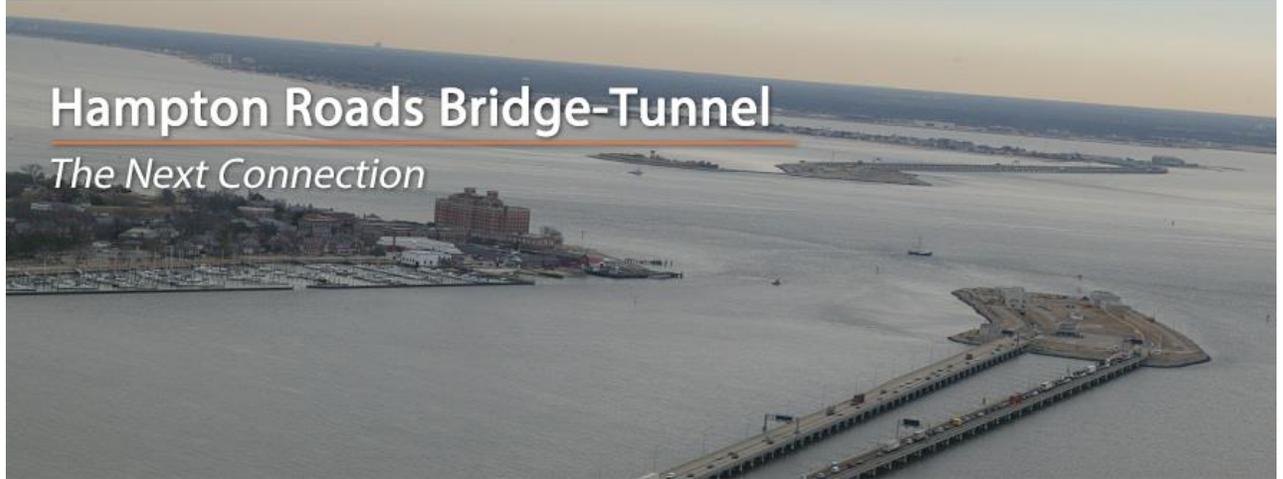




PREPARED FOR
Virginia Department of Transportation



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Economic Impact

Hampton Roads Bridge-Tunnel Expansion Project Construction

Executive Summary

The I-64 Hampton Roads Bridge-Tunnel Expansion project (the project) aims to improve the flow of commodities and people in the Hampton Roads region.¹ Virginia Department of Transportation (VDOT) engaged Chmura Economics & Analytics (Chmura) to provide an analysis of the economic impact of the construction phase of the project.

Assumptions about the extent of investment and timeframe were provided by VDOT. The project construction cost is estimated at a total of \$3.3 billion over the period of 2019 to 2025. The impact of construction spending is analyzed for the Hampton Roads metropolitan statistical area (MSA) and for Virginia. This analysis does not include the sustained impact of the projection in terms of reducing congestion and improving travel efficiency and productivity.

The economic impact of capital expenditures from the project is analyzed in the following three categories: direct, indirect, and induced.² Direct impact measures the actual dollar amount spent on the project in Hampton Roads and Virginia. Indirect and induced impacts measure the secondary benefits of project spending for state and regional businesses. For example, indirect effects are attributed to state and regional industries supporting construction activities, such as site development and heavy equipment deployment. Induced effects occur when individuals hired by the construction firms spend their income at regional or state businesses (such as retailers or doctors' offices), thus injecting more money into the regional and state economy.

The indirect and induced effects are estimated with IMPLAN³ software after the direct impact is estimated. IMPLAN is an economic impact assessment modeling system that allows the user to build economic models to estimate the impact of economic changes in states, counties, and communities. It is one of the most widely-used economic impact software packages. IMPLAN is updated annually and is customized for individual localities—thus providing a realistic picture of the impact of an economic change on local economies.

Economic Impact in Hampton Roads and Virginia

Table 1 presents the estimated economic impact from the construction of the Hampton Roads Bridge-Tunnel expansion project from 2019 through 2025 in Hampton Roads MSA and Virginia. The total planned project construction cost is \$3.3 billion. Chmura excludes the estimated spending outside the region, and direct spending in Hampton Roads is estimated to be \$2.9 billion (in nominal dollars). From 2019 through 2025, it is estimated that the construction expenditure from the project will generate a total economic impact (direct, indirect, and induced impacts) of \$4.6 billion (in nominal dollars) in Hampton Roads, supporting a total of 28,830 cumulative jobs.⁴

Of the total economic impact, \$2.9 billion is estimated to be direct spending within Hampton Roads, with direct cumulative jobs amounting to 16,008 from 2019 through 2025 (or 2,287 per year). The cumulative indirect impact in Hampton Roads is estimated to be \$899.2 million that can support 5,714 cumulative jobs (or 816 per year) in industries related to construction, such as architecture and engineering services, sitework and road maintenance, and truck transportation. The cumulative induced impact is expected to total \$864.7 million with 7,108 cumulative jobs (or 1,015 per year) in the region; these jobs will be concentrated in consumer service-related industries such as restaurants, hospitals, and retail stores. From 2019 through 2025, the

Table 1: Economic Impact of Hampton Roads Bridge-Tunnel Expansion Project Construction

| | | | Direct | Indirect | Induced | Total Impact |
|----------------------|----------------|----------------------|-----------|-----------|-----------|--------------|
| Hampton Roads | Cumulative | Spending (\$Million) | \$2,866.6 | \$899.2 | \$864.7 | \$4,630.4 |
| | (2019-25) | Employment | 16,008 | 5,714 | 7,108 | 28,830 |
| | Annual Average | Spending (\$Million) | \$409.5 | \$128.5 | \$123.5 | \$661.5 |
| | (2019-25) | Employment | 2,287 | 816 | 1,015 | 4,119 |
| Virginia | Cumulative | Spending (\$Million) | \$3,091.3 | \$1,153.5 | \$1,139.5 | \$5,384.3 |
| | (2019-2025) | Employment | 17,405 | 6,812 | 9,121 | 33,338 |
| | Annual Average | Spending (\$Million) | \$441.6 | \$164.8 | \$162.8 | \$769.2 |
| | (2019-25) | Employment | 2,486 | 973 | 1,303 | 4,763 |

Note: Numbers may not sum due to rounding

Source: IMPLAN Pro 2017 and Chmura

¹ The Hampton Roads region is defined as the Virginia portion of the Virginia Beach-Norfolk-Newport News metropolitan statistical area (MSA).

² Appendix 1 of this study provides a glossary including these terms.

³ IMPLAN is one of two major software packages used by economists to evaluate the effects of an economic event.

⁴ Please note that the number of cumulative jobs is the sum of jobs in each year. For example, if a construction worker is involved in the project for two years, the number of cumulative jobs will be two.

annual average economic impact of the Bridge-Tunnel Expansion project construction expenditure is estimated to total \$661.5 million that can support 4,119 jobs in Hampton Roads. The above job estimates include both full- and part-time jobs—it is estimated the total annual impact can support 3,954 full-time equivalent (FTE) jobs.

A standardized measure of indirect and induced impact is an economic multiplier. The output multiplier measures the amount of indirect and induced economic impact based on each dollar of the construction spending in the Hampton Roads area. The output multiplier for the construction spending is 0.62, meaning each dollar of the project spending generate \$0.62 in additional regional spending. Similarly, the employment multiplier measures additional jobs that can be supported by one direct job from construction spending. The employment multiplier is 0.80, meaning each direct project job can support 0.80 additional job in the Hampton Roads MSA.

The economic impact of the project in Virginia is larger than in Hampton Roads, as businesses elsewhere in the state will also benefit from the construction activities. It is estimated that from 2019 through 2025, the annual average statewide impact will reach \$769.2 million (direct, indirect, and induced) that can support 4,763 full- and part-time jobs in Virginia, or 4,570 full-time equivalent jobs.⁵ The state output and employment multipliers are estimated to be 0.74 and 0.92, respectively.

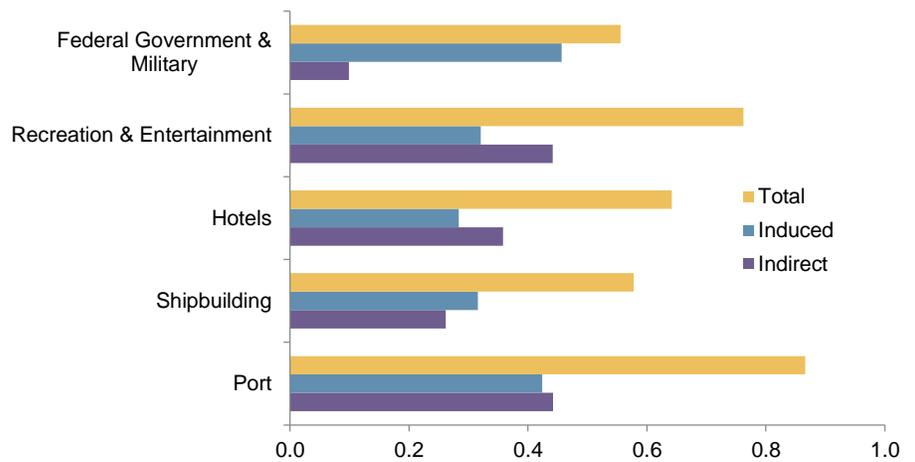
Hampton Roads Multipliers

Indirect and induced multipliers are provided for five key industries in Hampton Roads—federal government and military; recreation and entertainment; hotels; shipbuilding; and the port.

Output multipliers represent the additional local sales (indirect plus induced) that can be supported by one dollar of revenue from a given industry. Figure 1 displays the total, induced, and indirect output multipliers for key industries in Hampton Roads. The port has the largest total output multiplier (0.87), suggesting every dollar of port revenue can support 87 cents in additional local sales in the Hampton Roads region. The output multiplier for recreation and entertainment is 0.76, followed by hotels (0.64), shipbuilding (0.58), and federal government and military (0.56).

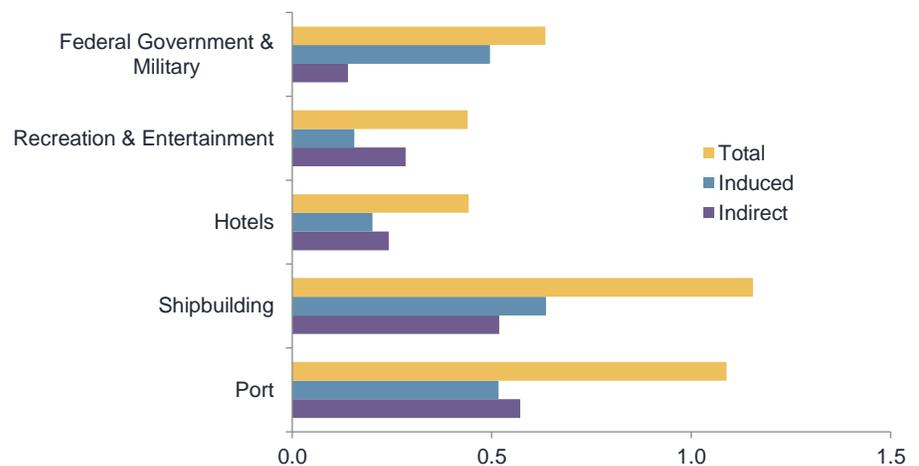
Employment multipliers represent the additional local job(s) that can be supported by one job in a given industry. Figure 2 displays the total, induced, and indirect employment multipliers for key industries in Hampton Roads. The total employment multiplier for shipbuilding is 1.16, suggesting each job in that industry can support additional employment in the region of a little more than one job. Similarly, the port has an employment multiplier of 1.09, followed by federal government and military (0.63), recreation and entertainment (0.44) and hotels (0.44).

Figure 1: Hampton Roads Key Industry Multipliers - Output



Source: IMPLAN

Figure 2: Hampton Roads Key Industry Multipliers - Employment



Source: IMPLAN

⁵ The economic impact in Virginia is inclusive of the impact in Hampton Roads.

Appendix 1: Impact Analysis Glossary

IMPLAN Professional—an economic impact assessment modeling system. It allows the user to build economic models to estimate the impacts of economic changes in states, counties, or communities. It was created in the 1970s by the Forestry Service and is widely used by economists to estimate the impact of specific events on the overall economy.

Input-Output Analysis—an examination of business-business and business-consumer economic relationships capturing all monetary transactions in a given period, allowing one to calculate the effects of a change in an economic activity on the entire economy (impact analysis).

Direct Impact—economic activity generated by a project or operation. For construction, this represents activity of the contractor; for operations, this represents activity by tenants of the property.

Overhead—construction inputs not provided by the contractor.

Indirect Impact—secondary economic activity that is generated by a project or operation. An example might be a new office building generating demand for parking garages.

Induced (Household) Impact—economic activity generated by household income resulting from direct and indirect impacts.

Ripple Effect—the sum of induced and indirect impacts. In some projects, it is more appropriate to report ripple effects than indirect and induced impacts separately.

Multiplier—the cumulative impacts of a unit change in economic activity on the entire economy.