	\$188.7 thousand	0.9%
Federal Tax Contribution	\$313.9 million	\$2.7 million	0.9%
State Income Tax Contribution	\$212.4 million	\$2.1 million	1.0%
State & Local Sales Tax Contribution	\$11.8 million	\$67.6 thousand	0.6%
City & County Sales Tax Contribution	\$808.6 thousand	\$4.6 thousand	0.6%

# The Economic Benefits of Highway and Bridge Investment— Impact on Sectors in Virginia

## INFORMATION

### SECTOR OVERVIEW

Information in Virginia contributed \$16.1 billion to state economic activity in 2013, accounting for 3.6% of the state’s Gross State Product (GSP).<sup>29</sup> Total sales in the industry were an estimated \$28.5 billion, which includes goods and services for final consumers as well as any inputs sold to other industries. This sector includes 3,847 establishments and sole proprietorships in Virginia with an existing payroll valued at \$8.0 billion. These businesses located in Virginia contribute an estimated \$653.2 million in state and federal payroll taxes. Individuals working in this sector earn an average of \$83,793 each year. The Information sector comprises establishments engaged in the following processes: (a) producing and distributing information and cultural products, (b) providing the means to transmit or distribute these products as well as data or communications, and (c) processing data.

### IMPACT OF HIGHWAY AND BRIDGE INVESTMENT ON THIS SECTOR

The highway and bridge construction industry in Virginia has an impact on the output, employment and value added for this industry in two ways. The first is through direct purchases from transportation construction firms and suppliers involved in building Virginia’s highways and bridges. The second effect is when employees of the transportation construction firms spend their wages and make purchases throughout the economy.

The highway and bridge work done by construction firms in Virginia supports 413 jobs in this sector, generating \$119.8 million in output and \$26.8 million in wages.

<sup>29</sup>GSP is the value added by an industry to the overall economy. Virginia’s GSP was \$452.6 in 2013, according to the U.S. Bureau of Economic Analysis. That is the difference between total sales and the intermediate goods. Gross output is the measure of total industry sales for both intermediate and final goods. Virginia’s gross output in 2013 is estimated to be \$799.2 billion.

Regional Profile	Current Value	Virginia Ranking	Percentage of State Total
Industry Output	\$28.5 billion	9	3.6%
Value Added (contribution to GSP)	\$16.1 billion	9	3.6%
Establishments	3,847 businesses	13	2.0%
Employment	95,292 people	11	3.1%
Average Annual Salary	\$83,793	4	
Total Payroll	\$8.0 billion	8	5.2%
State Payroll Tax Contribution	\$42.3 million	8	5.2%
Federal Payroll Tax Contribution	\$610.8 million	8	5.2%
State Income Tax Contribution	\$434.6 million	7	5.4%
State & Local Sales Tax Contribution	\$61.2 million	9	1.2%
City & County Sales Tax Contribution	\$4.2 million	9	1.2%

	Current Value	Activity supported by highway & bridge construction	Highway & bridge construction activity as % of total
Industry Output	\$28.5 billion	\$119.8 million	0.4%
Value Added (contributions to GSP)	\$16.1 billion	\$66.0 million	0.4%
Employment	95,292 people	413 people	0.4%
Total Payroll	\$8.0 billion	\$26.8 million	0.3%
State Payroll Tax Contribution	\$42.3 million	\$142.0 thousand	0.3%
Federal Tax Contribution	\$610.8 million	\$2.1 million	0.3%
State Income Tax Contribution	\$434.6 million	\$1.9 million	0.4%
State & Local Sales Tax Contribution	\$61.2 million	\$351.5 thousand	0.6%
City & County Sales Tax Contribution	\$4.2 million	\$24.1 thousand	0.6%



# The Economic Benefits of Highway and Bridge Investment— Impact on Sectors in Virginia

## FINANCE AND INSURANCE

### SECTOR OVERVIEW

Finance and insurance in Virginia contributed \$20.4 billion to state economic activity in 2013, accounting for 4.5% of the state’s Gross State Product (GSP).<sup>30</sup> Total sales in the industry were an estimated \$36.0 billion, which includes goods and services for final consumers as well as any inputs sold to other industries. This sector includes 11,261 establishments and sole proprietorships in Virginia with an existing payroll valued at \$12.1 billion. These businesses located in Virginia contribute an estimated \$990.7 million in state and federal payroll taxes. Individuals working in this sector earn an average of \$76,592 each year. The Finance and Insurance sector comprises establishments primarily engaged in financial transactions (transactions involving the creation, liquidation, or change in ownership of financial assets) and/or in facilitating financial transactions.

### IMPACT OF HIGHWAY AND BRIDGE INVESTMENT ON THIS SECTOR

The highway and bridge construction industry in Virginia has an impact on the output, employment and value added for this industry in two ways. The first is through direct purchases from transportation construction firms and suppliers involved in building Virginia’s highways and bridges. The second effect is when employees of the transportation construction firms spend their wages and make purchases throughout the economy.

The highway and bridge work done by construction firms in Virginia supports 696 jobs in this sector, generating \$176.2 million in output and \$40.6 million in wages.

<sup>30</sup>GSP is the value added by an industry to the overall economy. Virginia’s GSP was \$452.6 in 2013, according to the U.S. Bureau of Economic Analysis. That is the difference between total sales and the intermediate goods. Gross output is the measure of total industry sales for both intermediate and final goods. Virginia’s gross output in 2013 is estimated to be \$799.2 billion.

Regional Profile	Current Value	Virginia Ranking	Percentage of State Total
Industry Output	\$36.0 billion	6	4.5%
Value Added (contribution to GSP)	\$20.4 billion	6	4.5%
Establishments	11,261 businesses	7	5.8%
Employment	158,126 people	9	5.1%
Average Annual Salary	\$76,592	5	
Total Payroll	\$12.1 billion	4	7.9%
State Payroll Tax Contribution	\$64.2 million	4	7.9%
Federal Payroll Tax Contribution	\$926.5 million	4	7.9%
State Income Tax Contribution	\$655.7 million	3	8.2%
State & Local Sales Tax Contribution	\$2.4 million	20	0.05%
City & County Sales Tax Contribution	\$163.2 thousand	20	0.05%

	Current Value	Activity supported by highway & bridge construction	Highway & bridge construction activity as % of total
Industry Output	\$36.0 billion	\$176.2 million	0.5%
Value Added (contributions to GSP)	\$20.4 billion	\$100.4 million	0.5%
Employment	158,126 people	696 people	0.4%
Total Payroll	\$12.1 billion	\$40.6 million	0.3%
State Payroll Tax Contribution	\$64.2 million	\$215.2 thousand	0.3%
Federal Tax Contribution	\$926.5 million	\$3.1 million	0.3%
State Income Tax Contribution	\$655.7 million	\$2.9 million	0.4%
State & Local Sales Tax Contribution	\$2.4 million	\$13.6 thousand	0.6%
City & County Sales Tax Contribution	\$163.2 thousand	\$937.1	0.6%

# The Economic Benefits of Highway and Bridge Investment— Impact on Sectors in Virginia

## REAL ESTATE AND RENTAL AND LEASING

### SECTOR OVERVIEW

Real estate and rental and leasing in Virginia contributed \$65.5 billion to state economic activity in 2013, accounting for 14.5% of the state's Gross State Product (GSP).<sup>31</sup> Total sales in the industry were an estimated \$115.6 billion, which includes goods and services for final consumers as well as any inputs sold to other industries. This sector includes 8,753 establishments and sole proprietorships in Virginia with an existing payroll valued at \$2.5 billion. These businesses located in Virginia contribute an estimated \$205.2 million in state and federal payroll taxes. Individuals working in this sector earn an average of \$47,748 each year. The Real Estate and Rental and Leasing sector comprises establishments primarily engaged in renting, leasing, or otherwise allowing the use of tangible or intangible assets, and establishments providing related services.

### IMPACT OF HIGHWAY AND BRIDGE INVESTMENT ON THIS SECTOR

The highway and bridge construction industry in Virginia has an impact on the output, employment and value added for this industry in two ways. The first is through direct purchases from transportation construction firms and suppliers involved in building Virginia's highways and bridges. The second effect is when employees of the transportation construction firms spend their wages and make purchases throughout the economy.

The highway and bridge work done by construction firms in Virginia supports 688 jobs in this sector, generating \$296.6 million in output and \$18.8 million in wages.

<sup>31</sup>GSP is the value added by an industry to the overall economy. Virginia's GSP was \$452.6 in 2013, according to the U.S. Bureau of Economic Analysis. That is the difference between total sales and the intermediate goods. Gross output is the measure of total industry sales for both intermediate and final goods. Virginia's gross output in 2013 is estimated to be \$799.2 billion.

Regional Profile	Current Value	Virginia Ranking	Percentage of State Total
Industry Output	\$115.6 billion	1	14.5%
Value Added (contribution to GSP)	\$65.5 billion	1	14.5%
Establishments	8,753 businesses	9	4.5%
Employment	52,537 people	16	1.7%
Average Annual Salary	\$47,748	10	
Total Payroll	\$2.5 billion	14	1.6%
State Payroll Tax Contribution	\$13.3 million	14	1.6%
Federal Payroll Tax Contribution	\$191.9 million	14	1.6%
State Income Tax Contribution	\$130.7 million	14	1.6%
State & Local Sales Tax Contribution	\$75.9 million	8	1.5%
City & County Sales Tax Contribution	\$5.2 million	8	1.5%

	Current Value	Activity supported by highway & bridge construction	Highway & bridge construction activity as % of total
Industry Output	\$115.6 billion	\$296.6 million	0.3%
Value Added (contributions to GSP)	\$65.5 billion	\$223.0 million	0.3%
Employment	52,537 people	688 people	1.3%
Total Payroll	\$2.5 billion	\$18.8 million	0.7%
State Payroll Tax Contribution	\$13.3 million	\$99.6 thousand	0.7%
Federal Tax Contribution	\$191.9 million	\$1.4 million	0.7%
State Income Tax Contribution	\$130.7 million	\$1.7 million	1.3%
State & Local Sales Tax Contribution	\$75.9 million	\$435.9 thousand	0.6%
City & County Sales Tax Contribution	\$5.2 million	\$29.9 thousand	0.6%

# The Economic Benefits of Highway and Bridge Investment— Impact on Sectors in Virginia

## PROFESSIONAL, SCIENTIFIC, & TECHNICAL SERVICES

### SECTOR OVERVIEW

Professional, scientific, and technical services in Virginia contributed \$58.8 billion to state economic activity in 2013, accounting for 13.0% of the state's Gross State Product (GSP).<sup>32</sup> Total sales in the industry were an estimated \$103.8 billion, which includes goods and services for final consumers as well as any inputs sold to other industries. This sector includes 29,338 establishments and sole proprietorships in Virginia with an existing payroll valued at \$37.2 billion. These businesses located in Virginia contribute an estimated \$3.0 billion in state and federal payroll taxes. Individuals working in this sector earn an average of \$88,348 each year. The Professional, Scientific, and Technical Services sector comprises establishments that specialize in performing professional, scientific, and technical activities for others.

### IMPACT OF HIGHWAY AND BRIDGE INVESTMENT ON THIS SECTOR

The highway and bridge construction industry in Virginia has an impact on the output, employment and value added for this industry in two ways. The first is through direct purchases from transportation construction firms and suppliers involved in building Virginia's highways and bridges. The second effect is when employees of the transportation construction firms spend their wages and make purchases throughout the economy.

The highway and bridge work done by construction firms in Virginia supports 1,808 jobs in this sector, generating \$246.2 million in output and \$99.2 million in wages.

<sup>32</sup>GSP is the value added by an industry to the overall economy. Virginia's GSP was \$452.6 in 2013, according to the U.S. Bureau of Economic Analysis. That is the difference between total sales and the intermediate goods. Gross output is the measure of total industry sales for both intermediate and final goods. Virginia's gross output in 2013 is estimated to be \$799.2 billion.

Regional Profile	Current Value	Virginia Ranking	Percentage of State Total
Industry Output	\$103.8 billion	2	13.0%
Value Added (contribution to GSP)	\$58.8 billion	2	13.0%
Establishments	29,338 businesses	1	15.2%
Employment	421,502 people	1	13.6%
Average Annual Salary	\$88,348	3	
Total Payroll	\$37.2 billion	1	24.4%
State Payroll Tax Contribution	\$197.4 million	1	24.4%
Federal Payroll Tax Contribution	\$2.8 billion	1	24.4%
State Income Tax Contribution	\$2.0 billion	1	25.4%
State & Local Sales Tax Contribution	\$54.1 million	10	1.1%
City & County Sales Tax Contribution	\$3.7 million	10	1.1%

	Current Value	Activity supported by highway & bridge construction	Highway & bridge construction activity as % of total
Industry Output	\$103.8 billion	\$246.2 million	0.2%
Value Added (contributions to GSP)	\$58.8 billion	\$172.8 million	0.3%
Employment	421,502 people	1,808 people	0.4%
Total Payroll	\$37.2 billion	\$99.2 million	0.3%
State Payroll Tax Contribution	\$197.4 million	\$525.8 thousand	0.3%
Federal Tax Contribution	\$2.8 billion	\$7.6 million	0.3%
State Income Tax Contribution	\$2.0 billion	\$8.7 million	0.4%
State & Local Sales Tax Contribution	\$54.1 million	\$310.8 thousand	0.6%
City & County Sales Tax Contribution	\$3.7 million	\$21.3 thousand	0.6%

# The Economic Benefits of Highway and Bridge Investment— Impact on Sectors in Virginia

## MANAGEMENT OF COMPANIES AND ENTERPRISES

### SECTOR OVERVIEW

Management of companies and enterprises in Virginia contributed \$12.2 billion to state economic activity in 2013, accounting for 2.7% of the state's Gross State Product (GSP).<sup>33</sup> Total sales in the industry were an estimated \$21.5 billion, which includes goods and services for final consumers as well as any inputs sold to other industries. This sector includes 1,283 establishments and sole proprietorships in Virginia with an existing payroll valued at \$6.6 billion. These businesses located in Virginia contribute an estimated \$536.0 million in state and federal payroll taxes. Individuals working in this sector earn an average of \$102,884 each year. The Management of Companies and Enterprises sector comprises (1) establishments that hold the securities of (or other equity interests in) companies and enterprises for the purpose of owning a controlling interest or influencing management decisions or (2) establishments (except government establishments) that administer, oversee, and manage establishments of the company or enterprise and that normally undertake the strategic or organizational planning and decision making role of the company or enterprise.

### IMPACT OF HIGHWAY AND BRIDGE INVESTMENT ON THIS SECTOR

The highway and bridge construction industry in Virginia has an impact on the output, employment and value added for this industry in two ways. The first is through direct purchases from transportation construction firms and suppliers involved in building Virginia's highways and bridges. The second effect is when employees of the transportation construction firms spend their wages and make purchases throughout the economy.

The highway and bridge work done by construction firms in Virginia supports 299 jobs in this sector, generating \$62.2 million in output and \$27.2 million in wages.

Regional Profile	Current Value	Virginia Ranking	Percentage of State Total
Industry Output	\$21.5 billion	11	2.7%
Value Added (contribution to GSP)	\$12.2 billion	11	2.7%
Establishments	1,283 businesses	17	0.7%
Employment	63,693 people	14	2.1%
Average Annual Salary	\$102,884	1	
Total Payroll	\$6.6 billion	9	4.3%
State Payroll Tax Contribution	\$34.7 million	9	4.3%
Federal Payroll Tax Contribution	\$501.3 million	9	4.3%
State Income Tax Contribution	\$360.4 million	9	4.5%
State & Local Sales Tax Contribution	\$10.8 million	17	0.2%
City & County Sales Tax Contribution	\$742.3 thousand	17	0.2%

<sup>33</sup>GSP is the value added by an industry to the overall economy. Virginia's GSP was \$452.6 in 2013, according to the U.S. Bureau of Economic Analysis. That is the difference between total sales and the intermediate goods. Gross output is the measure of total industry sales for both intermediate and final goods. Virginia's gross output in 2013 is estimated to be \$799.2 billion.

	Current Value	Activity supported by highway & bridge construction	Highway & bridge construction activity as % of total
Industry Output	\$21.5 billion	\$62.2 million	0.3%
Value Added (contributions to GSP)	\$12.2 billion	\$43.8 million	0.4%
Employment	63,693 people	299 people	0.5%
Total Payroll	\$6.6 billion	\$27.2 million	0.4%
State Payroll Tax Contribution	\$34.7 million	\$144.2 thousand	0.4%
Federal Tax Contribution	\$501.3 million	\$2.1 million	0.4%
State Income Tax Contribution	\$360.4 million	\$1.7 million	0.5%
State & Local Sales Tax Contribution	\$10.8 million	\$62.1 thousand	0.6%
City & County Sales Tax Contribution	\$742.3 thousand	\$4.3 thousand	0.6%

# The Economic Benefits of Highway and Bridge Investment— Impact on Sectors in Virginia

## ADMINISTRATIVE & WASTE MANAGEMENT SERVICES

### SECTOR OVERVIEW

Administrative and waste management services in Virginia contributed \$13.7 billion to state economic activity in 2013, accounting for 3.0% of the state's Gross State Product (GSP).<sup>34</sup> Total sales in the industry were an estimated \$24.2 billion, which includes goods and services for final consumers as well as any inputs sold to other industries. This sector includes 10,476 establishments and sole proprietorships in Virginia with an existing payroll valued at \$10.0 billion. These businesses located in Virginia contribute an estimated \$817.4 million in state and federal payroll taxes. Individuals working in this sector earn an average of \$40,673 each year. The Administrative and Support and Waste Management and Remediation Services sector comprises establishments performing routine support activities for the day-to-day operations of other organizations.

### IMPACT OF HIGHWAY AND BRIDGE INVESTMENT ON THIS SECTOR

The highway and bridge construction industry in Virginia has an impact on the output, employment and value added for this industry in two ways. The first is through direct purchases from transportation construction firms and suppliers involved in building Virginia's highways and bridges. The second effect is when employees of the transportation construction firms spend their wages and make purchases throughout the economy.

The highway and bridge work done by construction firms in Virginia supports 1,302 jobs in this sector, generating \$83.2 million in output and \$32.2 million in wages.

<sup>34</sup>GSP is the value added by an industry to the overall economy. Virginia's GSP was \$452.6 in 2013, according to the U.S. Bureau of Economic Analysis. That is the difference between total sales and the intermediate goods. Gross output is the measure of total industry sales for both intermediate and final goods. Virginia's gross output in 2013 is estimated to be \$799.2 billion.

Regional Profile	Current Value	Virginia Ranking	Percentage of State Total
Industry Output	\$24.2 billion	10	3.0%
Value Added (contribution to GSP)	\$13.7 billion	10	3.0%
Establishments	10,476 businesses	8	5.4%
Employment	245,675 people	5	8.0%
Average Annual Salary	\$40,673	14	
Total Payroll	\$10.0 billion	6	6.5%
State Payroll Tax Contribution	\$53.0 million	6	6.5%
Federal Payroll Tax Contribution	\$764.4 million	6	6.5%
State Income Tax Contribution	\$511.3 million	5	6.4%
State & Local Sales Tax Contribution	\$15.1 million	14	0.3%
City & County Sales Tax Contribution	\$1.0 million	14	0.3%

	Current Value	Activity supported by highway & bridge construction	Highway & bridge construction activity as % of total
Industry Output	\$24.2 billion	\$83.2 million	0.3%
Value Added (contributions to GSP)	\$13.7 billion	\$59.6 million	0.4%
Employment	245,675 people	1,302 people	0.5%
Total Payroll	\$10.0 billion	\$32.2 million	0.3%
State Payroll Tax Contribution	\$53.0 million	\$170.7 thousand	0.3%
Federal Tax Contribution	\$764.4 million	\$2.5 million	0.3%
State Income Tax Contribution	\$511.3 million	\$2.7 million	0.5%
State & Local Sales Tax Contribution	\$15.1 million	\$86.9 thousand	0.6%
City & County Sales Tax Contribution	\$1.0 million	\$6.0 thousand	0.6%

# The Economic Benefits of Highway and Bridge Investment— Impact on Sectors in Virginia

## EDUCATIONAL SERVICES

### SECTOR OVERVIEW

Educational services in Virginia contributed \$4.0 billion to state economic activity in 2013, accounting for 0.9% of the state’s Gross State Product (GSP).<sup>35</sup> Total sales in the industry were an estimated \$7.0 billion, which includes goods and services for final consumers as well as any inputs sold to other industries. This sector includes 2,821 establishments and sole proprietorships in Virginia with an existing payroll valued at \$2.5 billion. These businesses located in Virginia contribute an estimated \$204.5 million in state and federal payroll taxes. Individuals working in this sector earn an average of \$33,787 each year. The Educational Services sector comprises establishments that provide instruction and training in a wide variety of subjects.

### IMPACT OF HIGHWAY AND BRIDGE INVESTMENT ON THIS SECTOR

The highway and bridge construction industry in Virginia has an impact on the output, employment and value added for this industry in two ways. The first is through direct purchases from transportation construction firms and suppliers involved in building Virginia’s highways and bridges. The second effect is when employees of the transportation construction firms spend their wages and make purchases throughout the economy.

The highway and bridge work done by construction firms in Virginia supports 454 jobs in this sector, generating \$28.2 million in output and \$11.8 million in wages.

<sup>35</sup>GSP is the value added by an industry to the overall economy. Virginia’s GSP was \$452.6 in 2013, according to the U.S. Bureau of Economic Analysis. That is the difference between total sales and the intermediate goods. Gross output is the measure of total industry sales for both intermediate and final goods. Virginia’s gross output in 2013 is estimated to be \$799.2 billion.

Regional Profile	Current Value	Virginia Ranking	Percentage of State Total
Industry Output	\$7.0 billion	16	0.9%
Value Added (contribution to GSP)	\$4.0 billion	16	0.9%
Establishments	2,821 businesses	14	1.5%
Employment	73,991 people	13	2.4%
Average Annual Salary	\$33,787	16	
Total Payroll	\$2.5 billion	15	1.6%
State Payroll Tax Contribution	\$13.2 million	15	1.6%
Federal Payroll Tax Contribution	\$191.2 million	15	1.6%
State Income Tax Contribution	\$124.7 million	15	1.6%
State & Local Sales Tax Contribution	\$6.6 million	19	0.1%
City & County Sales Tax Contribution	\$453.1 thousand	19	0.1%

	Current Value	Activity supported by highway & bridge construction	Highway & bridge construction activity as % of total
Industry Output	\$7.0 billion	\$28.2 million	0.4%
Value Added (contributions to GSP)	\$4.0 billion	\$15.8 million	0.4%
Employment	73,991 people	454 people	0.6%
Total Payroll	\$2.5 billion	\$11.8 million	0.5%
State Payroll Tax Contribution	\$13.2 million	\$62.5 thousand	0.5%
Federal Tax Contribution	\$191.2 million	\$902.7 thousand	0.5%
State Income Tax Contribution	\$124.7 million	\$765.1 thousand	0.6%
State & Local Sales Tax Contribution	\$6.6 million	\$37.9 thousand	0.6%
City & County Sales Tax Contribution	\$453.1 thousand	\$2.6 thousand	0.6%

# The Economic Benefits of Highway and Bridge Investment— Impact on Sectors in Virginia

## HEALTH CARE AND SOCIAL ASSISTANCE

### SECTOR OVERVIEW

Health care and social assistance in Virginia contributed \$27.5 billion to state economic activity in 2013, accounting for 6.1% of the state’s Gross State Product (GSP).<sup>36</sup> Total sales in the industry were an estimated \$48.6 billion, which includes goods and services for final consumers as well as any inputs sold to other industries. This sector includes 18,751 establishments and sole proprietorships in Virginia with an existing payroll valued at \$18.6 billion. These businesses located in Virginia contribute an estimated \$1.5 billion in state and federal payroll taxes. Individuals working in this sector earn an average of \$45,714 each year. The Health Care and Social Assistance sector comprises establishments providing health care and social assistance for individuals.

### IMPACT OF HIGHWAY AND BRIDGE INVESTMENT ON THIS SECTOR

The highway and bridge construction industry in Virginia has an impact on the output, employment and value added for this industry in two ways. The first is through direct purchases from transportation construction firms and suppliers involved in building Virginia’s highways and bridges. The second effect is when employees of the transportation construction firms spend their wages and make purchases throughout the economy.

The highway and bridge work done by construction firms in Virginia supports 2,064 jobs in this sector, generating \$170.8 million in output and \$79.0 million in wages.

<sup>36</sup>GSP is the value added by an industry to the overall economy. Virginia’s GSP was \$452.6 in 2013, according to the U.S. Bureau of Economic Analysis. That is the difference between total sales and the intermediate goods. Gross output is the measure of total industry sales for both intermediate and final goods. Virginia’s gross output in 2013 is estimated to be \$799.2 billion.

Regional Profile	Current Value	Virginia Ranking	Percentage of State Total
Industry Output	\$48.6 billion	4	6.1%
Value Added (contribution to GSP)	\$27.5 billion	4	6.1%
Establishments	18,751 businesses	5	9.7%
Employment	407,055 people	3	13.2%
Average Annual Salary	\$45,714	12	
Total Payroll	\$18.6 billion	2	12.2%
State Payroll Tax Contribution	\$98.6 million	2	12.2%
Federal Payroll Tax Contribution	\$1.4 billion	2	12.2%
State Income Tax Contribution	\$965.1 million	2	12.1%
State & Local Sales Tax Contribution	\$17.6 million	13	0.3%
City & County Sales Tax Contribution	\$1.2 million	13	0.3%

	Current Value	Activity supported by highway & bridge construction	Highway & bridge construction activity as % of total
Industry Output	\$48.6 billion	\$170.8 million	0.4%
Value Added (contributions to GSP)	\$27.5 billion	\$106.8 million	0.4%
Employment	407,055 people	2,064 people	0.5%
Total Payroll	\$18.6 billion	\$79.0 million	0.4%
State Payroll Tax Contribution	\$98.6 million	\$418.7 thousand	0.4%
Federal Tax Contribution	\$1.4 billion	\$6.0 million	0.4%
State Income Tax Contribution	\$965.1 million	\$4.9 million	0.5%
State & Local Sales Tax Contribution	\$17.6 million	\$101.1 thousand	0.6%
City & County Sales Tax Contribution	\$1.2 million	\$6.9 thousand	0.6%

# The Economic Benefits of Highway and Bridge Investment— Impact on Sectors in Virginia

## ARTS, ENTERTAINMENT, & RECREATION

### SECTOR OVERVIEW

Arts, entertainment, and recreation in Virginia contributed \$2.7 billion to state economic activity in 2013, accounting for 0.6% of the state’s Gross State Product (GSP).<sup>37</sup> Total sales in the industry were an estimated \$4.8 billion, which includes goods and services for final consumers as well as any inputs sold to other industries. This sector includes 2,741 establishments and sole proprietorships in Virginia with an existing payroll valued at \$1.3 billion. These businesses located in Virginia contribute an estimated \$104.8 million in state and federal payroll taxes. Individuals working in this sector earn an average of \$24,323 each year. The Arts, Entertainment, and Recreation sector includes a wide range of establishments that operate facilities or provide services to meet varied cultural, entertainment, and recreational interests of their patrons.

### IMPACT OF HIGHWAY AND BRIDGE INVESTMENT ON THIS SECTOR

The highway and bridge construction industry in Virginia has an impact on the output, employment and value added for this industry in two ways. The first is through direct purchases from transportation construction firms and suppliers involved in building Virginia’s highways and bridges. The second effect is when employees of the transportation construction firms spend their wages and make purchases throughout the economy.

The highway and bridge work done by construction firms in Virginia supports 455 jobs in this sector, generating \$18.8 million in output and \$7.2 million in wages.

Regional Profile	Current Value	Virginia Ranking	Percentage of State Total
Industry Output	\$4.8 billion	18	0.6%
Value Added (contribution to GSP)	\$2.7 billion	18	0.6%
Establishments	2,741 businesses	15	1.4%
Employment	52,685 people	15	1.7%
Average Annual Salary	\$24,323	18	
Total Payroll	\$1.3 billion	16	0.8%
State Payroll Tax Contribution	\$6.8 million	16	0.8%
Federal Payroll Tax Contribution	\$98.0 million	16	0.8%
State Income Tax Contribution	\$60.1 million	17	0.8%
State & Local Sales Tax Contribution	\$29.9 million	11	0.6%
City & County Sales Tax Contribution	\$2.1 million	11	0.6%

<sup>37</sup>GSP is the value added by an industry to the overall economy. Virginia’s GSP was \$452.6 in 2013, according to the U.S. Bureau of Economic Analysis. That is the difference between total sales and the intermediate goods. Gross output is the measure of total industry sales for both intermediate and final goods. Virginia’s gross output in 2013 is estimated to be \$799.2 billion.

	Current Value	Activity supported by highway & bridge construction	Highway & bridge construction activity as % of total
Industry Output	\$4.8 billion	\$18.8 million	0.4%
Value Added (contributions to GSP)	\$2.7 billion	\$11.4 million	0.4%
Employment	52,685 people	455 people	0.9%
Total Payroll	\$1.3 billion	\$7.2 million	0.6%
State Payroll Tax Contribution	\$6.8 million	\$38.2 thousand	0.6%
Federal Tax Contribution	\$98.0 million	\$550.8 thousand	0.6%
State Income Tax Contribution	\$60.1 million	\$518.7 thousand	0.9%
State & Local Sales Tax Contribution	\$29.9 million	\$171.6 thousand	0.6%
City & County Sales Tax Contribution	\$2.1 million	\$11.8 thousand	0.6%



# The Economic Benefits of Highway and Bridge Investment— Impact on Sectors in Virginia

## ACCOMMODATION

### SECTOR OVERVIEW

Accommodation in Virginia contributed \$2.7 billion to state economic activity in 2013, accounting for 0.6% of the state’s Gross State Product (GSP).<sup>38</sup> Total sales in the industry were an estimated \$4.7 billion, which includes goods and services for final consumers as well as any inputs sold to other industries. This sector includes 1,788 establishments and sole proprietorships in Virginia with an existing payroll valued at \$1.1 billion. These businesses located in Virginia contribute an estimated \$88.1 million in state and federal payroll taxes. Individuals working in this sector earn an average of \$23,519 each year. The Accommodation sector comprises establishments providing lodging or short-term accommodations for travelers, vacationers, and others.

### IMPACT OF HIGHWAY AND BRIDGE INVESTMENT ON THIS SECTOR

The highway and bridge construction industry in Virginia has an impact on the output, employment and value added for this industry in two ways. The first is through direct purchases from transportation construction firms and suppliers involved in building Virginia’s highways and bridges. The second effect is when employees of the transportation construction firms spend their wages and make purchases throughout the economy.

The highway and bridge work done by construction firms in Virginia supports 493 jobs in this sector, generating \$21.6 million in output and \$7.8 million in wages.

Regional Profile	Current Value	Virginia Ranking	Percentage of State Total
Industry Output	\$4.7 billion	19	0.6%
Value Added (contribution to GSP)	\$2.7 billion	19	0.6%
Establishments	1,788 businesses	16	0.9%
Employment	45,791 people	17	1.5%
Average Annual Salary	\$23,519	19	
Total Payroll	\$1.1 billion	18	0.7%
State Payroll Tax Contribution	\$5.7 million	18	0.7%
Federal Payroll Tax Contribution	\$82.4 million	18	0.7%
State Income Tax Contribution	\$50.1 million	18	0.6%
State & Local Sales Tax Contribution	\$169.9 million	5	3.3%
City & County Sales Tax Contribution	\$11.7 million	5	3.3%

<sup>38</sup>GSP is the value added by an industry to the overall economy. Virginia’s GSP was \$452.6 in 2013, according to the U.S. Bureau of Economic Analysis. That is the difference between total sales and the intermediate goods. Gross output is the measure of total industry sales for both intermediate and final goods. Virginia’s gross output in 2013 is estimated to be \$799.2 billion.

	Current Value	Activity supported by highway & bridge construction	Highway & bridge construction activity as % of total
Industry Output	\$4.7 billion	\$21.6 million	0.5%
Value Added (contributions to GSP)	\$2.7 billion	\$11.7 million	0.4%
Employment	45,791 people	493 people	1.1%
Total Payroll	\$1.1 billion	\$7.8 million	0.7%
State Payroll Tax Contribution	\$5.7 million	\$41.1 thousand	0.7%
Federal Tax Contribution	\$82.4 million	\$593.9 thousand	0.7%
State Income Tax Contribution	\$50.1 million	\$539.4 thousand	1.1%
State & Local Sales Tax Contribution	\$169.9 million	\$975.4 thousand	0.6%
City & County Sales Tax Contribution	\$11.7 million	\$67.0 thousand	0.6%

# The Economic Benefits of Highway and Bridge Investment— Impact on Sectors in Virginia

## FOOD SERVICES AND DRINKING PLACES

### SECTOR OVERVIEW

Food services and drinking places in Virginia contributed \$8.2 billion to state economic activity in 2013, accounting for 1.8% of the state’s Gross State Product (GSP).<sup>39</sup> Total sales in the industry were an estimated \$14.4 billion, which includes goods and services for final consumers as well as any inputs sold to other industries. This sector includes 15,037 establishments and sole proprietorships in Virginia with an existing payroll valued at \$4.1 billion. These businesses located in Virginia contribute an estimated \$337.1 million in state and federal payroll taxes. Individuals working in this sector earn an average of \$15,138 each year. The Food Services and Drinking Places sector comprises establishments providing customers with preparing meals, snacks, and beverages for immediate consumption.

### IMPACT OF HIGHWAY AND BRIDGE INVESTMENT ON THIS SECTOR

The highway and bridge construction industry in Virginia has an impact on the output, employment and value added for this industry in two ways. The first is through direct purchases from transportation construction firms and suppliers involved in building Virginia’s highways and bridges. The second effect is when employees of the transportation construction firms spend their wages and make purchases throughout the economy.

The highway and bridge work done by construction firms in Virginia supports 1,512 jobs in this sector, generating \$66.2 million in output and \$23.8 million in wages.

<sup>39</sup>GSP is the value added by an industry to the overall economy. Virginia’s GSP was \$452.6 in 2013, according to the U.S. Bureau of Economic Analysis. That is the difference between total sales and the intermediate goods. Gross output is the measure of total industry sales for both intermediate and final goods. Virginia’s gross output in 2013 is estimated to be \$799.2 billion.

Regional Profile	Current Value	Virginia Ranking	Percentage of State Total
Industry Output	\$14.4 billion	14	1.8%
Value Added (contribution to GSP)	\$8.2 billion	14	1.8%
Establishments	15,037 businesses	6	7.8%
Employment	272,246 people	4	8.8%
Average Annual Salary	\$15,138	20	
Total Payroll	\$4.1 billion	12	2.7%
State Payroll Tax Contribution	\$21.8 million	12	2.7%
Federal Payroll Tax Contribution	\$315.3 million	12	2.7%
State Income Tax Contribution	\$166.9 million	13	2.1%
State & Local Sales Tax Contribution	\$649.2 million	2	12.8%
City & County Sales Tax Contribution	\$44.6 million	2	12.8%

	Current Value	Activity supported by highway & bridge construction	Highway & bridge construction activity as % of total
Industry Output	\$14.4 billion	\$66.2 million	0.5%
Value Added (contributions to GSP)	\$8.2 billion	\$35.9 million	0.4%
Employment	272,246 people	1,512 people	0.6%
Total Payroll	\$4.1 billion	\$23.8 million	0.6%
State Payroll Tax Contribution	\$21.8 million	\$126.3 thousand	0.6%
Federal Tax Contribution	\$315.3 million	\$1.8 million	0.6%
State Income Tax Contribution	\$166.9 million	\$927.0 thousand	0.6%
State & Local Sales Tax Contribution	\$649.2 million	\$3.7 million	0.6%
City & County Sales Tax Contribution	\$44.6 million	\$256.0 thousand	0.6%

# The Economic Benefits of Highway and Bridge Investment— Impact on Sectors in Virginia

## OTHER SERVICES

### SECTOR OVERVIEW

Other services in Virginia contributed \$11.3 billion to state economic activity in 2013, accounting for 2.5% of the state’s Gross State Product (GSP).<sup>40</sup> Total sales in the industry were an estimated \$20.0 billion, which includes goods and services for final consumers as well as any inputs sold to other industries. This sector includes 21,238 establishments and sole proprietorships in Virginia with an existing payroll valued at \$5.6 billion. These businesses located in Virginia contribute an estimated \$460.3 million in state and federal payroll taxes. Individuals working in this sector earn an average of \$34,480 each year. The Other Services (except Public Administration) sector comprises establishments engaged in providing services not specifically provided for elsewhere in the classification system.

### IMPACT OF HIGHWAY AND BRIDGE INVESTMENT ON THIS SECTOR

The highway and bridge construction industry in Virginia has an impact on the output, employment and value added for this industry in two ways. The first is through direct purchases from transportation construction firms and suppliers involved in building Virginia’s highways and bridges. The second effect is when employees of the transportation construction firms spend their wages and make purchases throughout the economy.

The highway and bridge work done by construction firms in Virginia supports 1,159 jobs in this sector, generating \$107.4 million in output and \$32.8 million in wages.

<sup>40</sup>GSP is the value added by an industry to the overall economy. Virginia’s GSP was \$452.6 in 2013, according to the U.S. Bureau of Economic Analysis. That is the difference between total sales and the intermediate goods. Gross output is the measure of total industry sales for both intermediate and final goods. Virginia’s gross output in 2013 is estimated to be \$799.2 billion.

Regional Profile	Current Value	Virginia Ranking	Percentage of State Total
Industry Output	\$20.0 billion	13	2.5%
Value Added (contribution to GSP)	\$11.3 billion	13	2.5%
Establishments	21,238 businesses	3	11.0%
Employment	163,211 people	8	5.3%
Average Annual Salary	\$34,480	15	
Total Payroll	\$5.6 billion	11	3.7%
State Payroll Tax Contribution	\$29.8 million	11	3.7%
Federal Payroll Tax Contribution	\$430.5 million	11	3.7%
State Income Tax Contribution	\$281.6 million	11	3.5%
State & Local Sales Tax Contribution	\$109.4 million	6	2.2%
City & County Sales Tax Contribution	\$7.5 million	6	2.2%

	Current Value	Activity supported by highway & bridge construction	Highway & bridge construction activity as % of total
Industry Output	\$20.0 billion	\$107.4 million	0.5%
Value Added (contributions to GSP)	\$11.3 billion	\$60.2 million	0.53%
Employment	163,211 people	1,159 people	0.7%
Total Payroll	\$5.6 billion	\$32.8 million	0.58%
State Payroll Tax Contribution	\$29.8 million	\$173.8 thousand	0.58%
Federal Tax Contribution	\$430.5 million	\$2.5 million	0.58%
State Income Tax Contribution	\$281.6 million	\$2.0 million	0.7%
State & Local Sales Tax Contribution	\$109.4 million	\$628.2 thousand	0.6%
City & County Sales Tax Contribution	\$7.5 million	\$43.1 thousand	0.6%

# METHODOLOGY AND SOURCES

The impact of highway and bridge construction spending is calculated using the U.S. Department of Commerce Regional Input-Output Modeling System (RIMS II). RIMS II is based on input output (I-O) tables. For a given industry, the I-O tables show the industrial distribution of inputs purchased and outputs sold.

Research shows that RIMS II multipliers are similar to other regional I-O models based on in depth and often expensive surveys. According to the U.S. Department of Commerce, RIMS multipliers have been used to estimate such things as the regional impact of military base closings, tourist expenditures, new energy facilities, offshore drilling and the opening or closing of manufacturing plants and other facilities. The construction multipliers in this report are used frequently to analyze the impact of new construction projects, including transportation construction. The construction multipliers are specific to Virginia and are based on benchmark regional data from 2006 and industry data from the 1997 benchmark series, as published by the U.S. Department of Commerce. These multipliers are standard for this type of analysis and are the latest information available. Separate multipliers were not available for the Accommodation and Food services and drinking places sectors, so the multiplier provided for the combined Accommodation and food services sector was used to estimate the total impact on those sectors combined. Then the impacts for the Accommodation and Food services and drinking places sectors were estimated by multiplying the total Accommodation and food services sector impact number by the percent share of each sector's contribution to the GSP of the total Accommodation and food services sector in Virginia.

Industry value added (contribution to GSP) for Virginia is the most recent data from the U.S. Bureau of Economic Analysis GDP estimates for the state, broken out by industry, for 2013. 2013 figures were not available for the Accommodation and Food services and drinking places sectors, so their values were estimated by multiplying their

2012 percent share of the combined Accommodation and food services sector by the 2013 combined Accommodation and food services sector value. Industry output for Virginia was estimated by taking Virginia's percent share of national GSP for each industry and multiplying it by national gross output by industry. As with GSP, 2013 figures were not available for the Accommodation and Food services and drinking places sectors, so their values were estimated by multiplying their 2012 percent share of the combined Accommodation and food services sector by the 2013 combined Accommodation and food services sector value.

The employment estimates are derived from several different sources. The information includes establishment and employment data for sole proprietorships and businesses identified as relevant to highway, street and bridge construction. The total direct employment number for suppliers is calculated using the percentage of an industry's output that is related to highway, street and bridge construction, based on national input output tables from the U.S. Bureau of Economic Analysis. The private employment data is from the U.S. Census Bureau's County Business Patterns and Nonemployer Statistics series. Government employee data is from the U.S. Census Bureau's Annual State and Local Government Census. All payroll data has been adjusted for inflation to 2013 dollars using the Bureau of Labor Statistics Consumer Price Index.

Induced employment is calculated according to the same method used by the U.S. Department of Transportation Federal Highway Administration (FHWA). FHWA estimates that every \$1 billion invested in highway construction yields 27,823 jobs. Of that total, 13,861 are considered direct jobs for on-site construction and direct and indirect suppliers, and 13,962 jobs are induced. This study uses that ratio, calculating induced jobs based on the direct employment calculated above.

The state payroll tax rate is calculated using the average employer tax rate as a percent of total

# METHODOLOGY AND SOURCES

wages. The source for this information is the National Association of State Workforce Agencies (NASWA) and the U.S. Department of Labor Employment Training Administration (ETA) Financial Handbook 394. The federal payroll tax rate is estimated to be 7.65 percent. Income tax contributions are estimated using the average wage in each of the 19 industries and the corresponding tax rate as published by the state of Virginia. For industries where the average earnings are above \$17,000, the income tax is calculated as \$720 plus 5.75 percent of the average wages over \$17,000, as per the Virginia Department of Taxation. Total estimated income tax collections using this method are \$10.2 billion. Actual income tax collections reported by Virginia in the 2011 U.S. Census of State & Local Governments was \$9.5 billion. This difference is in part attributable to inflation, an expanded workforce and income taxes paid by government workers. Employment and economic impact of the public sector is not included in the 19 sector analysis.

Total state sales tax revenue is calculated as 5.3% of total taxable sales in Virginia in 2013. This includes a 4.3% state tax and a 1% local tax. Taxable sales values by sector for 2012 were provided by the Virginia Department of Taxation Fiscal Year 2013 Annual Report. Since 2013 taxable sales values were not available, sales were assumed to have grown by 3.29%, the rate of growth in total state and local retail sales and use tax net revenue collections between 2012 and 2013. Each sector's sales were estimated by multiplying its' share of total 2012 taxable sales by total 2013 taxable sales. The total estimated value of state and local sales tax receipts in this report is \$5.1 billion.

An additional sales tax of 0.7% is imposed on cities and counties located in the Northern Virginia and Hampton Roads regions. These regions include the following localities: Arlington county, Fairfax county, Loudoun county, Prince William county, Alexandria city, Fairfax City, Falls Church city, Manassas city, Manassas Park city, Isle of Wight county, James City county,

Southampton county, York county, Chesapeake city, Franklin city, Hampton city, Newport News city, Norfolk city, Poquoson city, Portsmouth city, Suffolk city, Virginia Beach city and Williamsburg city. Since county data was not available, the value of county sales tax receipts was estimated by multiplying the percent share of GSP reported in those regions (compared to the entire state) by 2013 taxable sales for each industry and the 0.7% sales tax rate. The Northern Virginia and Hampton Roads regions make up an estimated 52% of total Virginia GSP. GSP by city and county was compiled from the National Association of Counties County Tracker 2013, which collects data from Moody's Analytics. The total estimated value of city and county sales tax receipts in this report is \$348.7 million.

The total estimated value of state, local, county and city sales tax receipts in this report is \$5.4 billion. The estimate in this report comes very close to actual reported revenues for the estate sales and use tax. The 2011 Census of State and Local Government Finance, published by the U.S. Census Bureau, reports that Virginia collected \$4.8 billion in sales tax revenue at the state level.

The impact on state, local, county and city sales tax receipts was estimated based on the impact on gross output.

In this report, we estimate the impact of total Virginia highway and bridge construction investment on various sectors of the economy. In our analysis, we use the investment level of \$2 billion, which is the baseline investment in highway and bridge construction work in Virginia.

For additional information please contact:  
Dr. Alison Premo Black  
ARTBA Senior Vice President & Chief Economist  
202-289-4434  
ablack@artba.org

## **ABOUT THE ARTBA TRANSPORTATION DEVELOPMENT FOUNDATION**

This report was prepared for the American Road & Transportation Builders Association Transportation Development Foundation (ARTBA-TDF) by a team led by ARTBA Vice President of Policy & Chief Economist Dr. Alison Premo Black. The Foundation was established in 1985 as a 501(c)3 tax-exempt entity to support research, education and public awareness programs relating to transportation development in the United States.

The Foundation supports a wide array of programs and activities including: the National Work Zone Safety Information Clearinghouse; the Highway Workers Memorial Scholarship Program; the Transportation Builder Institute, which offers executive education and safety training; economic and research reports; the permanent Transportation Exhibition at the Smithsonian's National Museum of American History and annual awards programs recognizing best practices, innovation, community service and environmental stewardship.

