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Economic Impact Of Ohio Aerospace Institute, FY 1998-2015

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Maxine Goodman Levin
College of Urban Affairs
Center for Economic Development

Prepared for:
Ohio Aerospace Institute

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February 2016

**ECONOMIC
IMPACT OF OHIO
AEROSPACE
INSTITUTE,
FY 1998-2015**

**CENTER FOR
ECONOMIC
DEVELOPMENT**

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EXECUTIVE SUMMARY

This report assesses the contributions of The Ohio Aerospace Institute (OAI) to the economy of the State of Ohio during the specific period of its 1998-2015 fiscal years. The study was conducted by the Center for Economic Development at Cleveland State University's Maxine Goodman Levin College of Urban Affairs. The impact of OAI is described here in terms of the employment, labor income, value added, output, and tax revenue generated because of OAI's presence in the state. The impacts of OAI's four main operating functions were assessed, including OAI operating expenses, OAI employee compensation, support to industry research and development, and support for students and universities. These components of the impact are based on data from audits summarizing OAI's financial activities from fiscal year 1998 through fiscal year 2015 due to IMPLAN data availability.

The Ohio Aerospace Institute is a nonprofit organization founded in 1989 with a mission of enhancing its partners' aerospace competitiveness through research and technology development, workforce preparedness, and engagement with global networks for innovation and advocacy. The organization is a joint initiative of the NASA Glenn Research Center, the Air Force Research Laboratory at Wright-Patterson Air Force Base, the State of Ohio, ten Ohio public and private universities granting doctoral degrees in aerospace-related engineering disciplines, and numerous companies engaged in aerospace activities.

ECONOMIC IMPACT OF OAI

The economic impact on the State of Ohio due to the operations of OAI from 1998-2015 includes the following impact measures:

- Employment Impact: 1,702 total jobs
- Labor Income Impact: \$81.9 million¹
- Value Added Impact: \$130.2 million
- Output Impact: \$232.3 million
- Tax Impact: \$28.7 million
 - \$10.4 million to state and local governments
 - \$18.3 million to the federal government

¹ All monetary figures reported are in 2016 dollars.

INTRODUCTION

This report estimates the economic impact of the Ohio Aerospace Institute (OAI) within the State of Ohio from fiscal year 1998 through the most recent fiscal year of 2015.² The mission of the Ohio Aerospace Institute (OAI) is to enhance aerospace competitiveness for its partners and the State of Ohio through research and technology development, workforce preparedness, and engagement with global networks for innovation and advocacy.³ The work of OAI has significant outcomes on businesses, universities, and government agencies within the state, and helps provide employment opportunities across Ohio.

The first year of the period covered by this report represented the height of funding from the State of Ohio; OAI experienced frequent and consistent state funding reductions between 1998 and the complete cutting of support in 2010. Federal funding to OAI—which comes from various sources—has fluctuated over the study period, with its lowest amount of funding in 1998 and the highest in 2004. The most recent funding level (2015) is very similar to the base year (1998) funding level. The organization has faced challenges over the past 17 years due to a complete loss of investment from the State of Ohio, as well as declining funding from the federal government.

This report is organized into two sections. The first section provides information on OAI's operations, and analysis of their income sources and expenses, while the second section details the economic impact of the organization and describes the impacts on the economy which OAI provides due to its operation within Ohio.

² The OAI fiscal year runs from July 1 through June 30 of the reported year. All years discussed in this report refer to the OAI fiscal year.

³ The OAI mission statement was accessed from the organization website: <http://www.oai.org/about/index.html>.

OVERVIEW OF OAI

As President and CEO Dr. Michael Heil noted in the OAI silver anniversary report, “The Ohio Aerospace Institute was founded 25 years ago as the first NASA-associated institute chartered to foster collaboration between universities, industry and government laboratories. Over the years, we have evolved from our roots as a small, largely state-funded enterprise outside the gates of the NASA Glenn Research Center, into a diverse research, education and collaboration aerospace institute with important customer-funded operations in Cleveland and Dayton.”⁴ Headquartered in Cleveland, OAI and its partners engage in research and collaborative efforts that lead to innovative and cutting-edge technological solutions to complex aerospace problems.

FINANCES

The next two sections detail the revenue sources and expenditures of OAI from fiscal year 1998-2015 audits. These study years were chosen based on the availability of IMPLAN data.

Revenues

OAI revenues fluctuated greatly between fiscal years 1998 and 2015, as demonstrated in Table 1. The organization saw total revenues increase from \$13.6 million to \$24.1 million between 1998 and 2004, the peak year in its funding. Revenues dropped sharply between 2004 and 2007, to \$14.6 million. Funding from the State of Ohio fell to zero in 2011 due to state budget reallocations; these cuts had dramatic implications for the overall budget, as state funding accounted for 21% of the total budget for OAI in FY1998. Overall revenues increased to \$19 million through 2011 (when federal government contracts spiked). Funding had fallen to \$11.2 million by 2015; the most recent fiscal year saw total funding at an 18-year low.

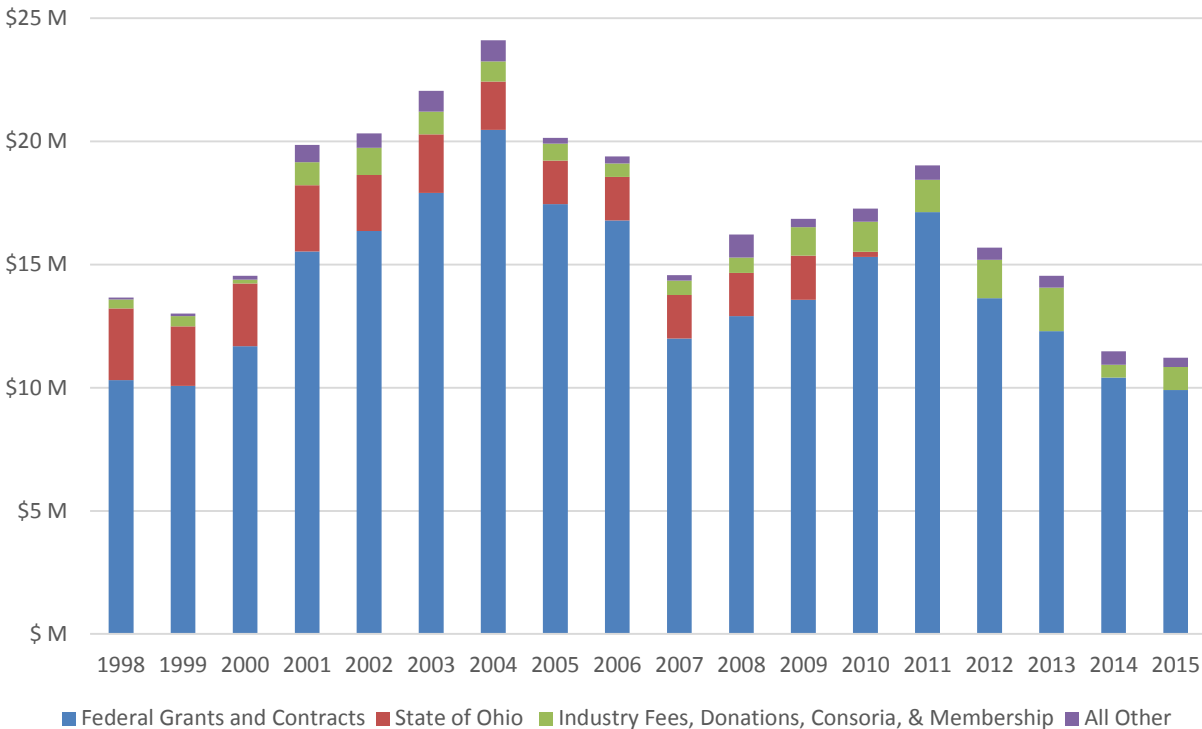
⁴ OAI 2014 Annual Report. <http://www.oai.org/about/corporate/pdfs/OAI-AnnualReport2014.pdf>.

Table 1: OAI Funding Sources by Type, 1998-2015

	Federal Grants and Contracts	State of Ohio	Industry Fees, Donations, Consortia, & Membership	All Other	Total
1998	\$10,305,034	\$2,910,696	\$363,000	\$76,813	\$13,655,543
1999	\$10,078,432	\$2,408,453	\$422,000	\$98,675	\$13,007,560
2000	\$11,680,828	\$2,546,280	\$160,600	\$157,996	\$14,545,704
2001	\$15,532,499	\$2,681,554	\$944,490	\$694,122	\$19,852,665
2002	\$16,366,129	\$2,266,433	\$1,112,814	\$580,300	\$20,325,676
2003	\$17,905,014	\$2,380,350	\$920,714	\$839,766	\$22,045,844
2004	\$20,471,187	\$1,960,915	\$817,625	\$860,824	\$24,110,551
2005	\$17,453,095	\$1,764,958	\$689,950	\$228,585	\$20,136,588
2006	\$16,788,610	\$1,764,957	\$555,047	\$285,915	\$19,394,529
2007	\$12,002,744	\$1,764,957	\$576,220	\$222,291	\$14,566,212
2008	\$12,901,002	\$1,764,957	\$612,804	\$945,887	\$16,224,650
2009	\$13,571,462	\$1,784,458	\$1,156,253	\$340,742	\$16,852,915
2010	\$15,316,127	\$200,000	\$1,227,363	\$525,005	\$17,268,495
2011	\$17,122,230	\$0	\$1,314,181	\$587,261	\$19,023,672
2012	\$13,637,061	\$0	\$1,554,697	\$496,164	\$15,687,922
2013	\$12,301,127	\$0	\$1,765,328	\$477,913	\$14,544,368
2014	\$10,416,554	\$0	\$517,474	\$542,007	\$11,476,035
2015	\$9,900,802	\$0	\$937,508	\$382,774	\$11,221,084

2016\$

The organization's main funding sources during the study period included Federal grants and contracts, funding from the State of Ohio, and industry contributions. Federal grants and contracts have remained the primary revenue source for the organization, contributing at least 75% of OAI's revenue every year (Figure 1). The largest consistent government sources include NASA, the Department of Defense, and the Department of Commerce.

Figure 1: OAI Funding Sources, 1998-2015

The second largest revenue source for OAI was initially funding from the State of Ohio. The state contributed approximately 20% of OAI income through 2001. State contributions dropped to 10% of OAI's income through 2010, when state income stopped completely. State funding reached a high of \$2.9 million in 1998 and fluctuated until the loss of funding in 2011.

Industry donations, fees, memberships, and consortia have remained a consistent income source for OAI, and have become the second largest funding source in recent years (behind government contracts). OAI member companies and contributors provided between \$500,000 and \$1.5 million in revenue to the organization in the last 18 years.

Other OAI income is generated through building rental, registration and seminar fees, foundation contributions, and interest. These income sources are important to OAI operations but are not as large as the federal grants, contracts, industry fees, and previous state funding.

Expenditures

Fluctuations in OAI funding patterns are visible in the organization's expenditure trends. Total expenses mirrored income throughout the 18-year period. The year of largest expenditures was 2004, with \$24 million spent, and the lowest year of expenditures was the most recent: 2015, with \$11.5 million (Table 2).

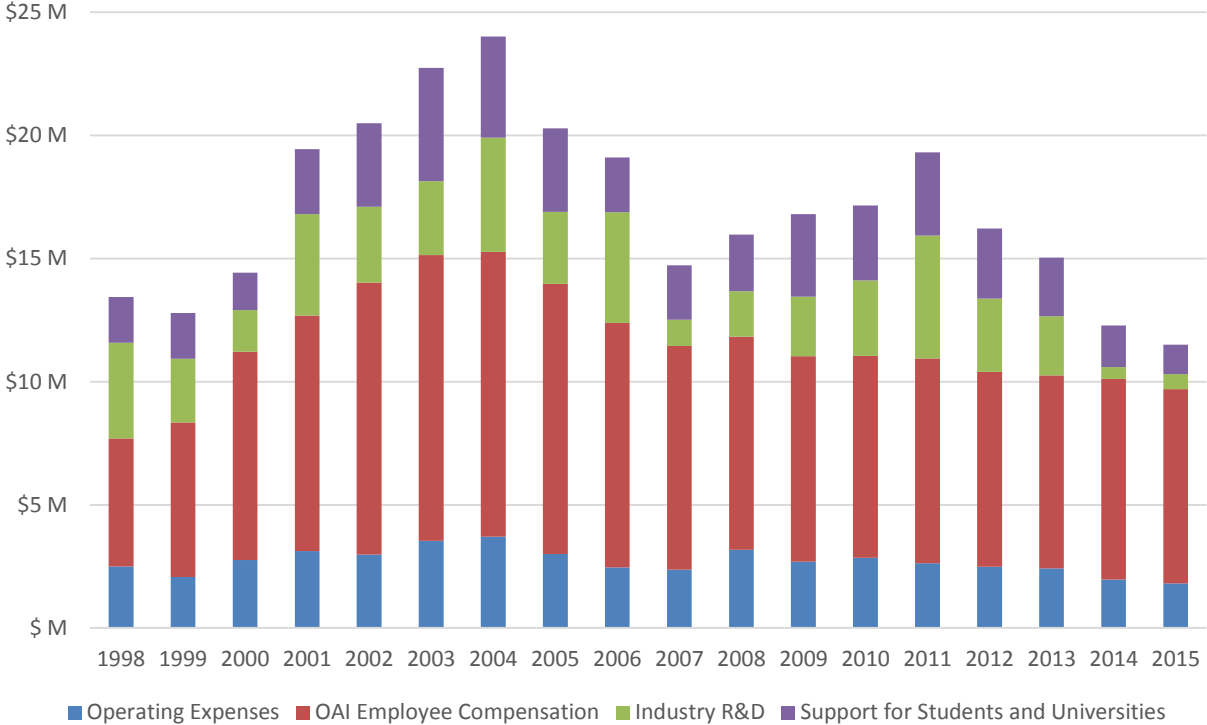
Table 2: OAI Expenditures by Type, 1998-2015

Year	Operating Expenses	OAI Employee Compensation	Industry R&D	Support for Students and Universities	TOTAL
1998	\$2,499,343	\$5,193,168	\$3,887,313	\$1,853,487	\$13,433,311
1999	\$2,075,428	\$6,270,463	\$2,590,917	\$1,854,684	\$12,791,492
2000	\$2,765,241	\$8,452,671	\$1,684,215	\$1,518,149	\$14,420,276
2001	\$3,118,525	\$9,565,367	\$4,121,681	\$2,638,532	\$19,444,105
2002	\$2,986,393	\$11,040,919	\$3,074,557	\$3,396,992	\$20,498,861
2003	\$3,533,381	\$11,605,517	\$2,999,253	\$4,603,547	\$22,741,698
2004	\$3,708,908	\$11,564,763	\$4,636,207	\$4,103,933	\$24,013,811
2005	\$3,011,664	\$10,960,699	\$2,923,783	\$3,390,622	\$20,286,768
2006	\$2,457,676	\$9,929,918	\$4,489,168	\$2,227,570	\$19,104,332
2007	\$2,372,465	\$9,076,085	\$1,064,454	\$2,209,258	\$14,722,262
2008	\$3,171,547	\$8,660,147	\$1,841,744	\$2,297,442	\$15,970,880
2009	\$2,697,475	\$8,335,751	\$2,417,990	\$3,346,871	\$16,798,087
2010	\$2,847,253	\$8,196,758	\$3,069,289	\$3,034,887	\$17,148,187
2011	\$2,635,148	\$8,303,717	\$4,998,543	\$3,376,282	\$19,313,690
2012	\$2,487,218	\$7,915,047	\$2,966,731	\$2,849,425	\$16,218,421
2013	\$2,421,832	\$7,828,640	\$2,411,257	\$2,372,795	\$15,034,524
2014	\$1,963,527	\$8,151,304	\$478,414	\$1,685,960	\$12,279,205
2015	\$1,817,648	\$7,875,310	\$610,421	\$1,197,840	\$11,501,219

Expenditures fall into four expense categories. The first category, *operations expenses*, includes all expenses required for the operation of the organization. These include “Professional Services,” “Travel,” “Supplies/Equipment/Maintenance/Depreciation,” “Building Operations,” “Seminars/Meetings,” “Administrative,” “Career Development,” “Program Development,” “Capital Expenses,” and “Strategic Planning.” *OAI employee compensation* includes “Resident Staff – Research,” “OAI Staff,” and “Fringe Benefits” expenditures. The third category, *industry research and development*, includes only research subcontract expenses. The fourth category, *support for students and universities*, includes expense items “Tuition,” “Faculty Support,” and “Student Support.”

The various expense items were affected differently by fluctuations in OAI’s funding, as shown in Figure 2. Support for industry R&D was highest when the organization saw increases in funding. Entering the 2014-2015 period, industry R&D expenses shrank significantly. Operating expenses and support for students and universities remained consistent throughout the same period. OAI Employee Compensation was the most consistent expenditure of OAI, rising slowly as income increased and decreasing as organizational funding diminished.

Figure 2: OAI Expenditures by Type, 1998-2015



ECONOMIC IMPACT OF OHIO AEROSPACE INSTITUTE

This section of the report outlines the economic impact of Ohio Aerospace Institute (OAI) on the State of Ohio from the 1998-2015 fiscal years but it does not include the initial period of the organization, from 1989 to 1997, for which IMPLAN data is not available. The impact is based on four aspects of spending: OAI operation expenses, OAI employee compensation, industry research and development (R&D), and support for students and universities. The impact is measured in terms of employment, labor income, output, value added, and taxes.

METHODOLOGY

Economic impact modeling requires the assumption that the organization came into existence instantaneously. Its establishment would stimulate the local economy through increased demand for goods and services. The effect of this change is then traced through Ohio's economy using the IMPLAN model, an input-output model which captures buy-sell relationships among all industries and the household sector. These relationships largely determine how an economy responds to changes in economic activity. Input-output (I-O) models estimate inter-industry relationships in a county, region, state, or country by measuring the industrial distribution of the economy. Thus, by using I-O models, it is possible to estimate how the impact of one dollar, or one job, ripples through the state economy, creating economic opportunities through additional expenditures and jobs. Economic multipliers measure the ripple effect that the initial expenditure has on the state economy.⁵ The OAI economic impact analysis was conducted using IMPLAN Professional economic impact modeling and IMPLAN Data Files. IMPLAN Professional® 3.0 is the latest economic impact assessment software system. The most updated version, based on 2014 data, was used to conduct this study.

OAI buys goods and services in order to run its operations and research functions. Due to this spending, three components of economic impact are generated: direct, indirect, and induced effects. *Direct impact* is the initial value of goods and services that OAI purchases in the state. *Indirect impact* measures the jobs and production needed to manufacture any goods and services required by the organization. *Induced impact* is the increase in spending of local households because of income received through their work at OAI and with its suppliers.

This report measures economic impacts using five indicators of the economy of Ohio: employment, output, value added, labor income, and taxes. *Employment* measures the number of jobs that exist in the state due to OAI operations. *Labor income* includes payroll paid to employees, plus proprietors' income. *Value added* measures the value of goods and services less intermediary goods, and represents a portion of output. Value added is often used as a proxy for

⁵ For example, suppose that a company reports sales of \$10 million. From the revenues of the company, they pay suppliers and workers and cover their costs. Once the suppliers and employees receive their payments, they will spend a portion of their money in the state economy purchasing goods and services, while another portion of the money will be spent outside the state economy (leakage). By evaluating the chain of local purchases that result from the initial infusion of \$10 million, it is possible to estimate a statewide economic multiplier.

Gross State Product. *Output* measures the total value of goods and services produced in the region as a result of the activities of spending. *Taxes* include federal, as well as state and local, tax revenues.

The model specifies the economic impact of OAI on the state for each of the 18 years of operation considered for this report. The Center calculated the economic impact of OAI based on the financial information provided in the Audit Reports of the organization. Only dollars from outside the state and dollars from inside the state that would have left Ohio but for OAI were counted in the impact.⁶ The OAI budget was split between their operations (broken down by spending type), OAI employee compensation, support for industry R&D, and support to universities. All OAI spending outside of the state was be excluded from the model.⁷

Using the audits provided by OAI for fiscal years 1998 to 2015, detailed OAI financial data was split into categories of OAI income, expenditures, grant sources, and pass-through grants to other entities. The figures were analyzed to separate income provided within Ohio and from out-of-state, and to determine the expenditures made due to OAI's presence. Revenues by source were analyzed, separating expenditures into categories of expenses from OAI operations, OAI employee compensation, investments in research and development, and funding for students and universities. The categories "contracts," and "grants and contracts," were combined, since audit data combines them beginning in 2005. Likewise, 2015's "consortia" and "membership" were combined into the previously-labeled "Industrial Fees/Donations" category, since they are combined under the "Industrial Fees" category through 2014.

Expenditures were then split into four categories for analysis. The first, *operation expenses*, includes Professional Services, Supplies/Equipment/Maintenance/Depreciation, Building Operations, Travel, Seminars/Meetings/Administrative, Career Development, Program Development, Capital Expenses, and Strategic Plan. The second, *OAI employment expenses*, includes expense items OAI Staff, Resident Staff – Research, and Fringe Benefits. The third, *support for industry research and development*, includes the Research Subcontract expense item only. Lastly, *support for students and universities* include expense items Student Support, Faculty Support, and Tuition. These four categories show organizational spending changes between 1998 and 2015.

Next, a determination as to which expenditures to use for the IMPLAN economic impact analysis model was made. Income from the State of Ohio, from Building Rental, and from Industrial Fees and Donations would have likely been spent in-state regardless of OAI's

⁶ This is due to the substitution effect which refers to the concept that if OAI did not receive the money from the State of Ohio, then the money likely would have gone to another organization in the state that would also have had an economic impact.

⁷ The economic impacts contained in this report are based on the information provided to the Center for Economic Development by the Ohio Aerospace Institute. The financial information is taken as data, and no attempt was made to verify or audit the financial systems and procedures of the organization. Every attempt was made to accurately measure and place the true economic impacts.

existence, and thus these sources were eliminated it from the model in order to show a pure economic impact analysis. Also, funds spent outside of the state were omitted from the model as they are considered leakage from the state economy.

ECONOMIC IMPACT

This section of the report splits the economic impacts of OAI into the effects of the organization's various expenditure areas. These four areas include the impact of OAI operating expenses,⁸ OAI employee compensation, industry research and development, and support for students and universities. These spending types impact the economy in different ways, as outlined below.

OAI Impact from Operations

Activities from OAI operations impacted the state through expenditures on services and supplies. The direct effect of OAI spending on state-wide employment cumulatively supported a total of 241 jobs over 18 years (Table 3).⁹ Indirect effect employment was 47 jobs, while induced effect employment was 71 jobs. The total employment effect from spending on operations was 359 jobs. The labor income effect was \$14.0 million. The value added to Ohio's economy was \$20.7 million, while the output was \$37.0 million. Taxes generated due to OAI expenditures include \$2.0 million in state and local taxes and \$3.0 million in federal taxes.

Table 3: OAI Impact from Operations Expenditures, 1998-2015

Impact Type	Employment	Labor Income	Value Added	Output	State & Local Tax	Federal Tax
Direct Effect	241	\$8,342,201	\$10,853,161	\$19,978,921	\$1,218,290	\$1,747,855
Indirect Effect	47	\$2,525,731	\$4,137,365	\$7,037,478	\$274,815	\$560,468
Induced Effect	71	\$3,126,403	\$5,705,323	\$9,900,994	\$522,759	\$752,814
Total Effect	359	\$13,994,335	\$20,695,849	\$36,917,393	\$2,015,864	\$3,061,137

OAI Impact from Employee Compensation

The impacts from employee compensation represent the largest share of the total economic impact from OAI. The compensation of OAI employees impacts Ohio's economy through household spending (Table 4), which only affects the induced effect. The effect of OAI wages and fringe benefits to its staff and researchers employed an additional 605 residents across Ohio between 1998 and 2015, or an average of 34 Ohioans per year. The total labor income induced from employee compensation spending was \$26.8 million. The value added for Ohio's

⁸ OAI operating expenses are separated out from the organization's employee compensation for this analysis.

⁹ These are the total jobs created as a result of the impact over the 18 years and do not represent an annual employment figure.

economy due to OAI employee compensation expenses was \$48.9 million, while the total economic output was \$84.8 million. These employee compensation expenses generated \$4.5 million in state and local taxes, and an additional \$6.4 million in federal taxes.

Table 4: OAI Impact from Employee Compensation, 1998-2015

Impact Type	Employment	Labor Income	Value Added	Output	State & Local Tax	Federal Tax
Direct Effect	0	\$0	\$0	\$0	\$0	\$0
Indirect Effect	0	\$0	\$0	\$0	\$0	\$0
Induced Effect	605	\$26,770,225	\$48,903,155	\$84,823,448	\$4,478,630	\$6,448,981
Total Effect	605	\$26,770,225	\$48,903,155	\$84,823,448	\$4,478,630	\$6,448,981

OAI Impact from Industry Research and Development

The impact from OAI's industry research and development functions on Ohio's economy were also significant between 1998 and 2015 (Table 5). R&D spending supported employment of 114 Ohioans through the direct effect, 103 Ohioans through the indirect effect, and 102 Ohioans through induced spending, adding up to 319 total jobs, or approximately 18 annually. The total labor income impact of research and development spending was \$20.2 million, the value added impact was \$30.4 million, and the economic output was \$57.8 million. The research and development spending also impacted taxes, generating \$1.7 million in state and local taxes and \$4.3 million in federal taxes.

Table 5: OAI Impact from Research and Development, 1998-2015

Impact Type	Employment	Labor Income	Value Added	Output	State & Local Tax	Federal Tax
Direct Effect	114	\$9,748,705	\$12,584,380	\$27,872,456	\$483,929	\$1,971,608
Indirect Effect	103	\$5,935,133	\$9,638,193	\$15,712,821	\$519,350	\$1,278,459
Induced Effect	102	\$4,503,765	\$8,218,426	\$14,260,775	\$754,345	\$1,086,073
Total Effect	319	\$20,187,603	\$30,440,999	\$57,846,052	\$1,757,624	\$4,336,140

OAI Impact from Support for Students and Universities

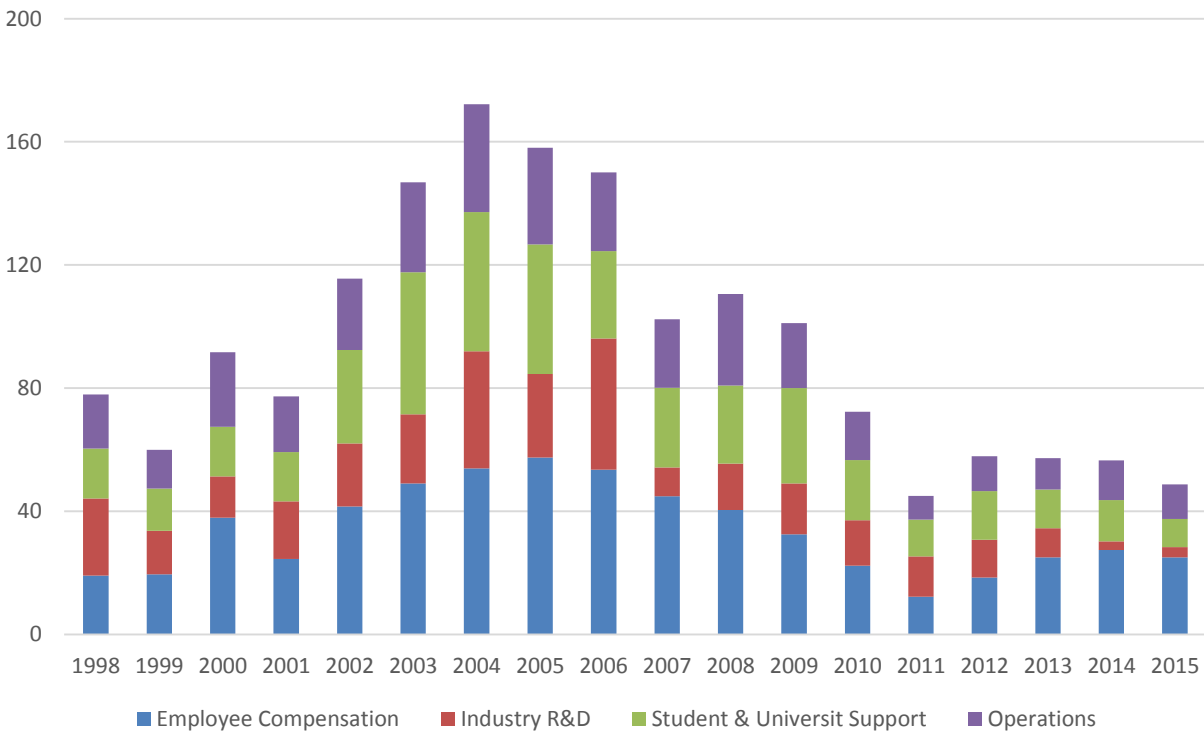
OAI provided support for students and universities through tuition assistance, donations, grants, and contracts. These expenses impacted the State of Ohio by supporting 254 new and existing direct jobs between 1998 and 2015 (or 14 jobs annually). They also provided 59 indirect jobs and 106 induced jobs, generating a total of 419 jobs in the state (Table 6). Spending on support for students and universities impacted the state, with \$20.9 million in labor income, \$30.1 million in value added, and \$52.7 million in output. This spending also provided \$2.1 million in taxes to the state and local governments and \$4.5 million in federal taxes.

Table 6: OAI Impact from Support for Students and Universities, 1998-2015

Impact Type	Employment	Labor Income	Value Added	Output	State & Local Tax	Federal Tax
Direct Effect	254	\$13,413,478	\$15,604,669	\$27,345,535	\$897,019	\$2,609,367
Indirect Effect	59	\$2,853,324	\$5,995,052	\$10,558,322	\$453,579	\$722,927
Induced Effect	106	\$4,678,013	\$8,536,755	\$14,814,678	\$782,228	\$1,126,429
Total Effect	419	\$20,944,815	\$30,136,476	\$52,718,535	\$2,132,826	\$4,458,723

The total impacts on Ohio’s economy differ by OAI expenditure type. Ohio Aerospace Institute’s employee compensation had the greatest impacts per year. A comparison by type, and total cumulative employment impacts, is displayed in Figure 3.

Figure 3: OAI Employment Impacts by Expenditure Type, 1998-2015



OAI Total Impact

OAI's total impact on the State of Ohio over the 18-year period is pronounced, with its expenditures creating a total of 1,702 jobs, \$81.9 million in labor income, \$130.2 million in value added, and \$232.3 million in output (Table 7). OAI's direct effect on the economy ranged from 25% to 38% of all effects. The indirect effect accounts for 12% to 15% of all effects. The induced effects made up between 48% and 63% of all effects.

Table 7: OAI's Overall Impact on Ohio, 1998-2015

Impact Type	Employment	Labor Income	Value Added	Output	State & Local Tax	Federal Tax
Direct Effect	609	\$31,504,384	\$39,042,210	\$75,196,912	\$2,599,238	\$6,328,830
Indirect Effect	210	\$11,314,188	\$19,770,610	\$33,308,621	\$1,247,744	\$2,561,854
Induced Effect	883	\$39,078,406	\$71,363,659	\$123,799,895	\$6,537,962	\$9,414,297
Total Effect	1,702	\$81,896,978	\$130,176,479	\$232,305,428	\$10,384,944	\$18,304,981

OAI's employment and expenditures created 609 direct effect jobs between 1998 and 2015, or 36% of all jobs created. There were 210 jobs created in the indirect effect, while 1,702 jobs were created in the induced effect (household spending). An average of 95 jobs per year was supported through OAI spending. The labor income impact of OAI was \$31.5 million in direct effect, \$11.3 million in indirect effect, and \$39 million in induced effect. The total labor income impact was nearly \$81.9 million in total, or an average of \$4.6 million per year.

The total value added impact of OAI expenditures was \$130.2 million across the study period, or an average of \$7.2 million a year. The total economic output impact of OAI was \$232.3 million, or an average of \$12.9 million per year. The total state and local tax impact was almost \$10.4 million, or an average of \$576,941 per year. The total impact on federal taxes was \$18.3 million, or an average of over \$1 million per year.

Overall OAI Impact by Year

Over the 18 year period, the presence of OAI supported 1,702 jobs. The organization supported \$81.9 million of labor income, \$130.2 million of value added, \$232 million in total economic output, and \$28.7 million in taxes.

The average yearly economic impact supported:

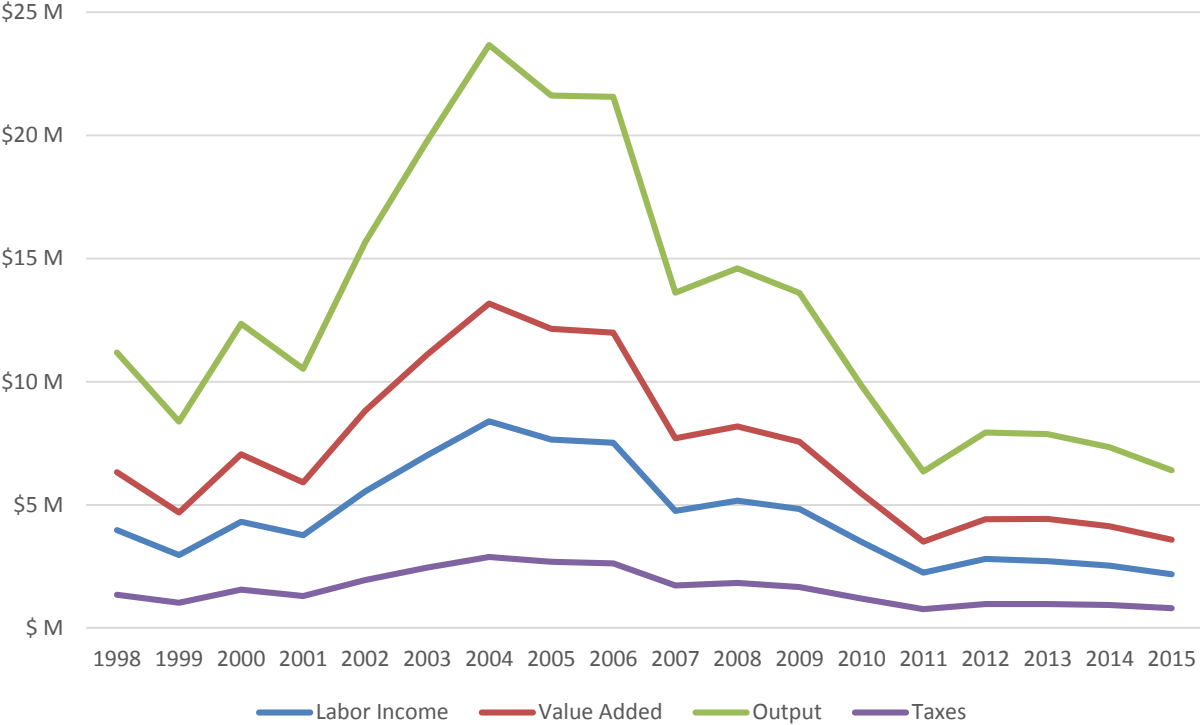
- 94 jobs,
- \$4.5 million in labor income,
- \$7.2 million in value added,
- \$12.9 million in total economic output, and
- \$1.6 million in taxes.

The impact was largest in 2004 across all four measures, with OAI supporting 172 jobs, producing \$23.7 million in output, and creating \$2.9 million in taxes. Interestingly, impacts did not increase in 2011 when funding for OAI rebounded. The economic impact of the organization by year is reported in Table 8 and is displayed in Figure 4.

Table 8: OAI Economic Impact, 1998-2015

Year	Employment	Labor Income	Value Added	Output	Total Taxes
1998	78	\$3,973,814	\$6,332,115	\$11,180,332	\$1,356,176
1999	60	\$2,964,851	\$4,686,742	\$8,375,699	\$1,025,052
2000	92	\$4,319,276	\$7,056,146	\$12,353,851	\$1,558,899
2001	77	\$3,770,028	\$5,909,362	\$10,528,785	\$1,296,153
2002	116	\$5,548,576	\$8,825,442	\$15,668,499	\$1,944,878
2003	147	\$7,014,675	\$11,101,600	\$19,780,032	\$2,450,755
2004	172	\$8,387,797	\$13,170,838	\$23,673,720	\$2,887,479
2005	158	\$7,654,508	\$12,149,081	\$21,618,647	\$2,687,877
2006	150	\$7,527,236	\$11,988,160	\$21,567,874	\$2,617,481
2007	102	\$4,758,581	\$7,702,449	\$13,614,552	\$1,728,318
2008	111	\$5,170,489	\$8,186,694	\$14,603,126	\$1,828,447
2009	101	\$4,826,529	\$7,556,808	\$13,597,614	\$1,668,954
2010	72	\$3,496,375	\$5,453,233	\$9,832,866	\$1,197,961
2011	45	\$2,248,063	\$3,502,436	\$6,350,913	\$761,136
2012	58	\$2,802,570	\$4,418,430	\$7,942,662	\$973,268
2013	57	\$2,709,742	\$4,426,785	\$7,871,367	\$974,937
2014	57	\$2,537,825	\$4,129,063	\$7,344,759	\$928,986
2015	49	\$2,186,043	\$3,581,095	\$6,400,130	\$803,168
TOTAL	1,702	\$81,896,978	\$130,176,479	\$232,305,428	\$28,689,925

Figure 4: OAI Economic Impacts by Type, 1998-2015



CONCLUSION

The Ohio Aerospace Institute's mission is to enhance its partners' aerospace competitiveness through research and technology development, workforce preparedness, and engagement with global networks for innovation and advocacy. OAI has managed over \$260 million in funding and over 325 federal awards in collaboration with over 100 industry, academic, and government organizations.¹⁰

During the 18 years considered in this study (FY1998-FY2015), OAI has had:

- an employment impact of 1,702 jobs,
- a labor income impact of \$81.9 million,
- a value added (gross state product) impact of \$130.2 million,
- an output (total value of goods and services) impact of \$232.3 million, and
- a tax impact of \$28.7 million.

These impacts came from sponsored research, education and training, partnerships with industry, universities, and government agencies for research and technology development, and information exchange opportunities for the years 1998 through 2015.

OAI activities annually generated, on average:

- 95 jobs per year,
- \$4.5 million in labor income,
- \$7.2 million in value added,
- \$12.9 million in output, and
- \$1.6 million in taxes.

In the face of increased competition and declining government support, OAI has nonetheless consistently led advances in the aerospace field for over 25 years. Its programs have driven partner success while encouraging, supporting, and training thousands of associated researchers and students throughout the state. The benefit this organization has provided Ohio and Ohioans is pronounced, both through its contribution to public knowledge and innovation, and through its contribution to the state's economy and vitality.

¹⁰ Ohio Aerospace Institute. <http://www.oai.org/about/corporate/index.html?sc=1> and <http://www.oai.org/about/corporate/pdfs/OAIfactsheet.pdf>.