

The Economic Impact of the University of Maryland School of Medicine Research Operations Occurring in the Health Sciences Facility III



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Introduction

The University of Maryland School of Medicine (SOM) retained the University of Baltimore's Jacob France Institute (JFI) to prepare an analysis of the economic impacts of the university research operations occurring in Health Sciences Facility III (HSF3), a state-of-the-art biomedical research facility currently under construction. HSF3 will allow for expansion of the School of Medicine's research operations in a facility designed to improve cross-pollination and interaction among Departments, Programs, Centers, and Institutes and increasing the SOM's standing as one of the top research institutions in the country. HSF3 is located across the street from two existing SOM research buildings and adjacent to the Schools of Dentistry and Pharmacy. The new building will include an outdoor park space in front of the entrance which will attract students, trainees, staff and faculty from the SOM and other adjacent areas. This outdoor space will serve as a much needed green space within the urban environment. UMB broke ground on HSF3 in September 2013 and the project is expected to be operational in January, 2018.

The completion of HSF3 will allow the School of Medicine to accommodate and meet the needs of its expanding research enterprise. HSF3 is a state-of-the-art facility that will house the SOM's most well-funded investigators working to answer "big science" research questions using a multidisciplinary approach. One of the first collaborative programs to be housed in the HSF3 will be the partnership of the Institute for Genome Sciences and the Program in Personalized and Genomic Medicine. HSF3 is a 430,000 GSF facility designed with two distinct forms: a lab tower that features wet lab, wet lab support and office spaces for wet lab researchers; and a lower dry lab bar that features workstations and offices for computational research groups. These two forms are connected by a glass atrium with bridges across it to allow for easy movement between wet lab and dry lab areas. The building includes a vivarium capable of housing varying species up to the size of non-human primates. HSF3 will also include a high-end research based imaging core in the lower level. A majority of the space in this highly collaborative facility has not been assigned to existing programs (the expectations are noted above) but will be used to recruit new, interdisciplinary researchers with the goals of expanding the world-renowned programs already housed with the SOM and UMB. The recruitment initiative underway is named, the Special Trans-Disciplinary Recruitment Award Program (STRAP).

In 2011, the JFI prepared an analysis of the planned construction expenditures associated with and expected educational and research operations occurring in the building prior to its construction.¹ This report updates this prior economic impact analysis using more recent estimates of the planned research operations projected to occur in the building that are based on the final operational characteristics of the building. Once it is developed and fully occupied, the building is projected to house 470 research and related personnel. The inputs to the economic impact analysis were based on the net assignable square feet of the project described in Table 1, based on: one job per 250 square feet of office space; and one job per 500 square feet of laboratory space; all generally accepted relationships of employment to building size.

¹ The Economic Impact of the University of Maryland, Baltimore's Health Sciences Facility III on The State of Maryland, May 2011.

Table 1: Modeling Inputs for the Health Sciences Facility III**Operational Phase**

Total Usable Space when Complete (sq. ft.)	<u>224,521</u>
Wet Lab & Lab Support	100,455
Dry Lab	11,890
Core Facilities	23,560
Office	24,864
Shell (to be developed later)	41,550
Lobby/ Break Rm/Gathering	22,202

Estimated Jobs Created¹ 470

(1) Estimated at 1 job per 250 sq. ft. for office space, and 1 job per 500 sq. ft. for laboratory and related space. Undeveloped shell space was allocated to uses based on available planning materials with any unallocated space allocated to office/laboratory uses based on the total project space.

Source: UMB and JFI.

Operating Impact

The development of HSF3 will provide the space needed by the University of Maryland Baltimore to support the continued and expected growth of the School of Medicine research programs. Once HSF3 is complete and fully occupied, it is projected to house 470 research and associated personnel and generate an estimated \$107.4 million in annual research funding. The \$107.4 million in new research revenues and associated 470 research jobs in HSF3 will be augmented with \$55.9 million and 319 jobs in the form of *indirect effects*, from the purchase of local supplies and raw materials as part of the research and development activities undertaken in the new building, and \$49.0 million and 339 jobs in the form of *induced effects* resulting from the new jobs created. This increase in research activities is projected to retain or increase economic activity in the Maryland economy by an estimated \$212.3 million, support 1,128 jobs earning \$84.5 million in labor income, and generate an estimated \$8.0 million in State and local government revenues.

Table 2: Economic Impacts of the Research Operations Occurring in HSF III

Operational Phase	Direct	Indirect	Induced	Total
Economic Output (\$s)	\$107,429,302	\$55,909,452	\$48,983,760	\$212,322,514
Employment (# of Jobs)	470	319	339	1,128
Labor Income (\$s)	\$46,632,483	\$20,908,327	\$16,927,220	\$84,468,030
Average Labor Income per Job (\$s)	\$99,218	\$65,523	\$49,962	\$74,890
State and Local Government Revenues (\$s)	\$2,452,818	\$2,420,489	\$3,122,983	\$7,996,289

Source: IMPLAN

As presented in Tables 3, 4 and 5, which describe the economic output, employment and labor income impacts of HSF3 by sector, the facility will have a broad-based impact on the State's economy, with the largest impacts in the professional services, real estate, finance and insurance, and health and social services sectors.

Table 3: Output Impact of the Research Operations Occurring in HSF3, By Sector

Item	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Total	<u>\$107,429,302</u>	<u>\$55,909,452</u>	<u>\$48,983,760</u>	<u>\$212,322,514</u>
Natural Resources	\$0	\$41,158	\$74,393	\$115,551
Mining	\$0	\$18,569	\$19,957	\$38,526
Utilities	\$0	\$1,136,227	\$1,338,102	\$2,474,329
Construction	\$0	\$636,231	\$701,960	\$1,338,191
Manufacturing	\$0	\$412,467	\$1,124,050	\$1,536,517
Wholesale Trade	\$0	\$421,313	\$2,231,461	\$2,652,774
Retail Trade	\$0	\$152,245	\$4,222,858	\$4,375,103
Transportation & Warehousing	\$0	\$1,170,986	\$1,244,276	\$2,415,262
Information	\$0	\$2,342,529	\$2,725,359	\$5,067,888
Finance & Insurance	\$0	\$3,124,877	\$5,013,210	\$8,138,087
Real Estate	\$0	\$13,560,609	\$10,493,748	\$24,054,357
Professional Scientific & Technical Services	\$107,429,302	\$25,081,285	\$1,981,769	\$134,492,356
Management of Companies	\$0	\$1,491,658	\$500,106	\$1,991,764
Administrative & Waste Services	\$0	\$4,186,174	\$1,268,805	\$5,454,979
Educational Services	\$0	\$2,281	\$1,204,354	\$1,206,635
Health & Social Services	\$0	\$245	\$8,095,541	\$8,095,786
Arts, Entertainment & Recreation	\$0	\$138,387	\$856,384	\$994,771
Accommodation & Food Services	\$0	\$609,654	\$2,735,242	\$3,344,896
Other Services	\$0	\$900,943	\$2,394,910	\$3,295,853
Government	\$0	\$481,614	\$757,275	\$1,238,889

Source: JFI and IMPLAN

Table 4: Employment (Jobs)² Impact of the Research Operations Occurring in HSF3, By Sector

Item	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Total	470	319	339	1,128
Natural Resources	0	1	1	1
Mining	0	0	0	0
Utilities	0	1	1	2
Construction	0	3	3	6
Manufacturing	0	1	2	3
Wholesale Trade	0	2	9	11
Retail Trade	0	2	52	54
Transportation & Warehousing	0	8	8	16
Information	0	5	5	10
Finance & Insurance	0	15	24	40
Real Estate	0	59	17	76
Professional Scientific & Technical Services	470	136	13	619
Management of Companies	0	6	2	8
Administrative & Waste Services	0	60	17	77
Educational Services	0	0	15	15
Health & Social Services	0	0	76	76
Arts, Entertainment & Recreation	0	2	12	14
Accommodation & Food Services	0	9	42	51
Other Services	0	9	32	41
Government	0	3	6	9

Source: JFI and IMPLAN

² Jobs created by HSF III and associated economic impacts on a headcount (not FTE) basis.

Table 5: Labor Income Impact of the Research Operations Occurring in HSF3, By Sector

Item	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Total	<u>\$46,632,483</u>	<u>\$20,908,327</u>	<u>\$16,927,220</u>	<u>\$84,468,030</u>
Natural Resources	\$0	\$17,519	\$23,534	\$41,053
Mining	\$0	\$6,726	\$6,400	\$13,126
Utilities	\$0	\$140,641	\$168,229	\$308,870
Construction	\$0	\$263,585	\$282,047	\$545,632
Manufacturing	\$0	\$90,345	\$136,130	\$226,475
Wholesale Trade	\$0	\$156,340	\$828,045	\$984,385
Retail Trade	\$0	\$57,646	\$1,889,452	\$1,947,098
Transportation & Warehousing	\$0	\$397,813	\$452,411	\$850,224
Information	\$0	\$701,700	\$577,998	\$1,279,698
Finance & Insurance	\$0	\$1,108,383	\$1,724,782	\$2,833,165
Real Estate	\$0	\$1,295,507	\$432,700	\$1,728,207
Professional Scientific & Technical Services	\$46,632,483	\$12,104,708	\$976,715	\$59,713,906
Management of Companies	\$0	\$743,972	\$249,431	\$993,403
Administrative & Waste Services	\$0	\$2,670,039	\$690,574	\$3,360,613
Educational Services	\$0	\$1,376	\$729,290	\$730,666
Health & Social Services	\$0	\$155	\$4,552,411	\$4,552,566
Arts, Entertainment & Recreation	\$0	\$55,562	\$309,597	\$365,159
Accommodation & Food Services	\$0	\$252,773	\$1,148,765	\$1,401,538
Other Services	\$0	\$595,639	\$1,372,447	\$1,968,086
Government	\$0	\$247,898	\$376,262	\$624,160

Source: JFI and IMPLAN

METHODOLOGY AND TERMS

The economic impact analysis of the development of the HSF3 research building used the IMPLAN input-output model for Maryland. IMPLAN is one of the most widely used models in the nation, and can be used to analyze the impacts of companies, projects, or of entire industries. An input-output analysis examines the relationships among businesses and among businesses and final consumers. Input-output analysis is based on the use of multipliers, which describe the response of an economy to a change in demand or production. Multipliers measure the effects on an economy from a source of economic activity, in this case the research operations occurring in HSF3.

The economic activity generated in a city, county, region or state is greater than the simple total of spending associated with the event or activity being studied. This is because as this money is earned it is, in turn, spent, earned and re-spent by other businesses and workers in the state economy through successive cycles of spending, earning and spending. However, the spending in each successive cycle is less than in the preceding cycle because a certain portion of spending “leaks” out of the economy in each round of spending. Leakages occur through purchases of goods or services from outside of the region and federal taxation. The IMPLAN multipliers used in this analysis capture the effects of these multiple rounds of spending. This analysis focuses on three measures of economic impact:

- **Output.** The total value of production or sales in all industries;
- **Employment.** The total number of full and part time jobs in all industries; and
- **Labor Income.** The wages and salaries, including benefits, and other labor income earned by the workers holding the jobs created.

Four measures of the economic activity and impact of the jobs supported by the research operations occurring in the HSF3 Research Building are included in this report:

- **Direct effects.** The change in economic activity being analyzed—in this case the UMB research operations occurring in or supported by HSF3;
- **Indirect effects.** The changes in inter-industry purchases, for example the purchase of research materials, in response to the change in demand from the directly affected industries;
- **Induced effects.** The changes in spending from households as income and population increase due to changes in production; and
- **Total effects.** The combined total of direct, indirect and induced effects.