

Economic Impact Analysis of Project Daffodil for the Charlottesville Region

Terance J. Rephann
Regional Economist
Weldon Cooper Center for Public Service
June 22, 2018

Copyright © 2018 by the Rector and Visitors of the University of Virginia



**WELDON COOPER
CENTER FOR PUBLIC SERVICE**
University of Virginia

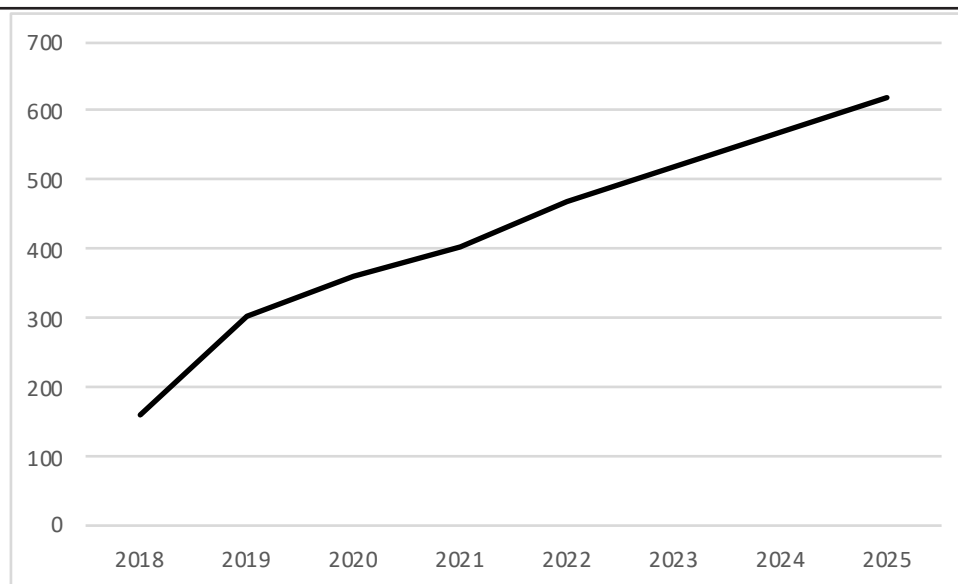
P.O. Box 400206
Charlottesville, VA 22904
(434) 982-5522 • FAX: (434) 982-5524 • TDD: (434) 982-HEAR
Website: www.coopercenter.org/

Richmond
11 South 12th Street, Suite 225
Richmond, VA 23219-4035
(804) 371-0202 • FAX: (804) 371-0234 • TDD: (804) 982-HEAR

Southwest
One College Avenue
Wise, VA 24293
(276) 328-0133 • FAX: (276) 328-0233 • TDD (540) 328-0191

This document describes the economic impact of the Albemarle County Department of Economic Development’s Project Daffodil on the Charlottesville region. The project involves the expansion of an area software firm into a renovated historically significant building complex within Albemarle County and projected near quadrupling of its existing workforce over a seven-year period. The adaptive reuse of the existing building will involve a capital expenditure of approximately \$12.3 million, of which approximately \$9.5 million will consist of building renovation expenditures and \$2.8 million will involve furniture, fixtures, and equipment purchases. The firm currently has 160 full-time workers at its Charlottesville City location. By 2025, the firm is anticipated to have 595 full-time workers, earning an average of \$80,000 in salary and wages (without adjusting for inflation) at its Albemarle County facility (see **Figure 1**). Moreover, it will employ 25 paid interns during the summer earning \$12 per hour.

Figure 1. Charlottesville Region Firm Direct Employment, Current (2018) and Projected (2019-2025)



The economic impact analysis relies on IMPLAN (Impact analysis for PLANning).¹ IMPLAN is an input-output model, which produces industry-specific economic multipliers that show how spending affects the local economy. The total economic impact consists of three parts: a “direct effect,” “an indirect effect,” and an “induced effect.” The “direct effect” measures project related employment and spending in the in the region. Expenditures made by the firm on worker payroll and purchases of supplies and services in the community cause a “ripple effect” on the local economy when money is re-spent. For example, local businesses furnish supplies and services to the firm such as legal and accounting services, utilities and advertising. These businesses spend a portion of their sales revenues on their supplies and services from other local firms who, in turn, purchase a portion of their supplies and services from other local firms. This cascading sequence of spending continues until the subsequent rounds of spending dissipate due to leakages in the form of spending outside the local area. The cumulative effect of these initial expenditures on local firms goods and services and cascading rounds of inter-industry purchases is referred to as the “indirect effect.” The final component of total impact (the “induced effect” or “induced impact”) is attributable to the

¹ IMPLAN is a product of MIG, Inc. <http://www.implan.com/>

spending of households. The firm pays its employees for their services. The households of these workers then purchase goods and services from local firms who in turn receive a portion of their labor, material and public service inputs from within the area. Again leakages occur at each round due to purchases outside the area. The “induced effect” is the sum of the impacts associated with these household purchases.

The impact analysis is conducted using IMPLAN software. It uses a 536-sector model based on 2014 data released in December 2015. Models are constructed for Albemarle County, Charlottesville City, and the Charlottesville Metropolitan Area using data for the constituent localities: the City of Charlottesville and Albemarle, Buckingham, Fluvanna, Greene, and Nelson counties. Economic impacts are evaluated within IMPLAN using three different measures: (a) total industrial output, (b) value-added, and (c) employment. Total industry output is the total value of industry production during a period. It measures sales of intermediate inputs for use in production as well as sales of products to final consumers. Value-added is a subset of total industrial output. It reflects only sales to final consumers and therefore avoids the double counting that occurs when intermediate inputs are included. It is the most commonly used measure of economic activity. Value-added is the concept behind gross domestic product (GDP) and can be compared to the GDP numbers provided by the Bureau of Economic Analysis for states and metropolitan areas. It can also be represented as total factor income plus indirect business taxes. Employment is measured in terms of person-years of employment. A person-year of employment is a job of one year in duration. Employment includes full-time and part-time employment as well as the self-employed and is measured by place of work.

Albemarle County Department of Economic Development staff provided key input data for economic impact modeling. This information included:

- Estimates of construction and furniture and equipment spending for the proposed renovated facility. The former expenditures were entered into the IMPLAN model as construction sales for IMPLAN Sector 58 (Maintenance and repair construction of nonresidential structures). The latter were entered as margins (trade markup factors) for IMPLAN Sector 395 (Wholesale trade). The percentage of direct spending resulting in sales to local businesses was estimated using IMPLAN local purchase coefficients, meaning that part of the sales occur outside the region and do not contribute to economic impacts.
- Description of the industry of firm operation. The firm is primarily engaged in writing, modifying, testing, and supporting software to meet the needs of particular customers. The North American Industrial Classification System equivalent code is 541511 (Custom Computer Programming Services). This NAICS industry maps perfectly onto IMPLAN Sector 451 (Custom computer programming services).
- Current and projected employment and employee compensation that result from firm expansion. Employee wages and salaries of full-time workers were assumed to be \$80,000 per worker per Albemarle County Department of Economic Development estimates based on the company’s current operations. These wage and salary estimates were converted to employee compensation estimates using the assumption that wages and salaries make up 71.1% of the total compensation package (which includes also benefits and payroll taxes) based on information from the Bureau of Labor Statistics on components of employee compensation for professional and business services industry (2-digit NAICS code 54).² In addition, paid interns were assumed to work for 10 weeks during the summer period at a wage rate of \$12 per hour without other forms of compensation. Employment and payroll estimates were entered into IMPLAN as employment and employee compensation inputs for IMPLAN sector 451.

2 Bureau of Labor Statistics, Employer Costs for Employee Compensation--September 2017.

Table 1 below show's the economic impact of the firm's current operations on Albemarle County. Since the firm is located within the City of Charlottesville, the direct economic impact occurs within that locality. The firm currently employs 160 workers with an estimated payroll of \$18 million, \$23.5 million in total value added, and \$32.6 million in total industrial output. Once indirect and induced effects are accounted for, the total economic impact on the firm on Albemarle County region is 31 in employment, \$2.6 million in value added, and \$4.4 million in output.³ The economic impact of the firm's current operations on the entire Charlottesville Metropolitan Area (including direct, indirect, and induced impacts) is 368 jobs, \$39.2 million in value-added, and \$58.5 million in total industrial output.

Table 1. Firm Operations Economic Impacts, Employment, Value Added, and Total Industrial Output

	Albemarle County	Charlottesville Metro-Area
Employment		
Direct	0	160
Indirect	9	97
Induced	22	111
Total	31	368
Value Added		
Direct	\$0	\$23,459,280
Indirect	\$798,317	\$7,066,622
Induced	\$1,844,419	\$8,666,608
Total	\$2,642,737	\$39,192,509
Output		
Direct	\$0	\$32,603,966
Indirect	\$1,389,260	\$11,120,345
Induced	\$3,022,469	\$14,812,798
Total	\$4,411,729	\$58,537,110

Table 2 shows the economic impact of the proposed capital spending activity. The proposed construction budget for all of the capital improvements will have a direct impact of 59 jobs, \$4 million in value added, and \$9.1 million in output. Once multiplier effects are included, the total economic impact for the Albemarle County is 82 jobs, \$5.8 million in value-added, and \$11.9 million in output. For the larger Charlottesville Metropolitan Area, the total economic impact is 93 jobs, \$6.6 million in value-added and \$13.6 million in output.

³ These estimates were made using an IMPLAN Multi-Regional Model with the linked component regions being the City of Charlottesville and Albemarle County. This model shows how direct economic stimulus in one region (City of Charlottesville) affects other geographically proximate regions (Albemarle County) through supply chain effects.

Table 2. Project Daffodil's Construction-Related Economic Impacts, Employment, Value Added, and Total Industrial Output

	Albemarle County	Charlottesville Metropolitan Area
Employment		
Direct	59	59
Indirect	13	17
Induced	10	17
Total	82	93
Value Added		
Direct	\$3,996,060	\$3,996,060
Indirect	\$983,987	\$1,296,924
Induced	\$774,285	\$1,313,108
Total	\$5,754,332	\$6,606,092
Output		
Direct	\$9,101,327	\$9,101,327
Indirect	\$1,531,036	\$2,214,615
Induced	\$1,239,395	\$2,242,800
Total	\$11,871,758	\$13,558,742

Table 3 shows the local economic impacts that result from the firm's expansion over the period 2019-2025. Firm direct employment is projected to nearly double to 305 workers at the new facility in 2019 and expand 50-70 jobs each year thereafter through 2025. The total employment impact on Albemarle County increases from 563 in 2019 to 1,152 in 2025. Corresponding value-added and output impacts are \$62.3 million and \$93.3 million in 2019 and \$131 million and \$190 million in 2025. For the Charlottesville Metropolitan Area, the total economic impact is 686 jobs in 2019, which grows to 1,412 jobs in 2025. Associated value added and output impacts are \$70.6 million and \$109.6 million in 2019 and growing to \$148.6 million and \$225.1 million in 2025.

Table 3. Project Daffodil's Projected Operations Economic Impacts, Employment, Value Added, and Total Industrial Output*

Albemarle County							
	2019	2020	2021	2022	2023	2024	2025
Employment							
Direct	305	363	403	470	520	570	620
Indirect	151	179	199	232	257	281	306
Induced	107	130	145	170	189	207	226
Total	563	672	747	872	966	1058	1152
Value Added							
Direct	\$41,759,833	\$50,777,261	\$56,669,296	\$66,538,450	\$73,903,493	\$81,268,533	\$88,633,576
Indirect	\$11,854,935	\$14,109,316	\$15,664,063	\$18,268,260	\$20,211,693	\$22,155,125	\$24,098,557
Induced	\$8,699,168	\$10,578,808	\$11,806,659	\$13,863,308	\$15,398,121	\$16,932,934	\$18,467,747
Total	\$62,313,936	\$75,465,385	\$84,140,018	\$98,670,018	\$109,513,307	\$120,356,592	\$131,199,880
Output							
Direct	\$62,151,315	\$73,970,251	\$82,121,252	\$95,774,156	\$105,962,901	\$116,151,637	\$126,340,382
Indirect	\$17,240,620	\$20,519,163	\$22,780,230	\$26,567,512	\$29,393,844	\$32,220,175	\$35,046,507
Induced	\$13,932,504	\$16,943,005	\$18,909,554	\$22,203,520	\$24,661,705	\$27,119,889	\$29,578,073
Total	\$93,324,438	\$111,432,420	\$123,811,036	\$144,545,188	\$160,018,450	\$175,491,701	\$190,964,962
Charlottesville Metro Area							
	2019	2020	2021	2022	2023	2024	2025
Employment							
Direct	305	363	403	470	520	570	620
Indirect	184	219	243	284	314	344	374
Induced	197	239	267	314	348	383	418
Total	686	821	913	1068	1182	1297	1412
Value Added							
Direct	\$41,759,833	\$50,777,261	\$56,669,296	\$66,538,450	\$73,903,493	\$81,268,533	\$88,633,576
Indirect	\$13,470,748	\$16,032,398	\$17,799,055	\$20,758,201	\$22,966,521	\$25,174,840	\$27,383,160
Induced	\$15,341,549	\$18,659,676	\$20,826,328	\$24,455,470	\$27,163,785	\$29,872,100	\$32,580,415
Total	\$70,572,130	\$85,469,335	\$95,294,679	\$111,752,121	\$124,033,799	\$136,315,473	\$148,597,151
Output							
Direct	\$62,151,315	\$73,970,251	\$82,121,252	\$95,774,156	\$105,962,901	\$116,151,637	\$126,340,382
Indirect	\$21,198,159	\$25,229,283	\$28,009,372	\$32,666,015	\$36,141,124	\$39,616,231	\$43,091,340
Induced	\$26,220,969	\$31,892,324	\$35,595,525	\$41,798,383	\$46,427,383	\$51,056,382	\$55,685,382
Total	\$109,570,443	\$131,091,858	\$145,726,149	\$170,238,554	\$188,531,408	\$206,824,250	\$225,117,104

* Note: All dollar denominated values are expressed in current (2018) dollars. They are not adjusted for projected inflation.

Table 4 shows the indirect and induced economic impacts on both Albemarle County and the Charlottesville Metropolitan Area on individual industries in build-out year 2025. These economic impacts largely reflect growth and future opportunities for business expansion in providing supplies and services to the regions as the firm expands. The largest sector of employment impact is services. Within services, the largest employment impact (210 in Charlottesville Metropolitan Area and 174 in Albemarle County) is felt within the Administrative and Support and Waste Management industry as a result of the increased utilization of temporary employment services by workers in all sectors. Professional services (e.g., legal, accounting, management, marketing) account for 74 indirect and induced jobs. Education, Health Care, and Social Assistance; Finance, Insurance, and Real Estate; Accommodation and Food Services; and Retail and Wholesale Trade industries account for at least 40 jobs in both Albemarle County and the Charlottesville Metropolitan Area.

Table 4. Project Daffodil Indirect and Induced Employment Impacts by Industry, 2025

	Albemarle County	Charlottesville Metropolitan Area
Agriculture	0	2
Mining	0	1
Construction	5	8
Manufacturing	1	3
Transportation, Information, and Public Utilities	12	35
Retail and Wholesale Trade	51	81
Services	462	656
Finance, Insurance, and Real Estate	53	85
Professional, Scientific, and Technical Services	74	96
Management of Companies and Enterprises	9	13
Administrative and Support and Waste Management	174	210
Education, Health Care, and Social Assistance	62	89
Arts, Entertainment, and Recreation	15	25
Accommodation and Food Services	40	76
Other Services	35	62
Government	1	6
Total	532	792