

LONG ISLAND CENTER FOR SOCIO-ECONOMIC POLICY

**ECONOMIC IMPACT
OF
BROOKHAVEN NATIONAL LABORATORY - 2021**

**PREPARED FOR
BROOKHAVEN SCIENCE ASSOCIATES**

**PREPARED BY
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of
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ABSTRACT

This analysis presents and quantifies the 2021 significant economic impact that Brookhaven National Laboratory had on the New York State and Long Island economy. The analysis illustrates how the \$781 million of revenues and grants received by Brookhaven National Laboratories generated primary and secondary economic activity from construction and non-construction gross output activity of \$826.5 million from 14,100 contracts with 886 suppliers. A total of \$446.1 million of direct, primary economic activity was generated from \$55.4 million of construction activity, \$111.8 million from non-construction activity, \$16.1 million from utilities and \$262.8 million from wages. The \$283.2 million of primary economic impact from earnings generated \$265.0 million of secondary economic impact for a total economic impact of \$548.2 million, also generating \$68.4 million of sales and payroll related taxes for state and local governments.

Of the 6,054 primary and secondary jobs generated from the 3,153 primary jobs, 95.2% of the jobs are located on Long Island, and of the 673 visiting scientists who spent a total of 24,140 dates at Brookhaven National Laboratory, 250 of the visitors reside on Long Island, spending 16,884 dates at the Laboratory.

INTRODUCTION

Brookhaven National Laboratory was established in 1947 on Long Island, approximately 60 miles east of Manhattan, at the site of the U.S. Army's former Camp Upton.

Originally built to explore the peaceful applications of atomic energy, Brookhaven National Laboratory has broadened its mission to perform basic and applied research at the frontiers of science. Brookhaven Lab's enduring priorities are discovery science and technology; transformational user facilities, including accelerator science and technology; and applying the Lab's capabilities to new opportunities, e.g., energy and national security solutions as well as isotopes. Brookhaven's current initiatives include:

- Nuclear physics: Uncovering the structure of visible matter
- Clean energy and climate: Enabling a net-zero U.S. economy
- Quantum information science and technology: Enabling the quantum computing revolution
- Human-AI-facility integration: Integrating artificial intelligence into facilities for discovery science
- High energy physics: Understanding the origin of space and time
- Isotope production: Ensuring the nation's isotope supply
- Accelerator science and technology: Delivering accelerator technology for the nation's future

Since its inception, Brookhaven National Laboratory has housed three research reactors, numerous one-of-a-kind particle accelerators, and other cutting-edge research facilities responsible for discoveries leading to many advances for science and society as well as seven Nobel Prizes.

The Laboratory's 2,700-plus staff members and scientists comprise diverse research teams that address the United States Department of Energy's mission to ensure the nation's security and prosperity by addressing its energy, environmental, and nuclear challenges through transformative science and technology solutions.

The staff of Brookhaven National Laboratory build and operate facilities that house unique tools used by interdisciplinary teams comprising researchers from Brookhaven National Laboratory as well as those from other national labs, academia, and industry. In fiscal year 2021, the Laboratory received \$731 million of revenues and grants and generated nearly \$827 million of

economic activity, while attracting as many as 4,440 national and international facility users and guest researchers. The Laboratory offers robust STEM education and workforce development programs that typically draw more than 30,000 participants annually.

The following analysis illustrates the economic importance of Brookhaven National Laboratory to the Long Island regional economy and to New York State during 2021, as the region and state began to emerge from the economic challenges of the COVID-19 pandemic.

METHODOLOGY AND TERMINOLOGY

The economic impact of Brookhaven National Laboratory on Long Island and New York State is assessed in this analysis by using the input-output model and resulting multipliers formulated by the Bureau of Economic Analysis (BEA). The economic impact of spending by Brookhaven National Laboratory consists of three components of direct, indirect and induced effect which appear in this analysis as primary and secondary economic activity.

Multipliers in this analysis quantify the secondary economic impact of the inter-industry purchases and wages paid and customized by BEA to account for economic activity in contiguous counties of the United States.

Multipliers are an economic concept where an increase in spending results in an increase in total output greater than the initial amount spent because initial spending on contractors, employees, and suppliers by Brookhaven National Laboratory is income for each group. These groups, in turn, spend part of the income earned from the spending by Brookhaven National Laboratory into further income and spending.

Thus, multipliers illustrate the total economic activity resulting from the primary spending by Brookhaven National Laboratory, and when the secondary economic impact is included, the total economic impact is greater than the original spending.

In this analysis the change in total economic activity is developed through analysis of total gross output (total economic impact of expenditures), earnings (wages), and employment (jobs). The economic activity in each category is expressed as primary and secondary economic activity.

Primary economic activity is the original spending in each of Brookhaven National Laboratory's spending centers in furtherance of its mission. Secondary economic activity is the multiplier impact of the primary spending in the surrounding economy.

Expenditures, or gross output are expressed as the total of primary spending and the secondary value-added impact of that spending in the economy. Expenditures include the total of primary spending on construction and non-construction activities, supplies, utilities, and wages and the multiplier impacted secondary value-added spending.

Earnings consists of wages, salaries and proprietor's income net of social security taxes and pension plan contributions withheld, which is that portion available for wage earners and householders to spend.

Employment is the primary count of jobs that include both full-time and part-time workers with the secondary jobs expressed as the primary jobs impacted by their respective multipliers.

The New York State Unemployment Insurance and the Metropolitan Transportation Authority tax are actual and sales taxes are calculated by applying applicable sales tax rates to the value of earnings generated.

DATA

The expenditure, wage, job and federal, state, and local payroll tax data presented in this analysis were provided by Brookhaven National Laboratory, while sales taxes are projected based upon sales tax rates obtained from the New York State Department of Taxation and Finance. Multipliers were obtained by RIMs II output by the Bureau of Economic Analysis. The multipliers were then applied to specific Brookhaven National Laboratory expense categories.

ECONOMIC IMPACT OF BROOKHAVEN NATIONAL LABORATORY

Gross Output Economic Impact

In 2021, the \$731 million of revenues and grants received by Brookhaven National Laboratory generated economic activity from construction and non-construction gross output activity. Table 1 illustrates that \$826.5 million of total primary and secondary economic activity was generated in 2021 from 14,100 contracts with 886 suppliers. A total of \$446.1 million of direct, primary economic activity was generated from \$55.4 million of construction activity, \$111.8 million from non-construction activity, \$16.1 million from utilities, and \$262.8 million from wages.

The \$446.1 million of direct, primary economic activity created an indirect, secondary economic impact of \$380.5 million comprised of \$40.9 million from construction, \$82.1 million from non-construction, \$6.5 million from utilities, and \$251.0 million from wages.

Table 1: Brookhaven National Laboratory 2021 Gross Output Economic Impact

<u>Expenditure Category</u>	<u>Contracts</u>	<u>Suppliers</u>	<u>Primary Economic Impact</u>	<u>Secondary Economic Impact</u>	<u>Total Economic Impact</u>
<u>Construction: Total</u>	<u>701</u>	<u>55</u>	<u>\$55,353,451</u>	<u>\$40,933,289</u>	<u>\$96,286,740</u>
Long Island	350	27	27,667,088	21,303,658	48,970,746
Rest of New York	351	28	27,686,363	19,629,631	47,315,994
<u>Non-Construction: Total</u>	<u>13,399</u>	<u>831</u>	<u>\$111,780,440</u>	<u>\$82,082,968</u>	<u>\$193,863,408</u>
Long Island	6,198	337	46,403,866	35,730,977	82,134,843
Rest of New York	7,201	494	65,376,574	46,351,991	111,728,565
Utilities	----	----	\$16,100,000	\$ 6,488,300	\$ 22,588,300
Wages	----	----	\$262,828,100	\$251,000,836	\$513,828,936
Total	14,100	886	\$446,061,991	\$380,505,393	\$826,567,384

Local Gross Output Economic Impact

In 2021, Brookhaven National Laboratory issued 14,100 contracts to 886 suppliers. Of these, 46.4% or 6,548 contracts went to 364 Long Island vendors or 42.1% of all suppliers. When earnings and utilities associated with these contracts and suppliers are spent locally, they generate for the Long Island economy a total economic impact of \$667.5 million, or 80.8% of the \$826.5 million total 2021 primary and secondary economic impact of Brookhaven National Laboratory.

Earnings Economic Impact

While Table 1 illustrates the total economic impact of Brookhaven National Laboratory spending, Table 2 projects the total economic impact of Brookhaven National Laboratory earnings expenditures. The \$283.2 million of primary economic impact from earnings generates \$265.0 million of secondary economic impact for a total economic impact of \$548.2 million.

Table 2: Brookhaven National Laboratory 2021 Economic Impact of Earnings

<u>Expenditure Category</u>	<u>Primary Economic Impact</u>	<u>Secondary Economic Impact</u>	<u>Total Economic Impact</u>
<u>Construction: Total</u>	<u>\$17,300,000</u>	<u>\$12,793,350</u>	<u>\$30,093,350</u>
Long Island	8,650,000	6,660,500	15,310,500
Rest of New York	8,650,000	6,132,850	14,782,850
Utilities	\$ 3,042,900	\$1,189,777	4,232,677
Wages	\$262,828,100	\$251,000,836	\$513,828,936
Total	\$283,171,000	\$264,983,963	\$548,154,963

Local Earnings Economic Impact

The Long Island economy benefits greatly from the earnings paid by Brookhaven National Laboratory with 97.1% of the primary economic impact and 97.7% of the secondary economic impact earned on Long Island. Similarly, of the \$548.2 million of total economic impact, 97.3% of the total economic impact from earnings was generated on Long Island.

Impact on Employment

Table 3 illustrates the impact on local employment of Brookhaven National Laboratory.

Table 3: Brookhaven National Laboratory 2021 Impact on Employment

Expenditure Category	Primary Jobs	Secondary Jobs	Total Jobs
<u>Construction: Total</u>	<u>346</u>	<u>255</u>	<u>601</u>
Long Island	173	133	306
Rest of New York	173	122	295
Utilities	62	25	87
Wages	2,745	2,621	5,366
Total	3,153	2,901	6,054

Of the 6,054 primary and secondary jobs generated from the 3,153 primary jobs, 95.2% of the jobs are located on Long Island. Additionally, of the 673 visiting scientists who spent a total of 24,140 dates at Brookhaven National Laboratory, 250 of the visitors reside on Long Island, spending 16,884 dates at the Laboratory.

State and Local Tax Impact

Table 4 illustrates that Brookhaven National Laboratory remits a total of \$68.4 million of New York State and local sales taxes, New York State Unemployment Insurance and the Metropolitan Transportation Authority Payroll Tax.

Table 4: Brookhaven National Laboratory 2021 Tax Payments

Expenditure Category	Total Paid
Sales Taxes	\$ 66,386,202
New York State Unemployment Insurance	983,817
Metropolitan Transportation Authority Tax	1,036,356
Total	\$ 68,406,375

CONCLUSION

In 2021, the \$731 million of revenues and grants received by Brookhaven National Laboratory generated primary and secondary economic activity from construction and non-construction gross output activity of \$826.5 million from 14,100 contracts with 886 suppliers. A total of \$446.1 million of direct, primary economic activity was generated from \$55.4 million of construction activity, \$111.8 million from non-construction activity, \$16.1 million from utilities, and \$262.8 million from wages. The \$283.2 million of primary economic impact from earnings generated \$265.0 million of secondary economic impact for a total economic impact of \$548.2 million, also generating \$68.4 million of sales and payroll related taxes for state and local governments.

Of the 6,054 primary and secondary jobs generated from the 3,153 primary jobs, 95.2% of the jobs are located on Long Island, and of the 673 visiting scientists who spent a total of 24,140 dates at Brookhaven National Laboratory, 250 of the visitors reside on Long Island, spending 16,884 dates at the Laboratory.

There is little doubt that Brookhaven National Laboratory provides a significant economic impact on Long Island's and New York State's economy.

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Martin R. Cantor has a Bachelor of Science Degree in Accounting from Brooklyn College of the City University of New York, a Master of Arts Degree in Interdisciplinary Studies from Hofstra University focusing on the socio-economic relationships between education, household income, community and workforce development, and a Doctor of Education Degree from Dowling College. He has won a Regional Edward R. Murrow Award and four Long Island Press Awards for his work on News 12's The New Normal during the pandemic. He has served as Suffolk County Economic Development Commissioner (New York State's largest suburban county), brought Computer Associates to Suffolk County, and created over 23,000 jobs with an estimated \$1.4 billion annual payroll economic impact. He has served as: Vice-Chair-Suffolk County Industrial Development Agency; Chief Economist-New York State Assembly Subcommittee for the Long Island Economy; Senior Fellow at the White Plains, New York based Institute for Socioeconomic Studies - a public policy think tank concentrating on poverty in America and senior citizen quality of life; Chair and Chief Economist of the Long Island Development Corp; Chief Economist for Destination LI; a building trades labor/management arbitrator; a consultant to the Nassau Interim Financial Authority; a faculty member in the Brooklyn College Department of Economics; Executive Director of the Patchogue Village Business Improvement District; and Director of Economic Development and Chief Economist for Sustainable Long Island, and the Long Island Fund for Sustainable Development, providing financial, technical assistance to businesses and not-for-profit organizations His work is included in the *National Tax Rebate-A New America With Less Government*, and has prepared downtown revitalization plans for Long Island and New York City neighborhoods featuring arts districts, economic restructuring, waterfront projects and community organizing. He was the architect of the Nassau County Comptroller's debt restructuring plan for resolving Nassau County's fiscal crisis; has been a columnist for Long Island Business Journal and Networking Newspaper for Women; has authored: federal, state and local legislation; economic impact analyses; analysis of Long Island's economic, demographic, employment, tax, and educational bases; a convention center feasibility study; an analyses of taxpayer costs of acquiring open space and health care reform; and Director of Dowling College's Long Island Economic and Social Policy Institute; and an Adjunct Associate Professor of Economics

He is a Certified Public Accountant in private practice; Director of the Long Island Center for Socio-Economic Policy, a consulting economist and economic development consultant to public officials, counties, towns, villages, Industrial Development Agencies, and communities; and Chairman of the Suffolk County Judicial Facilities Agency which financed the acquisition of the Cohalan State Court Complex, oversaw the construction of the Suffolk County Jail in Yaphank and financed the \$70 million purchase/leaseback of the Dennison Building to Suffolk County. He provides economic and business commentary on television and radio; was Co-host of Focus 55, a public affairs program on Channel 55, is a columnist for the Long Island Business News, Long Island's largest business weekly, has appeared in the New York Times, Newsday, and LI Pulse, and has been syndicated nationally by Newsday, Bridge News and Knight-Ridder/Tribune News Service. He is an Honorary Member of Delta Mu Delta - The National Honor Society in Business Administration and has been recognized by the National Association of Counties for innovative uses of Industrial Revenue Bonds, for international trade promotion initiatives, for downtown revitalization policies, and for minority business incubator initiatives. He was invited by Dr. William Julius Wilson of Harvard University's John F. Kennedy School of Government to present his paper entitled *Race Neutral Sustainable Economic Development*. He is the author of *Long Island, The Global Economy and Race: The Aging of America's First Suburb*, and his paper *Retention of Long Island Millennials at a Community College: Are They College Ready?* appeared in the international peer-reviewed Journal for Leadership and Instruction.