



ECONOMIC AND FISCAL IMPACT OF THE ARIZONA PUBLIC UNIVERSITY ENTERPRISE



Summary of Findings and Conclusions

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Prepared for



Prepared by

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and

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All photos courtesy of the Arizona Board of Regents

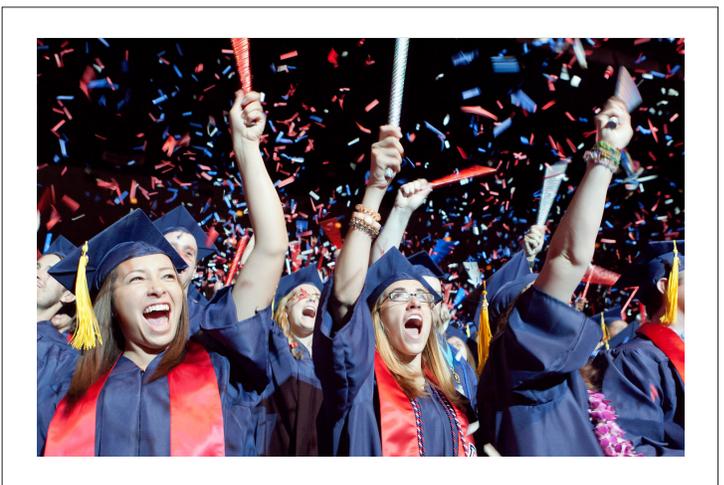
INTRODUCTION

Arizona's three public universities play a critical role in the Arizona economy. Most importantly, each year these institutions graduate tens of thousands of new entrants to Arizona's workforce. Along with the other participants in the State's post-secondary, higher educational institutions, the three public universities are the builders of Arizona's current and future workforce. And, that workforce, is the foundation of Arizona's economic prosperity.

Elliott D. Pollack & Company, in cooperation with The Maguire Company, performed an economic and fiscal impact study of Arizona's Public University Enterprise - composed of Arizona State University, Northern Arizona University, and the University of Arizona. Readers are referred to the full report: Economic and Fiscal Impacts of the Arizona Public University Enterprise.

The analysis calculates the economic and fiscal impacts in Arizona of annual operations of the universities, the impacts of the university spending, of university employees and student spending, the impacts of spending by out-of-state visitors, and research spending of the universities.

Finally, the analysis reviews the benefits of Tier 1 research universities and quantifies the estimated impact from research activities for the Arizona Public University Enterprise.



Impacts are based on data provided by the universities for Fiscal Year 2017 (FY17).

The impacts of Arizona's three public universities are quantified in terms of jobs, wages, value added, and economic output (collectively, the economic impact) as well as the resulting government revenues in Arizona (the fiscal impact). Assumptions for the analysis are based on data gathered from the universities, findings from student spending surveys, visitor exit surveys, standard economic impact methods, and other industry standards.

Multipliers have been developed to estimate the indirect and induced impacts of various direct economic activities. IMPLAN, a nationally recognized supplier of economic multipliers, developed the multipliers used in this study. The economic impact is categorized into four types of impacts:

- **Employment impact** – total jobs in a region including part-time and full-time workers.
- **Earnings Impact** – the personal income, earnings or wages, of the employees.
- **Value Added** - The difference between the total output and the cost of its intermediate inputs. It consists of compensation of employees, indirect business taxes and non-tax payments, and gross operating surplus.
- **Economic Output** – the economic output relates to the gross receipts for goods or services generated by the operations. It represents the total value of industry production.



The following results of the impact analysis are substantial and significant. However, it is important to note that the careful methodology employed herein ensures that the reported economic impacts of the Arizona Public University Enterprise are more likely to slightly understate the impacts rather than overstate them.

SUMMARY OF FINDINGS

The following sections summarize the economic and fiscal impacts of Arizona's Public University Enterprise based on the analysis completed by Elliott D. Pollack & Company, in cooperation with The Maguire Company

ECONOMIC IMPACTS

- The three public universities of the Arizona Public University Enterprise employed a total of 36,725 people, excluding student workers, on a full-time or part-time basis. FY 2017 payroll was \$2.6 billion. Wages and salaries accounted for \$1.9 billion and employee related expenses amounted to \$679.8 million.
- Student spending on items such as housing, utilities, groceries, retail merchandise, personal services and vehicle maintenance also impacted the economy. The 136,239 traditional students (those attending in person, not online) in the Arizona Public University Enterprise spent an estimated \$2.0 billion in FY17. Student spending generated an estimated 19,743 total jobs with wages of \$758.2 million, value added of \$1.2 billion and economic output of \$3.0 billion in the Arizona economy.
- Purchases of goods and services (within Arizona) by the universities for operating expenses, excluding payroll and construction, totaled \$600.8 million in FY17. The universities' purchases generated a total impact of 10,308 jobs, \$472.4 million in wages, \$688.0 million in value added and \$1.2 billion in economic output.
- Construction outlays in FY17, excluding soft costs, totaled \$323.7 million for all three universities. Construction spending generated a total of 4,047 direct, indirect and induced jobs with wages of \$210.2 million, value added of \$315.4 million and economic output of \$571.7 million.

In total, the Arizona Public University Enterprise is estimated to generate 84,355 jobs with \$4.6 billion in wages, \$6.0 billion in value added and \$11.1 billion in economic output for the Arizona economy.

- The spending of the university faculty & staff generated additional economic impact throughout the Arizona economy. An estimated 11,393 jobs were supported by their spending in FY17, generating wages of \$489.6 million, value added of \$750.5 million and total economic output of \$1.7 billion.
- In addition to the activities and spending described above, the universities draw visitors to Arizona for sporting events, family weekend, commencement, conferences, campus tours, and various other university sponsored events. Out-of-state visitors at these events bring outside dollars into the local economy generating jobs and creating additional economic impacts. In total, an estimated 2,139 jobs were created in FY17 with \$69.6 million in wages, \$104.5 million in value added and \$181.4 million in economic output.
- In total, the Arizona Public University Enterprise is estimated to generate 84,355 jobs with \$4.6 billion in wages, \$6.0 billion in value added and \$11.1 billion in economic output for the Arizona economy.

ECONOMIC IMPACT SUMMARY

ARIZONA PUBLIC UNIVERSITY ENTERPRISE IMPACT

(Fiscal Year 2017)

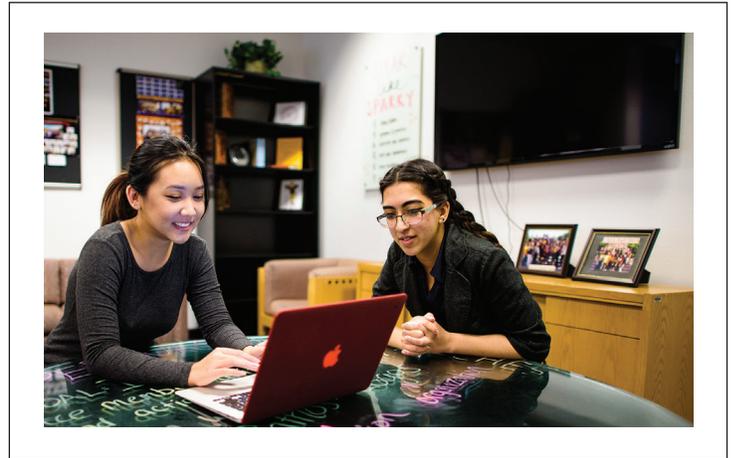
	Employment	Labor Income (\$ mil)	Value Add (\$ mil)	Economic Output (\$ mil)
University Payroll & Employment	36,725	\$2,582.9	\$2,858.0	\$4,395.9
Non-Payroll Operating Expenditures	10,308	\$472.4	\$688.0	\$1,198.9
University Construction	4,047	\$210.2	\$315.4	\$571.7
Spending by Faculty & Staff	11,393	\$489.6	\$750.5	\$1,716.9
Student Spending	19,743	\$758.2	\$1,249.5	\$2,990.5
Visitor Spending	2,139	\$69.6	\$104.5	\$181.4
Total	84,355	\$4,582.9	\$5,965.8	\$11,055.3



FISCAL IMPACTS

The annual operations of the universities (including faculty, student and visitor spending) generate a wide range of tax revenues for the State, counties, cities, and other local governments in Arizona. Taxes paid directly by the university and sales taxes and bed taxes paid by students and visitors are described as Direct or Primary tax revenues. Secondary tax revenues, on the other hand, are those resulting from taxes on the wages and spending of the employees – direct, indirect and induced – supported by the Arizona Public University Enterprise, living throughout the State.

The following table outlines the total fiscal impacts generated by all three universities' operations and the spending of faculty, students and visitors, including the secondary impact of those employees. In total, an estimated \$451.7 million in tax revenue was collected in FY 2017.



In total, the three Arizona public universities generated an estimated \$451.7 million in tax revenue for the State, county, city, and other local governments in FY 2017.

FISCAL IMPACT SUMMARY

ARIZONA PUBLIC UNIVERSITY

ENTERPRISE IMPACT

(Fiscal Year 2017) (\$ mil)

Primary Fiscal Impact

Direct taxes remitted by University	\$64.9
Faculty & staff spending sales tax	\$41.5
Student Spending sales tax	\$67.5
Visitor spending sales tax	\$4.7
Visitor spending bed tax	\$2.1
Sub Total	\$180.8

Secondary Fiscal Impact

Direct	\$207.9
Indirect	\$24.9
Induced	\$38.0
Sub Total	\$270.8

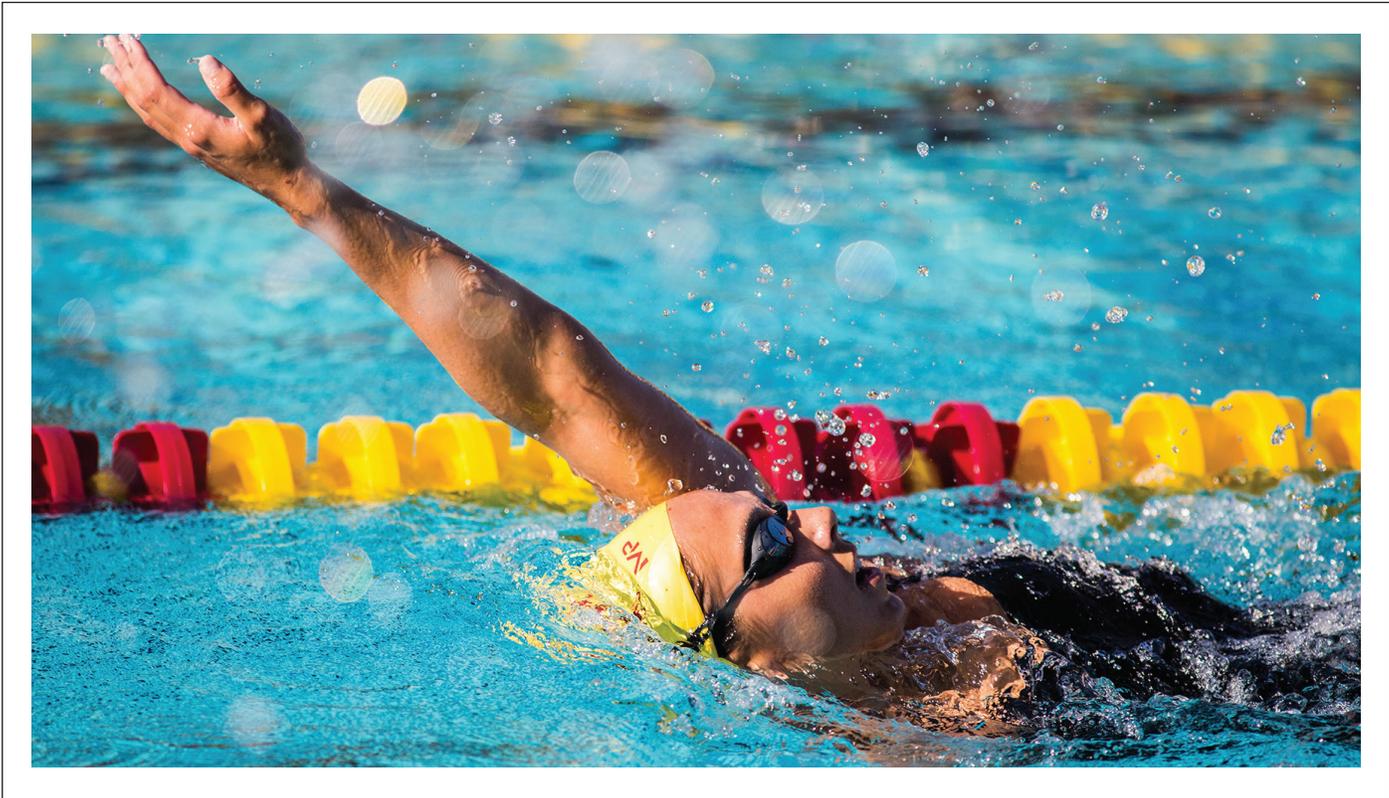
Total Fiscal Impact **\$451.7**

Notes: Impact includes State, County and Local government revenues.

- During ongoing operations the universities remitted an estimated \$64.9 million in taxes to the State, county, city and other local governments in FY17. This figure excludes the direct sales taxes remitted by the university at the bookstore and restaurants to avoid double counting from the impacts generated by the spending of faculty, staff and students.
- Taxable spending by faculty and staff generated an estimated \$41.5 million in state, county, city and other local government sales taxes in FY17 while student spending generated an estimated \$67.5 million.
- Visitors generated an estimated \$4.7 million in sales taxes and \$2.1 million in bed tax (including the lodging sales tax).



- Secondary impacts generated by employee spending totaled an estimated \$270.8 million. This includes the impact from the estimated 47,630 direct, indirect and induced employees and excludes the impacts accounted for in faculty and staff spending.



INCREMENTAL ECONOMIC AND FISCAL IMPACT DRIVEN BY OUT-OF-STATE FUNDING SOURCES

The analysis separately computed the incremental economic and fiscal impacts of the three public universities in Arizona derived by spending and other economic activity funded only by monies from sources outside Arizona. This includes the federal government sources, and other out-of-state sources such as out-of-state tuition, fees, scholarships, grants, loan program revenues, private gifts, and contract revenues. This incremental analysis provides a defensible and conservative estimate of the economic and fiscal impact of those that are “imported” into the state as a result

of the Arizona Public University Enterprise operations. That is, these impacts represents the estimated share of the total impact, described above, that is generated by these out-of-state dollars.

The incremental economic impact of the Arizona Public University Enterprise activities funded by out-of-state sources alone is estimated to have generated 31,760 jobs with \$1.7 billion in wages, \$2.2 billion in value added and \$3.8 billion in economic output in FY17.

INCREMENTAL ECONOMIC IMPACT SUMMARY FROM OUT-OF-STATE DOLLARS

ARIZONA PUBLIC UNIVERSITY ENTERPRISE IMPACT

(Fiscal Year 2017)

	Employment	Labor Income (\$ mil)	Value Add (\$ mil)	Economic Output (\$ mil)
University Payroll & Employment	13,230	\$931.0	\$1,030.2	\$1,584.6
Non-Payroll Operating Expenditures	3,747	\$171.7	\$250.1	\$435.8
University Construction	1,465	\$76.1	\$114.1	\$206.9
Spending by Faculty & Staff	4,101	\$176.3	\$270.2	\$618.5
Student Spending	7,078	\$271.9	\$448.0	\$807.7
Visitor Spending	2,139	\$69.6	\$104.5	\$181.4
Total	31,760	\$1,696.6	\$2,217.1	\$3,834.9

Notes: The total may not equal the sum of the impacts due to rounding. The net impact estimates the portion of the total impact that is generated by out-of-state dollars.

Sources: ASU; NAU; UA; Elliott D. Pollack & Co.; IMPLAN

The related incremental fiscal impact of the three public universities activities funded from out-of-state sources is estimated to be \$171.5 million for FY17. This includes net primary revenues of \$69.5 million and net secondary revenues of \$102.0 million.

INCREMENTAL FISCAL IMPACT SUMMARY FROM OUT OF STATE DOLLARS

ARIZONA PUBLIC UNIVERSITY
ENTERPRISE IMPACT
(Fiscal Year 2017) (\$ mil)

Primary Fiscal Impact

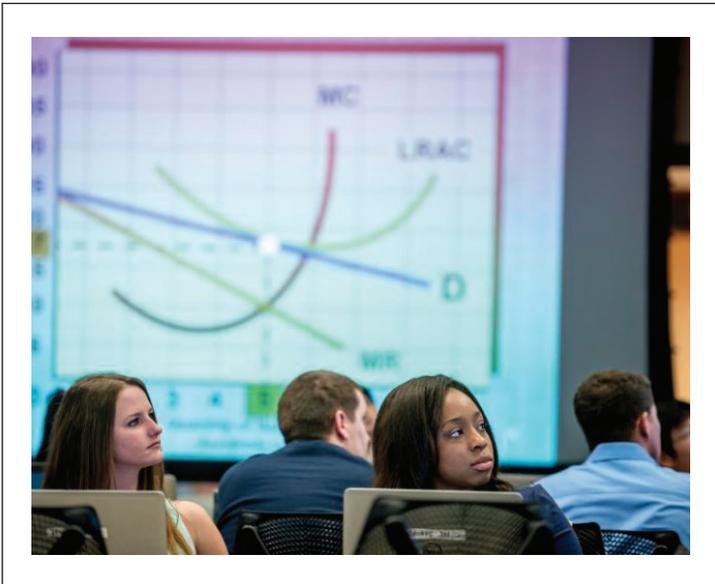
Direct taxes remitted by University	\$23.4
Faculty & staff spending sales tax	\$14.9
Student Spending sales tax	\$24.3
Visitor spending sales tax	\$4.7
Visitor spending bed tax	\$2.1
Sub Total	\$69.5

Secondary Fiscal Impact

Direct	\$77.9
Indirect	\$9.6
Induced	\$14.5
Sub Total	\$102.0

Total Fiscal Impact **\$171.5**

Notes: Impact includes State, County and Local government revenues.



RESEARCH AT THE UNIVERSITIES

Contemporary American universities have evolved over the last century to address multiple missions and, consequently, have taken on an enlarged role in civic and economic matters.

As externally funded research grants have grown since the end of World War II, the importance on university research has increased dramatically. University based research especially that undertaken in close collaboration with private businesses and industry, has facilitated much of the explosion of technological improvements in almost every conceivable aspect of modern life – from improved agriculture to modern high-tech devices that only a generation ago were only science fiction. The federal government, through several programs, provides a majority of the funding for university research, although industry funded research is another important component.

Obviously, spending at universities on research related activities, most notably funded by the federal government, results in spending in the region.

The total research expenditures at Arizona’s three public universities – the Arizona Public University Enterprise – exceeded \$1.2 billion in fiscal year 2017. The following table illustrates the breakdown of those expenditures by source of funding and by university.



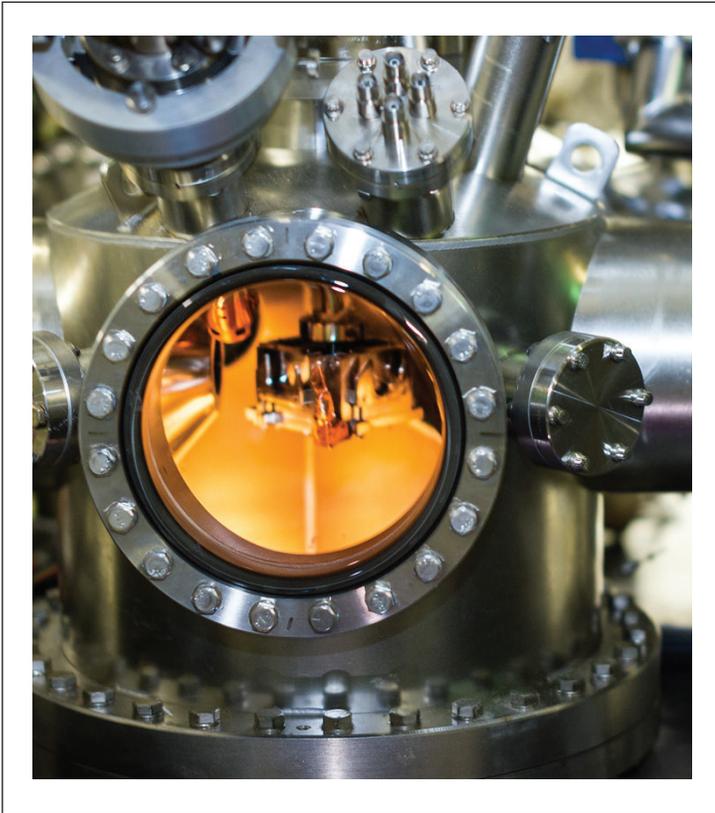
RESEARCH EXPENDITURES BY SOURCE OF FUNDS

ARIZONA PUBLIC UNIVERSITY ENTERPRISE IMPACT

(Fiscal Year 2017) (\$ mil)

Source of Funds	Arizona State University	Northern Arizona University	University of Arizona	Total
U.S. Federal Government	\$227.6	\$26.0	\$273.6	\$527.2
State & local government	\$31.9	\$6.3	\$19.6	\$57.8
Business	\$16.6	\$0.5	\$12.4	\$29.5
Non-profit organizations	\$30.5	\$2.1	\$35.6	\$68.2
Institutional	\$209.0	\$11.1	\$187.2	\$407.4
Other	\$29.3	\$0.3	\$93.8	\$123.4
Total	\$545.0	\$46.3	\$622.2	\$1,213.5

Sources: ASU; NAU; UA



The breadth and depth of activities at contemporary American universities has substantially transformed their impacts on regional economies and economic activity across the globe. Their economic impacts contribute importantly to the public good.

Spending at the universities on research related activities, most notably funded by the federal government, resulted in significant spending in the region and the State of Arizona. The Enterprise’s research expenditures include spending for personnel salaries and benefits as well as spending on equipment, supplies, contracts and other spending. This spending impacts the region’s and the state’s economy. That spending, in turn, drives other economic activity in the state. The total research expenditures at Arizona’s three public universities exceeded \$1.2 billion in fiscal year 2017. This represents over one-quarter of their total cumulative expenditures.

RESEARCH EXPENDITURES BY UNIVERSITY

ARIZONA PUBLIC UNIVERSITY ENTERPRISE IMPACT
(Fiscal Year 2017)

Source of Funds	Arizona State University	Northern Arizona University	University of Arizona	Total
Total research spending (\$ mil)	\$545.02	\$46.25	\$622.20	\$1,213.47
Total university expenditures (\$ mil)	\$2,188.53	\$498.60	\$1,954.10	\$4,641.23
Research spending share of total expenditure	24.9%	9.3%	31.8%	26.1%

Sources: ASU; NAU; UA

ECONOMIC IMPACTS OF RESEARCH EXPENDITURES

The Enterprise’s research expenditures include spending for personnel salaries and benefits as well as spending on equipment, supplies, contracts, and other spending. This spending impacts the region’s and the state’s economy. That spending, in turn, drives other economic activity in the state. In total, the statewide economic impact of the research expenditures of the Arizona Public University Enterprise

exceed \$2.0 billion dollars. The following table illustrates the overall economic output in the state as a result of the Enterprise’s research expenditures by category – direct and indirect & induced.

In total, the statewide economic impact of the research expenditures of the Arizona Public University Enterprise exceed \$2.0 billion dollars.

ECONOMIC IMPACT OF RESEARCH EXPENDITURES

ARIZONA PUBLIC UNIVERSITY ENTERPRISE IMPACT
(Fiscal Year 2017) (\$ mil)

Economic Output	Arizona State University	Northern Arizona University	University of Arizona	Total
Direct	\$545.0	\$46.3	\$622.2	\$1,213.5
Indirect & Induced	\$341.5	\$44.0	\$444.5	\$830.1
Total	\$886.5	\$90.3	\$1,066.7	\$2,043.5

Sources: ASU; NAU; UA



The economic impacts of the research spending illustrated in the preceding tables are relatively short-term and occur simultaneously with the actual research activity.

The described impacts represent the estimated share generated from research activities of the total impacts listed in Section 3.0 of this report. That is, the estimated impacts from research spending activities are not in addition to the total impacts, but instead, the figures represent research spending's estimated share of total impacts.



OTHER IMPACTS OF UNIVERSITY RESEARCH

Beyond the calculated benefits of the Enterprise's research expenditures described above, major research universities have other important impacts on their regional and state economies. These include their substantial impact on the regional workforce and regional human capital. By producing highly skilled graduates for the regional and state economies, research universities contribute to ensuring an adequate supply of qualified employees for the growth and expansion of the existing regional and state employers and for new and relocating businesses. For large universities, this is likely the most significant impact on the regional and state economies.

Large, sophisticated, research universities also benefit the regional economy through the outcomes and processes of their research. Through their findings and activities, especially when in collaboration with key regional industries, these universities perform an important knowledge transfer to key regional industries.

The free movement of ideas, innovations, and findings back and forth between regional industries and research universities facilitates the efficient transfer of research findings to those regional industries. The resulting increase in the productivity of those industries stimulates local economic growth

and development. These exchanges are far more valuable when the research areas are relevant to economically important regional and state industries and where is strong, joint collaboration.

Finally, some university research activities may produce spinoff start-ups and entrepreneurial ventures as a result of the research findings.



Due to their larger scale and, frequently, greater breadth of research areas, Research 1 universities can have a more significant impact on their regional and state economies.

All of these impacts – workforce enhancement, knowledge transfer, and spinoff – unlike the impacts resulting from the immediate impacts of the research spending, tend to be long-term impacts.



CHARACTERISTICS OF ARIZONA'S PUBLIC UNIVERSITIES AS AN INDUSTRY

The Arizona Public University Enterprise and the businesses whose operations are supported by it effectively form substantial and vibrant “industry”. Arizona’s public universities creates thousands of jobs, billions of dollars of economic activity, and hundreds of millions of dollars of state and local tax revenue.



Some of the special characteristics of the economic activity supported by the public universities of the state and related activities are as important as their size and scope of the economic and fiscal impacts in Arizona.

It is important to reiterate the discussion of organizations and economic activities excluded from this analysis. The analysis sought to consistently, but narrowly, define the impacts of the universities. A variety of university-related activities throughout Arizona were reviewed and excluded from this effort. For example, the analysis did not include the ongoing earnings of graduates, nor the impact of start-ups companies resulting from technology transfers from the universities. The exclusion of these earnings and businesses should not be interpreted as reflecting any diminishment of their importance or their positive contribution to the State’s economy.



Consequently, the impacts documented in this effort represent a conservative analysis of total university-related spending in Arizona. Even so, the economic and fiscal impacts determined through this study demonstrate the substantial and impressive impact that Arizona’s universities have on the State’s economy. The size and breadth of the employment and tax revenues produced compare very favorably with a variety of other industries and major employers in the State.



The jobs created and supported by Arizona's universities industry are an especially valuable part of Arizona's economy because they are largely unaffected by routine economic cycles. Unlike many other Arizona industries and businesses, university operations in the state do not contract substantially during economic slowdowns or recessions (nor do they increase dramatically during economic expansions). Similarly, the tax revenues generated in Arizona by the employees at the universities and in the businesses supported by those operations remain relatively constant throughout all phases of the normal economic cycle. The stability of employment and tax revenues produced by the

university related activities adds substantially to their value as a component of Arizona's economy.

The State's universities have provided a stable and reliable component of the economy as Arizona's economy has developed and diversified from the traditional "Five C's", with the development of more high tech employment, the expanded tourism industry, and other industrial shifts. As Arizona's economy continues to grow and diversify, the public universities will continue to be an important and positive contributor to the state's economic vitality.



COMPARISON OF STATEWIDE EMPLOYMENT

In order to provide a reasonable framework to evaluate the magnitude of the impacts of the Arizona Public University Enterprise Arizona, employment statistics from several sources for a variety of employers and industries within the state can be used to illustrate their general, comparative magnitude. Among the information reviewed were the findings of the Cluster Mapping Project of the Institute for Strategy and Competitiveness at the Harvard Business School and two surveys of top employers completed and published by The Arizona Republic and the Phoenix Business Journal.

The Institute for Strategy and Competitiveness describes a “cluster” as a “geographically proximate group of interconnected companies and associated institutions in a particular field, including product producers, service providers, suppliers, universities, and trade associations.” The Cluster Mapping Project separates industries into clusters. These clusters are divided between “traded” and “local” based on the degree of industry dispersion across geographic areas. Local industries are those present in most if not all geographic areas, are

evenly distributed, and hence primarily sell locally. Traded industries are those that are concentrated in a subset of geographic areas and sell to other regions and nations. Among traded industries, clusters are identified using the correlation of industry employment across geographic areas. The principle is that industries normally located together are those that are linked by some external economies. These industries, then, constitute a cluster.



The Arizona Republic conducts an annual survey of the largest private employers throughout Arizona and publishes its findings. The most relevant, complete survey was conducted in 2017. Phoenix Business Journal compiles a similar survey, but also includes large public employers. Their most relevant, complete survey was also conducted in 2017.

The table below illustrates the number of jobs created by Arizona Public University Enterprise both directly as well as in total (including indirect and induced impacts) in comparison to other major employers and traded industry clusters.



As illustrated below, the universities in Arizona directly provide 36,725 jobs and support a total of 84,355 jobs statewide. The 36,725 direct jobs at the three public universities would rank among the largest employers in the state.

The total number of jobs supported by Arizona's public universities exceeds the number of jobs in the financial services and insurance services industries and is almost as large as the hospitality and tourism industry as measured by the Cluster Mapping Project of the Institute for Strategy and Competitiveness at the Harvard Business School.

ARIZONA'S LARGEST TRADED INDUSTRY CLUSTERS

Business Services	246,271
Distribution and Electronic Commerce	91,696
Hospitality and Tourism	85,340
Arizona Public University Enterprise - Total	84,355
Financial Services	47,365
Insurance Services	43,687
Education and Knowledge Creation	42,013
Transportation and Logistics	40,283
Arizona Public University Enterprise - Direct	36,725
Aerospace Vehicles and Defense	22,838
Information Tech.& Analytical Instruments	19,557

Source: U.S. Cluster Mapping Project (<http://clustermapping.us/>), Institute for Strategy and Competitiveness, Harvard Business School. Data Sources (<http://clustermapping.us/content/data-sources-and-limitations>)

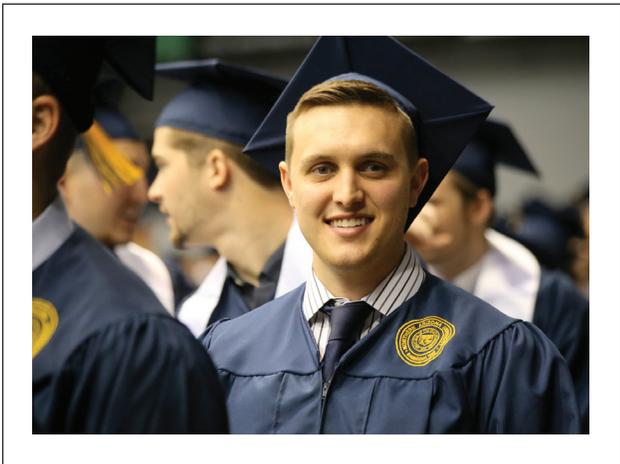
ARIZONA'S LARGEST EMPLOYERS

Banner Health ¹	43,128
State Of Arizona (x universities) ²	36,310
Walmart Stores ¹	33,910
Kroger Company ¹	21,248
Arizona State University	16,992
University of Arizona	15,056
McDonald's ¹	15,000
Wells Fargo & Co. ¹	15,000
Albertsons Companies ¹	14,490
City of Phoenix ²	13,776
Maricopa Count ²	12,939
HonorHealth ¹	11,500
Intel Corp. ¹	11,000
Northern Arizona University	4,677

Source1: Arizona Republic 100: State's Largest Employers, Russ Wiley, April 2017 **Source2:** Phoenix Business Journal Book of Lists December 2017

CONCLUSIONS

Arizona’s three public universities play a critical role in the Arizona’s economy. Most importantly each year these institutions graduate tens of thousands new entrants to Arizona’s workforce. Along with the other participants in the State’s post-secondary, higher educational institutions, the three public universities are the builders of Arizona’s current and future workforce. And, that workforce is the foundation of Arizona’s economic prosperity.

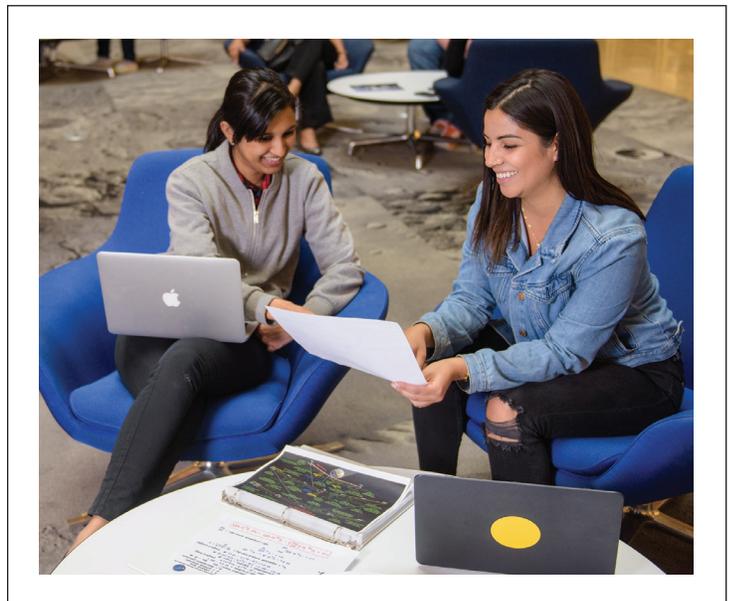


Spending by the three public universities is a significant contributor to the Arizona economy. Through their combined Direct, Indirect, and Induced economic impacts, the economic impacts generated by the universities in FY17 are estimated to generate 84,355 jobs with \$4.6 billion in wages, \$6.0 billion in value added and \$11.1 billion in economic output in the Arizona economy.

Within those totals, the economic impacts of research at the three public universities exceed \$2.0 billion dollars.

The incremental economic impact of the Arizona Public University Enterprise activities funded by out-of-state sources is estimated to have generated 31,760 jobs with \$1.7 billion in wages, \$2.2 billion in value added and \$3.8 billion in economic output in FY17. The associated incremental fiscal impact of the three public universities is estimated to be \$171.5 million for FY17. This includes net Primary revenues of \$69.5 million and net Secondary revenues of \$102.0 million.

Finally, University based research especially that undertaken in close collaboration with private businesses and industry, has facilitated much of the explosion of technological improvements in almost every conceivable aspect of modern life – from improved agriculture to modern high-tech devices that only a generation ago were only science fiction.





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