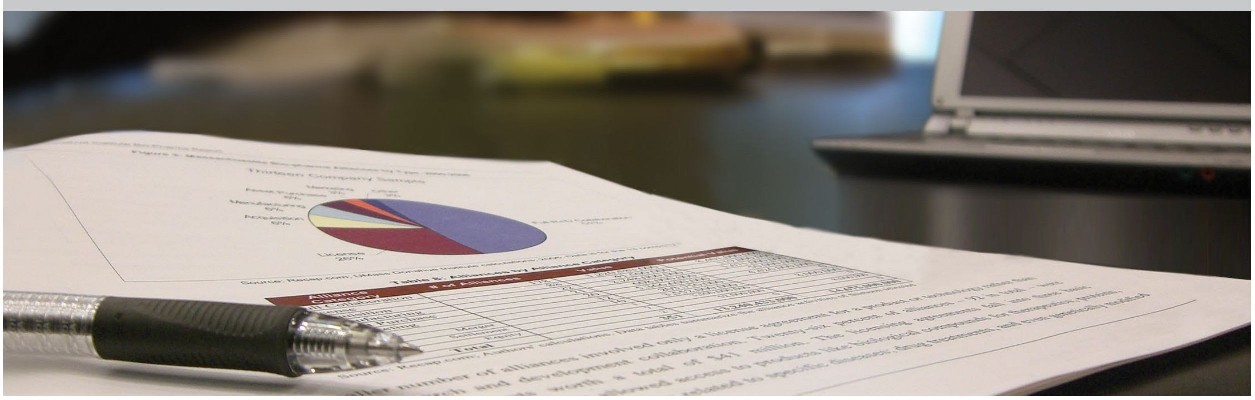
Economic Contributions of R&D Funding in Massachusetts

Estimates of Recent Funding and Economic Multipliers

July 2025



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Economic Contributions of R&D Funding in Massachusetts

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Acknowledgments

As any reader of this document undoubtedly knows, federal research funding plays an incredibly important role in the higher education and health care sectors of the economy, particularly in a state like Massachusetts with high concentrations of elite colleges and universities, teaching hospitals, and other research facilities. In the early months of 2025, the Trump Administration began a series of steps aimed at changing funding priorities and requirements for how research and development dollars are spent by receiving organizations. While these potential policy changes are not resolved at the time of this publication, any changes to how federal research funding is allocated would likely have significant implications for the Massachusetts economy. This research is an early attempt at understanding and quantifying the importance of federal research dollars to the overall economy of the state.

On such an important and time sensitive issue to the Commonwealth, the University of Massachusetts Donahue Institute (UMDI) received critical support at a variety of levels of both the university system and state government. First UMDI would like to thank President Marty Meehan and the University of Massachusetts President's Office for providing financial support for this work. UMDI would also like to acknowledge the administrative and thought leadership provided by various members of the University of Massachusetts Amherst community including:

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Introduction

Massachusetts has built its economy on a foundation of learning, teaching, and innovation. In turn, this knowledge economy depends on federal research and development (R&D) funding to support early-stage or high-risk, high-reward research projects. From the Commonwealth's colleges and universities to its hospitals and pharmaceutical firms, federal R&D funding underlies many of the inventions and innovations created in Massachusetts. The Commonwealth is regularly among the top three states for National Institutes of Health (NIH) and National Science Foundation (NSF) funding and typically the top recipient in the country in per capita terms. Moreover, Massachusetts is home to one in every 10 jobs in R&D in the US, compared to one in 40 for all jobs throughout the economy.

In the early months of 2025, the Trump Administration began a series of steps aimed at changing funding priorities and requirements for how dollars are spent by recipient organizations (e.g., capping the institutional overhead rate). While these potential policy changes are unresolved at the time of this publication, proposed and actual changes in federal funding and support for R&D create uncertainty over future economic outcomes in Massachusetts.

With this context in mind, the University of Massachusetts Donahue Institute (UMDI) developed a two-phase study examining the importance of federal research funding on the state and considers how changes in funding amounts and priorities could create disruptions today and in the future. This current report represents phase one and considers the direct economic contributions and multiplier effects ("spin offs") associated with federal research funding awarded to institutions in Massachusetts.

This study shows that research funding is an important part of the economic infrastructure of Massachusetts. R&D funding creates and supports jobs beyond those in research occupations and research organizations, with thousands more blue-collar and service jobs in sectors that support the industry including construction, food services, health care, retail, and administrative support. Two of every five jobs created by research funding are created outside of sectors that directly receive the funding itself.

Overall, research funding supports a total of 81,300 jobs, $7.8 billion in income, and more than $16 billion in total economic activity. The R&D also represents a good return on investment with every dollar of research funding creating nearly two dollars of economic activity before accounting for any of the future benefits of the new knowledge gained. Research funding has proven essential for the Massachusetts economy and maintenance of ongoing and reliable funding is essential for jobs, economic activity, and revenues. Researchers rely on these investments to ensure Massachusetts continues to lead in research and innovation.

Findings

Annual Economic Contributions

For R&D projects that include FY24, the average annual federal R&D funding to Massachusetts was $8.6 billion. The top three awarding agencies were the National Institutes of Health (NIH), Department of the Air Force, and National Science Foundation (NSF), which together accounted for $6.3 billion of the total. These funds were awarded to 715 unique entities across three main sectors: R&D in private and nonprofit organizations, universities, and hospitals, with funding shares of 52 percent, 41 percent, and seven percent, respectively.

The $8.6 billion annual funding directly creates or supports 46,600 jobs, $4.8 billion of income, and $5.8 billion of value added (or gross state product) (see **Table 1**).[1] NIH and NSF funding of $3.9 billion creates or supports 21,600 jobs, $2.2 billion of income, and $2.6 billion of value added (**Table 2**). From these direct investments, additional economic impacts are created through supply chain effects (indirect) and consumption effects (induced). These ripple effects roughly equal the initial direct effects. In other words, the total economic impacts are approximately double the direct effects. Overall, annual R&D funding supports 81,300 jobs, $7.8 billion of income, and total economic activity of $16.3 billion, of which nearly $11 billion is net new and additive to gross state product.

Total contributions to jobs and incomes from R&D funding account for about two percent of 2024 employment and wages in the state, or roughly the same size as the real estate and building construction sectors combined. Direct jobs, or those at the funded institutions, account for 57 percent of the total impact, meaning 43 percent, or two in five, jobs created or supported by federal R&D spending are in businesses that do not receive these funds. For example, activities associated with federal R&D funding support 4,200 jobs in real estate and construction, nearly 3,000 jobs in retail, and almost 1,600 jobs in transportation and warehousing. See **Table 13** in the appendix for output and employment by industry.

Table 1: Annual Economic Contributions of R&D Funding in Massachusetts

Impact	Employment	Labor Income	Value Added	Output
Direct	46,600	$4.80	$5.81	$8.57
Indirect	12,400	$1.20	$1.87	$3.06
Induced	22,200	$1.80	$3.10	$4.68
Total	81,300	$7.80	$10.78	$16.31

Source: USAspending, IMPLAN, UMDI calculations
Note: Jobs rounded to nearest 100 and dollars in billions.

[1] See Glossary of Terms for more details.

Table 2: Annual Economic Contributions of Only NIH and NSF R&D Funding in Massachusetts

Impact	Employment	Labor Income	Value Added	Output
Direct	21,600	$2.19	$2.64	$3.90
Indirect	5,700	$0.54	$0.84	$1.37
Induced	10,100	$0.82	$1.41	$2.12
Total	37,400	$3.55	$4.89	$7.40

Source: USAspending, IMPLAN, UMDI calculations
Note: Jobs rounded to nearest 100 and dollars in billions.

The jobs, incomes, and business revenues shown in the above tables also create fiscal impacts through local, state, and federal taxes. In these specific scenarios, direct taxes are low relative to total economic activity because universities and hospitals are generally tax exempt. That said, economic activity that spins off through the universities and hospitals is not tax exempt and will have indirect and induced effects, such as consumer spending of employees, business income of suppliers, and so on.

Total annual state and local taxes are $480 million, with $310 million going to the state. To put this in context, the state's share is slightly less than the combined FY26 budget amount for Veterans' Services and Free Community College.[2] State and local tax revenues from just NIH and NSF funded R&D are roughly half the total at $240 million per year.[3]

Table 3: Annual Tax Contributions of R&D Funding in Massachusetts, Millions

Impact	Local	State	Federal	Total
Direct	$24.0	$93.7	$487.9	$605.6
Indirect	$35.3	$71.0	$282.8	$389.1
Induced	$114.8	$145.9	$437.0	$697.7
Total	$174.1	$310.6	$1,207.7	$1,692.4

Source: USAspending, IMPLAN, UMDI calculations

Table 4: Annual Tax Contributions of Only NIH and NSF R&D Funding in Massachusetts, Millions

Impact	Local	State	Federal	Total
Direct	$25.4	$50.7	$229.3	$305.3
Indirect	$16.1	$32.0	$126.8	$174.9
Induced	$52.1	$66.2	$198.3	$316.6
Total	$93.6	$148.9	$554.4	$796.9

Source: USAspending, IMPLAN, UMDI calculations

Multipliers per $1 Million of Funding

The impacts described in the previous section highlight the total economic contributions of federal R&D spending to Massachusetts in a typical year. Another way to understand these contributions is through

[2] Governor Healey Signs $60.9 Billion Fiscal Year 2026 Budget | Mass.gov

[3] Note that these estimates are taken directly from the IMPLAN model and will differ from the estimates produced by the Department of Revenue, which uses a more specialized and diverse set of modeling tools.

their multiplier effects, here described in terms of impact per $1 million of funding. These multipliers allow readers to estimate the economic contributions of any amount of annual loss or gain of R&D funding by taking their chosen amount in millions and multiplying it by the numbers in **Table 5** through **Table 8**. Examples of how this data can be used are available in the next section about indirect costs.

The first two tables show multipliers for changes in funding in proportion to and reflective of the current allocation of R&D funds across industries. The second two tables allow readers to estimate the impacts of changes in funding for specific sectors by choosing only the rows that are of most interest. For example, **Table 7** shows that funding to universities creates more jobs per dollar than the other sectors whereas funding to R&D companies creates the most total output per dollar.

Table 5: Economic Contributions per $1 Million of R&D Funding by Impact Type

Impact	Employment	Labor Income	Value Added	Output
Direct	5.44	$560,494	$678,156	$1,000,000
Indirect	1.45	$139,704	$218,082	$356,933
Induced	2.59	$210,426	$362,221	$546,326
Total	9.49	$910,624	$1,258,458	$1,903,258

Source: USAspending, IMPLAN, UMDI calculations

Table 6: Tax Contributions per $1 Million of R&D Funding by Impact Type

Impact	Local	State	Federal	Total
Direct	$2,803	$10,934	$56,955	$70,691
Indirect	$4,116	$8,293	$33,009	$45,418
Induced	$13,406	$17,031	$51,007	$81,444
Total	$20,324	$36,258	$140,971	$197,553

Source: USAspending, IMPLAN, UMDI calculations

Table 7: Total Economic Contributions per $1 Million of R&D Funding by Industry Sector

Industry	Impact	Employment	Labor Income	Value Added	Output
R&D	Total	7.33	$893,929	$1,254,539	$2,019,435
Universities	Total	12.43	$937,761	$1,274,507	$1,749,574
Hospitals	Total	8.55	$878,045	$1,194,847	$1,926,661
All	Total	9.49	$910,624	$1,258,458	$1,903,258

Source: USAspending, IMPLAN, UMDI calculations

Table 8: Total Tax Contributions per $1 Million of R&D Funding by Industry Sector

Event Name	Impact	Local	State	Federal	Total
R&D	Total	$31,342	$63,558	$265,538	$360,438
Universities	Total	$89,606	$122,093	$382,500	$594,200
Hospitals	Total	$2,468	$3,537	$11,828	$17,834
All	Total	$20,324	$36,258	$140,971	$197,553

Source: USAspending, IMPLAN, UMDI calculations

Example of Lost NIH and NSF Indirect Costs

Among the changes to R&D funding that the federal government is currently proposing is to cap indirect costs on NIH and NSF grants (and perhaps all R&D grants) at 15 percent. Many institutions charge 50 to 60 percent so these reductions would be dramatic for many organizations. While it may seem reasonable to cap indirect costs to dedicate as much funding as possible to direct science, it is important to understand that grantees use indirect costs to support the ongoing maintenance and readiness of facilities, other research infrastructure, and equipment. Examples include support staff, computer systems, HAZMAT disposal, and so on. The presence and good condition of this infrastructure at institutions like colleges, universities, hospitals, and such are what allow research to start up quickly and efficiently.

One way the multiplier tables can be used to estimate future impacts is by estimating economic losses from a proposed change in the maximum indirect rate that grantees can charge to NIH- and NSF-funding projects. The research team used USAspending data to estimate the average indirect rate charged on NIH and NSF grants at 30 percent and 35 percent, respectively. A change to a maximum indirect rate of 15 percent would at least halve the costs that are currently reimbursed by the federal government and for some it could approach a reduction of three-quarters.

Based on the data available to the research team at this phase of the project, we estimate that lost funding from a cap on NIH and NSF indirect rates could be between $137 million and $558 million of funding. The wide range is due to incomplete reporting of indirect costs in the USAspending data. UMDI will refine this estimate in future phases of this project using data from other sources. As a result, readers should understand that there is currently still uncertainty about the estimate of lost indirect funds.[4] However, to provide an example of the possible impacts, we provide an economic impact estimate of the midpoint of the range using the multipliers from **Table 5** and **Table 6**. The midpoint estimate is $347.5 million per year, or about nine percent of total combined NIH and NSF funding. Readers can use the multiplier tables to assess any other funding change of their choice.

Table 9 and **Table 10** show the estimated impacts on the economy and taxes of a $347.5 million loss of funding due to a cap on NIH and NSF indirect rates. These estimates assume that cuts happen proportionally to the existing distribution of awarded funds across industry sectors. Direct losses to jobs, income, and gross state product (or value added) are 1,890, $194.8 million, and $235.7 million, respectively. Direct tax losses are $4.8 million for state and local governments. Of the 79 individual manufacturing sectors in the Commonwealth, 50 have fewer than the nearly 1,900 direct jobs of this reduction in indirect rates. When indirect and induced effects are added, losses increase to 3,300 jobs, $316.4 million of income, and $661.4 million of business revenues (or output), of which $437.3 million accrues to gross state product. Tax losses increase to $19.7 million. Federal tax losses reduce any savings to the government by approximately $50 million.

While these results represent an early-stage estimate of losses from NIH and NSF indirect funding, total losses to the state could be considerably greater than those shown here. Not only could this estimate be too low, but other large funders of R&D have announced similar caps, namely the Department of

[4] See the Methodology for more details on the derivation of this estimate.

Defense which awards nearly as much R&D funding to the state as the NIH and NSF combined. Coupled with less coverage of indirect costs, current proposals before Congress seek to greatly reduce total R&D funding (e.g., one proposal cuts NSF by over half), which would inevitably harm efforts in Massachusetts with it being among the largest total and per capita recipients of these funds.

Table 9: Estimated Economic Impacts of $347.5 Million Loss of Indirect Funding

Impact	Employment	Labor Income	Value Added	Output
Direct	-1,890	-$194.77	-$235.66	-$347.50
Indirect	-500	-$48.55	-$75.78	-$124.03
Induced	-900	-$73.12	-$125.87	-$189.85
Total	-3,300	-$316.44	-$437.31	-$661.38

Source: USAspending, IMPLAN, UMDI calculations
Note: Jobs rounded to nearest 10 and dollars in millions.

Table 10: Estimated Tax Impacts of $347.5 Million Loss of Indirect Funding, Millions

Impact	Local	State	Federal	Total
Direct	-$0.97	-$3.80	-$19.79	-$24.57
Indirect	-$1.43	-$2.88	-$11.47	-$15.78
Induced	-$4.66	-$5.92	-$17.72	-$28.30
Total	-$7.06	-$12.60	-$48.99	-$68.65

Source: USAspending, IMPLAN, UMDI calculations

Glossary of Terms

To fully appreciate the economic impacts, it is helpful to understand the terms that describe the results discussed in this report.

Employment: Employment is a count of jobs, not people, by place of work. It counts all jobs with the same weight regardless of whether the position is full-time or part-time or the labor of a self-employed proprietor. Additionally, jobs are counted as job-years, which are equivalent to one job lasting for one year. This is a similar concept to "person-hours." Jobs often carry over from year to year, so therefore the jobs in one year include many of the same jobs as in the previous year. For example, if a new business opens with 10 employees, then the host community of that business will have 10 more jobs than it would have had in every future year that the company maintains its workforce. Over five years, the business will have created 50 job-years (10 jobs at the company x five years = 50 job-years), though it is possible that it is not the same 10 people who are working there over time. When reviewing changes in employment across multiple years, knowledge of the concept of job-years is vital to proper interpretation. As shown in the example above, 50 job- years is not equivalent to 50 people with jobs or even 50 job slots.

Output: Output is the total economic value of production or sales, sometimes called business revenues, whether final (i.e., purchased by the end user) or intermediate (i.e., used by another business to produce its own output). It includes the value of inputs to production, wages paid to employees, capital expenses, taxes, and profits. It is useful as an indicator of business activity, but it should not be construed as net new economic activity.

Labor Income: Labor income is income and benefits from all sources (e.g., wages and salaries, government transfers, property income, etc.) earned by all people in an area. It excludes the income earned by non-resident workers who commute into an area, but it includes the income of residents who commute out.

Value Added: Value added is the value of all final goods and services, sometimes called net economic impact, created in an economy. It represents new economic activity and is also known as gross product or net economic impact. It differs from output by the value of inputs to production. Value added provides a useful summary of the economy, which is why all nations and U.S. states report their economic growth in this way, calling it either gross domestic product or gross state product as appropriate. Its usefulness derives from the elimination of the double-counting inherent in output, which stems from the inclusion of inputs. An example of the double- counting of inputs can be found and simplified in the process of making and selling a loaf of bread. A farmer sells wheat to a mill, which then sells flour to a baker, who then sells bread to the final customer. The sale price of the bread includes the cost of all necessary inputs, including growing the wheat, milling the flour, and baking the bread. Value added counts only the sale price of the bread to the final consumer, which is the net new value created in the economy. On the other hand, output counts the revenues earned by every business in the supply chain, which means that the value of the wheat and flour are counted more than once.

Methodology

This study is built on two main pillars: federal funding data from USAspending and economic modeling using the IMPLAN model. Each is addressed in detail below.

USAspending

USAspending is the federal government's official source for spending data. Its stated mission is to "show the American public what the federal government spends every year and how it spends the money." [5] As part of this effort, the website provides a searchable database of awards with details by agency, recipient, award type, and more.[6] UMDI downloaded a subset of the data that included all awards going to Massachusetts-based recipients for fiscal year 2024. In this case, the FY24 data includes both awards newly approved in that year and multi-year awards that include FY24 in their period of performance, meaning they were approved in some past year, but their funding continued into or beyond FY24. For the purposes of this study, total fundings includes both the federal and non-federal funds obligated to each award as noted in the USAspending data. Both funding sources are included because the award of non-federal funding is typically contingent upon the award of federal funding and therefore is part of the contribution to the economy of federal R&D funding. For NIH and NSF projects, non-federal sources are zero and are otherwise a small share of the total.

From the total dataset, UMDI's first task was to separate R&D funding from all other spending. For the purposes of this study, awards are primarily categorized in two ways: contracts or grants. The relevant difference between the two is how the purpose of the award is categorized, and therefore how R&D funding can be separated from all other funding purposes. In the case of contracts, the government assigns a product or service code (PSC) to each award. Within the PSCs there are three subcategories of research and development, product, and service, with R&D codes all beginning with "A". By filtering only PSCs starting with the letter A, UMDI was able to separate R&D contracts from all others. Grants do not have PSCs and instead have object classes. These include both a number and a text description of the object class. UMDI filtered for object classes that included research and development in their descriptions to separate R&D grants from all others.

One exception to the above filtering regards funding from the National Institutes of Health (NIH) and the National Science Foundation (NSF). This study includes all funding from these agencies regardless of PSC or object class with the assumption that this funding either directly funds R&D (in which case it would be included by the filters) or indirectly supports R&D (in which case it would not be included by the filters). The latter includes funds for activities like supplementing operations at hospitals and research organizations, increasing patient access to treatments, or supporting early-career researchers. In short, the awards considered in this study include all awards from NIH and NSF regardless of code or class and only awards classified as R&D from all other agencies.

[5] About | USAspending
[6] Details on USAspending's methods and data sources are here: Data Sources | USAspending

Note that the above description of the data used in this study only includes awards by the federal government to external recipients, meaning it excludes spending by the federal government on its own services. As a result, this data does not capture the government's spending on research and development carried out by federal government scientists in organizations such as the Environmental Protection Agency, National Oceanic and Atmospheric Administration, or the Department of Defense.

Once the full dataset was filtered down to only the relevant awards, UDMI next proceeded to estimate annual funding. First the team identified all awards that included 2024 in their period of performance and then calculated the duration of the award using the listed start and end dates. Finally, the total funding amount (or total obligated amount in the case of new awards) was divided by the duration to find the average funding per year for each award. As a result, the estimates used in this study are not for 2024 precisely but rather are better thought of as the average annual R&D funding that the Commonwealth has received in recent years. These estimates were close to FY24 actuals when spot checked against spending data directly from NIH and NSF.

The research team also used the USAspending data to provide an estimate of capping the NIH and NSF indirect rate to 15 percent. The dataset contained a column for indirect costs paid by the federal government, which the team divided by the total federal dollars obligated to find an indirect rate for each award. Data on indirect costs is not available for many awards, either because indirect costs were not charged to the federal government or simply because the data is missing, though the dataset does not make clear which it is. Therefore, the average existing indirect rate is estimated only from projects with non-zero federal indirect costs.

To model the economic impact of the R&D funding, the research team needed to assign industry sectors to the recipients of the awards. First the team created a list of unique recipients, of which there were 715. Each recipient was then assigned one of three sectors based on the research team's best judgement: university, higher education, or scientific research and development (a subset of professional, scientific, and technical services). Once each recipient had an industry associated with it, by extension each award also had an industry associated with it. The team then subtotaled the awards by industry. About 12 percent of awards by value did not have recipients associated with them. These blanks were allocated to each sector in proportion to each sector's share of the total of known awards. For example, universities received 41 percent of funding with known recipients and therefore 41 percent of funding with unknown recipients was allocated to universities.

IMPLAN

UMDI used the widely used IMPLAN input-output model to estimate the economic contributions of recent R&D spending. IMPLAN is a platform that combines a set of extensive databases, economic factors, multipliers, and demographic statistics with a highly refined modeling system that is fully customizable. Together, software and data can help gain insights into an industry's contributions to a region, quantify the impact of a shock to an economy, examine the effects of a new or existing business, model the impacts of expected growth or changes, or study any other event specific to the economy of a particular region and how it will be impacted.

The model identifies direct impacts by sector, then develops a set of indirect and induced impacts by sector.

- Direct Effects: Direct effects are the immediate result of the direct spending. Applying these initial changes/dollars spent to the multipliers in an IMPLAN model will then display how the region will respond economically to these purchases.
- Indirect Effects: Indirect impacts stem from local industries' purchases of inputs (goods and services) from other local industries. These purchases are also known as intermediate expenditures.
- Induced Effects: Induced effects are caused by household spending on consumption.

For example, one of the direct impacts of R&D funding is revenues to universities. The first round of indirect effects will include the university's purchase of equipment and supplies, typically from a wholesaler. In turn, these purchases spur the wholesaler to purchase more inventory from the manufacturer, which form part of the second round of indirect effects. This cycle of spending continues to work its way backward through the supply chain, with each round of impacts getting smaller and smaller, until all money leaks from the local economy by way of imports, taxes, and profits, which do not generate additional impacts locally.

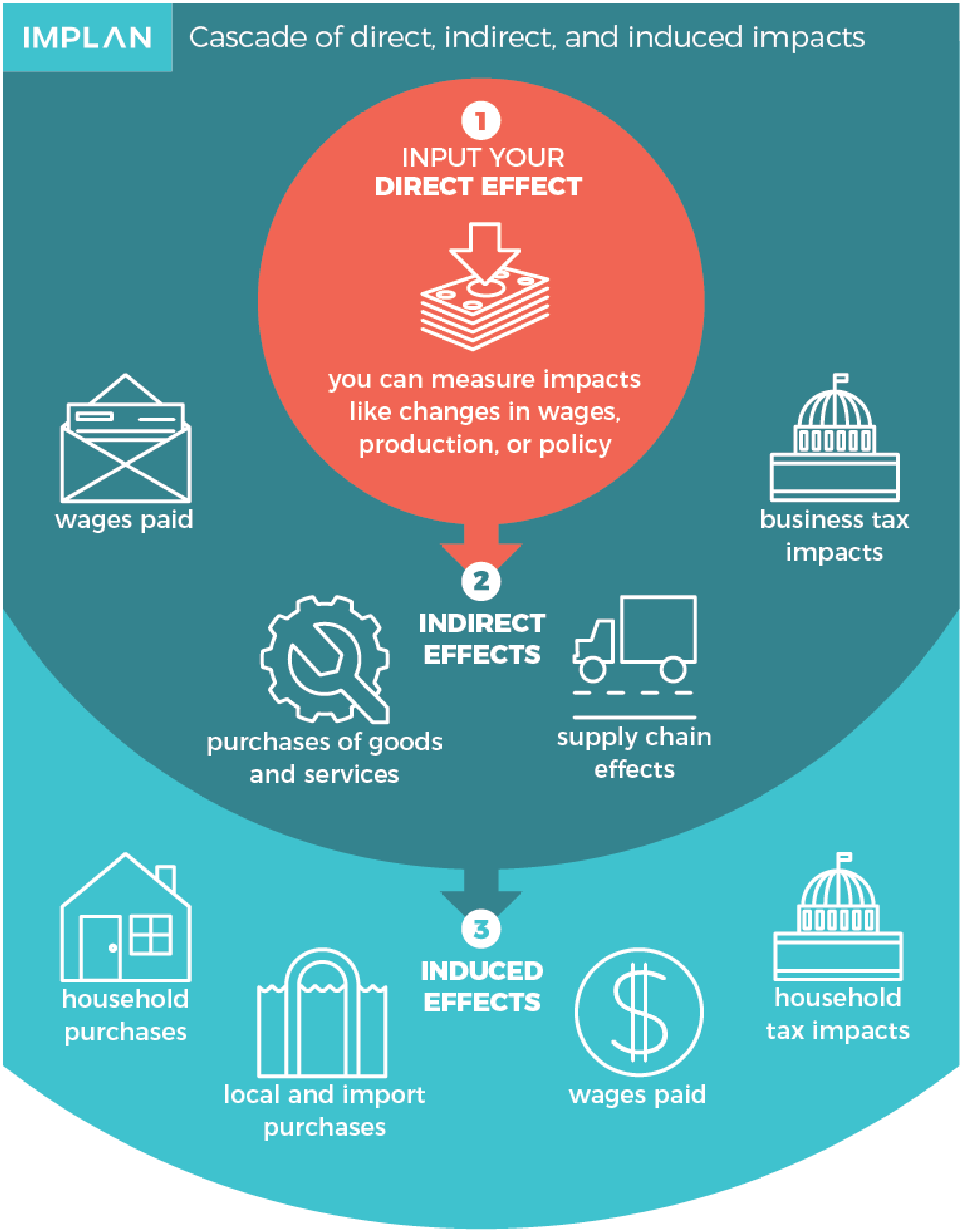
IMPLAN does not assume that all input purchases are made from local businesses; the proportion of local vs. non-local purchases varies by commodity and is built into the IMPLAN system.

The IMPLAN models account for commuting patterns; thus, induced impacts will only reflect the spending of wages from residents. IMPLAN removes payroll taxes, personal taxes, and savings before allowing the remainder to be spent on goods and services. IMPLAN also accounts for imports and does not assume that all purchases of goods and services are made within the study area.

Figure 1 on page **17** depicts how the IMPLAN model works.

To derive the inputs for the IMPLAN model from the USAspending data, UMDI assigned each of the three industry sectors described in the previous section of the methodology to one of three IMPLAN industries. The IMPLAN sectors used were junior colleges, colleges, universities, and professional schools; hospitals; and scientific research and development services. UMDI then totaled awards by industry sector and entered them into IMPLAN as industry output.

Figure 1: Depiction of IMPLAN Model



Source: IMPLAN

Appendix: Average R&D Funding by Agency

Table 11: Average R&D Funding by Agency

Awarding Agency and Subagency	Estimate
Department of Agriculture	**$19,660,809**
Agricultural Marketing Service	$5,766,028
Agricultural Research Service	$11,503,721
Forest Service	$2,301,646
Natural Resources Conservation Service	$89,414
Department of Commerce	**$286,915**
National Oceanic and Atmospheric Administration	$286,915
Department of Defense	**$3,780,356,113**
Defense Advanced Research Projects Agency	$196,591,574
Defense Contract Management Agency	$117,025,775
Defense Health Agency	$16,002,425
Defense Logistics Agency	$8,556,826
Defense Microelectronics Activity	$93,328,127
Defense Threat Reduction Agency	$8,823,737
Department of the Air Force	$2,352,999,159
Department of the Army	$269,188,305
Department of the Navy	$405,963,353
Missile Defense Agency	$305,398,072
U.S. Special Operations Command	$5,935,927
Washington Headquarters Services	$542,834
Department of Education	**$500,000**
Department of Education	$500,000
Department of Energy	**$62,164,985**
Department of Energy	$62,164,985
Department of Health and Human Services	**$4,097,479,900**
Centers for Disease Control and Prevention	$17,033,420
Food and Drug Administration	$38,834,475
National Institutes of Health	$3,479,595,011
Office of Assistant Secretary for Preparedness and Response	$561,367,024
Office of the Assistant Secretary for Administration	$649,969
Department of Homeland Security	**$18,476,439**
Federal Emergency Management Agency	$108,325
Office of Procurement Operations	$18,356,290
U.S. Coast Guard	$0

Awarding Agency and Subagency	Estimate
U.S. Customs and Border Protection	$11,824
Department of Justice	**$818,821**
Federal Prison System / Bureau of Prisons	$818,821
Department of Labor	**$1,106,378**
Office of the Assistant Secretary for Administration and Management	$1,106,378
Department of the Interior	**$10,113,894**
Bureau of Ocean Energy Management	$685,172
Bureau of Safety and Environmental Enforcement	$393,549
Departmental Offices	$9,035,173
National Park Service	$0
Department of Transportation	**$9,900,091**
Federal Aviation Administration	$925,263
Federal Highway Administration	$4,776,136
Federal Railroad Administration	$670,598
Immediate Office of the Secretary of Transportation	$1,832,499
Pipeline and Hazardous Materials Safety Administration	$1,695,595
Department of Veterans Affairs	**$16,104,049**
Department of Veterans Affairs	$16,104,049
Environmental Protection Agency	**$4,362,482**
Environmental Protection Agency	$4,362,482
Federal Communications Commission	**$90,893**
Federal Communications Commission	$90,893
General Services Administration	**$37,650**
Federal Acquisition Service	$0
Public Buildings Service	$37,650
National Aeronautics and Space Administration	**$121,411,347**
National Aeronautics and Space Administration	$121,411,347
National Science Foundation	**$423,891,537**
National Science Foundation	$423,891,537
Smithsonian Institution	**$177,672**
Smithsonian Institution	$177,672
Grand Total	**$8,566,939,975**

Source: USAspending, UMDI calculations

Appendix: Average R&D Funding by Industry Sector

Table 12: Average R&D Funding by Industry Sector

Industries with Blanks Allocated	Estimate
R&D	$4,483,767,305
University	$3,481,133,772
Hospital	$602,038,898
Grand Total	**$8,566,939,975**

Source: USAspending, UMDI calculations

Appendix: Contributions to Output and Jobs by Industry

Table 13: Contributions of R&D Funding to Output and Jobs by Industry

Industry	Output (M)	Employment
Educational Services	$3,612	32,460
Professional, Scientific, and Technical Services	$5,777	17,320
Health Care and Social Assistance	$1,473	8,290
Real Estate and Rental and Leasing	$1,551	4,050
Accommodation and Food Services	$338	2,940
Retail Trade	$341	2,920
Administrative and Support and Waste Management and Remediation Services	$395	2,780
Finance and Insurance	$816	2,340
Other Services (except Public Administration)	$271	2,270
Transportation and Warehousing	$205	1,580
Arts, Entertainment, and Recreation	$106	930
Information	$529	890
Wholesale Trade	$345	860
Management of Companies and Enterprises	$161	540
Manufacturing	$128	320
Construction	$61	300
Government Enterprises	$40	250
Agriculture, Forestry, Fishing and Hunting	$6	120
Utilities	$149	110
Mining, Quarrying, and Oil and Gas Extraction	$1	< 10

Source: USAspending, IMPLAN, UMDI calculations
Note: Table is sorted by employment. Jobs rounded to nearest 10.