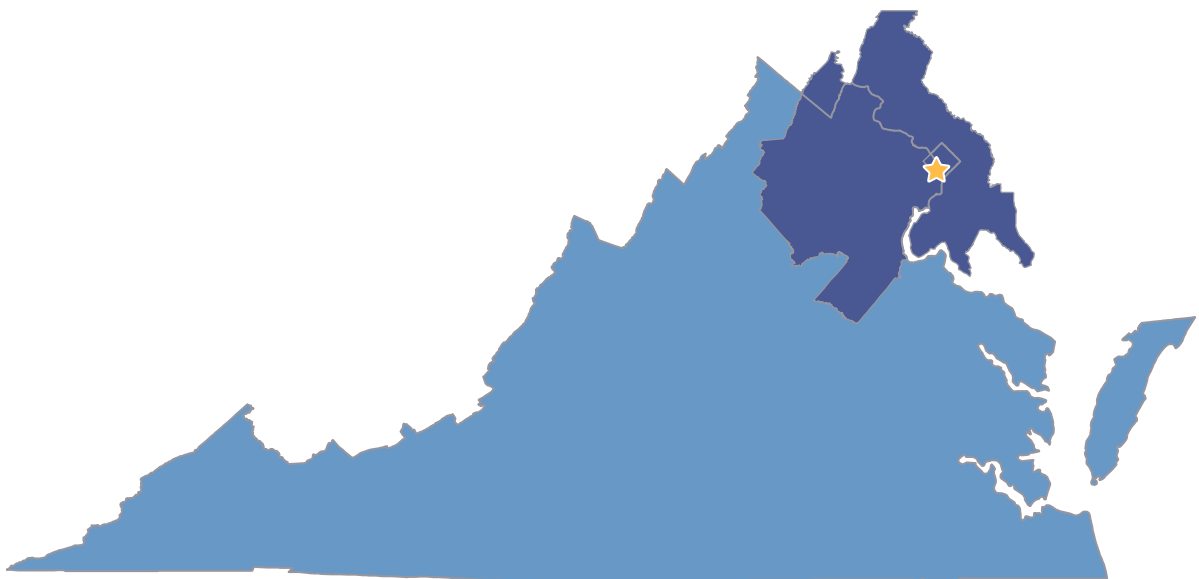




PREPARED FOR THE

**VA**CHAMBER  
FOUNDATION



December 7, 2018

# ECONOMIC IMPACT OF AMAZON'S MAJOR CORPORATE HEADQUARTERS

## IN VIRGINIA AND THE WASHINGTON MSA

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## 1. Executive Summary

On November 13, 2018 Amazon.com, Inc. announced that it has decided to locate its major corporate headquarters (MCH) at the National Landing development area in Northern Virginia.

In order to help the public understand this project's potential to transform the region, the Virginia Chamber Foundation (VCF) asked Chmura Economics & Analytics (Chmura) to conduct an economic impact analysis.

The MCH project will have tremendous economic impacts in the Commonwealth of Virginia as well as the Washington metro area.<sup>1</sup> The revenue streams most beneficial to Virginians are those that come from capital

spending and ongoing operations. A harder to quantify impact, however, is the diversification and new suppliers that Amazon's MCH will bring to this federal government-dependent region.

Combining capital expenditures and the MCH's operations, it is estimated that **the total economic impact (direct, indirect, and induced) of the Amazon MCH will be \$14.2 billion in Virginia, supporting 59,308 jobs in 2030, when the MCH reaches its full capacity. The total state tax revenue is estimated to be \$346.7 million in 2030 and \$1.83 billion from 2019 through 2030.**

### Economic Impact 101

The fundamentals of economic impact outcomes are 1) spending amount and 2) jobs. The direct economic impact comes from the capital expenditures and ongoing operations of Amazon's MCH. For example, for the MCH's operations, the direct impact is measured as the estimated revenue generated by the company and the number of employees it hires. In addition to the direct economic impact, there are other layers of impact that can be felt in the state and region: indirect and induced economic impacts.

The indirect and induced economic impacts are secondary in nature. An example is business-to-business (B-to-B) transactions during construction or remodeling of existing office space. These transactions generate sales across the supply chain for all industries engaged in the "construction" phase of the project (indirect impact). They will also generate benefits when employees and households spend their wages in the region on consumer goods and

services (induced impact). When indirect and induced jobs and spending are included, it increases the direct economic impacts for a larger total impact.

The fiscal impact is defined as the tax revenues that are derived from the economic impact. Increases in new sales and jobs will lead to more tax revenues for the state government. This can be calculated using two approaches: one that looks at the fiscal impact based on the direct impact of the project, and one that also includes the fiscal impact from indirect and induced impacts. Both are shown in this report.

In this report, we identify the annual average impact, which is the total impact divided by twelve years, as well as the cumulative impact, which is the summation of the impact over the twelve years. The impact in 2030 is also shown.

Figure 1.1: Economic & Fiscal Impact Analysis



<sup>1</sup> In this report, the Washington metro area or Washington MSA is defined as all cities and counties in the Washington-Arlington-Alexandria, DC-VA-MD-WV metropolitan statistical area. This area is made up of the following jurisdictions: District of Columbia; Counties of Frederick, Montgomery, Calvert, Charles, Prince George's in Maryland; Counties of Arlington (including the Crystal City area and site), Clarke, Culpepper, Fairfax, Fauquier, Loudoun, Prince William, Rappahannock, Spotsylvania, Stafford, Warren, and Cities of Alexandria, Fairfax, Falls Church, Fredericksburg, Manassas, and Manassas Park in Virginia; and Jefferson County in West Virginia.

### Economic Impact in Virginia

The direct impact in this report is estimated based on the number of jobs, average salary, and unit construction costs provided by the Virginia Chamber Foundation, who received these numbers from Amazon. The same data were provided to the Virginia Economic Development Partnership and Arlington County.

Amazon is planning an estimated \$1.8 billion (in nominal dollars) investment in the MCH project from calendar year 2019 through 2030. The capital spending can generate an annual average of \$137.9 million in economic impact (direct, indirect, and induced) in Virginia, supporting an average 748 jobs per year. The impact of the capital expenditures in Virginia is estimated to reach a cumulative total of \$1.7 billion in 2030.<sup>2</sup>

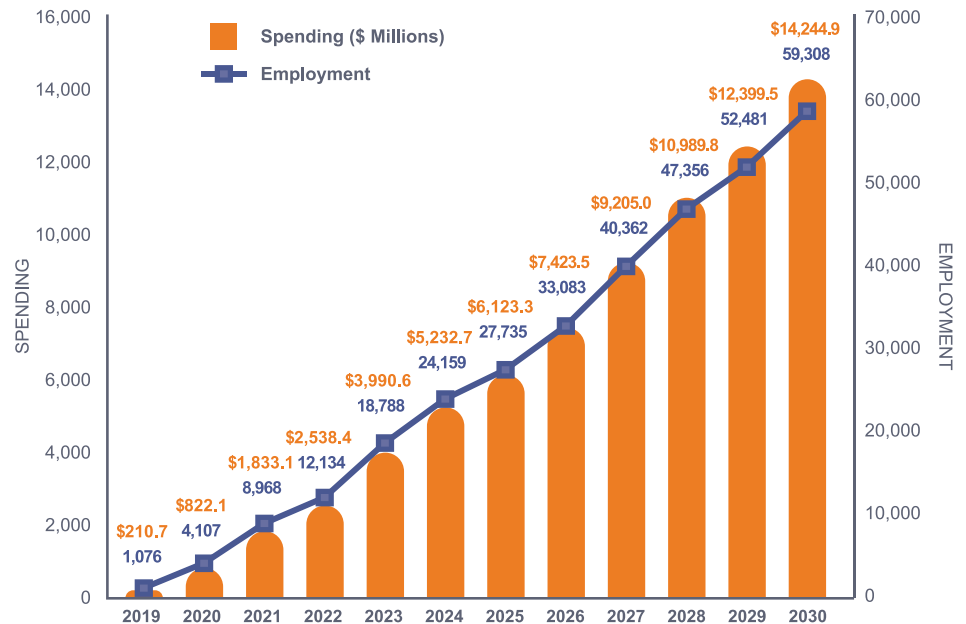
Amazon plans to steadily expand its workforce at its MCH, from an initial 400 employees in 2019 to 25,000 in 2030. The ongoing operations<sup>3</sup> of Amazon's MCH can produce an estimated annual average of \$6.1 billion in economic impact (direct, indirect, and induced) in Virginia from 2019 through 2030, supporting an average 26,715 jobs per year in the state over the same period.<sup>4</sup>

The addition of 25,000 Amazon jobs from 2019 to 2030 can boost the employment growth of Northern Virginia from 1.2% to 1.3% per year during this period, and from 1.2% to 2.2% per year for Arlington County.

Combining capital expenditures and the MCH's operations, the total economic impact (direct, indirect, and induced) is estimated to average \$6.3 billion per year from 2019 through 2030 in Virginia, supporting an average 27,463 jobs per year. **The total economic impact (direct, indirect, and induced) is estimated to increase steadily from 2019 onward, from \$210.7 million (in nominal dollars) and 1,076 jobs in 2019 to \$14.2 billion and 59,308 jobs in 2030** (Figure 1.2).

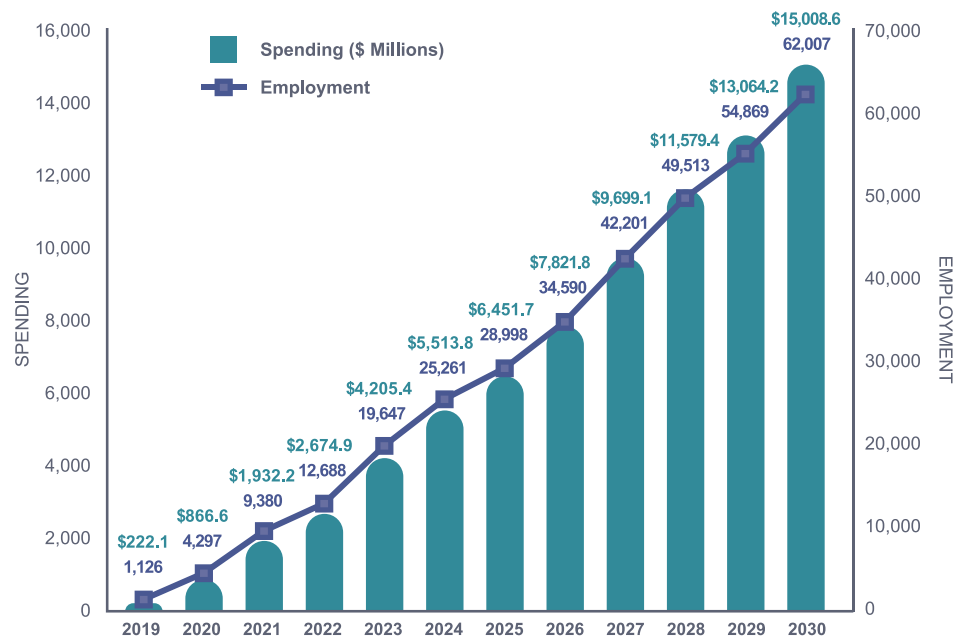
An alternative measure considers the incremental economic impact of Amazon. For every 1,000 employees, the direct, indirect, and induced economic impact can reach \$545.5 million in output that can support 2,397 jobs in the Commonwealth.

**Figure 1.2: Combined Total Economic Impact of Amazon's MCH in Virginia**  
(Capital Expenditures & Operations)



Source: Chmura Economics & Analytics

**Figure 1.3: Combined Total Economic Impact of Amazon's MCH in the Washington MSA**  
(Capital Expenditures & Operations)



Source: Chmura Economics & Analytics

<sup>2</sup> The total impact in Virginia is less than the Amazon investment because part of the capital expenditures will be spent on goods and services procured outside Virginia.

<sup>3</sup> Ongoing operations are defined as the day-to-day activities to run the MCH.

<sup>4</sup> The total employment impact includes employees hired by Amazon.

### Economic Impact in the Washington MSA

From 2019 through 2030, the capital spending of Amazon's MCH can generate an annual average of \$146.4 million in economic impact (direct, indirect, and induced) in the Washington MSA, supporting an average 787 jobs per year. The cumulative impact of capital expenditures is estimated to reach \$1.8 billion by 2030.

The ongoing operations of Amazon's MCH can produce an annual average \$6.4 billion in economic impact (direct, indirect, and induced) in the Washington MSA from 2019 through

2030, supporting an average 27,928 jobs annually in the region.

Combining capital expenditures and the MCH's operations, the total economic impact (direct, indirect, and induced) is estimated to average \$6.6 billion from 2019 through 2030 in the MSA, supporting an average 28,715 jobs over the same period. Figure 1.3 summarizes the impact of Amazon's MCH in the Washington MSA from 2019 through 2030. **It is estimated that the total economic impact (direct, indirect, and induced) will increase from \$222.1 million**

**and 1,126 jobs in 2019 to \$15.0 billion and 62,007 jobs in 2030.**

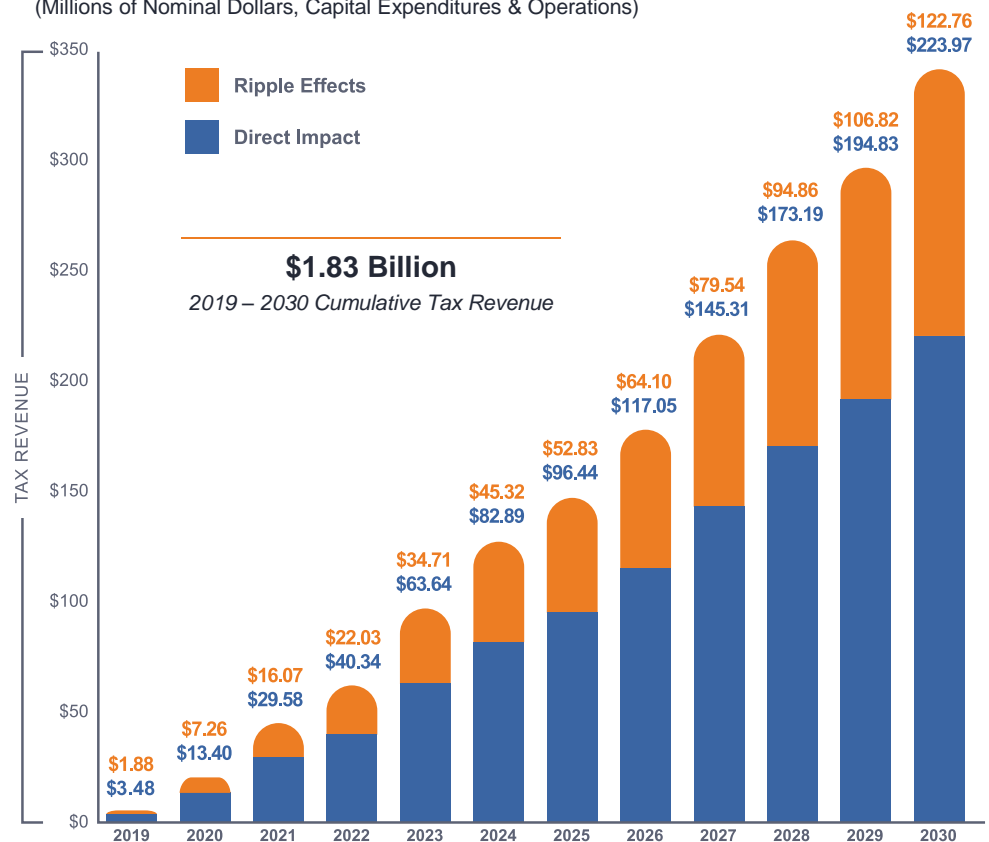
For every 1,000 Amazon employees, the associated total economic impact (direct, indirect, and induced) in the MSA can reach \$574.8 million in the metro area that can support 2,506 jobs. The total economic impact is larger in the Washington MSA than in Virginia because metro area businesses in the District of Columbia and Maryland will also benefit from the operations of Amazon's MCH.

### Fiscal Impact to Virginia

After the economic impact of Amazon's MCH capital expenditures and ongoing operations are estimated, the fiscal impact can be estimated. Both state and local governments in Virginia and the Washington MSA will see increased revenues from the location of Amazon's MCH in the National Landing area. However, Chmura focuses the analysis of the fiscal impact on the Commonwealth of Virginia.

From 2019 through 2030, the capital expenditures and the MCH's operations, **based on the total economic impact (direct, indirect, and induced), can potentially bring \$1.83 billion to Virginia in tax revenues mainly through individual income and sales taxes.** Excluding ripple effects,<sup>5</sup> the capital expenditures and the MCH's operations are estimated to bring a cumulative total of \$1.18 billion in tax revenues for the state government. Figure 1.4 shows the estimated tax revenue for Virginia for each year.

**Figure 1.4: Estimated Virginia Tax Revenues from Amazon's MCH**  
(Millions of Nominal Dollars, Capital Expenditures & Operations)



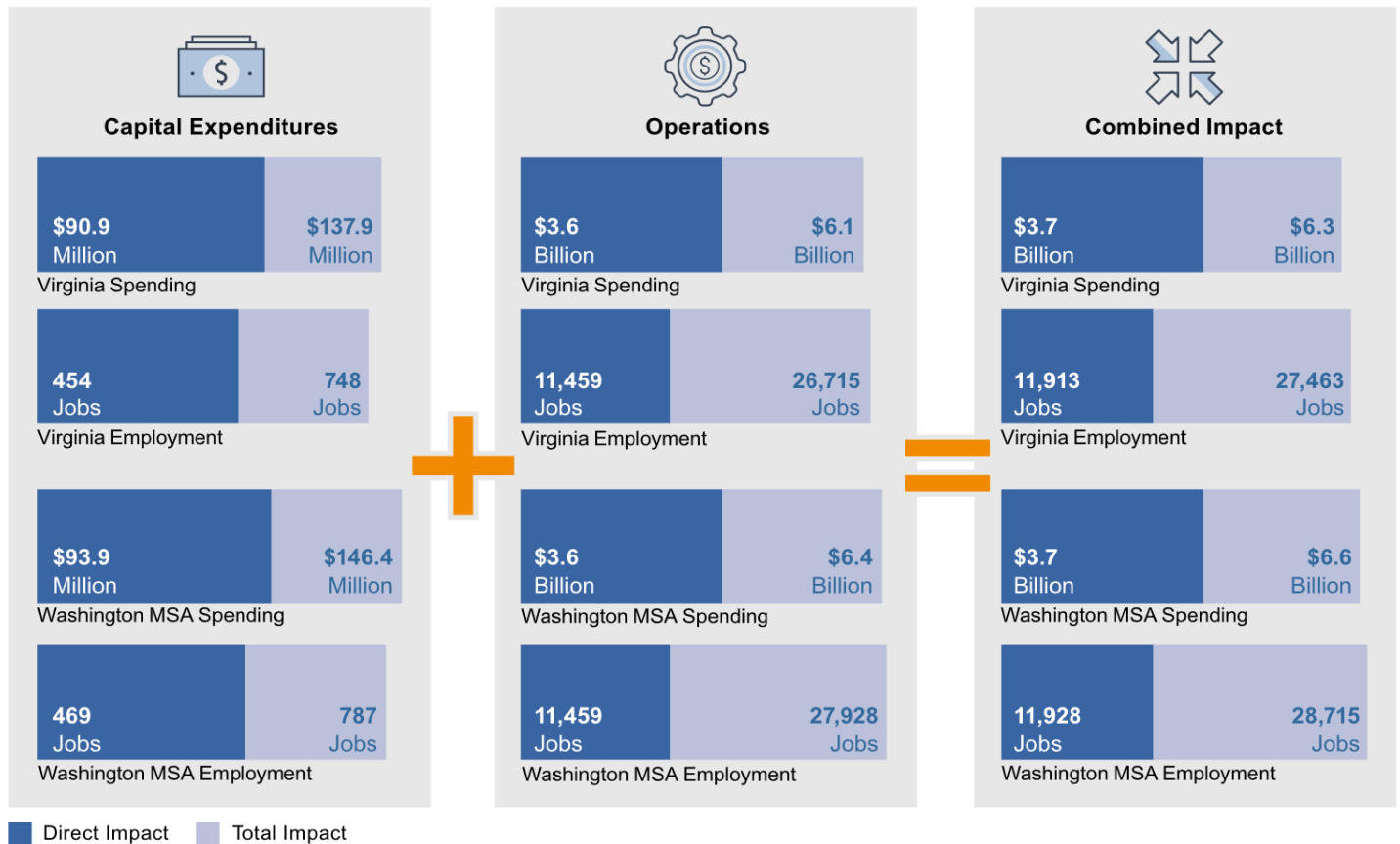
Source: Chmura Economics & Analytics

<sup>5</sup> This approach is recommended by Burchell and Listokin in *The Fiscal Impact Handbook*.

### Economic and Fiscal Impact Summary

The following figure summarizes key average annual economic impact estimates of Amazon's MCH. Note that the total economic impact includes direct as well as ripple impacts (indirect and induced). For example, from 2019 through 2030 Amazon plans to directly invest \$90.9 million in capital expenditures, which will total \$137.9 million of spending in Virginia when the ripple impacts (indirect and induced) are included.

**Figure 1.5: Average Annual Economic Impact of Amazon's Major Corporate Headquarters, 2019-2030**



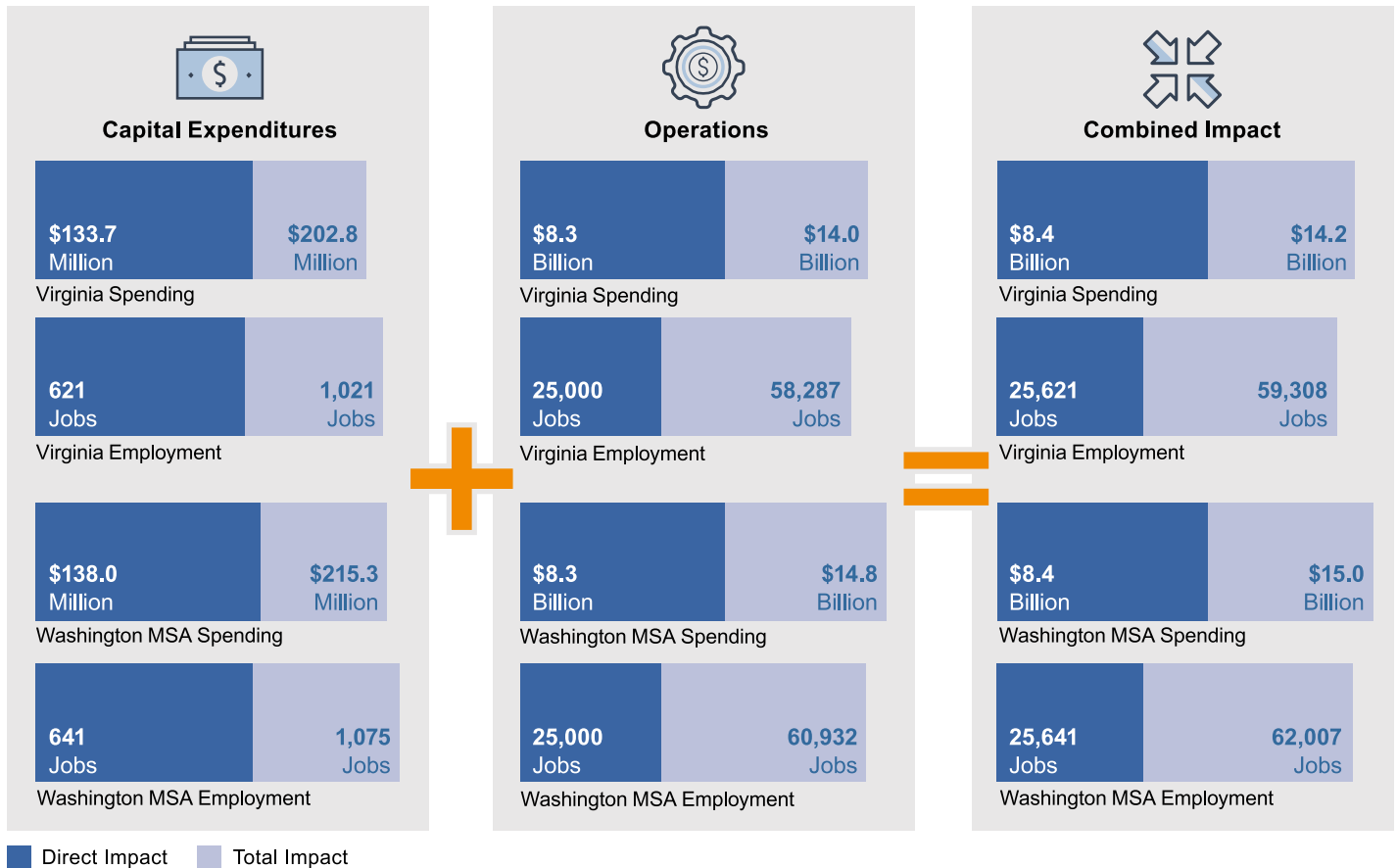
Source: Chmura Economics & Analytics

# ECONOMIC IMPACT OF AMAZON'S MAJOR CORPORATE HEADQUARTERS

## VIRGINIA CHAMBER FOUNDATION

The following two figures summarize key economic and fiscal impact estimates of Amazon's MCH in 2030 when it is staffed by 25,000 employees. Capital expenditures represent costs associated with the new employees hired in 2030. The total impact figures include indirect and induced effects, in addition to the direct spending and employment. The fiscal impact summarizes the potential revenue to the Commonwealth based on the direct impact, as well as the total impact (direct, indirect, and included).

**Figure 1.6: Economic Impact of Amazon's Major Corporate Headquarters, 2030**



**Figure 1.7: Tax Revenues from Amazon's Major Corporate Headquarters, 2030**

Virginia	Capital Expenditures	Operations	Combined Impact
Direct Impact	\$4.8 Million	\$219.2 Million	\$224.0 Million
Ripple Effects	\$2.3 Million	\$120.4 Million	\$122.8 Million
Total Impact	\$7.1 Million	\$339.6 Million	\$346.7 Million

Source: Chmura Economics & Analytics



## 2. Background

In September 2017, Amazon.com, Inc. (Amazon) issued a Request for Proposals (RFP) for a major corporate headquarters (MCH) in North America.<sup>6</sup> This RFP gathered widespread interest from cities across the United States, Canada, and Mexico. By the RFP deadline in October 2017, Amazon had received over 200 proposals from cities vying to become the home of Amazon's MCH.

In January 2018, Amazon announced twenty candidates for its MCH.<sup>7</sup> Three locations in the Washington metropolitan statistical area (MSA) were included among the twenty finalists—Washington, D.C.; Montgomery County, Maryland; and Northern Virginia. Due to the close proximity and integration of infrastructure

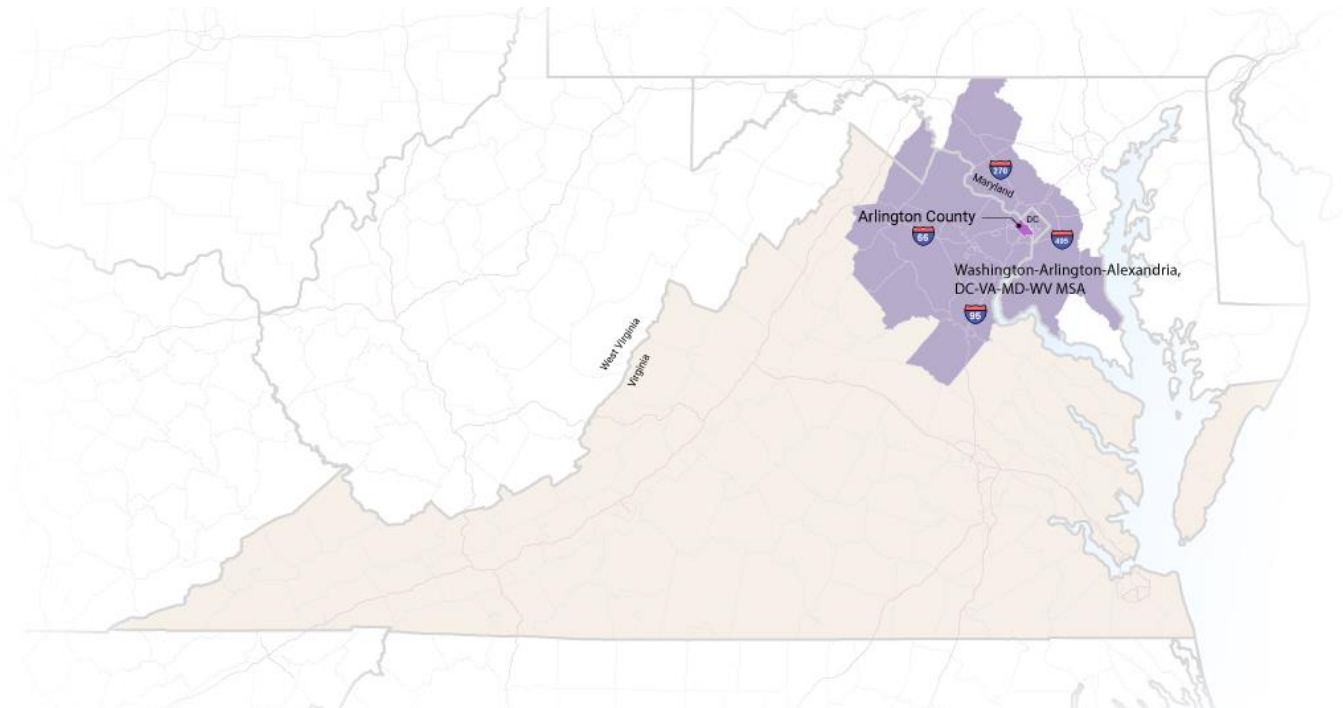
in the area, the selection of any of the three sites would benefit the region as a whole.

On November 13, 2018, Amazon announced that the MCH will be located in the National Landing area of Northern Virginia. A project of this magnitude will have a transformational impact in the Washington MSA and the Commonwealth of Virginia. To understand the economic and fiscal impacts of Amazon's MCH on the state of Virginia and the Washington MSA (Figure 2.1), the Virginia Chamber Foundation (VCF) retained Chmura Economics & Analytics (Chmura) to conduct such an analysis.

The remainder of this report is organized as follows:

- Section 3 explains the economic impact methodology;
- Section 4 analyzes the economic impact of Amazon's MCH in Virginia and the Washington MSA;
- Section 5 presents tax revenue the Virginia government will receive from the site location decision;
- Section 6 provides a summary and conclusion;
- Appendix 1 presents an alternative long-term impact scenario; and
- Appendix 2 offers an impact analysis glossary.

**Figure 2.1: Research Areas for Amazon's MCH: Virginia and the Washington MSA**



<sup>6</sup> Source: Amazon, [https://images-na.ssl-images-amazon.com/images/G/01/Anything/test/images/usa/RFP\\_3\\_V516043504\\_.pdf](https://images-na.ssl-images-amazon.com/images/G/01/Anything/test/images/usa/RFP_3_V516043504_.pdf), accessed on November 13, 2018.

<sup>7</sup> Source: Amazon, <https://www.amazon.com/b?node=17044620011>, accessed on November 13, 2018.

### 3. Economic Impact Methodology

The direct economic impacts of Amazon's MCH in the state and metro area mainly stem from the following two sources:

- **Capital expenditures.** From 2019 through 2030, Amazon plans to invest \$1.63 billion in 2019 fixed dollars (or \$1.82 billion in nominal dollars) on its MCH. This figure includes construction costs, the purchase of furniture and fixtures, equipment, and design fees.
- **Ongoing operations.** This is the sustained economic impact that will recur each year. By 2030, Amazon's MCH will employ an estimated 25,000 workers in its MCH who will spend part of their income in Virginia and the Washington MSA.

The total economic impact of Amazon's MCH also includes ripple effects from the direct

impact. Ripple effects, categorized as indirect and induced impacts (see Appendix 2 for definitions), measure secondary benefits generated by Amazon's MCH. For example, for the MCH's operations, the company will purchase office equipment and supplies from state and metro area businesses. It will also utilize professional services such as facility management, financial, and consulting services. The purchases made from regional suppliers are termed the indirect impact. Ripple effects also include benefits to the businesses where employees of Amazon's MCH and its suppliers spend their income in Virginia and the Washington MSA—termed the induced impact.

The direct impact is estimated based on the number of jobs, average salary, and unit construction costs provided by the Virginia Chamber Foundation, as received from

Amazon.<sup>8</sup> The indirect and induced effects are then estimated by Chmura using the IMPLAN Pro software package. Figure 3.1 illustrates the economic impact framework.

Both capital expenditures and ongoing operations of Amazon's MCH can generate tax revenues for the Commonwealth. Increased economic impact such as new sales and jobs will lead to the fiscal impact, generating taxes such as sales and individual income taxes.

This report provides two estimates of fiscal impact: a conservative estimate of tax revenue derived from the direct impact and a larger potential fiscal impact that includes tax revenues from indirect and induced impacts.

Figure 3.1: Economic & Fiscal Impact Analysis



<sup>8</sup> The same data were provided to the Virginia Economic Development Partnership and Arlington County.



## 4. Economic Impact of Amazon's MCH

### 4.1. Economic Impact of Capital Expenditures

From 2019 through 2030, it is estimated that Amazon will invest \$1.6 billion (in 2019 fixed dollars) on its MCH in Northern Virginia. Measured in nominal dollars, the total capital expenditures will reach \$1.8 billion over this period.<sup>9</sup> The estimated total capital expenditures are based on the assumption that each employee will occupy an average space of 160 square feet (SF). Therefore, a total of 4.0 million SF of office space will be constructed or rehabilitated by 2030. In addition, the assumed capital cost per square foot is \$407 (in 2019 dollars).<sup>10</sup> Chmura assumes that capital expenditures will be ongoing from 2019 through 2030 to accommodate the employees working at the MCH. Figure 4.1 presents the estimated capital expenditures by year from 2019 through 2030.

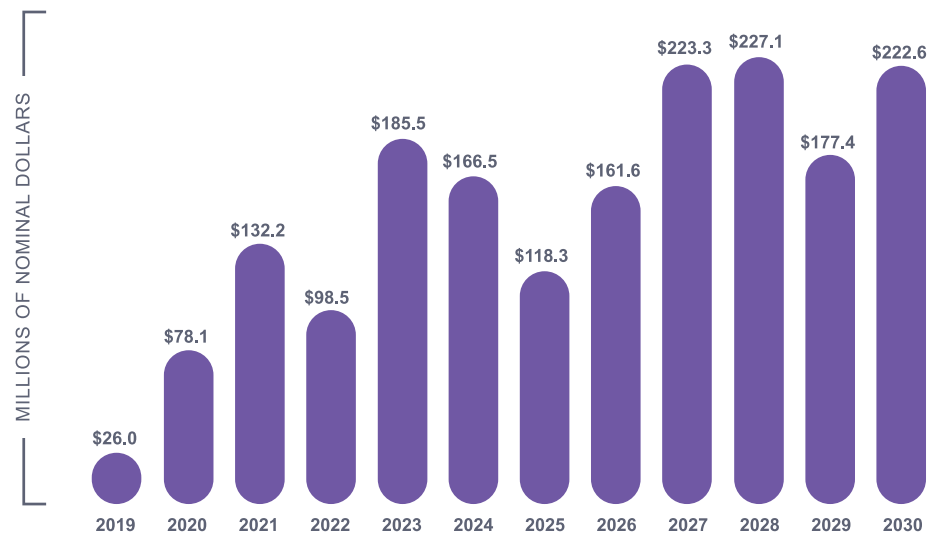
Chmura further allocated total capital expenditures into the following four major categories:<sup>11</sup>

- Hard costs of construction and renovation, including construction materials and labor;
- Soft costs such as design and professional fees;
- Furniture, fixtures, and equipment (FFE);
- Information technology (IT) systems.

Not all of the products and services necessary for the MCH's capital expenditures will be purchased from firms that operate in the Washington MSA or Virginia. Chmura utilized the IMPLAN Pro model to estimate the percentage of products and services that would be purchased outside the MSA or state.<sup>12</sup>

Table 4.1 summarizes the economic impact of the capital expenditures of Amazon's MCH in Virginia and the Washington MSA. In Virginia, Amazon's capital investments can generate an estimated total economic impact (direct, indirect, and induced) of \$1.7 billion (in nominal dollars) from 2019 through 2030, supporting 8,973 cumulative jobs in the state.<sup>13</sup> This

**Figure 4.1: Estimated Annual Capital Expenditures, 2019-2030 (Millions of Nominal Dollars)**



Source: Amazon through the Virginia Chamber Foundation and Chmura Economics & Analytics

number is smaller than the total Amazon investment of \$1.8 billion in nominal dollars for two reasons: 1) the direct impact is only \$1.1 billion due to purchases outside the state and 2) economic multipliers vary by region.

Of this total economic impact, \$1.1 billion is the estimated direct spending in Virginia, supporting 5,453 cumulative jobs, which are mainly in construction, architecture and design services, and manufacturing from 2019 through 2030.

The cumulative indirect impact from Amazon's capital expenditures in Virginia is estimated to be \$290.2 million from 2019 through 2030, which can support 1,480 cumulative jobs in the state. The indirect impact benefits regional businesses supporting capital investment activities, such as construction material suppliers, equipment repair and maintenance, and truck transportation.

The cumulative induced impact in the state is estimated to total \$273.6 million, associated with 2,040 cumulative jobs. Since the source of the induced impact is wages and salaries paid to workers, the beneficiaries are concentrated in consumer-related services such as retail, restaurants, and healthcare.

On an annual average basis, Amazon's capital expenditures are estimated to generate \$137.9 million in total impact (direct, indirect, and induced) that can support an average 748 jobs per year in Virginia from 2019 through 2030.

In the final year of the buildout (2030), the capital expenditures are expected to generate \$202.8 million in total impact (direct, indirect, and induced) that can support 1,021 jobs in Virginia, with the direct impact reaching \$133.7 million that can support 621 jobs in the state. (See Figure 1.6 in the executive summary.)

<sup>9</sup> Throughout this report, Chmura uses a 1.7% inflation rate to convert fixed-year dollar amounts into nominal dollar amounts. Based on data from the Bureau of Labor Statistics, 1.7% is the annual average growth rate of the consumer price index (CPI) from 2010 to 2017.

<sup>10</sup> Source: Amazon through the Virginia Chamber Foundation. This assumed cost could be a mixture of new construction and renovation.

<sup>11</sup> Ibid.

<sup>12</sup> The impact can be updated when specific vendor information is available.

<sup>13</sup> Cumulative jobs over several years are the sum of annual jobs. For example, if one employee works in construction for two years, the number of cumulative jobs is two. The employment (direct, indirect, and induced) estimated in this report includes both full- and part-time workers.

**Table 4.1: Economic Impact of Amazon's MCH Capital Expenditures (2019-2030)**

			DIRECT	INDIRECT	INDUCED	TOTAL IMPACT
Virginia	Total (2019-2030)	Spending (\$ Millions)	\$1,091.2	\$290.2	\$273.6	\$1,655.0
		Employment	5,453	1,480	2,040	8,973
	Annual Average (2019-2030)	Spending (\$ Millions)	\$90.9	\$24.2	\$22.8	\$137.9
		Employment	454	123	170	748
Washington Metro Area	Total (2019-2030)	Spending (\$ Millions)	\$1,126.5	\$304.7	\$325.7	\$1,756.9
		Employment	5,631	1,538	2,273	9,443
	Annual Average (2019-2030)	Spending (\$ Millions)	\$93.9	\$25.4	\$27.1	\$146.4
		Employment	469	128	189	787

*Note: Numbers may not sum due to rounding*

*Source: IMPLAN Pro 2016 and Chmura Economics & Analytics*

The estimated economic impact of Amazon's capital expenditures in the Washington MSA is slightly larger than its impact in Virginia. This may seem counterintuitive since more people are employed in Virginia (4.1 million in the second quarter of 2018) than in the Washington metro area (3.3 million in the second quarter of 2018).<sup>14</sup> However, based on estimates from Chmura's JobsEQ, gross domestic product is slightly larger in the Washington MSA—\$515.2

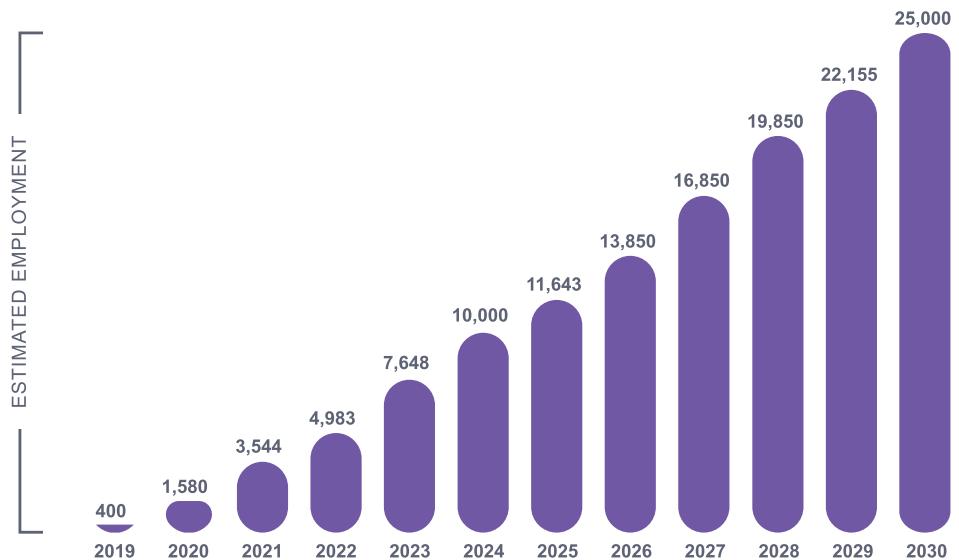
billion in 2017—compared with \$508.7 billion in Virginia in 2017. It is estimated that Amazon's capital expenditures can generate an average \$146.4 million in annual total impact (direct, indirect, and induced) in the Washington MSA, that can support an average 787 jobs per year from 2019 through 2030.

In 2030, the economic impact is expected to generate \$215.3 million in total impact (direct, indirect, and induced) that can support 1,075 jobs in the region, with the direct impact reaching \$138.0 million that can support 641 jobs.

## 4.2. Economic Impact of Amazon's MCH Operations

The ongoing operations of Amazon's MCH will generate significant economic impact in Virginia and the Washington MSA. As Figure 4.2 shows, the number of corporate headquarters employees will steadily increase over the years from an estimated 400 in 2019 to 25,000 in 2030. The average annual wage of Amazon employees is expected to be \$150,000 (excluding benefits) in 2019 which is expected to inflate by 1.7% each subsequent year. In this analysis, recognizing that the MCH will include corporate headquarter functions as well as software developers, Chmura chose to use a mixture of headquarter functions and software development to simulate the economic impact of the MCH.<sup>15</sup> The choice of industry is important because it identifies the average wages of the individuals employed, which impacts their spending patterns. It also identifies the linkages

**Figure 4.2: Estimated Employment at Amazon's MCH**



Source: Amazon through the Virginia Chamber Foundation and Chmura Economics & Analytics

<sup>14</sup> Source: Chmura's JobsEQ. Employment includes covered employment (based on the Quarterly Census of Employment and Wages from the Bureau of Labor Statistics) as well as estimates of non-covered employment in railroads, religious organizations, and the unincorporated self-employed whose primary job is self-employment.

<sup>15</sup> Industries included in this analysis are North American Industry Classification System (NAICS) code 5511—management of companies and enterprises, and NAICS 5415—computer system design and related services.

of the MCH with suppliers in the state and regional economies.

Table 4.2 presents the economic impact of Amazon's MCH operations in Virginia at four time periods: 2021, 2025, 2028, and 2030. In 2030, when Amazon's MCH will employ 25,000 workers, the direct impact (revenue or economic output) is estimated to be \$8.3 billion (in nominal dollars). The total economic impact (direct, indirect, and induced) of Amazon's MCH operations can reach \$14.0 billion in 2030, supporting 58,287 jobs in the state.

The indirect impact measures the benefits to other businesses in Virginia that supply products and services to Amazon's MCH. In 2030, the indirect impact is estimated to be \$2.5 billion that can support 11,225 jobs in Virginia. Examples of beneficiaries of the indirect impact are suppliers of office equipment and supplies, and professional services such as facility management, financial, and consulting services.

The induced impact is estimated to be \$3.2 billion. It can support 22,061 jobs in Virginia in 2030, concentrated in consumer service-related industries such as retail, restaurants, and healthcare. The estimation of induced impact takes into consideration the average compensation of the MCH's employees, regional commuting patterns, and household spending patterns.

The estimated economic impact of Amazon's MCH operations in the Washington MSA is higher than that of Virginia, reflecting the fact that metro area businesses in the District of Columbia and Maryland will also enjoy significant benefits from the indirect and induced impacts of the MCH's operations. For example, commuting patterns to Arlington County in 2018 indicate that while 91% of individuals working in the county lived in the Washington MSA, only 74% of them lived in Virginia, suggesting a larger benefit to the metro area from the induced impact.<sup>16</sup> For 2030, it is estimated that the total economic impact (direct, indirect, and induced) of Amazon's MCH operations in the Washington MSA can reach \$14.8 billion (in nominal dollars), supporting 60,932 jobs. The direct impact is estimated to be \$8.3 billion with 25,000 jobs in the region.

**Table 4.2: Economic Impact of Amazon's MCH Operations in Virginia**

		DIRECT	INDIRECT	INDUCED	TOTAL IMPACT
2021	Spending (\$ Millions)	\$1,009.8	\$310.1	\$392.8	\$1,712.7
	Employment	3,544	1,591	3,127	8,263
2025	Spending (\$ Millions)	\$3,546.8	\$1,089.2	\$1,379.5	\$6,015.5
	Employment	11,643	5,228	10,274	27,145
2028	Spending (\$ Millions)	\$6,357.8	\$1,952.4	\$2,472.8	\$10,783.0
	Employment	19,850	8,913	17,517	46,280
2030	Spending (\$ Millions)	\$8,279.4	\$2,542.6	\$3,220.2	\$14,042.2
	Employment	25,000	11,225	22,061	58,287
Annual Average (2019-2030)	Spending (\$ Millions)	\$3,604.4	\$1,106.9	\$1,401.9	\$6,113.2
	Employment	11,459	5,145	10,112	26,715

*Note: Numbers may not sum due to rounding*

*Source: IMPLAN Pro 2016 and Chmura Economics & Analytics*

**Table 4.3: Economic Impact of Amazon's MCH Operations in the Washington MSA**

		DIRECT	INDIRECT	INDUCED	TOTAL IMPACT
2021	Spending (\$ Millions)	\$1,009.8	\$345.0	\$449.5	\$1,804.3
	Employment	3,544	1,702	3,391	8,638
2025	Spending (\$ Millions)	\$3,546.8	\$1,211.8	\$1,578.7	\$6,337.3
	Employment	11,643	5,593	11,141	28,377
2028	Spending (\$ Millions)	\$6,357.8	\$2,172.2	\$2,829.9	\$11,359.9
	Employment	19,850	9,535	18,995	48,380
2030	Spending (\$ Millions)	\$8,279.4	\$2,828.8	\$3,685.2	\$14,793.4
	Employment	25,000	12,009	23,923	60,932
Annual Average (2019-2030)	Spending (\$ Millions)	\$3,604.4	\$1,231.5	\$1,604.3	\$6,440.2
	Employment	11,459	5,504	10,965	27,928

*Note: Numbers may not sum due to rounding*

*Source: IMPLAN Pro 2016 and Chmura Economics & Analytics*

<sup>16</sup> Source: Commuting Patterns for Arlington County, 2<sup>nd</sup> Quarter of 2018. Chmura's JobsEQ.

### 4.3. Amazon in Perspective

To put Amazon's MCH's job impact into perspective, Arlington County is expected to add 29,855 jobs over the next 12 years (from 2018 through 2030) based on pre-Amazon projections from Chmura's JobsEQ (Figure 4.3). That annual average growth rate of 1.2% is faster than the expected 0.7% growth rate in the nation over the same period. When the Amazon expansion is added to the current forecast, the Arlington County growth rate over the next 12 years increases to an annual average 2.2%—an entire percentage point—for a total of 54,855 new jobs.<sup>17</sup>

In addition, the Amazon jobs are expected to boost the average wages in the county. Amazon's MCH is expected to pay an average \$147,514 (in 2018 dollars) compared to the annual average wage of \$88,449 in Arlington County in the second quarter of 2018. As Figure 4.4 shows, by 2030, the infusion of Amazon's MCH jobs and their associated income can boost the average wage of the county by 6.5% to \$117,651.

Similarly, the Northern Virginia portion of the Washington MSA is expected to add 224,498 jobs over the next 12 years based on projections from Chmura's JobsEQ (Figure 4.5), which translates into an annual average growth rate of 1.2%. When the Amazon expansion is added to the current forecast, the Northern Virginia growth rate over the next 12 years increases to an annual average 1.3% for a total of 249,498 new jobs. In addition, Amazon's MCH jobs can boost the regional average wage by 1.5% in 2030.

Figure 4.3: Employment Growth – Arlington County, Virginia

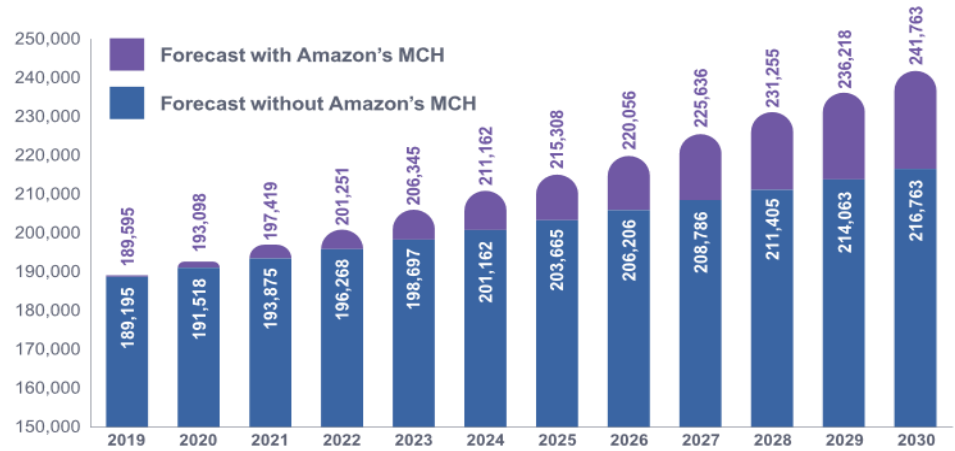


Figure 4.4: Average Wage Expectations – Arlington County, Virginia

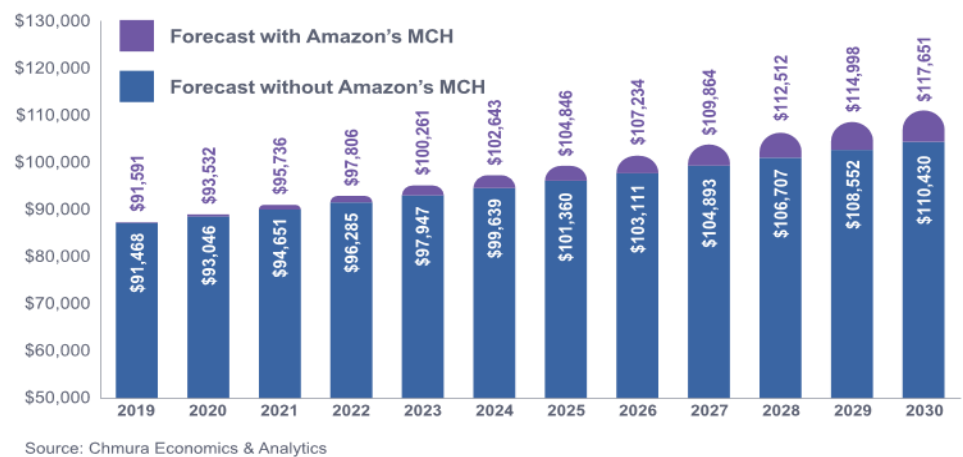
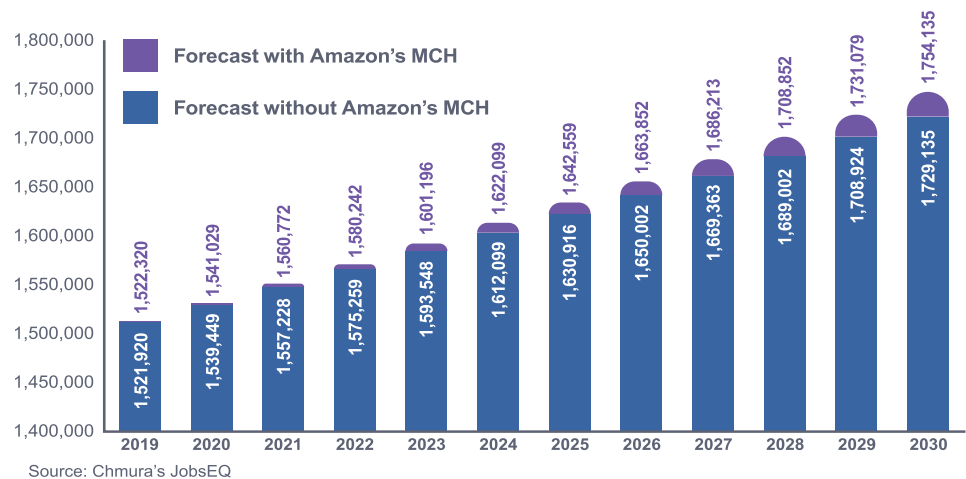


Figure 4.5: Employment Growth – Northern Virginia (Virginia portion of the Washington MSA)



<sup>17</sup> This forecast only takes into account direct jobs from the Amazon expansion. In other words, it is a conservative forecast because indirect and induced jobs that will be created as a result of the Amazon expansion are not included in the forecasts.

### 4.4. Economic Impact Summary

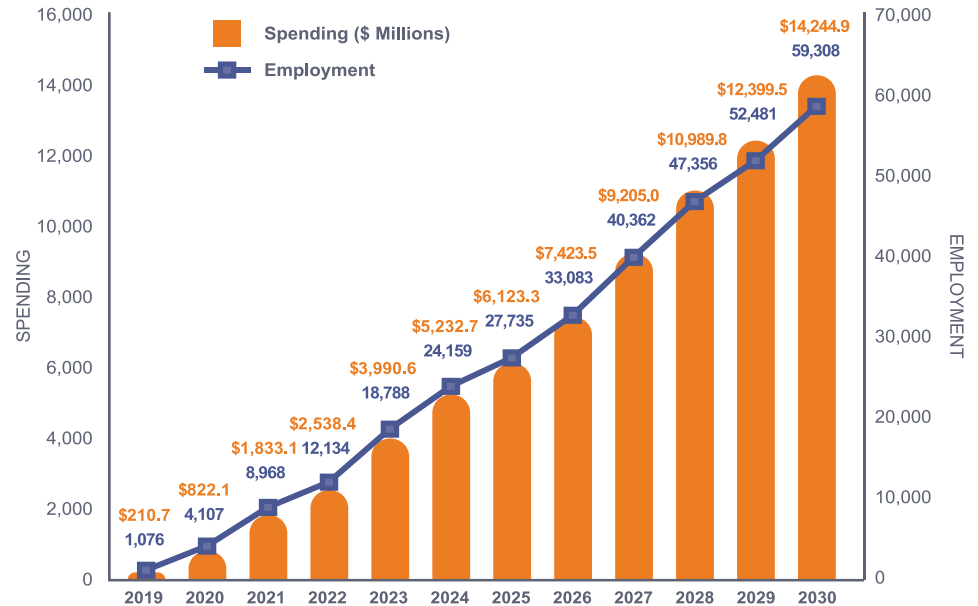
Combining the economic impact from capital expenditures and the MCH's operations, Figure 4.6 summarizes the impact of Amazon's MCH in Virginia from 2019 through 2030. The total economic impact (direct, indirect, and induced) is estimated to increase steadily from 2019 onward, from \$210.7 million (in nominal dollars) and 1,076 jobs in 2019 to \$14.2 billion and 59,308 jobs in 2030, for an annual average impact of \$6.3 billion and an annual average 27,463 jobs. The direct impact in 2030 is estimated to reach \$8.4 billion that can support 25,621 jobs in the state.

This analysis indicates that the associated total economic impact (direct, indirect, and induced) for every 1,000 Amazon employees can reach \$545.5 million in output that can support 2,397 jobs in the Commonwealth.<sup>18</sup>

The economic impact of the MCH in the Washington MSA follows a similar pattern (Figure 4.7). It is estimated that the total economic impact (direct, indirect, and induced) will increase from \$222.1 million (in nominal dollars) and 1,126 jobs in 2019 to \$15.0 billion and 62,007 jobs in 2030, for an annual average impact of \$6.6 billion and an annual average 28,715 jobs. The direct impact in 2030 is estimated to reach \$8.4 billion that can support 25,641 jobs in the metro area.

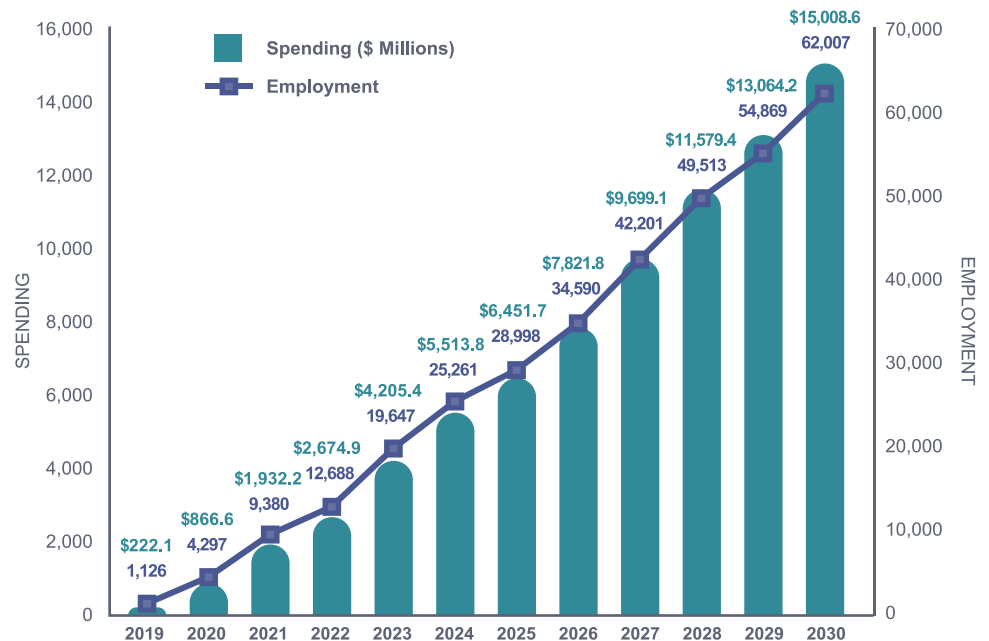
For every 1,000 Amazon employees, the associated total economic impact (direct, indirect, and induced) in the MSA can reach \$574.8 million in output in the metro area that can support 2,506 jobs.

**Figure 4.6: Combined Total Economic Impact of Amazon's MCH in Virginia**  
(Capital Expenditures & Operations)



Source: Chmura Economics & Analytics

**Figure 4.7: Combined Total Economic Impact of Amazon's MCH in the Washington MSA**  
(Capital Expenditures & Operations)



Source: Chmura Economics & Analytics

<sup>18</sup> The total employment impact includes employees hired by Amazon.



## 5. Fiscal Impact of Amazon's MCH

In addition to the billions of dollars in economic impact added to the state and metro economies that support tens of thousands of jobs, Amazon's MCH will also generate significant revenue for the state government. Many municipalities can benefit from the MCH's capital expenditures and operations. However,

Chmura focuses this analysis on the fiscal impact of the MCH on the Commonwealth of Virginia.<sup>19</sup>

This report offers two perspectives on the potential fiscal impact of Amazon's MCH in Virginia: a conservative estimate based on the

direct economic impact of the project and a broader estimate that includes the potential revenue when indirect and induced impacts are included.

### 5.1. Tax Revenues from the Direct Impact

#### 5.1.1. Tax Revenues from Capital Expenditures

When capital expenditures are made in Virginia, the state government will receive individual and corporate income taxes from businesses involved in the project. To estimate corporate and individual income tax revenue, Chmura used the following approach:

- From the IMPLAN Pro model, Chmura first obtained average wages for construction and other related businesses.
- For corporate income tax, the IMPLAN Pro model provides estimated profit margins for businesses supported by the capital expenditures.
- That information enabled Chmura to estimate the total wages and business profits for those involved in the capital investment, before applying Virginia's individual and corporate income tax rates.<sup>20</sup>

From capital expenditures, the state government is estimated to receive a cumulative total of \$16.3 million (in nominal dollars) in

**Table 5.1: Estimated Virginia Tax Revenue from Amazon's MCH Capital Expenditures (Direct Impact)**

	CUMULATIVE (Millions, 2019-2030)	ANNUAL AVERAGE (2019-2030)
Individual Income	\$16.3	\$1,361,528
Corporate Income	\$5.8	\$485,059
Sales	\$17.0	\$1,415,149
<b>Total</b>	<b>\$39.1</b>	<b>\$3,261,735</b>

*Source: Chmura Economics & Analytics*

individual income tax revenue from 2019 through 2030. The cumulative corporate income tax revenue is estimated at \$5.8 million over the same period.<sup>21</sup>

The combined state and local sales tax rate for Northern Virginia is 6.0%; 1% of retail sales is returned to local governments while the state retains 4.3% of total sales. The remainder (0.7% of sales) goes to the Northern Virginia Transportation Authority (NVTa) for regional transportation projects. Purchases of construction materials and other supplies in Virginia for Amazon's MCH's capital expenditures are subject to state sales tax.<sup>22</sup>

From total construction spending in Virginia, Chmura first estimated the percentage of the total construction cost (42.0%) that would be used to purchase goods and services subject to sales tax,<sup>23</sup> before applying the state sales tax rate.<sup>24</sup> Cumulative sales tax is estimated to be \$17.0 million for the state government from 2019 through 2030.

In summary, capital expenditures by Amazon from 2019 through 2030 can contribute \$39.1 million to the state government. In 2030, the state government can receive \$4.8 million in tax revenues from capital expenditures.

<sup>19</sup> The fiscal impact estimated in this section is based on current tax laws of Virginia. They do not reflect potential future changes to tax policies.

<sup>20</sup> Source: Virginia Department of Taxation. The corporate income tax rate is 6% of business income. Virginia has a progressive individual income tax rate, with rates ranging from 2.0% to 5.75%. Chmura chose the rate that corresponds to the average wage and salaries for the product suppliers. The individual tax estimate also takes into consideration that some workers involved in the project may not live in Virginia.

<sup>21</sup> Please note that these are taxes paid by contractors involved in the MCH's construction and installation, not by Amazon.

<sup>22</sup> Chmura assumed that the purchase of furniture, fixtures, and IT systems are either from out of state or from wholesalers, thus exempt from state sales tax.

<sup>23</sup> Amazon through the Virginia Chamber Foundation.

<sup>24</sup> Chmura used the IMPLAN Pro model to estimate this percentage.



### 5.1.2. Tax Revenues from the MCH's Operations

Amazon's MCH operations can generate significant tax revenue for Virginia. The largest revenue source will be individual income taxes for the state government, due to the relatively high salaries of the MCH's workers and the large number of jobs created. It is estimated that from 2019 through 2030, the cumulative employee compensation (excluding benefits) will reach \$23.5 billion (in nominal dollars), averaging \$2.0 billion per year. However, some of these employees will choose to live in the District of Columbia or Maryland.

Due to reciprocal agreements of several states and the District of Columbia with Virginia, residents of those areas working in Virginia do not pay state income tax to Virginia on their income.<sup>25</sup> Based on current commuting patterns to surrounding areas of National Landing, it is assumed that 25% of the MCH's workers will live outside the state. Excluding those commuters' incomes, Virginia can collect individual income taxes totaling \$975.8 million (in nominal dollars) from 2019 through 2030.

In addition, spending by the MCH's employees can generate sales tax for the state.<sup>26</sup> Chmura used the following methodology to estimate these tax revenues:

- The percentage of average salaries for the MCH's workers that will be spent within the state—excluding taxes, savings, investment, and spending leakage—is estimated first.<sup>27</sup>
- Using household spending patterns, the percentage of household spending is estimated that is subject to sales tax, before applying applicable state tax rate.<sup>28</sup>

The resulting state sales tax is estimated to total \$169.2 million from 2019 through 2030.

In summary, the operations of Amazon's MCH can contribute \$1.15 billion in cumulative tax revenue to the state government from 2019 through 2030.

### 5.1.3. Fiscal Impact Summary

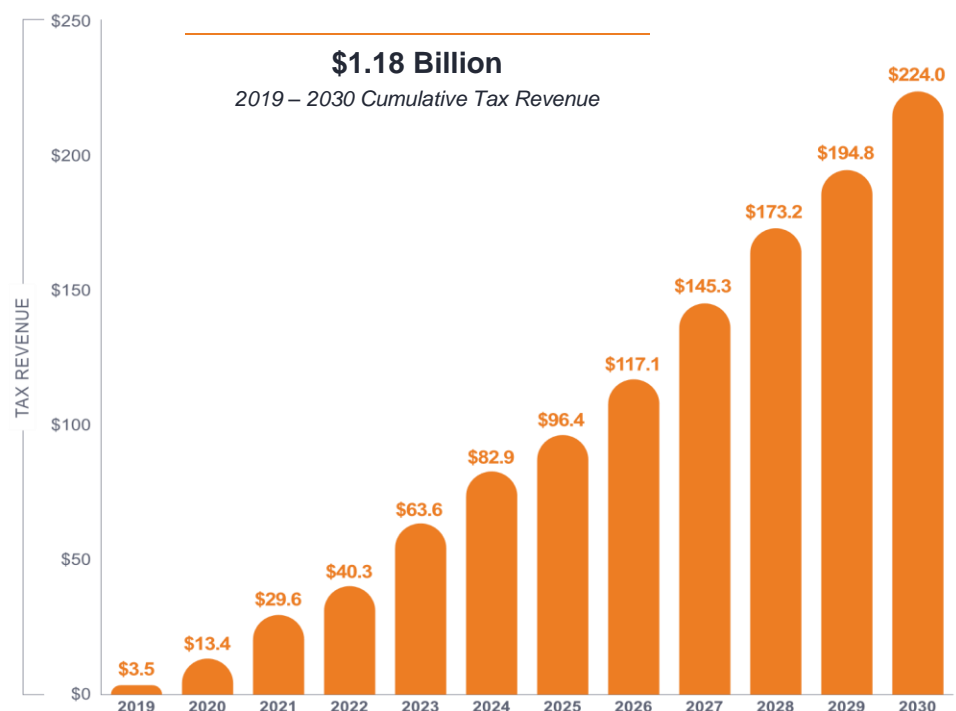
Combining state tax revenues from capital expenditures and the MCH's operations, Figure

**Table 5.2: Estimated Virginia Tax Revenue from Amazon's MCH Operations (Direct Impact)**

	CUMULATIVE (Millions, 2019-2030)	ANNUAL AVERAGE (Millions, 2019-2030)
Individual Income	\$975.8	\$81.3
Sales	\$169.2	\$14.1
<b>Total</b>	<b>\$1,145.0</b>	<b>\$95.4</b>

Source: Chmura Economics & Analytics

**Figure 5.1: Estimated Virginia Tax Revenues from Amazon's MCH (Millions of Dollars, Capital Expenditures & Operations, Direct Impact)**



Source: Chmura Economics & Analytics

In 2030, the state government can receive \$219.2 million in tax revenues. These estimates do not include new housing construction and the

associated taxes such construction would generate.

5.1 summarizes the tax revenue impact of Amazon's MCH. The tax revenues for the state

are estimated to increase steadily from 2019 onward: from \$3.5 million (in nominal dollars) in

<sup>25</sup> Source: Virginia Department of Taxation, available at: <https://tax.virginia.gov/reciprocity>, accessed November 13, 2018.

<sup>26</sup> Please note that taxes from household spending are paid by businesses where household spending occurs, not by Amazon.

<sup>27</sup> It is assumed that 80% of employee income will be household spending. Source: Bureau of Labor Statistics, Consumer Expenditure Survey. It is assumed that 13% of household spending is leaked outside Virginia. Source: IMPLAN Pro model.

<sup>28</sup> The household spending pattern is from the Bureau of Labor Statistics, Consumer Expenditure Survey.

2019 to \$224.0 million in 2030. The cumulative tax revenue for the state government is estimated to total \$1.18 billion from 2019 through 2030. For every 1,000 additional jobs, tax revenue can increase by \$8.6 million per year in Virginia.

## 5.2. Tax Revenues Including Indirect and Induced Impact

The tax revenue estimated in Section 5.1 is conservative, as it only includes tax revenue from the direct impact. The indirect and induced impacts of capital expenditures and operations can also generate tax revenues for the state government. To provide a broader view of the tax benefits, this section presents estimated total tax revenues, including those from the indirect and induced impacts.

### 5.2.1. Tax Revenues from Capital Expenditures

The total economic impact (including direct, indirect, and induced) of capital expenditures by Amazon can contribute \$58.1 million to the state government from 2019 through 2030, averaging \$4.8 million per year. In 2030, the state government can receive \$7.1 million in tax revenues (Table 5.3).

### 5.2.2. Tax Revenues from the MCH's Operations

The total economic impact (including direct, indirect, and induced) of the MCH's operations is estimated to generate \$1.77 billion state tax revenues from 2019 through 2030, averaging \$147.9 million per year. In 2030, the state government can receive \$339.6 million in tax revenues (Table 5.4).

### 5.2.3. Fiscal Impact Summary

Including the tax revenues from capital expenditures and operations, the cumulative tax revenue is estimated to be \$1.83 billion from 2019 through 2030 for Virginia, averaging \$152.7 million per year. The tax revenue will increase from \$5.4 million in 2019 to \$346.7 million in 2030 (Figure 5.2). For every 1,000 additional jobs, tax revenue can increase by \$13.3 million in Virginia.

**Table 5.3: Estimated Virginia Tax Revenue from Amazon's MCH Capital Expenditures, Including Ripple Effects**

	CUMULATIVE (Millions, 2019-2030)	ANNUAL AVERAGE (Millions, 2019-2030)
Individual Income	\$25.9	\$2.2
Corporate Income	\$8.8	\$0.7
Sales	\$23.4	\$2.0
<b>Capital Expenditures Total</b>	<b>\$58.1</b>	<b>\$4.8</b>

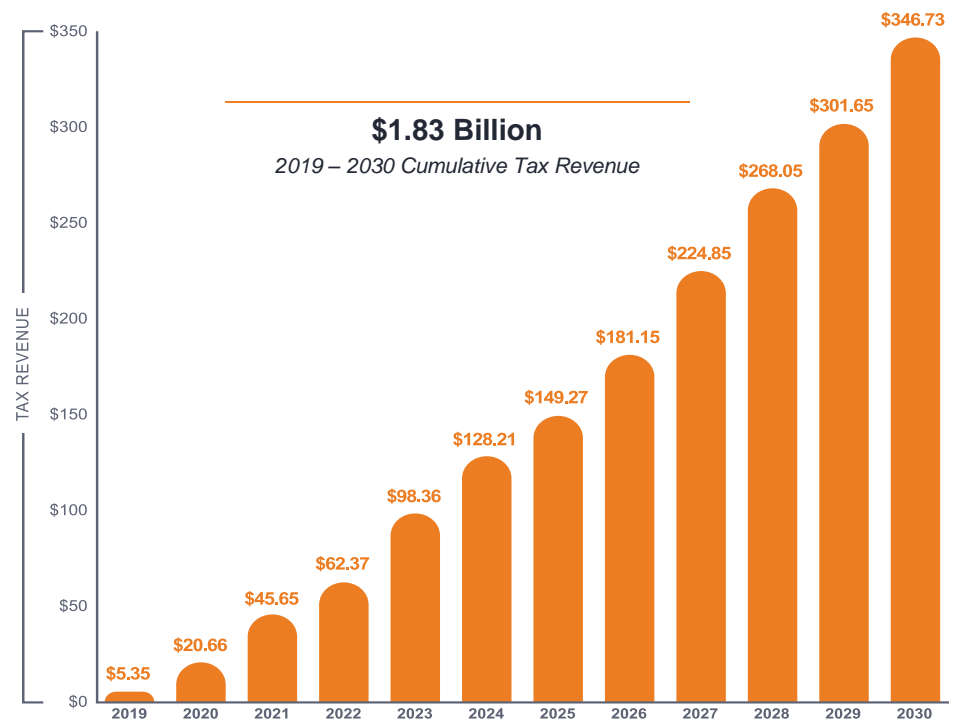
Source: Chmura Economics & Analytics

**Table 5.4: Estimated Virginia Tax Revenue from Amazon's MCH Operations, Including Ripple Effects**

	CUMULATIVE (Millions, 2019-2030)	ANNUAL AVERAGE (Millions, 2019-2030)
Individual Income	\$1,484.3	\$123.7
Sales	\$289.9	\$24.2
<b>Operations Total</b>	<b>\$1,774.2</b>	<b>\$147.9</b>

Source: Chmura Economics & Analytics

**Figure 5.2: Estimated Virginia Tax Revenues from Amazon's MCH, Including Ripple Effects**  
(Millions of Dollars, Capital Expenditures & Operations)



Source: Chmura Economics & Analytics

## 6. Conclusion

In conclusion, Amazon's MCH will generate significant economic impacts in Virginia and the Washington MSA. From 2019 through 2030, the capital expenditures and operations of Amazon's MCH can produce an annual average of \$6.3 billion (in nominal dollars) in economic impact (including direct, indirect, and induced impacts) in Virginia, supporting a total of 27,463 jobs. In the Washington MSA, the total economic impact can reach \$6.6 billion per year

from 2019 through 2030, supporting 28,715 jobs.

In 2030, the capital expenditures and ongoing operations associated with Amazon's MCH can produce \$14.2 billion and 59,308 jobs in total economic impact in Virginia, and \$15.0 billion and 62,007 jobs in the Washington MSA.

From 2019 through 2030, the cumulative tax revenue for the state government from the direct

economic impact is estimated to be \$1.18 billion over this period, with the potential to reach \$1.83 billion when indirect and induced impacts are included.

An impact that is not estimated is the diversification that Amazon's MCH brings to this federal government-dependent region, which includes new suppliers that will locate in the region because of Amazon's presence.

## Appendix 1: Amazon's MCH Impact Through 2034

### A1.1. Economic Impact of Amazon's MCH

From 2019 to 2034, it is estimated that Amazon will invest \$2.5 billion (in 2019 fixed dollars) on its MCH in Crystal City. Measured in nominal dollars, the total capital expenditures will reach \$2.9 billion over this period. Figure A1.1 presents the estimated capital expenditures by year from 2019 through 2034.

Table A1.1 summarizes the economic impact of the capital expenditures of Amazon's MCH in Virginia and the Washington MSA. In Virginia, Amazon's capital investments can generate an estimated total economic impact (direct, indirect, and induced) of \$2.6 billion (in nominal dollars) from 2019 through 2034, supporting 13,585 cumulative jobs in the state. On an annual average basis, Amazon's capital expenditures are estimated to generate \$163.1 million in total impact (direct, indirect, and induced) that can support an average 849 jobs per year in Virginia from 2019 through 2034.

The estimated economic impact of Amazon's capital expenditures in the Washington MSA is slightly larger than its impact in Virginia. It is estimated that Amazon's capital expenditures can generate an average \$173.1 million in annual total impact (direct, indirect, and induced) in the Washington MSA, that can support an average 894 jobs per year from 2019 through 2034.

**Figure A1.1: Estimated Annual Capital Expenditures**  
(2019-2034, Millions of Nominal Dollars)



Source: Amazon through the Virginia Chamber Foundation and Chmura Economics & Analytics

**Table A1.1: Economic Impact of Amazon's MCH Capital Expenditures (2019-2034)**

			DIRECT	INDIRECT	INDUCED	TOTAL IMPACT
Virginia	Total (2019-2034)	Spending (\$ Millions)	\$1,720.1	\$457.5	\$431.3	\$2,608.9
		Employment	8,256	2,241	3,088	13,585
	Annual Average (2019-2034)	Spending (\$ Millions)	\$107.5	\$28.6	\$27.0	\$163.1
		Employment	516	140	193	849
	Total (2019-2034)	Spending (\$ Millions)	\$1,775.8	\$480.3	\$513.5	\$2,769.6
		Employment	8,525	2,329	3,442	14,296
Washington Metro Area	Annual Average (2019-2034)	Spending (\$ Millions)	\$111.0	\$30.0	\$32.1	\$173.1
		Employment	533	146	215	894

Note: Numbers may not sum due to rounding

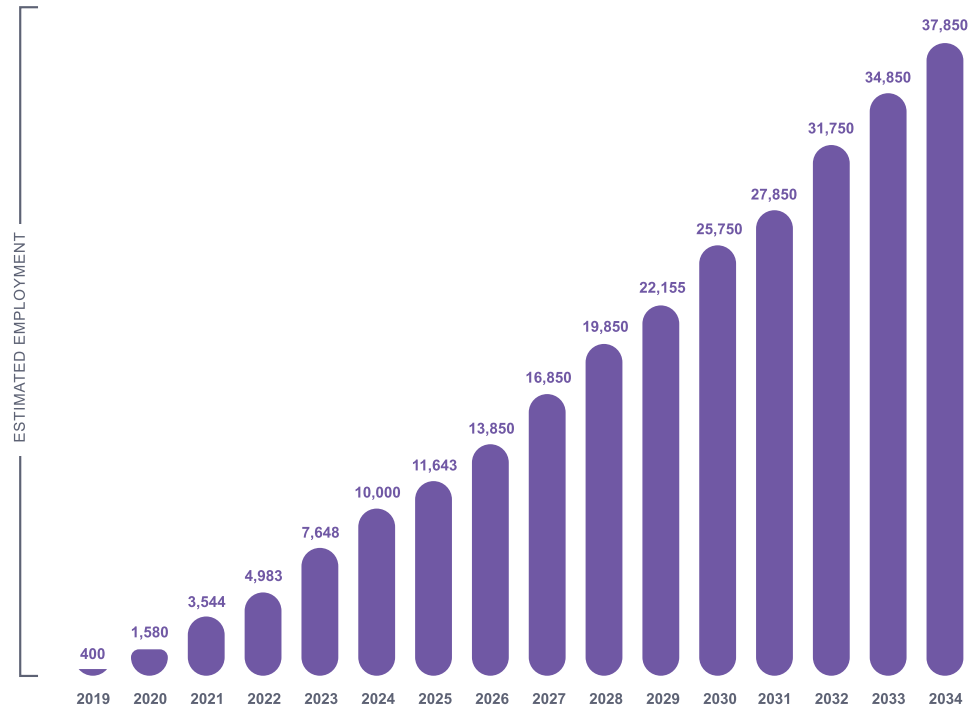
Source: IMPLAN Pro 2016 and Chmura Economics & Analytics

### A1.1.2. Economic Impact of Amazon's MCH Operations

The ongoing operations of Amazon's MCH will generate significant economic impact in Virginia and the Washington MSA. As Figure A1.2 shows, the number of MCH employees will steadily increase over the years from an estimated 400 in 2019 to 37,850 in 2034.

Table A1.2 presents the economic impact of Amazon's MCH operations in Virginia at five time periods: 2021, 2025, 2028, 2031, and 2034. In 2034, when Amazon's MCH is expected to employ 37,850 workers, the direct impact (revenue or economic output) is estimated to be \$12.7 billion (in nominal dollars). The total economic impact (direct, indirect, and induced) of Amazon's MCH operations can reach \$21.6 billion in 2034, supporting 88,246 jobs in the state.

Figure A1.2: Estimated Employment at Amazon's MCH



Source: Amazon through the Virginia Chamber Foundation and Chmura Economics & Analytics

Table A1.2: Economic Impact of Amazon's MCH Operations in Virginia

		DIRECT	INDIRECT	INDUCED	TOTAL IMPACT
2021	Spending (\$ Millions)	\$1,009.8	\$310.1	\$392.8	\$1,712.7
	Employment	3,544	1,591	3,127	8,263
2025	Spending (\$ Millions)	\$3,546.8	\$1,089.2	\$1,379.5	\$6,015.5
	Employment	11,643	5,228	10,274	27,145
2028	Spending (\$ Millions)	\$6,357.8	\$1,952.4	\$2,472.8	\$10,783.0
	Employment	19,850	8,913	17,517	46,280
2031	Spending (\$ Millions)	\$9,378.7	\$2,880.1	\$3,647.8	\$15,906.6
	Employment	27,850	12,505	24,576	64,931
2034	Spending (\$ Millions)	\$12,746.2	\$3,914.3	\$4,957.6	\$21,618.1
	Employment	37,850	16,995	33,401	88,246
Annual Average (2019-2034)	Spending (\$ Millions)	\$5,539.6	\$1,701.2	\$2,154.6	\$9,395.3
	Employment	16,910	7,593	14,922	39,424

Note: Numbers may not sum due to rounding

Source: IMPLAN Pro 2016 and Chmura Economics & Analytics

The estimated economic impact of Amazon's MCH operations in the Washington MSA is higher, reflecting the fact that metro area businesses in the District of Columbia and Maryland will enjoy significant benefits from the indirect and induced impacts of the MCH's operations. For 2034, it was estimated that the total economic impact (direct, indirect, and induced) of Amazon's MCH operations in the Washington MSA can reach \$22.8 billion (in nominal dollars), supporting 92,251 jobs.

### A1.1.3. Amazon in Perspective - 2034

To put Amazon's MCH jobs impact into perspective, Arlington County is expected to add 41,072 jobs over the next 16 years (from 2018 to 2034) based on projections from Chmura's JobsEQ (Figure A1.3). That annual average growth rate of 1.2% is faster than the expected 0.7% growth rate in the nation over the same period. When the Amazon expansion is added to the current forecast, the Arlington County growth rate over the next 16 years increases to 2.2% for a total of 78,922 new jobs.

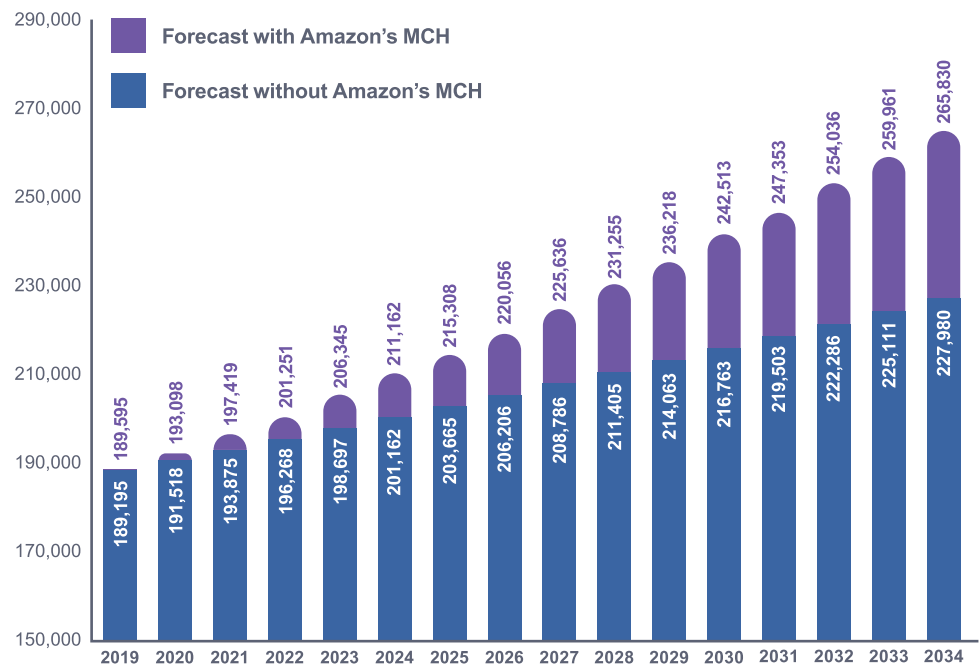
**Table A1.3: Economic Impact of Amazon's MCH Operations in the Washington MSA**

		DIRECT	INDIRECT	INDUCED	TOTAL IMPACT
2021	Spending (\$ Millions)	\$1,009.8	\$345.0	\$449.5	\$1,804.3
	Employment	3,544	1,702	3,391	8,638
2025	Spending (\$ Millions)	\$3,546.8	\$1,211.8	\$1,578.7	\$6,337.3
	Employment	11,643	5,593	11,141	28,377
2028	Spending (\$ Millions)	\$6,357.8	\$2,172.2	\$2,829.9	\$11,359.9
	Employment	19,850	9,535	18,995	48,380
2031	Spending (\$ Millions)	\$9,378.7	\$3,204.4	\$4,174.5	\$16,757.5
	Employment	27,850	13,378	26,650	67,878
2034	Spending (\$ Millions)	\$12,746.2	\$4,354.9	\$5,673.4	\$22,774.6
	Employment	37,850	18,182	36,219	92,251
Annual Average (2019-2034)	Spending (\$ Millions)	\$5,539.6	\$1,892.7	\$2,465.7	\$9,897.9
	Employment	16,910	8,123	16,181	41,213

*Note: Numbers may not sum due to rounding*

*Source: IMPLAN Pro 2016 and Chmura Economics & Analytics*

**Figure A1.3: Employment Growth – Arlington County, Virginia**



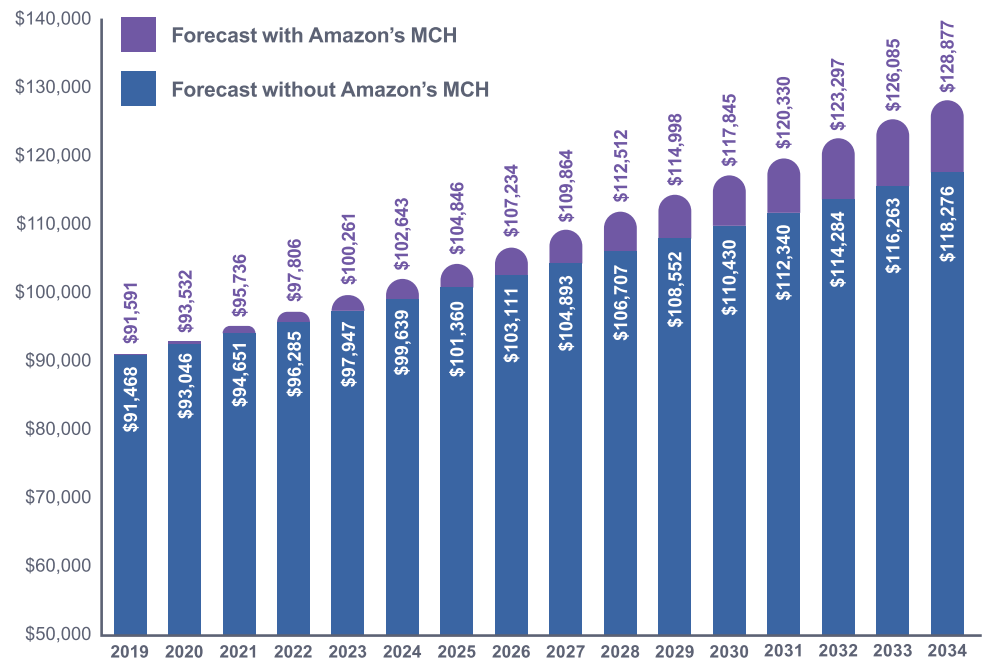
Source: Chmura's JobsEQ



In addition, the Amazon jobs are expected to boost the average wage of the county. By 2034, the infusion of Amazon's MCH jobs and employees' incomes can boost the average wage of the county by 9.0%. (Figure A1.4)

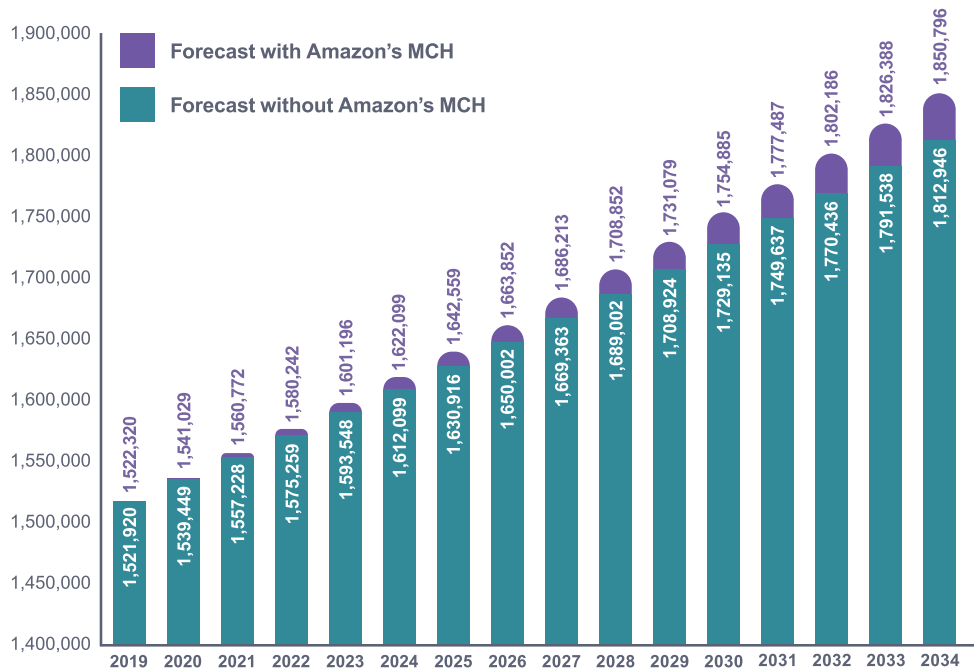
Similarly, the Northern Virginia portion of the Washington MSA is expected to add 308,309 jobs over the next 16 years based on projections from Chmura's JobsEQ. That translates to an annual average growth rate of 1.2%. When the Amazon expansion is added to the current forecast, the Northern Virginia growth rate over the next 16 years increases to 1.3% for a total of 346,159 new jobs (Figure A1.5).

**Figure A1.4: Average Wage Expectations – Arlington County, Virginia**



Source: Chmura Economics & Analytics

**Figure A1.5: Employment Growth – Northern Virginia (VA portion of the Washington MSA)**



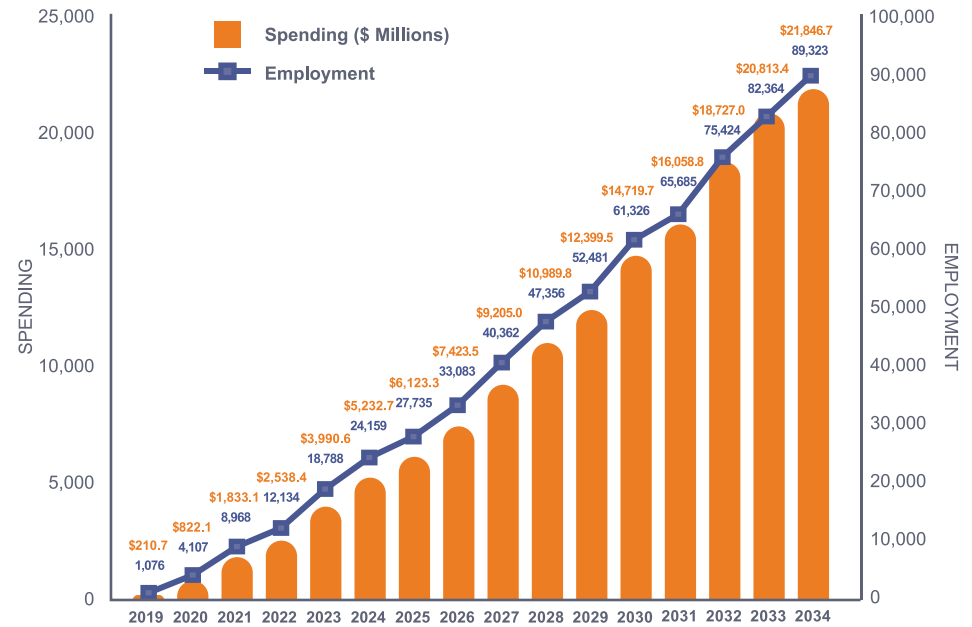
Source: Chmura's JobsEQ

### A1.1.4. Economic Impact Summary

Combining the economic impact from capital expenditures and the MCH's operations, Figure A1.6 summarizes the impact of Amazon's MCH in Virginia from 2019 through 2034. The total economic impact (direct, indirect, and induced) is estimated to increase steadily from 2019 onward, from \$210.7 million (in nominal dollars) and 1,076 jobs in 2019 to \$21.8 billion and 89,323 jobs in 2034, for an annual average impact of \$9.6 billion and an annual average 40,273 jobs. The above analysis also indicates that for every 1,000 Amazon employees, the associated total economic impact can reach \$565.3 million in the state and can support 2,382 jobs in Virginia.

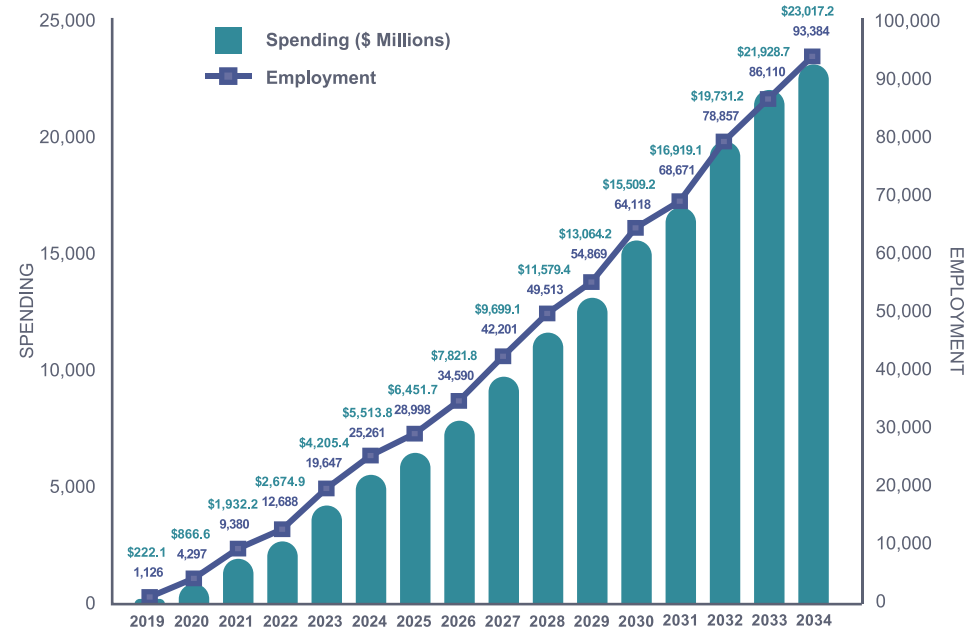
The economic impact of the MCH in the Washington MSA follows a similar pattern (Figure A1.7). It is estimated that the total economic impact (direct, indirect, and induced) will increase from \$222.1 million (in nominal dollars) and 1,126 jobs in 2019 to \$23.0 billion and 93,384 jobs in 2034, for an annual average impact of \$10.1 billion and an annual average 42,107 jobs. For every 1,000 Amazon employees, the associated total economic impact can reach \$595.6 million in the metro area and can support 2,490 jobs.

**Figure A1.6: Combined Total Economic Impact of Amazon's MCH in Virginia**  
(Capital Expenditures & Operations)



Source: Chmura Economics & Analytics

**Figure A1.7: Combined Total Economic Impact of Amazon's MCH in the Washington MSA**  
(Capital Expenditures & Operations)



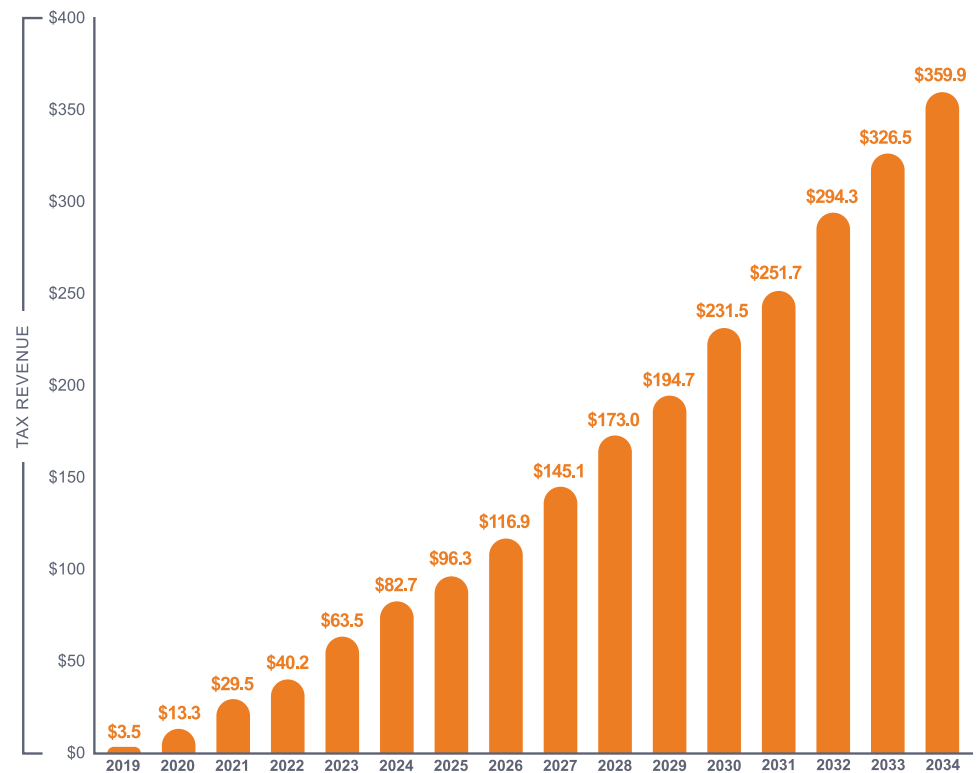
Source: Chmura Economics & Analytics

### A1.2. Fiscal Impact of Amazon's MCH

Combining state tax revenues from capital expenditures and the MCH's operations, Figure A1.6 summarizes the tax revenue impact of Amazon's MCH, based on the direct economic impact. The tax revenues for the state are estimated to increase steadily from 2019 onward: from \$3.5 million (in nominal dollars) in 2019 to \$359.9 million for the state in 2034. The cumulative tax revenue for the state government is estimated to total \$2.42 billion from 2019 through 2034, averaging \$151.4 million per year.

Including tax revenues from the indirect and induced impacts, the state tax will increase from \$5.3 million (in nominal dollars) in 2019 to \$545.1 million in 2034. The cumulative tax revenue for the state government is estimated to total \$3.74 billion from 2019 through 2034, averaging \$233.7 million per year.

**Figure A1.6: Estimated Virginia Tax Revenues (Direct Impact) from Amazon's MCH**  
(Millions of Dollars, Capital Expenditures & Operations)



Source: Chmura Economics & Analytics

## Appendix 2: Impact Analysis Glossary

**Impact 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 (input-output 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.

**Total Economic Impact**—the sum of the direct, indirect and induced impact.

**Fiscal Impact**—the tax revenue for federal, state or local governments derived from the direct economic impact. Appendix 2 shows the fiscal impact when ripple effects are also included.

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