



The Economic and Fiscal Impact of Carmel Church Station on Caroline County, Virginia

The Carmel Church Station development is expected to create 13,762 jobs and \$2.3 billion in annual economic impact in Caroline County, Virginia upon completion in 2035. The construction of the project is expected to support 13,834 cumulative jobs during the 20-year development period. The cumulative economic impact from 2015 to 2035 is estimated to reach \$22.7 billion. Upon completion, the county is expected to collect \$66.1 million a year from real estate, personal property, and other taxes from businesses and residents located at Carmel Church Station. Meanwhile, the county will also incur \$40.8 million a year in additional expenses to provide public services for the businesses and residents located in Carmel Church Station. Thus, the net fiscal gain for Caroline County is expected to be positive at \$25.3 million per year after project completion. The local fiscal impact is positive every year for the development period, having a cumulative positive value of \$235.9 million from 2015 to 2035.

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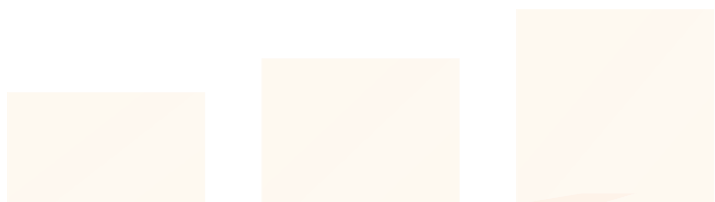
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1. Executive Summary

Carmel Church Station (CCS), currently in the proposal phase, will be a mixed-use, transit-oriented development situated in Caroline County. The site location encompasses approximately 1,100 acres of land along I-95. The current plans for the project call for the development of one million square feet of retail space and restaurants, 1,560,000 square feet of office space, 600,000 square feet of industrial/manufacturing space, 1,000 hotel rooms, and 8,659 residential units. A project of this magnitude is expected to have a significant and positive impact on the economy and fiscal budget for Caroline County.

In 2010, Chmura Economics & Analytics (Chmura) conducted an economic and fiscal impact study of CCS in Caroline County.¹ An update of the 2010 study is necessary due to the following changes:

- The project schedule has been moved to 2015 through 2035. The original benchmark year of 2032 needed to be updated to 2035, taking inflation into consideration.
- The Chmura 2010 study was based on 2009 county tax rates. Since then, the county has increased its real estate tax rate from 0.53% to 0.72%, while reducing personal property tax rate from 6.25% to 3.5%.
- An updated IMPLAN model is used that reflects the most recent economic situation in Caroline County. The economic multipliers are larger than those in Chmura 2010 study.

Using the latest IMPLAN Pro model to estimate the total economic and fiscal impacts of this project, Chmura found that:

- Upon project completion, spending within CCS will support 13,762 jobs both within the development and elsewhere in Caroline County.
- Each dollar spent at CCS businesses will have a \$0.28 ripple effect throughout the county. Each job located at CCS will support an additional 0.18 jobs in the county.
- Upon completion, the project will result in \$66.1 million per year in county revenue. Over the construction and development period from 2014 through 2035, total county revenue from the project will be \$590.4 million.
- The project will have a net annual fiscal impact on Caroline County of \$25.3 million upon completion in 2035.
- The cumulative net fiscal impact on Caroline County from 2014 through 2035 is \$235.9 million. In fact, the project has a net positive fiscal impact each year during its development phase.
- Total project construction spending is estimated at \$3.76 billion, which will generate \$2.72 billion of economic impact in Caroline County during its development phase.
- During the 20-year construction and development period, 13,834 cumulative jobs will be created or supported in Caroline County.

¹ Source: The Economic and Fiscal Impact of Carmel Church Station on Caroline County, Virginia, prepared for Virginia Land Investments, by Chmura Economics & Analytics, June 21, 2010. This is referred to as the Chmura 2010 Study in this report.

2. Background

Virginia Land Investments has proposed the Carmel Church Station (CCS) project: a mixed-use, transit-oriented development on approximately 1,100 acres of land located along Interstate 95 (I-95) in Caroline County, Virginia.

Focusing on the new trend of transit-oriented developments, CCS will be a progressive community in which to live, work, and play. This new development will feature an inter-city rail station, a regional park along the North Anna River, and a blend of different housing types, shopping options, and employment opportunities. All of this will be maintained in a sustainable environment to assure energy efficiencies and minimal negative impact on the environment.

The location of CCS within Caroline County provides advantages that will underpin its anticipated success. Caroline County offers a rural lifestyle with access to the nation's capital, and it is one of the most vibrant economic regions in the country. The CCS location is situated on I-95 between Richmond, VA and Washington, D.C. The train station in CCS will afford a walkable and convenient option for residents, employees, and visitors who want to visit or commute to Richmond or Washington and avoid the traffic congestion on I-95.

In 2010, Chmura Economics & Analytics (Chmura) conducted an economic and fiscal impact study of CCS in Caroline County based on the latest project plan approved by the Caroline County Planning Commission in April 2010. An update of the 2010 study is necessary due to the following changes:

- The project schedule has been moved to 2015 through 2035. The benchmark year needed updating to 2035, considering inflation.
- Since 2010, the county has increased its real estate tax rate from 0.53% to 0.72%, while reducing the personal property tax rate from 6.25% to 3.5%.
- An updated IMPLAN model is used that reflects current economic conditions in Caroline County. The economic multipliers are larger than those in Chmura 2010 study.

This rest of this report is organized in the following manner:

- Section 3 briefly describes the Chmura methodology for the economic and fiscal impact analysis
- Section 4 details the project plan and timeline
- Section 5 discusses the economic impact resulting from construction and the ongoing operation of CCS
- Section 6 analyzes the fiscal impact of the project on the county with regard to additional revenue and expenses
- Section 7 provides a conclusion

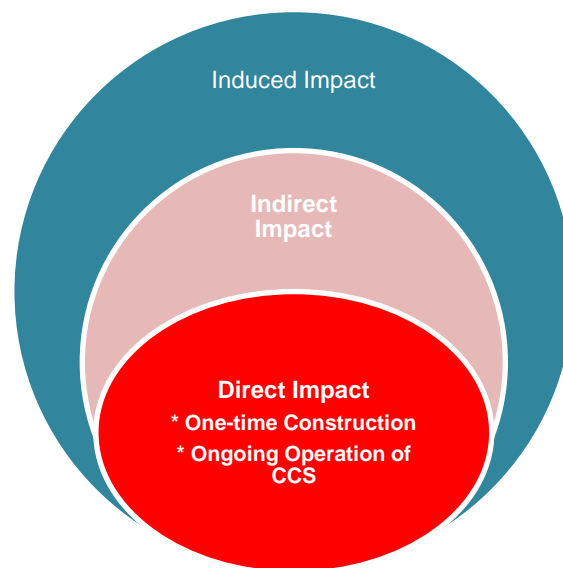
3. Methodology

The economic impact of the Carmel Church Station project comes from the following two sources: (1) the one-time economic impact from construction activities, and (2) ongoing operation such as the spending activities of businesses and residents located within the development.

These components constitute the direct economic impact of Carmel Church Station on Caroline County. The total economic impact will also include the economic ripple effects from the direct impact. Ripple effects, categorized as indirect and induced impacts (see Appendix 1 for definitions), measure the secondary benefits generated by CCS construction and its ongoing operation. These effects include the benefits for the many local businesses supporting CCS construction and operation phases, such as suppliers to local construction companies, and local businesses that cater to employees working in CCS.

The indirect and induced effects are estimated with IMPLAN Pro software after the direct impact is determined. Total construction spending and operational revenue are input into the various IMPLAN model sectors to estimate both the indirect and induced impacts for each sector. Those impacts are eventually aggregated to reach the estimated overall economic impact of CCS. Figure 3.1 illustrates the economic impact framework.

Figure 3.1: Economic Impact Analysis Framework

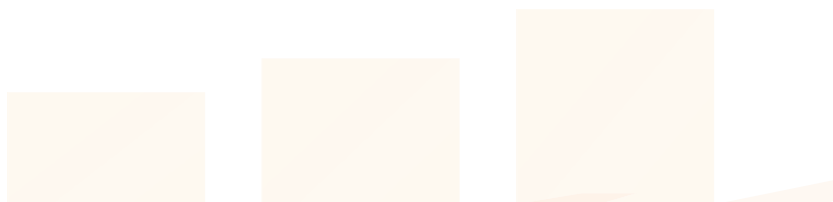


This study also estimates the fiscal effect of Carmel Church Station on Caroline County government entities. As development proceeds, the county can collect recordation taxes and one-time cash proffers. After completion, the county will continue to collect tax revenue from the following sources within CCS:

- Real estate and personal property taxes from commercial and residential properties
- Sales, meals, and lodging taxes from retail, restaurants, and hotels
- Machinery and tools tax from industry property
- Business, professional, occupational licenses tax (BPOL) from all eligible businesses

The current tax rates for the county are used to estimate tax revenue even though the rates may change in the future. The county would also incur costs to provide education, fire protection, public safety, and other services to workers and residents in CCS. Since education costs are one of the largest expense items for the county, Chmura first analyzes the household patterns and the number of school-age children living in CCS. Based on the household patterns and education cost per pupil, Chmura estimates the total education cost associated with CCS development. For other costs such as public safety, social services, and general administration, Chmura utilizes a per capita approach to estimate total county costs.

By comparing both county cost and tax revenue, it then can be determined whether the CCS development is fiscally positive for Caroline County, and to what extent.



4. Carmel Church Station Development

Commercial, industrial, and residential properties are included in the proposed CCS development. The initial plan for CCS is presented in Table 4.1. The project spans 20 years, from commencement of construction in 2015 to its completion in 2035. When it is complete, the project will host 1,000,000 square feet (SF) of retail space that is planned to include grocery stores, clothing stores, pharmacies, and home improvement stores. Also included are 80,000 SF of restaurant space. In addition to retail and restaurants, CCS will also offer 1,560,000 SF of office space and 600,000 SF of industrial/manufacturing space. Finally, multiple hotels with a total of 1,000 rooms are included in this plan.

Table 4.1: Plans for Carmel Church Station		
	Square Footage	Units
Commercial		
Grocery	160,000	
Clothing	60,000	
Drug	100,000	
Home Improvement	100,000	
Misc. Retail	500,000	
Restaurants	80,000	
Total Retail & Restaurants	1,000,000	
Office	1,560,000	
Industrial	600,000	
Total Commercial Square Footage	3,160,000	
Hotel		1,000
Residential		
Apartment		2,500
Condos		2,500
Townhomes		2,500
Single Family Dwelling		1,159
Total Residential		8,659
Source: Virginia Land Investments		

Since a mixed-used development aims to bring work and retail close to their residents, minimizing dependence on automobiles, another important component of CCS is its residential development. The plan for CCS includes 8,659 residential units, allocated among apartments, condos, townhomes, and single-family dwellings.

The entire project will be completed over a 20-year period from 2015 to 2034. The first year of full operation will be 2035. The total project construction spending is estimated to be \$3.76 billion in nominal dollars. To arrive at this estimate, the following assumptions were used:

- The unit construction cost is assumed to increase 2.5% per year
- The average construction cost for retail and commercial properties is \$153.40/SF in 2015
- The average construction cost for industrial/manufacturing property is \$128.80/SF in 2015
- The average construction cost for residential property is \$281,147 per unit in 2015
- The average construction cost for a hotel is \$46,499 per room in 2015

The construction cost assumptions for CCS are consistent with other studies Chmura has conducted in the Richmond metropolitan area, with slight differences attributable to locations and timing of construction. In this

update, Chmura uses the construction cost assumption from the Chmura 2010 study, adjusted for inflation to arrive at 2015 figures.

The total project construction spending of \$3.76 billion is assumed to be evenly spread during the construction phase. Table 4.2 provides the construction outlays by year.

Table 4.2: Estimated Construction Cost (Current \$Million)

Year	Residential	Retail & Restaurants	Office	Light Industry	Hotel	Total
2015	\$121.7	\$7.7	\$12.0	\$3.9	\$2.3	\$147.5
2016	\$124.7	\$7.9	\$12.3	\$4.0	\$2.4	\$151.2
2017	\$127.8	\$8.1	\$12.6	\$4.1	\$2.4	\$154.9
2018	\$131.0	\$8.3	\$12.9	\$4.2	\$2.5	\$158.8
2019	\$134.2	\$8.5	\$13.2	\$4.3	\$2.6	\$162.7
2020	\$137.6	\$8.7	\$13.5	\$4.4	\$2.6	\$166.7
2021	\$141.0	\$8.9	\$13.9	\$4.5	\$2.7	\$170.9
2022	\$144.5	\$9.1	\$14.2	\$4.6	\$2.8	\$175.1
2023	\$148.0	\$9.3	\$14.5	\$4.7	\$2.8	\$179.4
2024	\$151.7	\$9.6	\$14.9	\$4.8	\$2.9	\$183.9
2025	\$155.5	\$9.8	\$15.3	\$4.9	\$3.0	\$188.4
2026	\$159.3	\$10.0	\$15.7	\$5.1	\$3.0	\$193.1
2027	\$163.3	\$10.3	\$16.0	\$5.2	\$3.1	\$197.9
2028	\$167.3	\$10.5	\$16.4	\$5.3	\$3.2	\$202.8
2029	\$171.4	\$10.8	\$16.8	\$5.4	\$3.3	\$207.8
2030	\$175.7	\$11.1	\$17.3	\$5.6	\$3.4	\$213.0
2031	\$180.0	\$11.3	\$17.7	\$5.7	\$3.4	\$218.2
2032	\$184.5	\$11.6	\$18.1	\$5.9	\$3.5	\$223.6
2033	\$189.1	\$11.9	\$18.6	\$6.0	\$3.6	\$229.2
2034	\$193.8	\$12.2	\$19.0	\$6.2	\$3.7	\$234.9
Total	\$3,102.1	\$195.4	\$304.8	\$98.5	\$59.3	\$3,760.1

Source: Virginia Land Investments

The greater part of construction spending is for residential units, accounting for 82.5% (\$3.10 billion) of project spending. Office and retail construction will account for 8.1% and 5.2% of construction spending, respectively. The rest is allocated to industrial/manufacturing properties (2.6%) and hotels (1.6%).

5. Economic Impact of Carmel Church Station

In this section, the one-time construction impact from the development is shown, followed by an analysis of the impact of the ongoing operation of the project's commercial and residential components. Lastly, the overall impact of the project is summarized by year, providing the foundation for the fiscal analysis.

5.1. One-time Economic Impact from Construction Spending

The construction of CCS will create jobs in construction and related industries in Caroline County and the surrounding area. As a result, CCS construction spending will bring more business to local suppliers and construction companies.² In addition, area restaurants and shops will benefit as construction workers spend money at local establishments.³

The total construction spending of the project is estimated to be \$3.76 billion. This spending is spread evenly over a span of twenty years. The construction outlays include site development, construction of the structures, and professional fees such as architecture and engineering fees and other soft costs. Construction spending was entered into IMPLAN software to estimate job creation and the ripple economic effects of related construction activities.

The model shows that from 2015 through 2034, a total of \$2.18 billion will be directly spent in Caroline County to support the construction of Carmel Church Station (Table 5.1).⁴ In 2015, for example, yearly construction spending will be \$85.5 million, directly creating 577 jobs in construction trades in Caroline County. The indirect impact for 2015 is expected to result in \$8.2 million in additional sales and 46 additional jobs in industries supporting construction, such as truck transportation and utilities. The induced impact is projected to total \$13.0 million and 68 jobs in Caroline County in 2015. The induced jobs, which are generated when construction workers spend their income in the area, will be concentrated in consumer services-related industries such as restaurants, healthcare, and retail stores.

² This is commonly referred to as an indirect impact.

³ This is commonly referred to as an induced impact.

⁴ This number is smaller than the \$3.76 billion total project cost because some spending will occur in businesses outside Caroline County. Chmura uses the IMPLAN model to estimate the percentage of construction spending that will leak out of the county.

Table 5.1: Economic Impact of Construction of Carmel Church Station (2015-2035, Nominal \$)

Year	Spending (\$Million)				Employment			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
2015	\$85.5	\$8.2	\$13.0	\$106.7	577	46	68	692
2016	\$87.6	\$8.4	\$13.3	\$109.3	577	46	68	692
2017	\$89.8	\$8.6	\$13.7	\$112.0	577	46	68	692
2018	\$92.0	\$8.8	\$14.0	\$114.8	577	46	68	692
2019	\$94.3	\$9.0	\$14.3	\$117.7	577	46	68	692
2020	\$96.6	\$9.3	\$14.7	\$120.6	577	46	68	692
2021	\$99.0	\$9.5	\$15.1	\$123.6	577	46	68	692
2022	\$101.4	\$9.7	\$15.4	\$126.6	577	46	68	692
2023	\$104.0	\$10.0	\$15.8	\$129.8	577	46	68	692
2024	\$106.5	\$10.2	\$16.2	\$133.0	577	46	68	692
2025	\$109.2	\$10.5	\$16.6	\$136.3	577	46	68	692
2026	\$111.9	\$10.7	\$17.0	\$139.6	577	46	68	692
2027	\$114.6	\$11.0	\$17.4	\$143.1	577	46	68	692
2028	\$117.5	\$11.3	\$17.9	\$146.6	577	46	68	692
2029	\$120.4	\$11.6	\$18.3	\$150.3	577	46	68	692
2030	\$123.4	\$11.8	\$18.8	\$154.0	577	46	68	692
2031	\$126.4	\$12.1	\$19.2	\$157.8	577	46	68	692
2032	\$129.6	\$12.4	\$19.7	\$161.7	577	46	68	692
2033	\$132.8	\$12.7	\$20.2	\$165.7	577	46	68	692
2034	\$136.1	\$13.1	\$20.7	\$169.8	577	46	68	692
Total (2015-2034)	\$2,178.4	\$209.1	\$331.5	\$2,719.0	11,550	915	1,369	13,834
Annual Average (2015-2034)	\$108.9	\$10.5	\$16.6	\$135.9	577	46	68	692

Source: Virginia Land Investments and IMPLAN Pro 2012

Overall, during the 20-year construction phase, Carmel Church Station is expected to generate a total of \$2.72 billion in economic impact for Caroline County businesses. This economic impact averages \$135.9 million in spending and 692 jobs per year for the 2015 through 2034 project cycle.

5.2. Ongoing Economic Impact of CCS Development

This section analyzes the total ongoing spending and employment effects of CCS, based on the economic impact of a fully-built CCS in 2035. The next section (Section 5.3) presents the economic impact for the years 2015 through 2034, as different components of CCS are completed and come into operation each year.

New businesses have an economic ripple effect in a local economy. Consider a restaurant as an example. As sales increase, the restaurant purchases more local supplies from grocery stores or farmers. As a result, the output (sales) of the underpinning businesses also increases. In this example, the restaurant will need to hire additional workers to meet rising demand.⁵ As the income of the restaurant workers rise, their consumption increases, further enhancing spending effects in the area.⁶

⁵ This is commonly referred as an indirect impact.

⁶ This is commonly referred as an induced impact.

Table 5.2 presents the total output and employment from the ongoing operation of CCS beginning in 2035. When all components are operating, all businesses located in the development are estimated to have direct economic sales of \$1.77 billion. Of the commercial components, the largest contributor to economic output will come from office space, which is expected to generate annual direct sales of \$837.9 million. The manufacturing industries located in CCS are expected to generate \$452.3 million in sales annually, while the remaining direct sales are expected to come from retail merchants, restaurants, and hotels. In addition, the apartments located in CCS are expected to generate \$33.9 million in annual sales in the form of rental income. The total direct impact of CCS is estimated to be \$1.81 billion in 2035.

Table 5.2: Annual Economic Impact of Carmel Church Station (2035 Onward)								
	Spending (\$Million)				Employment			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Grocery Store	\$42.2	\$2.3	\$1.9	\$46.3	391	9	7	408
Clothing	\$39.6	\$4.4	\$1.5	\$45.5	372	20	7	398
Drug Store	\$28.3	\$1.6	\$1.4	\$31.3	322	11	9	342
Home Improvement Store	\$47.1	\$3.0	\$2.1	\$52.2	390	15	10	415
Misc. Retail	\$235.6	\$8.0	\$10.0	\$253.6	2,781	45	52	2,878
Restaurant	\$60.3	\$10.7	\$7.2	\$78.1	580	47	30	657
Office	\$837.9	\$93.1	\$127.0	\$1,057.9	5,278	579	551	6,408
Industry	\$452.3	\$139.6	\$45.3	\$637.3	1,226	319	244	1,788
Hotel	\$28.9	\$8.7	\$2.1	\$39.6	183	46	10	239
Total Commercial	\$1,772.1	\$271.3	\$198.5	\$2,241.9	11,524	1,091	920	13,534
Apartment	\$33.9	\$4.8	\$1.2	\$39.9	131	14	4	148
Condominium	\$0.0	\$8.0	\$2.0	\$10.0	0	23	7	30
Townhouse	\$0.0	\$8.0	\$2.0	\$10.0	0	23	7	30
Single Family Dwelling	\$0.0	\$5.6	\$1.4	\$7.0	0	16	5	21
Total Residential	\$33.9	\$26.5	\$6.5	\$67.0	131	76	22	228
Total CCS	\$1,806.0	\$297.8	\$205.0	\$2,308.9	11,654	1,167	941	13,762

Source: Virginia Land Investments and IMPLAN 2012

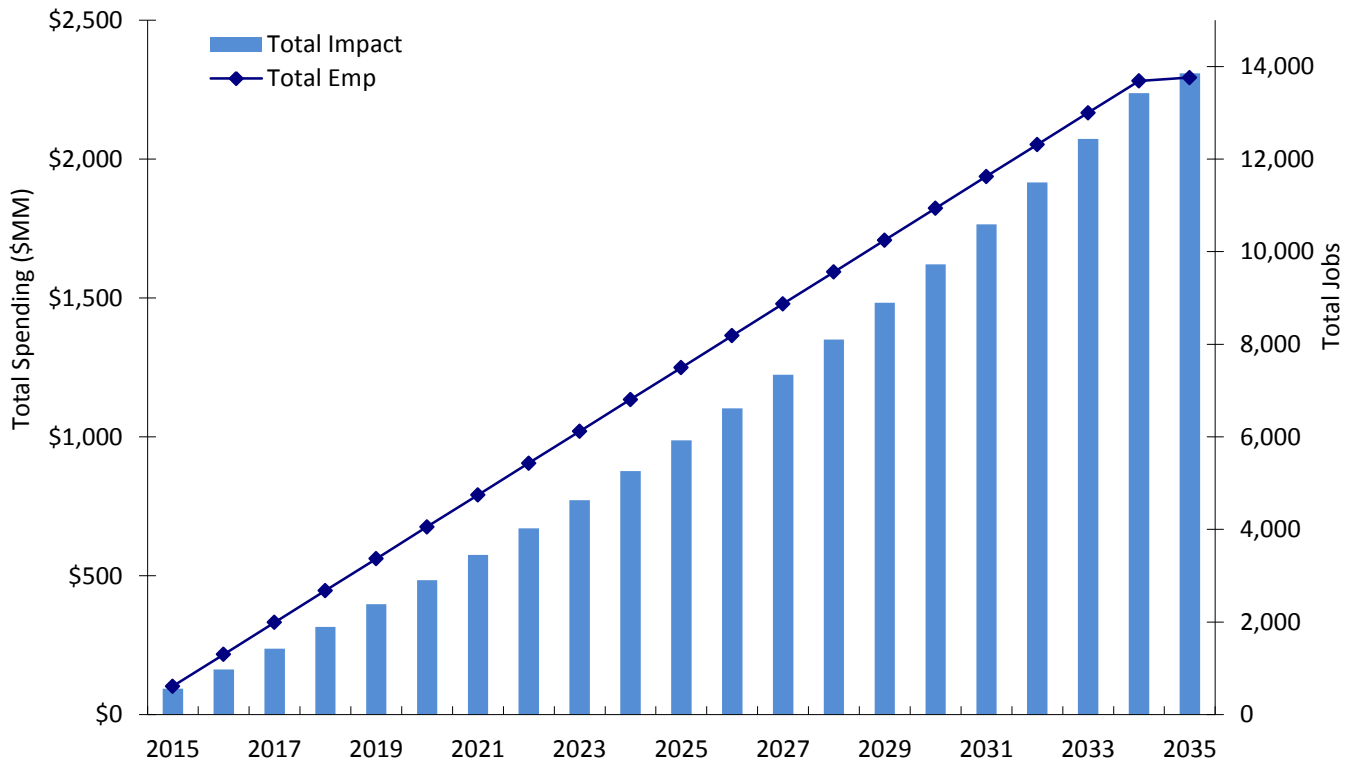
In addition to direct spending, CCS will create new jobs in Caroline County. It is estimated that 11,654 people will be directly employed by CCS establishments, with the largest component (5,278) working in offices. Other jobs in CCS establishments will include those in the manufacturing industry (1,226), restaurants (580), and various retail establishments.

The indirect and induced impacts measure the extent to which other businesses in the county benefit from CCS operation. The indirect and induced effects normally occur during the same year of the direct impact. The indirect impact of \$297.8 million and 1,167 jobs represents increased spending and employment for county businesses supporting the operation of Carmel Church Station. Some examples are local suppliers to retailers, local banks with CCS businesses as their customers, and local landscape companies hired to maintain the property. The induced impact of \$205.0 million and 941 jobs is the result of increased spending from local consumers who are employed by CCS businesses. Beneficiary businesses include hospitals, doctor’s offices, and other retailers and restaurants throughout the county. On average, one dollar spent at CCS businesses is expected to have a \$0.28 ripple effect throughout the county. One job located in CCS will support an additional 0.18 jobs in the county.

5.3. Economic Impact over Time

Given that construction, commercial, and residential operations overlap, the economic impact of CCS will gradually escalate to its fully-built level (Figure 5.1). Since total construction spending is assumed to be split evenly during the construction phase, the economic impact over time will expand at a steady pace. Between 2015 and 2034, the economic impact is derived from both construction spending and ongoing operation of the residential and commercial properties. After 2035, the impact will stabilize.

Figure 5.1: CCS Economic Impact Summary: Spending and Employment



Source: Chmura Economics & Analytics

6. Fiscal Impact on Caroline County

In addition to creating thousands of jobs and injecting millions of dollars into the county’s economy, CCS will also produce significant tax revenue for Caroline County after it is complete. Major revenue sources from this project for the county government come from the following taxes: real estate, tangible (personal) property, machinery and tools, sales, meals, lodging, and BPOL. In addition, Caroline County will benefit from a one-time cash proffer from the developer, and realize recordation tax revenue as properties transfer. However, the county will also incur costs in the areas of public safety and education for workers and residents of CCS. Therefore, tax revenue and service costs of CCS operation are both calculated to determine the net fiscal impact of this project on the county.

6.1. Real Estate Tax and Tangible Personal Property Tax

In 2013, Caroline County taxed real estate at \$0.72 per \$100 of assessed value. The tangible personal property tax rate is \$3.50 per \$100 of assessed value.⁷ Caroline County uses fair market value as the base for real estate property assessments. In this report, the estimated assessed value for real estate property is assumed to be the construction cost.⁸ The estimated assessed value for personal property tax is estimated as follows. For residential households, it is assumed that each household has 1.5 vehicles. The assessed value for each vehicle is estimated to be \$9,723 in 2035. The estimated assessed value of tangible personal property for commercial properties is assumed to be 2.7% of the assessed real property tax.⁹

Component	Size	Total Assessed Value	Real Estate Tax	Personal Property Tax
Grocery Store	160,000	\$80,976,691	\$583,032	\$76,216
Clothing	60,000	\$30,366,259	\$218,637	\$28,581
Drug Store	100,000	\$50,610,432	\$364,395	\$47,635
Home Improvement Store	100,000	\$50,610,432	\$364,395	\$47,635
Misc. Retail	500,000	\$253,052,160	\$1,821,976	\$238,174
Restaurant	80,000	\$40,488,346	\$291,516	\$38,108
Office	1,560,000	\$789,522,738	\$5,684,564	\$743,102
Industry	600,000	\$255,076,577	\$1,836,551	\$240,079
Hotel	1,000	\$153,457,578	\$1,104,895	\$144,435
Total Commercial	3,161,000	\$1,704,161,213	\$12,269,961	\$1,603,964
	Number of Unit	Assessed Value Per Unit	Real Estate Tax	Personal Property Tax
Apartment	2,500	\$770,678,117	\$5,548,882	\$1,301,552
Condominium	2,500	\$1,300,519,323	\$9,363,739	\$1,301,552
Townhouse	2,500	\$1,445,021,470	\$10,404,155	\$1,301,552
Single Family Dwelling	1,159	\$1,060,693,926	\$7,636,996	\$603,400
Total Residential	8,659	\$4,576,912,836	\$32,953,772	\$4,508,057
Total Property Tax			\$45,223,733	\$6,112,021
Minus Current Tax Estimate		\$4,389,300	\$59,558	
Net Property Tax			\$45,164,175	\$6,112,021

Source: Virginia Land Investments, Caroline County, and Chmura Economics & Analytics

⁷ In the 2010 Chmura Study, the real estate tax rate was \$0.53 per \$100 of assessed value and tangible personal property tax rate was \$6.25 per \$100 of assessed value. Those changes resulted in a significant increase in real estate tax revenue and a decrease in personal property tax revenue.

⁸ The assessed value for residential property is based on estimated sales price, with 95% assessment ratio.

⁹ Those assumptions are from the 2010 Chmura study, adjusted for inflation when necessary.

Table 6.1 details the real estate and personal property tax estimates from the CCS development upon full completion in 2035. The annual real estate taxes from commercial properties at CCS are estimated to be \$12.3 million, while the estimated annual real estate tax from residential properties is \$33.0 million. Currently, the total assessed value of land amounts to \$4.4 million. This translates to an annual revenue loss of \$59,558 for the county in 2035. As a result, the net real estate tax for the county is \$45.2 million in 2035.

The personal property tax for commercial properties, including taxes on cars, trucks, and office equipment is estimated to be \$1.6 million in 2035. The personal property tax associated with residential properties, derived from cars owned by households in CCS, is estimated to be \$4.5 million in 2035. The total real estate and personal property tax is thus estimated to be \$51.3 million in 2035.

Caroline County also collects a recordation tax for real estate sales. The current tax rate is 8.3 cents per \$100 transaction value. Chmura applies this rate on the estimated sales value of residential units in CCS. Based on the construction schedule, there are 433 units of new houses for sale each year. As a result, the total recordation tax is estimated to be \$0.18 million in 2015 and \$0.30 million in 2035, assuming housing prices appreciate at the rate of the consumer price index.

6.2. Other Commercial Taxes from CCS

The Virginia state sales tax is 5.3%—1% of which is returned to the county by the state. The sales tax is levied on the purchase of goods but not services. In this study, a 1% tax rate is applied to sales at restaurants, hotels, and retail shops located at CCS to arrive at the sales tax estimate. The total sales tax from all operations in 2035 is estimated to be \$4.8 million (Table 6.2).

Table 6.2: Other Commercial Taxes (2035 Onward)					
	Local Sales Tax	Meal Tax	Lodging Tax	BPOL Tax	Machinery & Tools Tax
Grocery Store	\$422,144			\$63,322	
Clothing	\$395,760			\$59,364	
Drug Store	\$282,686			\$42,403	
Home Improvement Store	\$471,143			\$70,671	
Misc. Retail	\$2,355,714			\$353,357	
Restaurant	\$603,063	\$2,412,251		\$90,459	
Hotel	\$288,905		\$1,444,524	\$43,336	
Office				\$2,848,793	
Industry					\$2,208,695
Total	\$4,819,414	\$2,412,251	\$1,444,524	\$3,571,706	\$2,208,695

Source: Virginia Land Investments, County of Caroline, and Chmura

As of 2013, Caroline County had a 4% meals tax, which is applied to restaurant sales. The total meals tax from restaurants in 2035 is estimated to be \$2.4 million. Caroline County also has a 5% lodging tax, which is applied to hotel receipts. The total lodging tax from hotels in 2035 is estimated to be \$1.4 million.

Caroline County has a business, professional, and occupational license (BPOL) tax, which is applied to retail and service businesses at different rates. As of 2013, the BPOL tax rate for retailers was \$0.15 per \$100 of gross receipts. This rate was \$0.12 for contractors, \$0.19 for personal services, and \$0.49 for professional businesses. All retail, restaurants, and lodging businesses are subject to the retail BPOL tax rate, as are office businesses, which are assumed to be half professional services and half personal services. As a result, the total BPOL taxes from all businesses located in CCS is estimated to be \$3.6 million in 2035.

Caroline County also has a machinery and tools tax which is applied to manufacturers and is based on the assessed value of their machines and equipment. Since the assessed equipment values of the potential manufacturing industries in CCS are not available, Chmura utilized a per capita approach. In the 2010 Chmura study, it is estimated that the average machinery and tools tax per worker is \$965. Applying this base amount as a guide for manufacturing industries that may locate in CCS, it is estimated that the machinery and tools tax in 2035 will be \$2.2 million.

Overall, all taxes derived from the commercial operation of CCS are estimated to be \$14.5 million in 2035. Measured in 2013 dollars, total taxes from commercial operation are projected to be \$8.3 million.

6.3. Cash Proffer Impact

Caroline County has a cash proffer policy for both residential and commercial development—termed impact fees and road improvement fees. The cash proffer is paid when the building permits for CCS are obtained and is primarily used to build schools, roads, and parks. The preliminary impact fees for residential developments are \$5,500 per dwelling unit, due at the time of building permit issuance, but the total amount is limited to \$36.5 million. The maximum limit is lowered to \$25.0 million if one million square feet of commercial space is built. For industrial and commercial developments, there is a road improvement fee paid to Caroline County at \$0.35 per square foot. Cash proffers are adjusted each year based on the consumer price index.

Based on the above cash proffer formula and the construction schedule outlined in section 4, the total impact fees from the residential development are estimated to be \$25.0 million. Under the current construction schedule, the development will reach 1.0 million SF in commercial/industrial development in 2021; however, the accumulated impact through 2018 is \$18.9 million. As a result, Caroline County will continue to collect impact fees up to \$25.0 million when this maximum is reached in 2024. In addition, the total road improvement fees are estimated to be \$1.5 million from 2015 to 2034, averaging over \$70,000 per year.

Overall, the total cash proffer from CCS is estimated to be \$26.4 million from 2015 to 2034. Most of the revenue will be paid to the county during the first half of the construction phase, as building permits are issued each year for the completed site construction.

6.4. Tax Revenue Summary

When the development is fully operational in 2035, CCS is expected to generate annual revenue of \$66.1 million for Caroline County (Table 6.3). Of this amount, \$45.2 million is expected from real estate tax, \$6.1 million from personal property tax, \$4.8 million from sales tax, and the rest from meals, lodging, BPOL, recordation, and machinery and tools taxes. During the years of construction, Caroline County will also receive cash proffers. Since the development will come into operation in different phases, the county will see increased tax revenue each year. Table 6.3 outlines the county tax revenue from CCS operation from 2015 to 2035.

Table 6.3: County Fiscal Revenue Summary (Annual 2015-2035, \$Million)

Year	Proffer	Real Estate	Personal Property	Sales	Meal	Lodging	BPOL	Machinery & Tools	Recordation	Total Taxes	Cumulative Total Tax
2015	\$2.4	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$2.4	\$2.4
2016	\$2.5	\$1.3	\$0.2	\$0.1	\$0.1	\$0.0	\$0.1	\$0.1	\$0.2	\$4.6	\$7.0
2017	\$2.6	\$2.7	\$0.4	\$0.3	\$0.1	\$0.1	\$0.2	\$0.1	\$0.2	\$6.7	\$13.7
2018	\$2.6	\$4.2	\$0.6	\$0.4	\$0.2	\$0.1	\$0.3	\$0.2	\$0.2	\$8.9	\$22.6
2019	\$2.7	\$5.7	\$0.8	\$0.6	\$0.3	\$0.2	\$0.4	\$0.3	\$0.2	\$11.2	\$33.8
2020	\$2.8	\$7.3	\$1.0	\$0.8	\$0.4	\$0.2	\$0.6	\$0.4	\$0.2	\$13.6	\$47.3
2021	\$2.8	\$9.0	\$1.2	\$1.0	\$0.5	\$0.3	\$0.7	\$0.4	\$0.2	\$16.1	\$63.4
2022	\$2.9	\$10.7	\$1.4	\$1.1	\$0.6	\$0.3	\$0.8	\$0.5	\$0.2	\$18.7	\$82.1
2023	\$3.0	\$12.6	\$1.7	\$1.3	\$0.7	\$0.4	\$1.0	\$0.6	\$0.2	\$21.5	\$103.6
2024	\$1.4	\$14.5	\$2.0	\$1.5	\$0.8	\$0.5	\$1.1	\$0.7	\$0.2	\$22.7	\$126.2
2025	\$0.1	\$16.5	\$2.2	\$1.8	\$0.9	\$0.5	\$1.3	\$0.8	\$0.2	\$24.3	\$150.5
2026	\$0.1	\$18.6	\$2.5	\$2.0	\$1.0	\$0.6	\$1.5	\$0.9	\$0.2	\$27.3	\$177.9
2027	\$0.1	\$20.8	\$2.8	\$2.2	\$1.1	\$0.7	\$1.6	\$1.0	\$0.2	\$30.5	\$208.4
2028	\$0.1	\$23.1	\$3.1	\$2.5	\$1.2	\$0.7	\$1.8	\$1.1	\$0.2	\$33.9	\$242.3
2029	\$0.1	\$25.5	\$3.4	\$2.7	\$1.4	\$0.8	\$2.0	\$1.2	\$0.2	\$37.4	\$279.7
2030	\$0.1	\$28.0	\$3.8	\$3.0	\$1.5	\$0.9	\$2.2	\$1.4	\$0.3	\$41.0	\$320.7
2031	\$0.1	\$30.6	\$4.1	\$3.3	\$1.6	\$1.0	\$2.4	\$1.5	\$0.3	\$44.8	\$365.5
2032	\$0.1	\$33.3	\$4.5	\$3.5	\$1.8	\$1.1	\$2.6	\$1.6	\$0.3	\$48.8	\$414.2
2033	\$0.1	\$36.1	\$4.9	\$3.8	\$1.9	\$1.2	\$2.9	\$1.8	\$0.3	\$52.9	\$467.1
2034	\$0.1	\$39.1	\$5.3	\$4.2	\$2.1	\$1.2	\$3.1	\$1.9	\$0.3	\$57.2	\$524.3
2035	\$0.0	\$45.2	\$6.1	\$4.8	\$2.4	\$1.4	\$3.6	\$2.2	\$0.3	\$66.1	\$590.4
Total	\$26.4	\$384.5	\$52.0	\$41.0	\$20.5	\$12.3	\$30.4	\$18.8	\$4.6	\$590.4	

Source: Chmura Economics & Analytics

The tax revenue generated from the Carmel Church Station project is significant for Caroline County. In fiscal year (FY) 2012, the total revenue for the county was \$40.3 million.¹⁰ The future annual tax revenue from CCS, discounted to FY2012, is estimated to be \$35.1 million. This project can potentially increase the county revenue by 87% from its current level.

6.5. Estimating Resident Population of CCS

Based on the Census Bureau 2007-2011 estimates from the American Community Survey, the average household size in Caroline County is 2.68.¹¹ The average household size within CCS is expected to be smaller, as the county average includes a large number of single-family households. Since the majority of residential units in CCS are apartments, condos, and townhouses, the development is expected to attract empty-nesters or active retirees. Chmura assumes that single-family dwellings in CCS average 2.63 persons per household and the remaining residential units average 2.37 persons per household. The average household size in CCS is estimated to be 2.42. The total number of residents in CCS is estimated to be 20,918 when construction is complete.¹²

¹⁰ Source: Caroline County Virginia Fiscal Year 2013-2014 Adopted Budget. Available at: <http://www.visitcaroline.com/adoptedfy14budget.pdf>.

¹¹ Source: U.S. Census, http://factfinder2.census.gov/faces/nav/jsf/pages/community_facts.xhtml.

¹² Those are the same assumptions as the 2010 Chmura study.

The number of school-age children in CCS is expected to be smaller than in similar developments of single-family housing in other parts of the county. Studies have found that the number of school-age children in a Transit-Oriented Development (TOD) is smaller than other mixed-used developments. For example, a 2008 TOD study of 32 developments around the country found the average number of school-age children ranged from 0.00 to 0.12 per household. The developments in the referenced study averaged about 1.45 bedrooms per unit. For Carmel Church Station, the average number of bedrooms is between 2 and 3. Other studies on TOD suggest that the average number of school-age children is 0.06 per bedroom. Since the average residence size in CCS is expected to be between 2 and 3, the average number of school-age children per household in CCS is estimated to be 0.14. As a result, the number of school-age children in CCS is estimated to be 1,191.

6.6. Additional County Costs for CCS Residents and Workers

Ongoing operation of CCS, which includes retail and residential properties, are estimated to generate \$66.3 million in annual tax revenue in 2035 (including sales, real estate, and personal property taxes) for the county. However, the county will incur additional costs to provide public safety services, water, and sewage services for residents and businesses located in CCS. Public education will also be provided for school-age children who move into the neighborhood.

Chmura utilizes a per-capita approach to estimate the additional county cost in all budget categories except education. Only expenditures from the general fund are counted as incremental costs to the county.

In a mixed-use project, both new employees and residents result in additional cost for the county. Chmura first estimates the county cost per employee and county cost per resident, excluding expenditures for education. To allocate county expenses among residents and employees, Chmura assumes that 100% of the following expenditures are for the residents: health and welfare; parks, recreation, and library; and community and economic development. For other expenditures, 16% is allocated for employees and 84% is allocated for residents. Based on the Fiscal Year (FY) 2013 adopted county budget (Table 6.4), excluding education, the annual county cost per employee is estimated to be \$536.50 and the county cost per resident is estimated to be \$669 according to the FY2013 cost structure for Caroline County.

Table 6.4: Caroline County Budget			
	2013 Proposed Budget	% Designated for Employees	% Designated for Resident
General Government	\$2,934,202	16%	84%
Judicial Administration	\$1,225,479	16%	84%
Public Safety	\$11,215,178	16%	84%
Public Works	\$2,788,241	16%	84%
Health and Welfare	\$621,984	0%	100%
Education	\$0	0%	100%
Parks, Recreation & Library	\$692,494	0%	100%
Community Development	\$1,279,692	0%	100%
Non-departmental	\$1,185,905	0%	100%
School Enrollment	4,340	County Cost Per Student	\$2,584

Source: Caroline County

The total number of residents in this development is estimated to be 20,918. This project will also host 11,654 employees. Allowing a cost appreciation of 2.5% per year, the total county cost, excluding education, is estimated to be \$35.5 million in 2035.

Based on the FY2013 proposed county budget, the net county cost for educating each student is calculated to be \$2,584. CCS is estimated to house 1,191 school-age children. As a result, the county cost to educate these children is estimated to be \$3.1 million, based on 2013 dollars. Allowing a cost appreciation of 2.5% per year, the total county cost, excluding education, is estimated to be \$5.4 million in 2035.

Adding education and other incremental county costs together, the total cost for all county services provided to CCS residents and employees will be \$40.8 million in 2035, after the project is complete.

6.7. Net Fiscal Impact for Caroline County

As operation begins for the residential and commercial properties, Caroline County will collect tax revenue from CCS. Meanwhile, it will also incur additional costs. The local fiscal impact is positive for all years. Notably, the fiscal impact will increase as more properties begin operating. The continuing operation of Carmel Church Station is expected to result in a net \$25.3 million annual gain in revenue for Caroline County when the project is complete in 2035.

Table 6.5: County Fiscal Impact by Year (Annual \$Million)

Year	County Revenue	County Cost	Net Revenue Per Year	Cumulative Net Revenue
2015	\$2.4	\$0.3	\$2.2	\$2.2
2016	\$4.6	\$1.5	\$3.1	\$5.3
2017	\$6.7	\$2.7	\$3.9	\$9.2
2018	\$8.9	\$4.1	\$4.8	\$14.0
2019	\$11.2	\$5.5	\$5.7	\$19.7
2020	\$13.6	\$6.9	\$6.7	\$26.4
2021	\$16.1	\$8.4	\$7.6	\$34.0
2022	\$18.7	\$10.0	\$8.7	\$42.7
2023	\$21.5	\$11.7	\$9.8	\$52.5
2024	\$22.7	\$13.4	\$9.2	\$61.7
2025	\$24.3	\$15.3	\$9.0	\$70.8
2026	\$27.3	\$17.2	\$10.2	\$80.9
2027	\$30.5	\$19.1	\$11.4	\$92.3
2028	\$33.9	\$21.2	\$12.7	\$105.0
2029	\$37.4	\$23.4	\$14.0	\$119.0
2030	\$41.0	\$25.7	\$15.3	\$134.3
2031	\$44.8	\$28.0	\$16.8	\$151.1
2032	\$48.8	\$30.5	\$18.3	\$169.4
2033	\$52.9	\$33.0	\$19.8	\$189.2
2034	\$57.2	\$35.7	\$21.5	\$210.7
2035	\$66.1	\$40.8	\$25.3	\$235.9

Source: Chmura Economics & Analytics

The cumulative net revenue for Caroline County in the twenty-year construction period is shown in Table 6.6. By the year 2035, this amount is estimated to be \$235.9 million.

Table 6.6: County Fiscal Impact by Year (Cumulative \$Million)			
Year	County Revenue	County Cost	Net Revenue Per Year
2015	\$2.4	\$0.3	\$2.2
2016	\$7.0	\$1.8	\$5.3
2017	\$13.7	\$4.5	\$9.2
2018	\$22.6	\$8.6	\$14.0
2019	\$33.8	\$14.0	\$19.7
2020	\$47.3	\$20.9	\$26.4
2021	\$63.4	\$29.4	\$34.0
2022	\$82.1	\$39.4	\$42.7
2023	\$103.6	\$51.1	\$52.5
2024	\$126.2	\$64.5	\$61.7
2025	\$150.5	\$79.8	\$70.8
2026	\$177.9	\$96.9	\$80.9
2027	\$208.4	\$116.1	\$92.3
2028	\$242.3	\$137.3	\$105.0
2029	\$279.7	\$160.7	\$119.0
2030	\$320.7	\$186.4	\$134.3
2031	\$365.5	\$214.4	\$151.1
2032	\$414.2	\$244.8	\$169.4
2033	\$467.1	\$277.9	\$189.2
2034	\$524.3	\$313.6	\$210.7
2035	\$590.4	\$354.5	\$235.9

Source: Chmura Economics & Analytics

7. Conclusion

The construction and ongoing operation of Carmel Church Station in Caroline County will inject millions of dollars into the local economy every year and provide jobs for workers in construction, retail, personal services, and professional services. The county will also reap considerable fiscal benefits from this project. It is estimated that when the project is complete, the county will receive tax benefits totaling \$66.1 million per year, while paying \$40.8 million to provide services for residents and businesses at Carmel Church Station. As a result, the CCS development will be fiscally positive for Caroline County not only upon completion, but also for each year of its development. The findings of this study are summarized in Table 7.1.

Table 7.1: Annual Economic and Fiscal Impact Summary							
Year	Spending (\$Million)		Employment		Fiscal Impact (\$ Million)		
	Direct	Total Impact	Direct	Total	County Revenue	County Cost	Net Revenue
2015	\$79.4	\$93.1	526	616	\$2.4	\$0.3	\$2.2
2016	\$134.4	\$163.2	1,109	1,304	\$4.6	\$1.5	\$3.1
2017	\$192.5	\$237.2	1,692	1,992	\$6.7	\$2.7	\$3.9
2018	\$253.8	\$315.3	2,275	2,680	\$8.9	\$4.1	\$4.8
2019	\$318.4	\$397.6	2,857	3,368	\$11.2	\$5.5	\$5.7
2020	\$386.3	\$484.3	3,440	4,056	\$13.6	\$6.9	\$6.7
2021	\$457.7	\$575.3	4,023	4,744	\$16.1	\$8.4	\$7.6
2022	\$532.8	\$671.0	4,605	5,432	\$18.7	\$10.0	\$8.7
2023	\$611.5	\$771.4	5,188	6,121	\$21.5	\$11.7	\$9.8
2024	\$694.1	\$876.8	5,771	6,809	\$22.7	\$13.4	\$9.2
2025	\$780.7	\$987.2	6,354	7,497	\$24.3	\$15.3	\$9.0
2026	\$871.3	\$1,102.8	6,936	8,185	\$27.3	\$17.2	\$10.2
2027	\$966.2	\$1,223.8	7,519	8,873	\$30.5	\$19.1	\$11.4
2028	\$1,065.4	\$1,350.4	8,102	9,561	\$33.9	\$21.2	\$12.7
2029	\$1,169.1	\$1,482.7	8,684	10,249	\$37.4	\$23.4	\$14.0
2030	\$1,277.5	\$1,620.9	9,267	10,937	\$41.0	\$25.7	\$15.3
2031	\$1,390.7	\$1,765.3	9,850	11,625	\$44.8	\$28.0	\$16.8
2032	\$1,508.8	\$1,916.0	10,433	12,314	\$48.8	\$30.5	\$18.3
2033	\$1,632.0	\$2,073.2	11,015	13,002	\$52.9	\$33.0	\$19.8
2034	\$1,760.4	\$2,237.1	11,598	13,690	\$57.2	\$35.7	\$21.5
2035	\$1,806.0	\$2,308.9	11,654	13,762	\$66.1	\$40.8	\$25.3
Total (2015-2035)	\$17,889.0	\$22,653.5			\$590.4	\$354.5	\$235.9

Source: Chmura Economics & Analytics

The summary of the cumulative economic and fiscal impact is listed in Table 7.2.

Table 7.2: Cumulative Economic and Fiscal Impact Summary					
Year	Spending (\$Million)		Fiscal Impact (\$ Million)		
	Direct	Total Impact	County Revenue	County Cost	Net Revenue
2015	\$79.4	\$93.1	\$2.4	\$0.3	\$2.2
2016	\$213.9	\$256.2	\$7.0	\$1.8	\$5.3
2017	\$406.4	\$493.5	\$13.7	\$4.5	\$9.2
2018	\$660.2	\$808.8	\$22.6	\$8.6	\$14.0
2019	\$978.6	\$1,206.4	\$33.8	\$14.0	\$19.7
2020	\$1,364.9	\$1,690.7	\$47.3	\$20.9	\$26.4
2021	\$1,822.6	\$2,266.0	\$63.4	\$29.4	\$34.0
2022	\$2,355.4	\$2,937.1	\$82.1	\$39.4	\$42.7
2023	\$2,966.9	\$3,708.5	\$103.6	\$51.1	\$52.5
2024	\$3,661.0	\$4,585.3	\$126.2	\$64.5	\$61.7
2025	\$4,441.6	\$5,572.5	\$150.5	\$79.8	\$70.8
2026	\$5,312.9	\$6,675.3	\$177.9	\$96.9	\$80.9
2027	\$6,279.1	\$7,899.1	\$208.4	\$116.1	\$92.3
2028	\$7,344.5	\$9,249.4	\$242.3	\$137.3	\$105.0
2029	\$8,513.7	\$10,732.1	\$279.7	\$160.7	\$119.0
2030	\$9,791.1	\$12,353.0	\$320.7	\$186.4	\$134.3
2031	\$11,181.8	\$14,118.3	\$365.5	\$214.4	\$151.1
2032	\$12,690.6	\$16,034.3	\$414.2	\$244.8	\$169.4
2033	\$14,322.5	\$18,107.5	\$467.1	\$277.9	\$189.2
2034	\$16,083.0	\$20,344.6	\$524.3	\$313.6	\$210.7
2035	\$17,889.0	\$22,653.5	\$590.4	\$354.5	\$235.9

Employment number should not be presented as cumulative number
 Source: Chmura Economics & Analytics

Appendix 1: Glossary

Transit-oriented Development (TOD)—a mixed-use residential or commercial area designed to maximize the access to public transportation. A TOD neighborhood typically has a center with a train station, metro station, or bus stop, surrounded by relatively high density development.

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).

Economic Impact—total economic activity generated by a project or operation. It is typically measured in economic spending and job creation. Economic impacts include direct, indirect, and induced impacts.

Fiscal Impact—the effect of a project or operation on the fiscal situations of state or local governments. It is typically measured in the tax revenues and government costs resulting from the project or operation.

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.

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

Appendix 2: Data Breakdown by Year

The yearly details of construction cost, construction impact, and tax revenue have been provided in the body of the report. The following three tables show the planned yearly breakdown of the construction schedule, the impact of CCS ongoing operation, and county cost.

Table A1: Detailed Construction Schedule (Annual)				
Year	New Residential Unit	New Commercial Space (SF)	Cumulative Residential Unit	Cumulative Commercial Space (SF)
2015	433	158,000	433	158,000
2016	433	158,000	866	316,000
2017	433	158,000	1,299	474,000
2018	433	158,000	1,732	632,000
2019	433	158,000	2,165	790,000
2020	433	158,000	2,598	948,000
2021	433	158,000	3,031	1,106,000
2022	433	158,000	3,464	1,264,000
2023	433	158,000	3,897	1,422,000
2024	433	158,000	4,330	1,580,000
2025	433	158,000	4,762	1,738,000
2026	433	158,000	5,195	1,896,000
2027	433	158,000	5,628	2,054,000
2028	433	158,000	6,061	2,212,000
2029	433	158,000	6,494	2,370,000
2030	433	158,000	6,927	2,528,000
2031	433	158,000	7,360	2,686,000
2032	433	158,000	7,793	2,844,000
2033	433	158,000	8,226	3,002,000
2034	433	158,000	8,659	3,160,000
2035	0	0	8,659	3,160,000

Source: Virginia Land Investments

Table A2: Detailed Table in Section 5.2-CCS Ongoing Operation (Annual Impact \$Million)

Year	Direct Impact of CCS Operation	Indirect/Induced Impact	Total Impact of Operation	Direct Employment of CCS	Indirect/Induced Employment Impact	Total Employment of CCS
2015	\$0.0	\$0.0	\$0.0	0	0	0
2016	\$53.0	\$14.8	\$67.8	583	105	688
2017	\$109.1	\$30.4	\$139.5	1,165	211	1,376
2018	\$168.3	\$46.9	\$215.2	1,748	316	2,064
2019	\$230.8	\$64.3	\$295.0	2,331	422	2,752
2020	\$296.5	\$82.6	\$379.1	2,914	527	3,441
2021	\$365.7	\$101.8	\$467.6	3,496	632	4,129
2022	\$438.5	\$122.1	\$560.6	4,079	738	4,817
2023	\$514.9	\$143.4	\$658.3	4,662	843	5,505
2024	\$595.1	\$165.7	\$760.8	5,244	949	6,193
2025	\$679.2	\$189.1	\$868.3	5,827	1,054	6,881
2026	\$767.4	\$213.7	\$981.0	6,410	1,159	7,569
2027	\$859.6	\$239.3	\$1,099.0	6,993	1,265	8,257
2028	\$956.2	\$266.2	\$1,222.5	7,575	1,370	8,946
2029	\$1,057.3	\$294.4	\$1,351.6	8,158	1,476	9,634
2030	\$1,162.9	\$323.8	\$1,486.6	8,741	1,581	10,322
2031	\$1,273.2	\$354.5	\$1,627.7	9,324	1,686	11,010
2032	\$1,388.4	\$386.6	\$1,774.9	9,906	1,792	11,698
2033	\$1,508.6	\$420.0	\$1,928.6	10,489	1,897	12,386
2034	\$1,634.0	\$455.0	\$2,089.0	11,072	2,003	13,074
2035	\$1,806.0	\$502.9	\$2,308.9	11,654	2,108	13,762

Source: Chmura Economics & Analytics

Table A3: Detailed Table in Section 5.2-CCS Ongoing Operation (Cumulative Impact, \$Million)

Year	Direct Impact of CCS Operation	Indirect/Induced Impact	Total Impact of Operation
2015	\$0.0	\$0.0	\$0.0
2016	\$53.0	\$14.8	\$67.8
2017	\$162.2	\$45.2	\$207.3
2018	\$330.5	\$92.0	\$422.5
2019	\$561.3	\$156.3	\$717.6
2020	\$857.8	\$238.8	\$1,096.7
2021	\$1,223.6	\$340.7	\$1,564.2
2022	\$1,662.1	\$462.8	\$2,124.8
2023	\$2,177.0	\$606.1	\$2,783.1
2024	\$2,772.1	\$771.8	\$3,543.9
2025	\$3,451.3	\$960.9	\$4,412.3
2026	\$4,218.7	\$1,174.6	\$5,393.3
2027	\$5,078.3	\$1,413.9	\$6,492.3
2028	\$6,034.6	\$1,680.2	\$7,714.7
2029	\$7,091.8	\$1,974.6	\$9,066.4
2030	\$8,254.7	\$2,298.3	\$10,553.0
2031	\$9,527.8	\$2,652.8	\$12,180.6
2032	\$10,916.2	\$3,039.4	\$13,955.6
2033	\$12,424.8	\$3,459.4	\$15,884.2
2034	\$14,058.8	\$3,914.4	\$17,973.2
2035	\$15,864.9	\$4,417.2	\$20,282.1

Employment number should not be presented as cumulative number
 Source: Chmura Economics & Analytics

Table A4: Detailed Table in Section 6.5-County Cost (Annual, \$Million)

Year	Number of Workers in CCS	Number of Residents CCS	Number of Students CCS	Employment/Resident Cost	Education Cost	Total County Cost
2015	526	0	0	\$0.3	\$0.0	\$0.3
2016	1,109	1,046	60	\$1.3	\$0.2	\$1.5
2017	1,692	2,092	119	\$2.4	\$0.3	\$2.7
2018	2,275	3,138	179	\$3.6	\$0.5	\$4.1
2019	2,857	4,184	238	\$4.8	\$0.7	\$5.5
2020	3,440	5,229	298	\$6.0	\$0.9	\$6.9
2021	4,023	6,275	357	\$7.4	\$1.1	\$8.4
2022	4,605	7,321	417	\$8.7	\$1.3	\$10.0
2023	5,188	8,367	476	\$10.2	\$1.5	\$11.7
2024	5,771	9,413	536	\$11.7	\$1.7	\$13.4
2025	6,354	10,459	595	\$13.3	\$2.0	\$15.3
2026	6,936	11,505	655	\$14.9	\$2.2	\$17.2
2027	7,519	12,551	714	\$16.7	\$2.5	\$19.1
2028	8,102	13,596	774	\$18.5	\$2.7	\$21.2
2029	8,684	14,642	833	\$20.4	\$3.0	\$23.4
2030	9,267	15,688	893	\$22.3	\$3.3	\$25.7
2031	9,850	16,734	952	\$24.4	\$3.6	\$28.0
2032	10,433	17,780	1,012	\$26.5	\$4.0	\$30.5
2033	11,015	18,826	1,072	\$28.7	\$4.3	\$33.0
2034	11,598	19,872	1,131	\$31.1	\$4.7	\$35.7
2035	11,654	20,918	1,191	\$35.5	\$5.4	\$40.8

Source: Chmura Economics & Analytics

Table A5: Detailed Table in Section 6.5-County Cost (Cumulative \$Million)			
Year	Employment/Resident Cost	Education Cost	Total County Cost
2015	\$0.3	\$0.0	\$0.3
2016	\$1.6	\$0.2	\$1.8
2017	\$4.0	\$0.5	\$4.5
2018	\$7.6	\$1.0	\$8.6
2019	\$12.4	\$1.7	\$14.0
2020	\$18.4	\$2.5	\$20.9
2021	\$25.8	\$3.6	\$29.4
2022	\$34.5	\$4.9	\$39.4
2023	\$44.7	\$6.4	\$51.1
2024	\$56.4	\$8.1	\$64.5
2025	\$69.7	\$10.1	\$79.8
2026	\$84.7	\$12.3	\$96.9
2027	\$101.3	\$14.8	\$116.1
2028	\$119.8	\$17.5	\$137.3
2029	\$140.2	\$20.5	\$160.7
2030	\$162.5	\$23.9	\$186.4
2031	\$186.9	\$27.5	\$214.4
2032	\$213.4	\$31.5	\$244.8
2033	\$242.1	\$35.8	\$277.9
2034	\$273.2	\$40.4	\$313.6
2035	\$308.6	\$45.8	\$354.5

Employment, resident and student number should not be presented as cumulative numbers
 Source: Chmura Economics & Analytics

